

OBSERVATIONS AND DISCUSSION

FAMILY PENTATOMIDAE LEACH

Diagnostic Characters: Third largest family in suborder Heteroptera, known as 'Shield bugs' or 'Stink bugs' because of the emission of a disagreeable pungent odour by means of a pair of scent glands which open in the region of the metacoxae, and 'Penataomids' because of distinct five segments in the antennae or may be because their body appears to have five parts. Generally, round, ovoid or elliptical in shape; head frequently clypeated; antennae with five segments (Four in Serbaninae and Cyrtocorinae, and some Discocephalinae, Eddesinae and Podopinae) inserted on the lower side of the head below the lateral margins; labium four jointed, inserted usually near the labrum towards the apex of head; scutellum more or less triangular, covering more than half of the abdomen or even entire in some (Subfamily Podopinae); three segmented tarsi (Two in Phyllocephalinae), one or a pair of trichobothria on or near spiracular line on each side of sterna 3-7.

Key to the studied subfamilies of family Pentatomidae

1. Labium thickened, not concealed between bucculae.... **Asopinae**
- Labium not thickened, concealed between bucculae.... 2
2. Scutellum reaching half way to abdomen or passing just slightly beyond it, but never reaching the apex; trichobothria paired; frena one-third or more length of scutellum; 1st labial segment longer or subequal to bucculae; tibiae sulcate on outer surface; membrane exposed..... **Pentatominae**
- Scutellum large and long, U-shaped, almost reaching the apex of abdomen; trichobothria single; frena short, less than one-third scutellar margin length; 1st labial segment shorter than bucculae; tibiae not sulcate on outer surface; membrane covered with scutellum..... **Podopinae**

SUBFAMILY – ASOPINAE AMYOT AND SERVILLE

Diagnosis: Antennae five segmented; basal joint very short, not passing the apex of head; labium crassate adapted for predation, long passing or reaching the intermediate

coxae, very robust, inserted at labrum; anterior tibiae usually with a small spine on the inner surface, frequently obscure and sometimes obsolete.

Key to the studied genera of subfamily Asopinae

1. Humeral angles of pronotum moderately or strongly produced beyond the costal margins of corium..... 2
 - Humeral angles not produced..... ***Perillus* Stal**
2. Base of scutellum with conspicuous gibbosities and tubercles..... ***Cazira* Amyot and Serville**
 - Base of scutellum without any conspicuous gibbosities and tubercles..... 3
3. Head broad, scutellum as long as broad at base; males lack glandular patches of hairs on abdominal venter; abdominal base practically without any spine..... ***Picromerus* Amyot and Serville**
 - Head narrow, much longer than broad, scutellum longer than broad at base; males with glandular patches of hairs on abdominal venter; humeral angles strongly produced..... 4
4. Anterior femora unarmed; abdomen at base with a tubercle; preocular distance longer than posterior of head including eyes..... ***Andrallus* Bergroth**
 - Anterior femora with a prominent spine; abdomen at base with a distinct spine; preocular distance smaller than or subequal to length of posterior head including eyes... ***Eocanthecona* Bergroth**

GENUS *PERILLUS* STÅL

Perillus, Stål (1862) *Stettin. ent. Ztg.*, **23**(1): p. 88.

Mineus, Stal (1867) *Öfv. Vet.-Ak. Förh.*, p. 498.

Gordonerius, Distant (1887) *Tr. E. S.*, p. 343.

Perilloides, Schouteden (1907b) *Genera Insectorum Fasc.*, **52**: p. 37.

Perillus, Knight (1952) *Ann. Entomol. Soc. Am.*, **45**: p. 229.

Type species: *Asopus confluens* Herrich-Schaeffer

Diagnosis: Labium crassate, reaching mesocoxae; segment II longer, III shortest. III and IV combined longer than or equal to II; bucculae closed behind; paraclypei and clypeus subequal in length; anterolateral pronotal margin obtuse, rectilinear in dorsal view; humeri not produced; frenal margin of scutellum slightly longer than postfrenal part; scutellar apex about as wide as corium; scent gland osteolar peritreme flat extending about half way to metapleural margin; base of abdomen with short, stout forwardly directed tubercle; prefemora armed with preapical tubercle; protibiae prismatic; males with pair of glandular patches of silky hairs on abdominal venter.

Remarks: The genus was proposed by Stål (1862) based on type species *Asopus confluens* Herrich-Schaeffer. It is represented by 6 predatory species from the world viz., *Perillus bioculatus*, *Perillus circumcinctus*, *Perillus confluens*, *Perillus exaptus*, *Perillus lunatus* and *Perillus splendidus*. Members are exclusively predaceous and are used as biological control agents in fields especially for lepidopteran larvae.

***Perillus bioculatus* (Fabricius)**
(Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)

Cimex bioculatus, Fabricius (1775) *Syst. Ent.*, p. 715.

Pentatoma clanda, Say (1825) *J. Acad. Nat. Sci. Phila.*, **4**: p. 312.

Perillus claudus, (sic) Uhler (1876) *Bull. Geol. & Geogr. Surv. Terr.*, **1**: p. 281.

Oplomus virgatus, Stål (1862) *Stett. Entomol. Zeit.*, **23**: p. 89.

Perillus bioculatus, Stal (1872) *Kongl. Svensk. Vetén.-Akad. Handl.*, **10**: p. 129.

Mineus bioculatus, Uhler (1886) *Brooklyn Entomol. Soc.* New York: p. 4.

Perriloides bioculatus, Schouteden (1907b) *Genera Insectorum Fasc.*, **52**: p. 37.

Perillus bioculatus var. *claudus*, Caesar (1912) *Annu. Rpt. Entomol. Soc. Ontario.*, **42**: p. 33.

Perillus bioculatus: Knight (1952) *Ann. Entomol. Soc. Am.*, **45**: p. 229.

MALE:

Measurements (mm): Head length: 1.80; width across eyes: 2.09; interocular space: 1.20; interocellar space: 0.70; preocular distance: 0.80; length of posterior head including eyes: 1.0; antennal segments lengths: I: 0.40, II: 1.0, III: 1.02, IV: 1.10, V: 1.10; pronotal length: 3.04; width across humeral angles: 6.40; scutellar length: 4.0; width: 4.25; length of abdomen: 4.50; maximum width of abdomen: 5.94; length of

rostral segments: I: 0.92, II: 1.10, III: 0.50, IV: 0.60; Distance - base scutellum-apex clavus: 2.30, apex clavus-apex scutellum: 1.70, apex scutellum-apex abdomen including membrane: 2.80; total body length: 10.50; length of abdominal spine : 0.80.

Dorsal Coloration: Head pitch black, punctured with black; eyes dark brownish; ocelli dark red; area just before and posterior end of head impunctate; antennae black; pronotum sparingly punctate, bicolorous with anterior three-fourth portion reddish, rest black; anterior pronotal area with two centrally broken broad transverse black punctate callosities; scutellum reddish except medial Y-shaped black fascia not reaching extreme ends, lateral margins of scutellum, clavus and corium black and finely punctured; anterior most area of costal margin reddish, rest black; membrane black; connexiva with lateral margins and last segment impunctate and reddish, inner margins black and punctate.

Ventral Coloration: Labium, ventral area of head, lateral area of sternum, metathoracic scent gland peritreme, area between thoracic legs black; pleural margins reddish, except ventroposterior area of prosternum with incomplete brownish yellow transverse fascia reaching just half way towards pleural margin; abdominal tubercle reddish; abdomen reddish with broad continuous fascia on entire Vth, VIth and anterior half of VIIth abdominal segments. IVth segment with two large fascia on lateral sides and small on mediolateral sides; spiracles black; legs black and pubescent.

STRUCTURE:

Head (Fig. 2): Head broader than long, rugulose with irregular callosities, strongly declivent, rectilinear at apex; paraclypeus and clypeus equal in length, lateral margins of former slightly sinuous above eyes, reflexed upwards, clypeus slightly raised medially; antennal length formula: I<II<III<IV=V; labium robust reaching mesocoxae, IIIrd segment smallest and broad, labial length formula: III<IV<I<II.

Thorax: Pronotum (Fig. 3) deflected downwards, distinctly broader than long, anterior margin concave, depressed, truncate behind eyes, produced into small obtuse tubercles, directed anterolaterad; anterolateral margins slightly crenulated, smooth, sinuous medially; humeral angles subprominent, obtusely angulated; scutellum as long as broad; frenal region slightly longer than post frenal, beyond frena, margins slightly sinuous produced as long narrow apical impunctate lobe; metathoracic scent gland osteoar peritreme (Fig. 4) broad, concave medially, curved and rounded at apex,

reaching halfway to metapleural margin; evaporatorium completely surrounding peritreme with narrow strip like anterior margin; legs with protibia flattened with antepical small tubercle; prefemora with broad and blunt antepical tubercle; **Abdomen:** Venter moderately ampliate; abdominal tubercle arising from base of IIIrd abdominal segment reaching metacoxae in opposition to labium; connexiva exposed at repose dorsally, not ventrally; ventroanterior and ventroposterior margins of abdominal sternite VII medially concave, somewhat an inverted U-shaped (Fig. 5); hemelytral membrane passing beyond the apex of abdomen.

FEMALE:

Measurements (mm): Head length: 1.80; width across eyes: 2.09; interocular space: 1.20; interocellar space: 0.75; preocular distance: 0.80; length of posterior head including eyes: 1.0; antennal segments lengths: I 0.40, II 0.90, III 1.05, IV 1.15, V 1.15; pronotal length: 3.4; width across humeral angles: 6.40; scutellar length: 4.0; width: 4.25; length of abdomen: 4.80; maximum width of abdomen: 5.94; ; length of abdominal spine: 0.80; length of rostral segments: I 1.0, II 1.10, III 0.50, IV 0.60; Distance - base scutellum-apex clavus: 2.12, apex clavus-apex scutellum: 1.88, apex scutellum-apex abdomen including membrane: 3.20; total body length: 10.50.

Coloration and Structure: Dorsal coloration is similar to males except some variation on ventral surface: abdomen reddish with double series of black fascia from segments II to VI; broad continuous black fascial spot on anterior margin of VII abdominal segment, punctate; genital capsule black with golden pubescence; legs black except large yellow patch on metatibia, smaller in mesotibia; without any structural modification; ventroanterior and ventroposterior margins of abdominal sternite VII medially concave, somewhat an inverted U-shaped (Fig. 6).

Male Genitalia: Pygophore (Fig. 9) broader than long, lateral margins sinuous; dorsolateral lobes narrow and slightly curved on inner side; ventroposterior margin irregularly sinuous; paramere (Fig. 10) with short and broad stem, broad blade, squarish at one end, with distinct subacute spine at other end; aedeagus (Fig. 11, 12) with theca oval and spinosely produced with a pair of sclerotized thecal appendages, directed anteriorly; conjunctiva with a pair of dorsolateral membranous conjunctival

appendages and a mediodorsal conjunctival appendage; vesica long but not passing beyond thecal appendages.

Female Genitalia: 1st gonocoxae triangular, outer margin convex, slightly sinuous and irregular on posterior margin; 8th paratergites broadly triangular, subrounded at outer margins; 9th paratergites narrowed at apex, distinctly shorter than posterior margin of fused 8th paratergites (Fig. 7); spermatheca (Fig. 8) with distinct distal and proximal flanges; pump region membranous, short; spermathecal bulb longer than broad, somewhat rectangular with subrounded margins; proximal spermathecal duct 2X longer than distal spermathecal duct.

Population Variation: Coloration on pronotum, scutellum and connexival margins varies from reddish to pale yellowish red or bright brownish yellow to paler; posterior area of pronotum blackish to chocolate brown; thickness of punctures varies in density; lateral areas of sternum pitch black in red specimens, brownish yellow in paler specimens; maculate fascia on lateral sides of abdomen irregular; legs pitch black to brownish yellow, with reddish tinge in some.

Material Examined:

Punjab: Hoshiarpur, 17. viii. 2009 - 24♀♀, 15♂♂, 11. iv. 2010 - 1♀; Pathankot, 20. viii. 2009 - 17♀♀, 13♂♂; Tarantaran, 8. iv. 2010 - 3♀♀, 1♂; Gurdaspur, 10 .iv. 2010 - 1♀, 2♂♂; Ropar, 6. viii. 2010 - 5♀♀, 6♂♂; Patiala, 1. x. 2010 - 1♀, 1♂.

Himachal Pradesh: Nagwain, 22. vii. 2010 - 1♀, 5♂♂; Mandi, 23. vii. 2010 - 1♀, 4♂♂.

Distribution: Czechoslovakia; France; Germany; Russia; Yugoslavia; India (Punjab, Himachal Pradesh).

Remarks: It is commonly known as a two spotted stink bug. An American species, *Perillus bioculatus* (Fabricius) was introduced in Europe as a biological control agent to control Colorado Potato Beetle (*Leptinotarsa decemlineata* Say), occurring throughout the Northwest and is also predaceous on the larvae of *Crioceris asparagi*, *Lema trilineata*, *Trichoplusia ni*, *Disonycha xanthomelaena* and *Trirhabda canadensis*. This species shows distinct colour polymorphism ranging from red, yellow, white and black. Studies have proved that the food of this bug consists of the eggs and larvae of the potato beetle as well as the adult beetle itself, which is

responsible for its colour variations. Carotin has also been proved to be one of the reasons for the red and yellow color patterns in the hypodermis of this stink-bug.

GENUS CAZIRA AMYOT AND SERVILLE

Cazira, Amyot and Serville (1843) *Hem.*, p. 78.

Type species – *Cazira verrucosa* Westwood

Diagnosis: Body somewhat short and stout; head somewhat long, lobes about equal in length, their apices obscurely lobate; lateral margins sinuate; antennae five-jointed, the basal joint not reaching apex of head; pronotum strongly rugose, the lateral margins broadly sinuate, anterior angles obscurely spinous, lateral angles spinously produced; scutellum gibbous and lobately tuberculous at base, longer than broad at base, its apex subtruncate; corium more or less rugulose; membrane extending considerably beyond the apex of abdomen; abdomen with a distinct abdominal spine about reaching the posterior coxae; anterior tibiae strongly dilated, femora with a prominent spine before apex.

Remarks: This genus is represented by 24 species from the Oriental region, out of which 9 species have been recorded from India. The members belonging to this genus are characterized by having anterior tibiae strongly dilated, femora with a anteapical spine and rugose body.

***Cazira verrucosa* (Westwood) (Figs. 13, 14, 15, 16, 17, 18, 19, 20, 21)**

Pentatoma verrucosa, Westwood (1835) *Zool. Journ.*, **5**: p. 445.

Asopus verrucifer, Burmeister (1835) *Handb.*, **2**: p. 380.

Cazira verrucosa: Dallas (1851) *List. Hem.*, **1**: p. 82.

MALE:

Measurements (mm): Head length: 1.65; width across eyes: 1.75; interocular space: 0.95; interocellar space: 0.50; preocular distance: 0.75; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.40, II: 0.90, III: 1.0, IV: 1.20, V: 1.40; pronotal length: 2.88; width across humeral angles: 5.94; scutellar length: 4.0; scutellar width: 3.75; length of abdomen: 3.50; maximum width of abdomen: 5.28; length of abdominal spine: 0.30; length of rostral segments: I: 0.70, II: 1.10, III: 0.55, IV: 0.60; Distance - base scutellum-apex clavus: 2.16; apex clavus-apex scutellum:

1.84; apex scutellum-apex abdomen including membrane: 2.88; total body length: 10.20.

Dorsal Coloration: Head brownish yellow, two levigate yellow spots just before eyes; eyes black; ocelli reddish bordered with black; antennae brownish yellow, apical two segments darker; pronotum brownish yellow, thickly punctured, with irregular pale rugosities; humeral angles paler; scutellum anteriorly reddish black, brownish yellow posteriorly, with dark brown punctures; clavus, corium and costa brownish yellow, scarcely punctate; a maculate black spot on posterolateral margin of corium, anteriormost portion of costa levigate, pale; hemelytral membrane translucent.

Ventral Coloration: Labium brownish yellow, apex black; head with lateral margin brownish yellow, posterior pale, levigate; sternum brownish yellow, with admixture of brown black suffusions, brownly punctate; area between pro and meso legs impunctate, black, meso and meta legs brownish yellow, pilosed; metathoracic scent gland opening dark brown at base, pale apex, evaporatorium brownish; abdominal spine pale; abdomen pale yellow with brown suffusions, medial area of III and IV segment black with flousoscent tinge; lateral area with dense brown punctures, lateral area of abdominal sternite VI with green tinge; genital capsule brownish yellow; ventroanterior margin and lateral margin of abdominal segment VII with two black spots; connexiva with anteriormost portion blackish, rest brownish yellow; legs brownish, annulated with pale yellow, tarsi darker, spines on legs pale.

STRUCTURE:

Head (Fig. 14): Head declivent; paraclypei slightly longer than clypeus, lateral margins of former strongly sinuous above eyes, slightly reflexed downwards, obscurely lobulate at apices; clypeus slightly raised medially; antennal segmental formula – I<II<III<IV<V; labium with 1st segment robust, labial lengths formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 15) distinctly tessellately rugulose, moderately deflected; anterior pronotal margin concave, truncate behind eyes spinosed anterolaterad; anterolateral margins finely serrated, sinuous medially, humeral angles produced into small obtuse angles, somewhat bifurcated; scutellum triangular, notched at apex, rugose with a pair of large raised tuberculate gibbosities and additional pair of small lateral gibbosities at each basal scutellar angle; metathoracic scent gland osteolar peritreme (Fig. 16) moderately long, blade like, rounded at apex

reaching half way to metapleural margin; evaporatorium broad, well developed, covering more than half sternite; anterior tibia dilated, femora with prominent spine before apex; abdomen with basal spine reaching in apposition to metacoxae. **Abdomen:** Lateral margins of abdomen somewhat raised and thickened; connexiva not exposed at repose; ventroanterior margin of abdominal sternite VII concave medially, giving shape of inverted V-shaped, with subrounded connexival posterior angles (Fig. 17); hemelytral membrane passing much beyond the apex of abdomen; genital capsule pilosed.

Male Genitalia: Pygophore (Fig. 18) distinctly broader than long; dorsomedial surface concave; dorsal opening short, inverted V-shaped; dorsolateral lobes narrowed at apex, beset with strong spines; ventroposterior margin concave; paramere (Fig. 19) with a short stem, blade broadly truncated at apex, inner margin with small lobe like ridge near apex; aedeagus (Fig. 20, 21) with a somewhat heart shaped theca, with a pair of sclerotized acutely spined thecal appendages, directed distally; a pair of elongated bag like dorsolateral membranous conjunctival appendages, a reduced median dorsal conjunctival appendage and a sclerotized basally fused, apically bifurcated medial penial lobes; vesica short and thin, not reaching margin of membranous appendages.

Population Variation: Single specimen studied.

Material Examined:

Himachal Pradesh: Solan, 13. x. 2011 - 1♂

Distribution: India (Sikkim, Meghalaya, Nagaland, Paschim Banga, Himachal Pradesh).

Remarks: It is an Asopine predatory form, characterized by presence of short spine on abdominal base, profemora with couple of antepical spines and males with a pair of pilosed glandular patches. It is a new record from North India, earlier known from the Eastern states only.

GENUS *PICROMERUS* AMYOT AND SERVILLE

Picromerus, Amyot and Serville (1843) *Hem.*, p. 84.

Type species - *Picromerus bidens* Linnaeus, a Palearctic species.

Diagnosis: This genus is to be distinguished from the two preceding ones by the abdomen being practically unarmed at base, or having the 2nd segment produced in a short obtuse tubercle; the lateral lobes of the head are scarcely longer than the central and do not meet beyond it; the pronotum is also distinctly elongate and narrowed anteriorly, much longer than its width at anterior margin; the anterior tibiae are not dilated; anterior femora prominently spined before apex; anterior tibiae distinctly spined on inner margin.

Remarks: The genus was proposed on the basis of type species *P. bidens*, Linnaeus, which is a Palaearctic species. It is represented by 10 species from the World. Members of this genus closely resemble those of *Andrallus* in general appearance of body form, but can be easily separated from it in having outer margin of corium concolorous with rest of corium, abdominal venter without glandular patches in males, in comparison to calloused costal margin and glandular patches in *Andrallus* Bergroth. The members are well distributed in the Palaearctic and Oriental regions.

***Picromerus obtusus* (Walker)**
(Figs. 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33)

Picromerus obtusus, Walker (1867) *Cat. Het.*, 1: p. 133.

Picromerus nigrivitta, Walker (1867) *loc. cit.*

Picromerus obtusus: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 252.

MALE:

Measurements (mm): Head length: 2.10; width across eyes: 2.30; interocular space: 1.30; interocellar space: 0.90; preocular distance: 1.20; length of posterior head including eyes: 0.88; antennal segments lengths: I: 0.40, II: 1.50, III: 1.50, IV: 1.85, V: 1.70; pronotal length: 3.20; width across humeral angles: 7.50; scutellar length: 4.25; scutellar width: 4.25; length of abdomen: 5.28; maximum width of abdomen: 6.10; length of rostral segments: I: 1.10, II: 1.40, III: 1.05, IV: 1.10; Distance - base scutellum-apex clavus: 3.25; apex clavus-apex scutellum: 1.0; apex scutellum-apex abdomen including membrane: 2.88; total body length: 12.0.

Dorsal Coloration: Head finely pilosed laterally, brownish yellow, with thick black punctures, with metallic tinge of bronzy black, except narrow posterior area and two spots just below eyes levigate and impunctate; eyes black, outer margin brownish yellow; ocelli red; antennae brownish yellow with reddish tinge, except apices of 3rd,

4th and 5th black; pronotum brownish yellow, thickly punctate with black, more pronounced on anterior and angulated area; anterior area with two transverse brownish callosities; an obscure central longitudinal pale brownish yellow fascia; humeral angles shining brown with bronzy black punctures; scutellum brownish yellow, uniformly punctured, two small impunctate spots at each basal angle, basal margins black; clavus and corium slightly opaque, sparingly punctured; costa somewhat rugulose, anteriormost portion pale; connexiva brownish yellow, thickly punctured with bronzy black, anterior one third margin of each segment black; hemelytral membrane brownish, veins darker.

Ventral Coloration: Labium brownish yellow, apical segment black, with reddish tinge; legs dark brownish yellow, freckled with coarse black punctures, apex and base of tibiae, entire tarsi black; head pale yellowish brown, punctured, lateral areas shining black with metallic bronze punctures; lateral areas of sternum dark yellowish brown, with thick black punctures and few pale rugosities; abdomen darker, with dark brown punctures, central broad longitudinal fascia extending from IV abdominal segment and narrowing upto VII, few obscure irregular fascia on lateral area and spiracles black; transverse line to each spiracle brown; lateral area of abdomen strongly rugulose; posterior connexival angles pale brownish yellow; legs brownish yellow, femora with red tinge and black spots, apex and base of tibiae black; genital capsule dark brownish yellow, finely punctured.

STRUCTURE:

Head (Fig. 23): Head moderately deflected, somewhat truncate at apex; paraclypeal lobes as long as clypeus, slightly sinuate above eyes, anterolaterally reflexed upwards, rounded at apex; inner margins of clypeus parallel; antennae moderately long, antennal segmental formula – I<II=III<V<IV; labium robust, apex slightly slender, reaching metacoxae, labial lengths formula – III<I=IV<II. **Thorax:** Pronotum (Fig. 24) much longer, anteriorly deflected, slightly elevated posteriad; anterior pronotal margins subequal to width across eyes, truncate behind eyes; lateral margins crenulated, humeral angles bidentately produced, spines blunt with anterior spine longer; scutellum slightly raised medially, frenal region distinctly greater than post frenal, beyond frena scutellum narrowed into subrounded apical lobe; connexiva exposed at repose; metathoracic scent gland osteolar peritreme (Fig. 25) narrowed, broad medially, slightly curved at apex, reaching less than half way to metapleural

margin; evaporatorium just covering peritreme; legs strongly pilosed, profemora with prominent spine before apex, anterior tibiae with anteapical spine on inner margin. **Abdomen:** slightly ampliate; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped, subrounded at posterior angles (Fig. 26); hemelytral membrane passing much beyond abdominal apex; abdominal base with obscure tuberculate prominence arising from base of abdominal segment II.

FEMALE:

Measurements (mm):Head length: 2.60; width across eyes: 2.80; interocular space: 1.60; interocellar space: 1.0; preocular distance: 1.44; length of posterior head including eyes: 1.44; antennal segments lengths: I: 0.40, II: 1.60, III: 1.60, IV: 1.85, V: 1.70; pronotal length: 4.25; width across humeral angles: 8.50; scutellar length: 5.0; scutellar width: 5.0; length of abdomen: 7.25; maximum width of abdomen: 8.0; length of rostral segments: I: 1.20, II: 1.60, III: 1.10, IV: 1.20; Distance - base scutellum-apex clavus: 3.0; apex clavus-apex scutellum: 2.0; apex scutellum-apex abdomen including membrane: 3.625; total body length: 5.0.

Coloration and Structure: Coloration and morphology of female is similar to male except, ventroanterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped, subrounded at posterior angles and ventroposterior margin somewhat subsquarish medially (Fig. 27).

Male Genitalia: Pygophore (Fig. 30) as long as broad, somewhat cup shaped, lateral margins convex; dorsolateral lobes not prominent; dorsomedial surface concave, V-shaped; dorsal opening broad, inverted U-shaped; ventroposterior margin invaginated medially, sinuously convex laterally; paramere (Fig. 31) sickle shaped, with very short stem, elongated blade with broad base, apex acute, slightly curved downwards, inner margin strongly concave with a small thumb like process; aedeagus (Fig. 32, 33) with theca shorter and narrower than thecal shield with a pair of sclerotized penial lobes that are basally fused and U-shaped; vesica short, not passing beyond margins of dorsolateral membranous conjunctival appendages; ejaculatory reservoir smaller.

Female Genitalia: 1st gonocoxae triangular, posterior margins convex, acute at apices; 2nd gonocoxae with posterior margins convex; 8th paratergites small, triangular; 9th paratergites elongate lobe like, broadly rounded at apices, almost

reaching fused posterior margin of 8th paratergites (Fig. 28); spermatheca (Fig. 29) with distinct proximal and distal flanges; pump region narrow, tube like, slightly broad proximally, subequal to distal proximal duct; bulb oblong, well defined; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Humeral angles black; coloration of entire body dorsally and ventrally vary from being darker to more pale; scutellum may show distinct dense punctation of dark brown to even black; punctation on head, pronotum and abdomen vary; longitudinal fascial line on abdominal venter may be well developed or even reduced as a streak; legs show prominent variation of punctations on tibiae and tarsi, posterior femora thickened in some.

Material Examined:

Himachal Pradesh: Hamirpur, 21. x. 2010 - 1♂ ; Solan, 13. x. 2011 - 4♀♀ ; Shimla, 14. x. 2011 - 2♀♀.

Distribution: India (Himachal Pradesh, Sikkim, Uttar Pradesh, Nagaland).

Remarks: *Picromerus obusus* (Walker) is characterized in having a pair of sclerotized penial lobes that are basally fused as U-shaped; paramere wedge shaped with a small thumb like process and spermatheca with indistinct distal and proximal flanges. It has been reported as a minor pest of *Mangifera indica* from Uttar Pradesh, India and is usually found on *Lantana camara* (Navratan Plant). It is a new record from North India.

GENUS *ANDRALLUS* STÅL

Audinetia, Ellenr. (1862) *Nat. Tijdschr. Nederl. Ind.*, **24**: p. 136
Andrallus, Bergroth (1906) *Ann. Soc. Ent. Belg.*, **49**: p. 370

Type species – *Audentia spinidens* Fabricius

Diagnosis: Body elongate; head somewhat long, lateral lobes very slightly longer than the central; pronotum deflected anteriorly, convex at basal area, anterior lateral margins not denticulate, obsoletely crenulate, lateral angles produced in straight subacute spines, notched behind before apex; scutellum moderately long and slender; corium with the lateral margin obliquely straight; femora unarmed; ventral spine short and blunt.

Remarks: The genus was proposed by Bergroth (1906) to replace the existing preoccupied generic name *Audinetia* Eller that includes predatory forms. It is widely distributed throughout the Neotropical, Ethiopian, Oriental, Australian and Palaearctic regions. It is represented by a single species from India as provided in Distant (1902).

***Andrallus spinidens* (Fabricius)**
(Figs. 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45)

Cimex spinidens, Fabricius (1787) *Mant. Inst.*, **2**: p. 285.
Asopus geometricus, Burmeister (1835) *Handb.*, **2**: p. 380.
Pentatoma alienna, Westwood (1837) *Hope cat. Hem.*, **1**: p. 40.
Arma geometricus, Dallas (1849) *Tran.ent. Soc.*, **5**: p. 187.
Picromerus spinidens, Dallas (1851) *List Hem.*, **1**: p. 95.
Audinetia aculeata, Ellenr (1862) *Nat. Tijdschr. Nederl. Ind.*, **24**: p. 137.
Arma spinidens, Vollenhoven (1868) *Faun. Ind. Neerl.*, **3**: p. 10.
Audinetia spinidens, Stål (1868) *Hem. Fabr.*, **7**(11): p. 16.
Andrallus spinidens: Bergroth (1906) *Ann. Soc. Ent. Belg.*, **49**: p. 370.

MALE:

Measurements (mm): Head length: 2.0; width across eyes: 1.70; interocular space: 1.50; interocellar space: 0.75; preocular distance: 1.10; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.30, II: 1.40, III: 1.20, IV: 1.70, V: 1.40; pronotal length: 3.04; width across humeral angles: 7.50; scutellar length: 5.0; scutellar width: 4.0; length of abdomen: 5.61; maximum width of abdomen: 5.36; length of rostral segments: I: 0.90, II: 1.30, III: 0.90, IV: 0.95; Distance - base scutellum-apex clavus: 3.60; apex clavus-apex scutellum: 1.40; apex scutellum-apex abdomen including membrane: 4.75; total body length: 14.06.

Dorsal Coloration: Head brownish yellow, thickly punctured with black, except for one third lateral area above eyes less punctate; eyes blackish with red tinge; ocelli pinkish; 1st, 2nd and basal half 3rd antennal segments yellowish brown, apical half of 3rd blackish brown, bases of 4th and 5th yellowish brown, rest black; pronotum bicolorous, apical portion brownish yellow punctured with dark brown, posterior portion with black fascia and black punctures; a broad brownish yellow levigate uneven line, not exactly reaching apices of pronotal angles, humeral angles black, thickly punctured, anterior area with two brown transverse callosities; scutellum brownish yellow with dark brown punctures, a yellow line originating below center, opening into levigate impunctate scutellar apical lobe; clavus and corium brown, blackly punctured; costal margin yellow; hemelyteral membrane smoky brown; connexiva dorsally brown on outer edge, blackly punctate on inner margin broadly;

Ventral Coloration: Labium reddish brown, apex blackish; legs yellow with reddish fascia, tarsi black; metathoracic scent gland peritreme yellow, impunctate, surrounded with black fascia; area between legs yellowish black; lateral areas of sternum and connexiva brownish yellow with thick black punctures; abdomen reddish brown, with coarse black punctures; venter strongly pilose with golden hairs, especially on IV and V segments; a central broken fascial line and spiracles black with yellow border, transverse line between each spiracle and trichobothria black with green tinge.

STRUCTURE:

Body somewhat elongate with golden pubescence, more longer at the abdominal tip; **Head** (Fig. 35): Head distinctly broad, slightly deflected anteriorly, truncated at apex, paraclypeal lobes subequal to clypeus, latter slightly raised medially and flattened; paraclypeal lobes slightly sinuous above eyes and anterolaterally reflexed; antennal segmental formula: $I < III < II = V < IV$; labium stout, just reaching metacoxae, labial lengths formula – $I = III < IV < II$. **Thorax:** Pronotum (Fig. 36) with anterior margin equivalent to width across eyes, anterior angles produced as small tubercles, midanterolateral margins denticulate, humeral angles notched with subacute spines, posterior spine short and blunt, posterior angles subprominent, subrounded, posterior margin straight; scutellum distinctly longer, slightly sinuous beyond frena, opening into a subrounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 37) short, blade like reaching one 3rd distance to metapleural margin; evaporatorium discontinuous, reduced as a narrow strip behind opening; legs hairy, forefemora without prominent spine, foretibia with a small sized spine on antepical margin.

Abdomen: somewhat slightly convex, ventrolateral sides more flattened, lateral margins moderately thickened and produced into small acute connexival spines directed downwards; an irregular depressed thin line arising just above trichobothrial pair distinct; abdominal base without spine, but with a basal prominence; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subacute posterior angles (Fig. 38); genital capsule pubescent; membrane of hemelytra passing much beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 2.30; width across eyes: 2.0; interocular space: 1.50; interocellar space: 0.90; preocular distance: 1.50; length of posterior head

including eyes: 0.80; antennal segments lengths: I: 0.30, II: 1.50, III: 1.30, IV: 1.90, V: 1.50; pronotal length: 3.75; width across humeral angles: 9.25; scutellar length: 5.75; scutellar width: 4.62; length of abdomen: 7.50; maximum width of abdomen: 6.75; length of rostral segments: I: 1.30, II: 1.80, III: 1.30, IV: 1.15; Distance - base scutellum-apex clavus: 4.50; apex clavus-apex scutellum: 1.25; apex scutellum-apex abdomen including membrane: 4.50; total body length: 17.62.

Coloration and Structure: General body shape and coloration similar to males except few variations: scutellum opening into a subquadrate apical lobe; connexiva brownish black with metallic green tinge on inner margin; prefemora with anteapical minute tubercle, foretibiae armed with moderate spine before apex; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped (Fig. 39).

Male Genitalia: Pyophore (Fig. 42) distinctly broader than long, somewhat quadrate, lateral margins concavely sinuate, with well developed subprominent dorsolateral lobes, narrowed posteriad; dorsomedial surface broadly concave; dorsal opening distinctly large; ventroposterior margin sinuate; paramere (Fig. 43) somewhat wedge shaped, with short stem, blade acute and bent medially, with a small thumb like process near base on inner side; aedeagus (Fig. 44, 45) with small rounded theca, thecal shield longer and concave; conjunctiva with a single elongated median dorsal membranous conjunctival appendage, bifurcated apically; a pair of bag like dorsolateral membranous conjunctival appendages, sclerotized at tip; a pair of apically broad sclerotized medial penial lobes that are not fused basally; vesica short, not reaching margins of membranous appendages.

Female Genitalia: 1st gonocoaxe somewhat triangular, medially placed wide apart, posterior margins sinuate, apices acute; 2nd gonocoxae medially fused, posterior margin concave; 8th paratergites small, triangular, posterior margin sinuate; 9th paratergites broad, lobe like, rounded at apices, outer margin sinuate just reaching the fused posterior margins of 8th paratergites (Fig. 40); spermatheca (Fig. 41) with indistinct distal and proximal flanges; pump region distinctly short, subequal to distal spermathecal duct; bulb elongate egg shaped; medial dilation balloon like; posterior spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Coloration varies from being brownish yellow to pale or even darker. Similarly punctation on each part and green tinge varies in density and thickness from being brown, dark brown to even black punctures. Ventrally it may bear reddish tinge of variable densities to being paler. Central longitudinal line on pronotum may be continuous or broken in some, or even reduced as mere large black spots; transverse depressed line between spiracle and trichobothria with or without distinct metallic green tinge; pilosity in abdomen of males vary in being golden brown or silver and in thickness; membrane vary as being hyaline or with brown suffusions.

Material Examined:

Punjab: Hoshiarpur, 17. viii. 2009 - 1♀, 1♂; Pathankot, 20-22. viii. 2009 - 5♀♀, 4♂♂; Ropar, 6. viii. 2010 - 3♀♀

Himachal Pradesh: Bilaspur, 21. vii. 2010 - 2♂♂

Distribution: China; Taiwan; Japan; Phillipines; Sumatra; Indonesia; Indonesia; Vietnam; Borneo; New Guinea, Bangladesh; Fiji; Tahiti; Russia; Azerbaijan; Turkey; Iran; Syria; Ethiopia; Equatorial Guinea; Malawi; South Africa; Mozambique; Sudan; Zaire; Madagascar; Malaysia; Australia; North America; India (Punjab, Himachal Pradesh, Haryana).

Remarks: It has been recorded as a serious pest of rice in the Kangra Valley of Himachal Pradesh. Its nymphs and adults are known to feed on some lepidopteran larvae of *Pelopidas mathias* (F.), *Melanitis leda ismene* (Cram.), *Spodoptera litura* (F.), *S. mauritia* (Boisd.), *Eurema hecabe* (L.) (*Terias hecabe*) and *Mythimna separata* (Wlk.) in rice fields. Its other food plants include *Medicago sativum* and *Triticum vulgare*.

GENUS *EOCANTHECONA* Bergroth

Eocanthecona, Bergroth (1915) *Ann. Mag. Nat. Hist.*, **8**(15): 484.

Type species – *Cimex furcellata* Wolff

Diagnosis: Elongately-ovate; head rather flat, lobes about equal in length, margins concavely sinuate in front of eyes, antennae with the basal joint not nearly reaching apex of head; pronotum with the lateral margins sinuate, the anterior portion finely

crenulate, anterior angles slightly spinous, posterior angles spinously produced; scutellum longer than broad; anterior tibiae moderately or obsoletely dilated; anterior femora with a prominent spine before apex; metasternum elevated, mesosternum centrally carinate; abdomen armed with a short central basal spine.

Remarks: The genus is represented by 20 species from the world. Bergroth (1915) erected this genus for those species having a non-specialized metasternum where he included only two species *furcellata* Wolff and *eburnea* Distant that were earlier placed in genus *Canthecona*. This genus closely resembles *Andrallus* except lateral pronotal margins crenulate, abdomen base with a short spine, anterior femora with a prominent spine, paramere without any thumb like process on inner margin, thecal shield distinctly longer and strongly sclerotized and long medial penial lobes in male genitalia. Members of this genus are predatory in feeding behaviour.

***Eocanthecona furcellata* (Wolff)**
(Figs. 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57)

Cimex furcellatus, Wolff (1801) *Icones Cimicum descriptionibus illustratae Erlangae*, 5: p. 176.

Asopus armiger, Herr.-Schaff. (1844) *Wanz. Ins.*, 7: pp. 113 & 119.

Canthecona furcellata, Dallas (1851) *List Hem.*, 1: p. 91.

Cantheconidea furcellata, Schouteden (1907b) *Genera Insectorum Fasc.*, 52: p. 45.

Eocanthecona furcellata: Bergroth (1915) *Ann. Mag. Nat. Hist.*, 8(15): p. 484.

MALE:

Measurements (mm): Head length: 2.20; width across eyes: 1.90; interocular space: 1.10; interocellar space: 0.75; preocular distance: 0.90; length of posterior head including eyes: 1.30; antennal segments lengths: I: 0.30, II: 1.35, III: 1.45, IV: 1.60, V: 1.30; pronotal length: 3.20; width across humeral angles: 7.75; scutellar length: 4.50; scutellar width: 4.0; length of abdomen: 6.10; maximum width of abdomen: 5.94; length of rostral segments: I: 1.0, II: 1.30, III: 1.10, IV: 1.0; Distance - base scutellum-apex clavus: 3.0; apex clavus-apex scutellum: 1.50; apex scutellum-apex abdomen including membrane: 3.52; total body length: 13.50.

Dorsal Coloration: Head black, thickly punctured with metallic green tinge, central pale yellow fascial line bordering posterior margin and two uneven brownish yellow small patches just above the eyes; eyes reddish brown; ocelli red; 1st and 2nd antennal segments brownish, 3rd, 4th and 5th segments blackish, basal portions of 4th and 5th pale brownish yellow; pronotum brownish yellow, punctured with dark brown,

anterolateral margins pale brownish yellow, humeral angles bronzy black, broken transverse irregular pale brown yellow callosities surrounded with impunctate black on anterior pronotal margins, more or less distinct longitudinal fascia medially on anterior half; scutellum brownish yellow with bronzy black punctures, a large levigate yellow spot at each basal scutellar angle, apex less punctate; clavus and corium brownish yellow with bronzy black punctures and suffusions; costal margin of corium chocolate brown maculate punctations; membrane of hemelytra dark brown, pale suffusions on anterolateral areas; connexiva brownish yellow, alternating with basal subquadrate bronzy black patches at intersegmental sutures.

Ventral Coloration: Labium brownish yellow, apex reddish brown; lateral margin of head black, area between eyes pale brownish yellow and impunctate, area between prolegs blackish with metallic green tinge, between other thoracic legs yellow; legs yellow, freckled with reddish brown punctures; apices of femora, tibiae and tarsi black; basal abdominal spine pale; metathoracic scent gland peritreme brown with green tinge, and grey border; evaporatorium chocolate brown, with thick greenish punctures; lateral areas of sternum pale brownish yellow, punctured with metallic green and black; abdomen paler, punctured with brown medially, lateral area thickly punctured with black; connexiva pale, anterior and posterior margin blackly punctate; spiracles, a depressed black line below spiracle, a central oblong spot on abdominal segment VII black; genital capsule paler with blackish brown suffusions and pilosed with golden hairs.

STRUCTURE:

Body somewhat elongate, tapering narrowly at both ends. **Head** (Fig. 47): Head slightly deflected, anteriorly somewhat truncated apically, paraclypeal lobes and clypeus equal, latter flattened, slightly raised medially, paraclypeal lobes sinuous above eyes, slightly reflexed anterolaterally; antennal segmental formula – I<V<II<III<IV; labium moderately robust, just reaching 3rd abdominal segment, labial lengths formula – I=IV<III<II. **Thorax:** Pronotum (Fig. 48) with anterior margin concave, with anterior angles recurved outwardly as minute tubercles, anterolateral pronotal margins crenulated, humeral angles long, bidentate, posterior spine tuberculate, posterior margin straight, angles subacute; scutellum medially sulcate, narrowed and subrounded at apex beyond frena; metathoracic scent gland osteolar peritreme (Fig. 49) dagger shaped, medially concave, apex narrow, reaching more

than half way to metalpleural margin; evaporatorium somewhat Y-shaped with prominent anterior margin and subrounded posterior margin, covering about two third sternite; legs setosed with long hairs, prefemora with subapical spine, protibiae prismatic, not dilated with minute spine close to distal end. **Abdomen:** Venter medially convex, pilosed ventrally; base with short spine directed forward in opposition to metasternum; ventrolateral sides with a fine narrow transverse depressed line; connexiva thickened or somewhat calloused, produced as acute spine; presence of a pair of pilosed glandular patches on abdominal venter; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped, with posterior acute connexival angles (Fig. 50); membrane of hemelytra passing much beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 2.60; width across eyes: 2.30; interocular space: 1.30; interocellar space: 0.80; preocular distance: 1.10; length of posterior head including eyes: 1.50; antennal segments lengths: I: 0.30, II: 1.60, III: 1.70, IV: 1.90, V: 1.20; pronotal length: 4.12; width across humeral angles: 9.25; scutellar length: 5.30; scutellar width: 4.62; length of abdomen: 7.0; maximum width of abdomen: 7.25; length of abdominal spine: 0.60; length of rostral segments: I: 1.20, II: 1.50, III: 1.30, IV: 1.20; Distance - base scutellum-apex clavus: 3.0; apex clavus-apex scutellum: 2.30; apex scutellum-apex abdomen including membrane: 2.88; total body length: 16.87 .

Coloration and Structure: General body shape and coloration similar to males except, females are paler; head punctured with much more green tinge; pronotal angles longer; presence of a pair of pilosed glandular patches on abdominal venter and ventroanterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped (Fig. 51).

Male Genitalia: Pygophore (Fig. 54) broader than long, with dorsolateral lobes subprominent, narrowed posteriorly, inner processes of lobular; ventroposterior margin concave and sinuate; paramere (Fig. 55) with short stem, blade acute, broad basally, slightly curved downwards; aedeagus (Fig. 56, 57) with small theca, long and broad thecal shield; well developed trunk like medial dorsal membranous conjunctival appendage, bilobed at apex; a pair of bag like dorsolateral membranous conjunctival

appendages; a pair of sclerotized medial penial lobes, apically free, fused near apex; vesica short, not reaching margins of membranous appendages.

Female Genitalia: 1st gonocoxae somewhat triangular, medially placed wide apart, posterior margins convex; 2nd gonocoxae medially fused, posterior margin slightly concave; 8th paratergites triangular, posterior margin convex; 9th paratergites broad, lobe like, rounded at apices, outer margin sinuate, just reaching the fused posterior margins of 8th paratergites (Fig. 52); spermatheca (Fig. 53) with distinct distal and proximal flanges; pump region distinctly short, tube like subequal to distal spermathecal duct; bulb elongated; medial dilation balloon like; posterior spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Body color may vary from being paler to dark brownish yellow; punctation also varies from being dense to fine; reddish brown and green tinge on dorsal and ventral surfaces variable, spot on VII abdominal segment may be dark or obscure in some; ventrally humeral angles paler in some, with black punctures; transverse distinct black line on ventrolateral sides may not be distinct.

Material Examined:

Punjab: Pathankot, 22. iv. 2009 - 1♂; 22. viii. 2009 - 2♀♀; Hoshiarpur, 17. viii. 2009 - 1♀; Talwara, 20. viii. 2009 - 6♀♀, 2♂♂; Ludhiana, 12. iv. 2010 - 4♀♀, 1♂♂; Patiala, 12. v. 2010 - 2♀♀, 1♂

Himachal Pradesh: Paonta Sahib, 4. x. 2009 - 1♀; Himachal Pradesh: Manali, 22. vii. 2010 - 1♂

Uttarakhand: Dehradun, 15-16. ix. 2010 - 3♀

Jammu and Kashmir: Kathua, 21. viii. 2009 - 1♀

Distribution: Phillipines; Sri Lanka; Myanmar; Indonesia; Molucca Island; Caroline Island (Palau); Bangladesh; Taiwan; China; Japan; Thailand; Pakistan; India (Punjab, Himachal Pradesh, Uttarakhand, Jammu and Kashmir, Paschim Banga, Jharkhand, Maharashtra, Tamil Nadu, Andhra Pradesh).

Remarks: *Eocanthecona furcellata* has been used as biological control agent for control of several lepidopterous caterpillar pests, throughout the growing season of cotton in various countries. It has also been useful as a predator of the introduced

Parthenium Zygogramma bichlorata (Pallister) (Coleoptera: Chrysomelidae), an exotic beetle introduced in India for biological suppression of *Parthenium hysterophorus* Linnaeus. It has also been reported as a minor pest of mulberry tree in Formosa.

SUBFAMILY – PENTATOMINAE LEACH

Diagnosis: Largest subfamily of family Pentatomidae; varied in form and colors, some species brightly colored, humeral angles caudolateral; scutellum extending about two-fifth or more length of scutellum, but never reaching apex of abdomen; metasternum rarely produced anteriorly onto mesosternum; labium usually reaching metacoxae; trichobothria usually single or a pair on lateral side of sterna 3-7 on or near spiracular line.

Key o the studied genera of family Pentatomidae

- | | | |
|----|--|--------------------------|
| 1. | Posterior tibia dilated..... | <i>Erthesina Spinola</i> |
| - | Posterior tibia simple..... | 2 |
| 2. | Head triangular, tapering at apex..... | 3 |
| - | Head narrowly rounded or truncated at apex... | 6 |
| 3. | Head longer than broad..... | 4 |
| - | Head broader than long..... | 5 |
| 4. | Width of pronotum across humeral angles smaller than maximum width of abdomen; labium extending upto 4 th abdominal segment.. | <i>Halys Fabricius</i> |
| - | Width of pronotum across humeral angles equal to maximum width of abdomen; labium extending upto metacoxae only..... | <i>Mecidea Dallas</i> |
| 5. | Metathoracic scent gland osteolar peritreme and evaporatoria elongate; antennae sexually diverse, in males 2 nd antennal segment subobsolete..... | <i>Aeliomorpha Stal</i> |
| - | Metathoracic scent gland osteolar peritreme and evaporatoria very small; antennae alike in both sexes, in males 2 nd antennal segment | |

	normal.....	<i>Adria Stal</i>
6.	Paraclypeal lobes toothed near apex.....	7
-	Paraclypeal lobes not toothed near apex.....	9
7.	Head as long as broad, truncated at apex.....	<i>Paranevisanus Distant</i>
-	Head longer than broad, narrowly rounded at apex.....	8
8.	Bucculae long, reaching to base of head; humeral angles nodulated.....	<i>Dalpada Amyot and Serville</i>
-	Bucculae small, not reaching to base of head; humeral angles short, horn like, acutely produced.....	<i>Cahara Ghauri</i>
9.	Abdomen with basal spine.....	10
-	Abdomen without basal spine	17
10.	Abdominal spine small and tuberculate	11
-	Abdominal spine long and acute	13
11.	Antennae with 2 nd segment longer than 3 rd ; metathoracic scent gland peritreme short and wide, never reaching beyond half distance of metapleural margin.....	<i>Nezara Amyot and Serville</i>
-	Antennae with 2 nd segment smaller than 3 rd ; metathoracic scent gland peritreme long and acuminate, extending beyond half distance of metapleural margin.....	12
12.	Preocular distance greater than posterior head including eyes; abdominal tubercle distinctly elevated and compressed.....	<i>Glaucias Kirkaldy</i>
-	Preocular distance less than posterior head including eyes; abdominal tubercle neither elevated nor compressed.....	<i>Acrosternum Fieber</i>
13.	Lateral margins of pronotum finely serrated....	14
-	Lateral margins of pronotum entire (not serrated).....	15

-
14. Anterior margins of pronotal angles straight, apices acute or subacute..... ***Priassus* Stal**
- Anterior margins of pronotal angles gradually rounded or forming an angle towards apex..... ***Tropicoris* Hahn**
15. Head narrowed to apex; scutellum as long as broad..... 16
- Head broad at apex; scutellum broader than long..... ***Menida* Motschulsky**
16. Head distinctly narrowed and subtruncate at apex; labium reaching metacoxae; clavus without any spot..... ***Chaubattiana* Distant**
- Head narrowed, subounded at apex; labium reaching mesocoaxe; extreme apex of clavus with a punctiform black spot..... ***Piezodorus* Fieber**
17. Scutellum longer than broad at base..... 18
- Scutellum as long as broad at base..... 25
18. Metathoracic scent gland peritreme reduced, not passing half of evaporatoria..... 19
- Metathoracic scent gland peritreme well developed, distinctly passing half of evaporatoria..... 22
19. Labium just reaching upto mesocoxae; anterior margin of pronotum elevated and callous..... 20
- Labium passing beyond metacoxae; anterior margin of pronotum neither elevated nor callous..... ***Bagrada* Stal**
20. Body pilosed ***Agonoscelis* Spinola**
- Body not pilosed 21
21. Eyes sessile; paraclypeal lobes larger than clypeus, enclosing the latter; lateral margins of pronotum entire, straight..... ***Eurydema* Laporte**

-
- Eyes stylate; paraclypeal lobes subequal to clypeus; lateral margins of pronotum slightly concave ***Stenozygum* Fieber**
 - 22. Paraclypeal lobes longer than clypeal lobe and meeting beyond it ***Halyabbas* Distant**
 - Paraclypeal lobes equal to clypeal lobe or slightly longer, not meeting beyond it 23
 - 23. Metathoracic scent gland opening short, not acuminate ***Dolycoris* Mulsant and Ray**
 - Metathoracic scent gland opening long and acuminate 24
 - 24. Anterior and lateral margins of pronotum elevated and callous; labium reaching metacoxae only ***Tolumnia* Stal**
 - Anterior and lateral margins of pronotum neither elevated nor callous; labium reaching 3rd abdominal segment ***Halyomorpha* Mayr**
 - 25. Humeral angles of pronotum rounded, not spinosely produced ***Plautia* Stal**
 - Humeral angles of pronotum prominent, obtusely or acutely produced 26
 - 26. Humeral angles of pronotum long and acuminate, produced beyond the costal margins of corium ***Hoplistodera* Westwood**
 - Humeral angles of pronotum short and obtuse, not produced beyond the costal margins of corium 27
 - 27. Posterior margin of pronotum sinuate; anterior pronotal margin distinctly laminated (collar like) ***Sciocoris* Fallen**
 - Posterior margin of pronotum straight; anterior pronotal margin without any laminate impression or collar 28

28. Labium long, reaching 4th abdominal segment;
head narrow, deflected perpendicularly ***Hermolaus Distant***
- Labium small, slightly extending beyond
metacoxae; head broad, deflected anteriorly 29
29. Scutellum as long as corium, slightly narrowed
in posterior half; frenal region smaller than
postfrenal region ***Eysarcoris Hahn***
- Scutellum shorter than corium, distinctly
narrowed apically in posterior half; frenal
region larger than postfrenal region ***Carbula Stal***

GENUS *ERTHESINA SPINOLA*

Erthesina, Spinola (1837) *Ess.*, p. 291

Type species – *Erthesina fullo* Thunberg

Diagnosis: In this genus both the anterior and posterior tibiae are dilated, the head is long, somewhat tapering at apex, the basal joint of the antennae does not nearly reach the apex of the head; basal joint of the labium extending beyond the bucculae; the veins of the membrane are simple or somewhat furcate.

Remarks: The genus is widely distributed in India, Burma, Sri Lanka, China, Japan and Pakistan, represented by 7 species, out of which 5 species have been reported from India so far viz., *E. aberrans* Distant, *E. acuminata* Dallas, *E. fullo* Thunberg, *E. pakistanensis* Ahmad et al., *E. robertsi* Distant. Members are generally large in size and closely resemble members of genus *Dalpada* in body form.

***Erthesina fullo* (Thunberg)** (Figs. 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69)

Cimex fullo, Thunberg (1783) *Nov. Ins. Spec.*, 2: p. 42.

Cimex mucoreus, Fabricius (1794) *Ent. Syst.*, 1: p. 117.

Erthesina mucoreus, Spinola (1837) *Essai.*, p. 291.

Erthesina fullo: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: pp. 117 & 118.

MALE:

Measurements (mm): Head length: 5.0; width across eyes: 3.90; interocular space: 1.80; interocellar space: 1.10; preocular distance: 3.12; length of posterior head

including eyes: 1.87; antennal segments lengths: I: 0.80, II: 2.24, III: 2.58, IV: 3.20, V: 2.88; pronotal length: 5.60; width across humeral angles: 10.80; scutellar length: 8.0; scutellar width: 6.76; length of abdomen: 9.5; maximum width of abdomen: 10.50; length of rostral segments: I: 2.66, II: 4.75, III: 4.75, IV: 2.20; Distance - base scutellum-apex clavus: 4.88; apex clavus-apex scutellum: 3.12; apex scutellum-apex abdomen including membrane: 5.61; total body length: 22.87.

Dorsal Coloration: Head black, coarsely punctured with dark black punctures except lateral margins, a central longitudinal line, area around eyes and two spots on posterior area brownish yellow, impunctate; eyes black; ocelli red; antennae hairy, brownish yellow, except 1st, 2nd, 3rd and base of 4th black; pronotum brownish yellow, coarsely punctured with thick black punctures, more pronounced laterally and anteriorly with few scattered pale callosities; anterior, lateral margin and a central longitudinal line brownish yellow, impunctate, two anterior transverse blackish impunctate callosities, two oblique fascial lines on lateral sides not reaching posterior margin, levigate, impunctate, brownish yellow; scutellum brownish yellow, thickly punctured, three basal spots, one central, two angular, with additional basal triangular black spots on angles and clavus brownish yellow; corium brownish yellow anteriorly and posteriorly, purplish brown medially thickly punctured with scattered pale callosities; anteriormost portion of costa pale, impunctate; membrane of hemelytra black; connexiva brownish yellow, alternating with black.

Ventral Coloration: Labium brownish yellow, apical two segments black; head paler, except lateral margins and two longitudinal fasciae towards apex black; area between thoracic legs black; legs brownish yellow, femora with longitudinal streaks, apices of tibiae and tarsi black; sternum pale, blackly punctured along with scattered rugosities, laterally broadly impunctate; evapotaorium with anterior margin black; abdomen dark, sparingly punctate, more on lateral areas, incisures, spiracles, marginal spots, and subapical spot distinctly black; connexivum brownish yellow alternating with black patches; genital capsule pale suffused with black fascia; two subapical fascial spots on abdominal sternite VII black.

STRUCTURE:

Head (Fig. 59): Head distinctly acuminate, slightly deflected downwards, apical half depressed; paraclypeal lobes equal to slightly raised medial clypeus; former slightly

sinuous above eyes anterolaterally reflexed upwards, angulated subacutely near apex; antennal segmental formula – I<II<III<V<IV; labium long, slender, reaching base of fourth abdominal segment, labial lengths formula – IV<I<II=III. **Thorax:** Pronotum (Fig. 60) slightly anteriorly deflected, raised posteriorly, anterior pronotal margin longer than width of head across eyes, truncate behind eyes, anterolateral margins crenulated, humeral angles subprominent, obtuse; scutellum somewhat rugose, beyond fena narrowed as subrounded apical lobe; metathoracic scent gland osteolar opening (Fig. 61) moderately long, curved, raised, narrow at apex, wavy laterally, reaching about one third way to metapleural margins; evaporatorium larger, well developed, with extended anterior margin, covering more than half of sternite; legs with fore and metatibiae dilated at base, mesotibia moderately dilated. **Abdomen:** ampliate, somewhat depressed laterally; connexiva well exposed at repose dorsally and ventrally; hemelytral membrane passing much beyond abdominal apex; ventroanterior margin of abdominal sternite VII slightly less broadly concave, an inverted V-shaped with subacute posterior connexival angles (Fig. 62); genital capsule with golden pubescence.

FEMALE:

Measurements (mm): Head length: 4.75; width across eyes: 3.70; interocular space: 1.80; interocellar space: 1.0; preocular distance: 3.0; length of posterior head including eyes: 1.75; antennal segments lengths: I 0.50, II 2.24, III 2.08, IV 3.04, V 2.72; pronotal length: 5.61; width across humeral angles: 10.50; scutellar length: 8.50; scutellar width: 6.60; length of abdomen: 10.0; maximum width of abdomen: 11.10; length of rostral segments: I: 2.40, II: 3.80, III: 4.0, IV: 2.40; Distance - base scutellum-apex clavus: 5.25; apex clavus-apex scutellum: 3.25; apex scutellum-apex abdomen including membrane: 5.94; total body length: 24.

Coloration and Structure: Similar to males in body form and coloration except: IInd antennal segment slightly longer than IIIrd; ventroanterior margin of abdominal sternite VII broadly concave, an inverted U-shaped, with subacute posterior connexival angles (Fig. 63).

Male Genitalia: Pygophore (Fig. 66) longer than broad, lateral margins sinuate; dorsolateral lobes truncated posteriad beset with long hairs, dorsal opening small; paramere (Fig. 67) with distinctly broad blade, trilobed; aedeagus (Fig. 68, 69) with

unilobed elongated theca, with a single trunk like median membranous conjunctival appendage; a pair of bag like dorsal membranous conjunctival appendages, a pair of elongated U-shaped medial penial lobes, not fused basally and apically; vesica short, not even reaching the apex of penial lobes, ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae broadly triangular, overlapping, posterior margins convex; 2nd gonocoxae medially fused, posterior margin straight; 8th paratergites broad, obliquely straight and toothed posterior margin; 9th paratergites elongate, lobe like, distinctly narrowed at base, outer margin straight, not passing fused posterior margins of 8th paratergites (Fig. 64); spermatheca (Fig. 65) with distinct distal and proximal flanges; pump region distinctly short, tube like, shorter than distally dilated distal spermathecal duct; bulb rounded with three downwardly directing acute processes; medial dilation long; posterior spermathecal duct smaller than distal spermathecal duct.

Population Variation: Clavus and corium with purplish brown fascia more broader and darker; color of abdomen and punctation on sternum and abdomen vary from being paler to dark and thick punctures.

Material Examined:

Punjab: Hoshiarpur, 18. viii. 2009 - 2♀♀ ;

Himachal Pradesh: Bilaspur, 20-21. x. 2010 6♀♀, 5♂♂

Uttarakhand: Dehradun, 14. ix. 2010 - 3♀♀

Distribution: China; Japan; India (Punjab, Himachal Pradesh, Uttarakhand, Sikkim, Assam, Meghalaya, Paschim Banga, Andaman Islands, Uttar Pradesh).

Remarks: The most conspicuous character of this species is its labium extending beyond 3rd abdominal segment and dilated posterior tibia. *E. fullo* is commonly trapped on light apart from wild vegetation. In India, it has been reported as secondarily pest on Neem (*Azadirachta indica*) and Mango (*Mangifera indica*) throughout the year. The species is known to camouflage to escape from enemies, attack during hibernating winter period. In Assam and Manipur, it is used as one of the edible insects by local populations as a source of animal protein supplement instead of fish and meat.

GENUS *HALYS FABRICIUS*

Halys, Fabricius (1803) *Syst. Rhyng.*, p. 180 .

Type species - *Halys dentatus* Fabricius

Diagnosis: Non-dilated tibiae; head long, tapering in front, the central lobe as long as the lateral lobes or longer; 1st joint of the labium not extending beyond the bucculae; veins of the membrane irregularly ramulose; abdomen profoundly sulcated.

Remarks: *Halys* is a cosmopolitan genus, distributed in India, China, Japan, Pakistan, Iran and North and West Africa. Members of this genus feed on a variety of host plants, and they show variation with geography and ecology. The genus is closely allied to *Erthesina* Spinola except for having non dilated tibiae, length of paraclypeal lobes equal to clypeus, head distinctly longer and tapering anteriorly and the shapes of various parts of male and female genitalia.

Halys dentatus (Fabricius) (Figs. 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81)

Cimex dentatus, Fabricius (1775) *Syst. Ent.*, p. 702.

Cimex sulcatus, Thunberg (1788) *Nov. Ins. Spec.*, 2: p. 43.

Halys serrigera, Westwood (1837) in *Hope Cat. Hem.*, 1: p. 23.

Halys serricollis, Westwood (1837) in *Hope Cat. Hem.*, 1: p. 23.

Halys dentatus: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 119.

MALE:

Measurements (mm): Head length: 5.61; width across eyes: 2.66; interocular space: 2.05; interocellar space: 1.10 preocular distance: 3.96; length of posterior head including eyes: 1.65; antennal segments lengths: I: 0.90, II: 1.50, III: 1.90, IV: 1.90 V: 1.80; pronotal length: 5.61 width across humeral angles: 10.35; scutellar length: 9.07; scutellar width: 6.27; length of abdomen: 10.20; maximum width of abdomen: 11.40; length of rostral segments: I: 2.75 II: 5.0, III: 5.0, IV: 2.66; Distance - base scutellum-apex clavus: 5.94; apex clavus-apex scutellum: 3.135; apex scutellum-apex abdomen including membrane: 5.19; total body length: 25.50.

Dorsal Coloration: Head brownish yellow, thickly punctured with dark brown; eyes black; ocelli red; antennae black, apices of 3rd, 4th and base of 5th yellow; pronotum brownish yellow with thick dark brown punctures, more pronounced on lateral margins, anterior area with two dark yellow levigate callosities; scutellum brownish

yellow, anterior three fourth thickly punctured with dark brown, apex sparingly punctured, two black punctured obscure semicircular lines on scutellum; clavus, corium and costa concolorous to scutellum with few scattered black fascial spots; connexiva brownish yellow punctured with distinct black on anterior and posterior margins; membrane of hemelytra greyish brown, veins darker.

Ventral Coloration: Labium brownish yellow, apex black; legs brownish yellow with black spots, more pronounced on apices of femora and tarsi, dorsal surface of tibiae; head and sternum thickly punctured with black; lateral margins of sternum pale yellow, sparingly punctured; connexiva slightly pale with dark brown anterior and posterior margins; spiracles, trichobothria black; transverse line between spiracle and trichobothria reddish brown; area between legs darker, punctated; abdomen and genital capsule brownish yellow, with dark brown punctures; obscure pale transverse fascia on each abdominal segment.

STRUCTURE:

Head (Fig. 71): Head distinctly acuminate, paraclypeal lobes shorter than distinct lobulate medially raised clypeus; former obliquely straight above eyes, angulated before apex, narrowed apically; antennal segmental formula – I<II<V=III=IV; labium very long, slender, reaching abdominal segment VI, labial lengths formula – II=III<IV<I. **Thorax:** Pronotum (Fig. 72) smaller than head, rugulose, slightly deflected anteriorly, anterior margin U-shaped, angles subrounded behind eyes, anterolateral margins crenulated, humeral angles prominent, subacute; posterior margin straight; scutellum distinctly narrowed beyond frena as subtriangular apical lobe; metathoracic scent gland osteolar peritreme (Fig. 73) moderately sized, slightly curved and narrowed at apex, reaching only one third way to metapleural margin, evaporatorium broad, well developed with extended anterior margin, covering about half sternite; legs hairy. **Abdomen:** connexiva well exposed at repose dorsally and ventrally; abdomen flattened laterally; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles and ventroposterior margin broadly concave, inverted U-shaped (Fig. 74); hemelytral membrane passing beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 5.61; width across eyes: 3.50; interocular space: 2.09; interocellar space: 1.10 preocular distance: 4.125; length of posterior head including eyes: 1.48; antennal segments lengths: I: 0.90, II: 1.75, III: 2.66, IV: 2.60, V: 1.825; pronotal length: 5.44; width across humeral angles: 10.35; scutellar length: 9.50; scutellar width: 6.60; length of abdomen: 9.25; maximum width of abdomen: 11.50; length of rostral segments: I: 2.80, II: 5.0, III: 4.75, IV: 3.12; Distance - base scutellum-apex clavus: 6.27; apex clavus-apex scutellum: 3.04; apex scutellum-apex abdomen including membrane: 5.61; total body length: 26.62.

Coloration and Structure: Body form and coloration similar to males except: females are darker; abdominal segment VII with dark brown fascia anteriorly; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, with subrounded posterior connexival angles (Fig. 75); membrane slightly shorter than males.

Male Genitalia: Pygophore (Fig. 78) usually as long as broad with subprominent broad dorsolateral lobes; ventroposterior margins deeply concave with a small medial notch; dorsomedial surface broadly concave; dorsal opening small; paramere (Fig. 79) with a short stem, broad blade, with acutely pointed and curved apex, inner margin with distinct concave hump near apex; aedeagus (Fig. 80, 81) with elongate theca, a pair of bag like dorsolateral membranous conjunctival appendages, a pair of sclerotized elongated ventral membranous conjunctival appendages with inner margins fused basally, a pair of sclerotized finger like medial penial lobes; vesica short, not passing beyond margins of membranous appendages.

Female Genitalia: 1st gonocoxae medially placed apart, somewhat quadrate, posterior margins almost straight; 2nd gonocoxae medially fused, posterior margin convex; 8th paratergites broadly triangular, posterior margins convex; 9th paratergites lobe like, distinctly shorter than 8th paratergites (Fig. 76); spermatheca (Fig. 77) with distinct distal and proximal flanges; pump region tube like, shorter than distal spermathecal duct; bulb rounded with beak shaped acute process directed downwards; medial dilation distinctly broad, balloon like; proximal spermathecal duct smaller than distal spermathecal duct.

Population Variation: Color vary from dark yellowish brown to pale; size, color and thickness of punctures variable; corium sometimes shows dark fascia with red tinge and black fascia on anterior and posterior margins of connexiva may be small or distinctly broad.

Material Examined:

Punjab: Pathankot, 21. iv. 2010 - 18♀♀, 10♂♂; Patiala, 2-8. vii. 2009 - 1♀♀, 1♂♂

Himachal Pradesh: Paonta Sahib, 4. x. 2009 - 1♂; Bilaspur, 21. x. 2010 - 1♀

Uttarakhand: 24. vi. 2010 - 4♀♀

Distribution: Sri Lanka; Myanmar; Pakistan; India (Punjab, Himachal Pradesh, Uttarakhand, Paschim Banga, Kerala, Sikkim, Uttar Pradesh).

Remarks: It has been recorded to occur throughout the year on various economically important trees like Neem (*Azadirachta indica*), mango (*Mangifera indica*), Pine, *Cassia javanica* and *Ziziphus jujuba*, feeding on sap as well as shoot and leaves causing severe damage.

GENUS *MECIDEA* DALLAS

Cerataulax, Signoret (1851) *Ann. Soc. Ent. Fr.*, p. 335.

Mecidea, Dallas (1851) *List. Hem.*, 1: p. 139.

Type species - *Mecidea indica* Dallas

Diagnosis: Body elongate, somewhat depressed; head somewhat long and convex, the lateral lobes much longer than the central lobe and generally meeting beyond it; antenniferous tubercles entirely visible from above; eyes globose, touching the anterior margin of the pronotum; ocelli large, on a line with the base of the eyes; antennae five-jointed, basal joint not reaching the apex of the head, 2nd joint as long as the others or longer; labium extending to the metasternum, inserted towards the apex of the head; scutellum long, triangular, much narrowed at the apex; membrane with simple longitudinal veins; mesosternum with a central furrow; legs moderate, femora unarmed.

Remarks: The genus is represented by 16 species from the World. It is a cosmopolitan genus, widely distributed in Nearctic, Neotropical, Eastern and Southern Palaeractic regions, South Africa and India.

***Mecidea indica* Dallas**
(Figs. 82, 83, 84, 85, 86, 87, 88, 89, 90)

Mecidea indica: Dallas (1851) *List. Hem.*, 1: p. 139.

MALE

Measurements (mm): Head length: 1.60; width across eyes: 1.375; interocular space: 0.80; interocellar space: 0.45; preocular distance: 1.05; length of posterior head including eyes: 0.55; antennal segments lengths: I: 0.40, II: 1.30, III: 0.875, IV: 1.10, V: 0.90; pronotal length: 1.60; width across humeral angles: 2.88; scutellar length: 3.04; width: 1.70; length of abdomen: 4.38; maximum width of abdomen: 2.88; length of rostral segments: I: 0.70, II: 1.0, III: 0.55, IV: 0.60; Distance - base scutellum-apex clavus: 1.72, apex clavus-apex scutellum: 1.32, apex scutellum-apex abdomen including membrane: 4.0; total body length: 10.50.

Dorsal Coloration: Head greenish yellow, with dark green punctures; lateral area around eyes excluding central impunctate paler; eyes shining, green; ocelli yellow with reddish margin; antennae with 1st and 2nd segments brownish green, remaining segment darker with red suffusion; pronotum greenish yellow, with irregular brown suffusion; anterior area with two pale transverse callosities; somewhat an obscure levigate central longitudinal yellow line, lateral margins impunctate; humeral angles paler with brown tinge, punctation dark green, dark on anterior and lateral margin, pale on central area; scutellum concolorous to pronotum; a central longitudinal obscure levigate line reaching apex; clavus, corium and costal margin greenish yellow with dark green punctures and brown suffusions in some areas; hemelytral membrane translucent.

Ventral Coloration: Labium brownish yellow, apex black; lateral margins of head green, rest pale yellowish, finely punctured; sternum multilayered (lateral area pale, sparingly punctured followed by broad dark green fascia, rest with brown suffusion); area between legs yellow with brown suffusions, impunctate; metathoracic scent gland peritreme pale, impunctate; abdomen greenish-yellow with brown fascia, lateral

area pale; spiracle black with obscure transverse stigmatal line; genital capsule and legs greenish yellow.

STRUCTURE:

Head (Fig. 83): Head somewhat convex, triangular, acuminate at apex; paraclypei distinctly longer than clypeus, meeting beyond at base, not at apex, slightly sinuous above eyes, clypeus raised medially; antenniferous tubercles spined on inner margin, basal antennal segment not reaching apex of head; Antennal segmental formula – I<III<V<IV<II; labium long, slender passing mesocoxae; labial lengths formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 84) with anterior margin truncate behind eyes, touching latter, anterolateral margin slightly sinuous, concave medially, posterior margin straight, humeral angles subprominent, obtuse; scutellum long, raised anteriorly, distinctly narrowed apically; inner margin of costa straight; hemelytral membrane longer than scutellar length; metathoracic scent gland osteolar peritreme (Fig. 85) leaf like, subrounded at apex, broad medially, reaching half way to metapleural margin; evaporatorium well developed covering half sternite. **Abdomen:** depressed slightly; connexiva well exposed at repose flattened; ventroanterior margin of abdominal sternite VII somewhat an arc shaped, subrounded posteriorly (Fig. 86); angles of intersegmental sutures not visible; genital capsule with golden pubescence; hemelytral membrane passing much beyond apex of abdomen.

Male Genitalia: Pygophore (Fig. 87) longer than broad, distinctly sinuate laterally; dorsomedial surface straight; dorsal opening small; dorsolateral lobes prominent rounded at apices, with small acute angulation directed on inner sides; ventrolateral margins V-shaped, laterally sinuate, medially concave; paramere (Fig. 88) somewhat comma shaped, short stem, blade broad basally, narrowed at apex, outer margin convex, inner margin shallowly convex and sinuate; aedeagus (Fig. 89, 90) with somewhat rectangular theca, with two pair of bag like dorsolateral membranous conjunctival appendages fused basally, a pair of S-shaped sclerotized medial penial lobes; vesica, short, not passing beyond the margins of appendages; ejaculatory reservoir broad.

Female: Not available.

Population variation: Single specimen studied.

Material examined :

Punjab: Patiala, 26. viii. 2009 - 1♂

Distribution: India (Punjab, Maharashtra).

Remarks: The species is characterized by narrow and acuminate head; anterolateral margins and abdomen beneath with transverse rugose stridulatory vittae and a pair of S-shaped sclerotized penial lobes. It has not been recorded as a pest till now.

GENUS *AELIOMORPHA* STÅL

Tetratoma, Signoret (1851) *Ann. Soc. Ent. Fr.*, p. 339.

Aeliomorpha, Stål (1858) *Öfv. Vet.-Ak. Förh.*, p. 313.

Type species: *Æ. simulans*, Stål, an African species.

Diagnosis: Body moderately elongate, subovate; head large, not longer than broad at base, narrowing to apex, but not depressed before it, central lobe prominent, reaching apex of head; antenniferous tubercles remote from the lateral margins, distinctly within longitudinal lines through the eyes; antennae sexually diverse, 2nd joint in male very short, subobsolete, in the female slender and elongate, 1st joint slender, incrassate, not reaching apex of head; labium about reaching posterior coxae; pronotum broader than long, lateral margins obliquely straight, base slightly gibbous, depressed anteriorly; scutellum somewhat long, moderately broad, narrowed at its posterior half, not reaching the apical angles of the corium.

Remarks: This genus is represented by 6 species from the Oriental and Ethiopian regions and is closely allied to *Adria* in having paraclypeal lobes equal to clypeus, but can be easily separated from the same in having anterior pronotal margin concave, well developed metathoracic scent gland peritreme and sulcate meso and metasternum. The members of this genus distinctly show sexual dimorphism with respect to 2nd antennal segment that is very short in males and slender and elongate in females.

***Aeliomorpha lineaticollis* (Westwood)**
(Figs. 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102)

Pentatoma lineaticollis, Westwood (1837) in *Hope Cat.*, 1:p. 36.

Aeliomorpha lineaticollis: Distant (1902): *Faun. Brit. Ind. Rh.*, 1: p. 139.

MALE:

Measurements (mm): Head length: 1.40; width across eyes: 1.70; interocular space: 1.30; interocellar space: 0.85; preocular distance: 0.95; length of posterior head including eyes: 0.45; antennal segments lengths: I: 0.30, II: 0.10, III: 1.10, IV: 0.90, V: 1.0; pronotal length: 1.50; width across humeral angles: 4.0; scutellar length: 2.31; scutellar width: 3.20; length of abdomen: 2.88; maximum width of abdomen: 3.90; length of rostral segments: I: 0.60, II: 1.0, III: 0.65, IV: 0.70; Distance - base scutellum-apex clavus: 1.20; apex clavus-apex scutellum: 1.15; apex scutellum-apex abdomen including membrane: 1.55; total body length: 7.50.

Dorsal Coloration: Head brownish yellow, thickly punctured with dark brown; lateral areas brighter; eyes brownish yellow; ocelli red; antennae multicoloured, with 1st three segments brownish green, apical two yellowish brown; pronotum with medial area greenish, a longitudinal central impunctate line extending throughout length, green, lateral area bright brownish yellow with distinct reddish suffusions and coarse brown punctures; anterior pronotal area with two yellow impunctate transverse callosities; scutellum yellowish green, lateral margins brownish yellow, apical and subapical margins pale with dark brown punctures, two small brownish yellow impunctate spots at each basal scutellar angle; clavus, corium and costa with a distinct reddish brown fascia on inner margin of apical margin, anteriormost portion of costal margin bright yellow with reddish tinge; hemelytral membrane pale brownish.

Ventral Coloration: Labium brownish yellow, apex black; head, sternum yellow, punctured with dark brown, punctation more pronounced on lateral margins; humeral angles reddish yellow with brown punctures; costal margin reddish yellow, impunctate; metathoracic scent gland peritreme, evaporatorium, legs brownish yellow, femora spotted with brown; abdominal disk pale yellow, sparingly punctate; connexiva yellowish brown; a series of black spots on anterior part of each connexival segment.

STRUCTURE:

Head (Fig. 92): Head somewhat subtriangular, slightly declivent, convex; paraclypeal lobes slightly smaller than lobulated clypeus; paraclypeal lobe slightly sinuate above eyes, distinctly narrowed apically; distinct sexual dimorphism visible with respect to 2nd antennal segment that is extremely short, indistinct; antennal segmental formula – II<I<IV<V<III; labium passing metacoxae, labial lengths formula – I<III<IV<II.

Thorax: Pronotum (Fig. 93) anteriorly deflected and depressed, slightly gibbous posteriorly, anterior margin concave and truncate behind eyes, protruded as small subacute tubercles, lateral margins obliquely straight, humeral angles subprominent, obtuse; scutellum broad at base, beyond frena, narrowed posteriorly as subrounded apical lobe; metathoracic scent gland osteolar opening (Fig. 94) uniformly thick, concavely sinuate medially, subrounded at apex, reaching less than half way to metapleural margin; evaporatorium broad, with well defined anterior and posterior margins covering about of sternite. **Abdomen:** Venter slightly ampliate; connexiva exposed at repose, dorsoventrally flattened; hemelytral membrane passing beyond abdominal apex; spiracles indistinctly small; ventroanterior and ventroposterior margin margin of abdominal sternite VII broadly concave with subrounded posterior angles (Fig. 95); genital capsule with brown pilosity.

FEMALE:

Measurements (mm): Head length: 1.50; width across eyes: 1.80; interocular space: 1.30; interocellar space: 0.90; preocular distance: 1.05; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.30, II: 0.40, III: 0.65, IV: 0.80, V: 0.90; pronotal length: 1.70; width across humeral angles: 4.10; scutellar length: 2.35; scutellar width: 2.66; length of abdomen: 3.04; maximum width of abdomen: 3.90; length of rostral segments: I: 0.60, II: 0.95, III: 0.65, IV: 0.60; Distance - base scutellum-apex clavus: 1.25; apex clavus-apex scutellum: 1.10; apex scutellum-apex abdomen including membrane: 1.45; total body length: 7.50.

Coloration and Structure: Body form and coloration almost similar to males except: 2nd antennal segment slender and normal; antennal length formula – I<II<III<IV<V; abdominal disk bright brownish yellow, with reddish tinge, sparingly punctate; connexiva reddish brown, with dark brown punctures; ventroanterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped with subacute

posterior angles; ventroposterior margin narrowly concave, somewhat an inverted V-shaped (Fig. 96).

Male Genitalia: Pygophore (Fig. 99) about as long as broad, lateral margins slightly sinuous; dorsolateral lobes rounded; ventroposterior margin sinuate, convex medially; dorsal opening inverted V-shaped; paramere (Fig. 100) F-shaped, apex of blade narrowed, outer margin slightly humped, inner margin shallowly concave with lobe like structure; aedeagus (Fig. 101, 102) with elongate theca, distally broad, a pair of broad ventral membranous conjunctival appendages, a pair of sclerotized elongate medial penial lobes; vesica short, not passing beyond the margins of ventral membranous conjunctival appendages; ejaculatory reservoir distinctly broad.

Female Genitalia: 1st gonocoxae broadly triangular, with rounded apices; 2nd gonocoxae with anterior margin straight, posterior margin concave; 8th paratergites triangular; 9th paratergites broad, lobe like, not reaching fused posterior margins of 8th paratergites (Fig. 97); spermatheca (Fig. 98) with distinct distal and proximal flanges; pump region broadly sinuate, shorter than distal spermathecal duct; bulb elongate; proximal duct about distinctly longer than distal spermathecal duct.

Population variation: Body coloration shows remarkable variation with suffusion of colors like green, reddish, brown and yellow forming varied patterns on head, pronotum and scutellum; similarly punctation vary in thickness and color.

Material Examined

Punjab: Talwara, 20. viii. 2009 - 1♂, Ropar, 6. viii. 2010 - 1♂, 1♀

Himachal Pradesh: Solan, 19. viii. 2009 - 1♂, Bilaspur, 21. vii. 2010 - 1♀, 1♂

Uttarakhand: Dehradun, 26. vii. 2009 - 1♂

Distribution: Pakistan; India (Punjab, Himachal Pradesh, Uttarakhand, Paschim Banga, Maharashtra).

Remarks: The species shows distinct sexual polymorphism with respect to size of 2nd antennal segment, being subobsolete in males and slender and normal in females. *A. lineaticollis* has been recorded as a pest of mostly grasses, *Cyperus* sp., *Echinochloa* sp., *Cynodon dactylon* (Bermuda grass), *Desmostachya bipinnata*, *Sorghum bicolor*

(sudangrass) and some few food crops like paddy, rice, sorghum and *Santalum album* (sandalwood). It is a new record from North India.

Genus *ADRIA* STÅL

Adria, Stål (1876) *En. Hem.*, **5**: p. 58.

Type species: *Adria parvula* Dallas

Diagnosis: Body elongate; length of head moderate, less than its breadth between the eyes, lobes about equal in length; antenniferous tubercles remote from lateral margins, just within longitudinal lines through the eyes; antennae five-jointed, 1st joint short, incrassate, fourth shorter than fifth, which is distinctly broadened; labium reaching posterior coxae; pronotum broader than long, lateral margins oblique, anterior angles slightly prominent; scutellum moderately long, not quite reaching apex of corium; sternum sulcated.

Remarks: This genus is represented by 6 species from the Oriental and Ethiopian regions and is closely allied to *Aeliomorpha* with respect to characters discussed in keys and descriptions.

Adria parvula (Dallas)

(Figs. 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114)

Pentatoma parvula, Dallas (1851) *List Hem.*, **1**: p. 246.

Pentatoma brevitata, Walker (1867) *Cat. Het.*, **3**: p. 312.

Adria parvula: Atkinson (1888) *J. Asiat. Soc. Beng.*, **57**: p. 34.

MALE:

Measurements (mm): Head length: 1.30; width across eyes: 1.60; interocular space: 1.10; interocellar space: 0.50; preocular distance: 0.80; length of posterior head including eyes: 0.50; antennal segments lengths: I: 0.30, II: 0.45, III: 0.45, IV: 0.40, V: 0.70; pronotal length: 1.50; width across humeral angles: 3.60; scutellar length: 2.65; scutellar width: 2.09; length of abdomen: 3.5; maximum width of abdomen: 3.50; length of rostral segments: I: 0.60, II: 1.0, III: 0.40, IV: 0.45; Distance - base scutellum-apex clavus: 1.36; apex clavus-apex scutellum: 1.28; apex scutellum-apex abdomen including membrane: 1.62; total body length: 7.25.

Dorsal Coloration: Head brownish yellow, lateral margins dark brown, thickly punctured with brown; eyes black, with slight reddish tinge; ocelli red; antennae brownish yellow, apex of 4th and entire 5th black; pronotum brownish yellow, coarsely punctured with brown; anterior, lateral and posterior pronotal margins levigate, pale, anterior area with two brown transverse callosities; scutellum brownish yellow, punctured with brown, more pronounced on anterior, lateral and apex, two yellow maculate spots at each basal scutellar angle, an indistinct V-shaped longitudinal levigate line in centre, one apical and two subapical spots, brown; calvus, corium and costa concolorous to scutellum, anteriormost portion of costal margin pale, impunctate; hemelytral membrane hyaline.

Ventral Coloration: Labium brownish yellow, apex black; head brownish yellow, black punctures more pronounced on anterior area, impunctate below labial segment; area between legs black; lateral area of sternum, with indistinct maculate levigate patches; metathoracic scent gland peritreme yellowish brown with black punctures; legs brownish yellow, apices of tarsi black; abdominal disk brownish yellow, finely punctate with brown, black thick fascia on mediolateral area; spiracles surrounded with brown; connexiva brownish yellow with black anterior margins; genital capsule brownish yellow with dark brown punctures.

STRUCTURE:

Head (Fig. 104): Head slightly declivent, somewhat broadly triangular at apex; paraclypal lobes equal to medially raised clypeus; former sinuate above eyes, narrowed at apex; antennal segmental formula – I<IV<II=III<V; labium just reaching metacoxae, labial lengths formula – III<IV<I<II. **Thorax:** pronotum (Fig. 105) slightly deflected anteriorly, subrugulose, anterior margins concave, truncate behind eyes, protruded anteriorly as small subacute tubercles, anterolateral margins obliquely straight, humeral angles subprominent, obtuse; scutellum with frenal region much shorter than post frenal, beyond frena, lateral margins obliquely straight, narrowed as subrounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 106) short, somewhat globose shaped, raised, curved, narrowed acutely at apex reaching only one fourth way to metapleural margin; evaporatorium small surrounding opening. **Abdomen:** connexiva convex, moderately exposed at repose; hemelytral membrane passing beyond abdominal apex; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subrounded posterior

connexival angles, ventroposterior margin broadly concave, an inverted U-shaped (Fig. 107); genital capsule with golden pubescence.

FEMALE:

Measurements (mm): Head length: 1.25; width across eyes: 1.70; interocular space: 1.20; interocellar space: 0.60; preocular distance: 0.80; length of posterior head including eyes: 0.45; antennal segments lengths: I: 0.30, II: 0.45, III: 0.45, IV: 0.45, V: 1.70; pronotal length: 1.70; width across humeral angles: 3.85; scutellar length: 3.0; scutellar width: 2.73; length of abdomen: 4.12; maximum width of abdomen: 4.0; length of rostral segments: I: 0.50, II: 1.1.8, III: 0.40, IV: 0.45; Distance - base scutellum-apex clavus: 1.75; apex clavus-apex scutellum: 1.25; apex scutellum-apex abdomen including membrane: 1.72; total body length: 8.0.

Coloration and Structure: Body form and coloration similar to males except, punctures on abdominal venter are less coarse and dense; ventroanterior and ventroposterior margin of abdominal sternite VII concave, somewhat an arc shaped, with subacute posterior connexival angles (Fig. 108).

Male Genitalia: Pygophore (Fig. 111) as long as broad, lateral margins slightly sinuous; dorsolateral lobes rounded apically; ventroposterior margin sinuate; paramere (Fig. 112) sickle shaped, apex of blade narrowed, outer margin straight, inner margin distinctly sinuate with notch like impressions; aedeagus (Fig. 113, 114) with elongate theca, a pair of ventral membranous conjunctival appendages, sclerotized L-shaped medial penial lobes; vesica short, not passing beyond the margins of ventral membranous conjunctival appendages.

Female Genitalia: 1st gonocoxae (Fig. 109) triangular, posterior margin deeply sinuate and concave; 2nd gonocoxae quadrangular, posterior margin straight; 8th paratergites triangular; 9th paratergites lobe like elongated, narrowed at apex, inner margin sinuate, reaching posterior margins of 8th paratergites; spermatheca (Fig. 110) with distinct distal and proximal flanges; pump region sclerotized, tube like, longer than distal spermathecal duct; bulb elongate; proximal spermathecal duct about 3X longer than distal spermathecal duct.

Population Variation: Body color may vary from being dark brownish yellow to paler; punctation may vary in color and density; subapical spots on scutellum may be

well defined or reduced as black fascia in some; size of basal scutellar spots variable in shape and size.

Material Examined

Punjab: Ropar, 7. viii. 2010 - 23♂♂, 5♀♀

Distribution: Myanmar; India (Punjab, Paschim Banga, Jharkhand, Karnataka, Maharashtra).

Remarks: The species is characterized by having two yellow maculate spots at each basal scutellar angle, one apical and two subapical small brown spots on scutellum; 9th paratergites elongated and lobe like, reaching posterior margins of 8th paratergites and spermatheca with proximal spermathecal duct about 3X longer than distal spermathecal duct. *Adria parvula* has been recorded as pest of mostly grasses, *Cynodon dactylon* (Bermuda grass), *Sorghum bicolor* (sudangrass), corn and maize in various countries. It is a new record from North India.

GENUS *PARANEVISANUS* DISTANT

Paranevisanus, Distant (1908) *Faun. Brit. Ind. Rh.*, **4**: p. 435.

Type species - *Paranevisanus subgenericus* Distant

Diagnosis: Lateral lobes of the head distinctly upwardly recurved; 1st joint of antennae not reaching apex of head, 2nd joint much longer than 3rd.

Remarks: The genus belongs to the group of genera having broad truncated apical paraclypei, unarmed lateral margins and pale spots on pronotum but can be separated in having distinctly long 2nd antennal segment. It is well distributed in Himalayan range from West to East.

Paranevisanus subgenericus Distant (Figs. 115, 116, 117, 118, 119, 120, 121, 122, 123)

Paranevisanus subgenericus: Distant (1908) *Faun. Brit. Ind. Rh.*, **4**: pp. 435 & 436.

MALE:

Measurements (mm): Head length: 3.60; width across eyes: 3.60; interocular space: 2.20; interocellar space: 1.10; preocular distance: 2.0; length of posterior head

including eyes: 1.60; antennal segments lengths: I: 0.90, II: 2.56, III: 1.92, IV: 2.72, V: 2.72; pronotal length: 4.625; width across humeral angles: 8.75; scutellar length: 6.75; scutellar width: 5.94; length of abdomen: 7.75; maximum width of abdomen: 9.50; length of rostral segments: I: 1.80, II: 3.20, III: 3.60, IV: 1.70; Distance - base scutellum-apex clavus: 4.45; apex clavus-apex scutellum: 2.31; apex scutellum-apex abdomen including membrane: 5.61; total body length: 19.50.

Dorsal Coloration: Head dark brown, shining, coarsely punctured with reddish and green tinge; a longitudinal maculate levigate shining yellow line reaching posterior end of head, area just before eyes black impunctate, two small oblique impunctate spots on extreme posterior margin of head, brownish yellow; eyes black; ocelli crimson red; antennae black, pilosed with long golden hairs; pronotum dark brownish yellow, thickly punctured with black; anterior and lateral margins bronzy black, except collar of pronotum, central longitudinal line and irregular maculate spot arising posteriorly narrowed medially as irregular broad patch on either side of pronotum, shining yellow; scutellum brownish yellow, punctured coarsely with black; base of scutellum with three yellow spots (one medial, two angular), few similar spots on posterior margin; clavus, corium purplish brown with few brownish yellow spots; costal margin darker, thickly punctured; anteriormost portion of costal margin levigate, pale; hemelytral membrane shining black; connexiva bronzy black, punctured with black alternating with brownish yellow impunctate spots.

Ventral Coloration: Head black, thickly punctured, strongly pilosed; sternum brownish yellow, thickly punctured with black, sometimes with reddish tinge and yellow striations, entirely pilosed; metathoracic scent gland brownish yellow, evaporatorium faded black; abdomen brownish yellow, black punctures, central longitudinal area paler in hue with margins spotted with brownish yellow spots in between; connexiva same as dorsal coloration; genital capsule and legs brownish yellow, thickly darkly punctate; spiracles black.

STRUCTURE:

Head (Fig. 116): Head elongated, truncate at apex; paraclypei slightly longer than clypeus, former sinuous above eyes, slightly reflexed anterolaterally upwards, distinctly angulated before subacute apex; clypeus raised medially; antennal segment I not reaching apex of head; antennal segmental formula – I<III<II<IV=V; labium very

long, reaching posterior margin of IV abdominal segment; labial length formula – IV<I<II<III. **Thorax:** Pronotum (Fig. 117) anteriorly deflected, region of transverse callosities forming distinct callosities; anterior pronotal margin concave, subtruncate behind eyes, anterolateral margins finely serrated, smooth posteriorly, humeral angles subrounded, obtuse; scutellum concave medially, narrowed into apical lobe; metathoracic scent gland osteolar peritreme (Fig. 118) small, narrow, raised, curved at apex, reaching only one fourth way to metapleural margin; evaporatorium broad, well developed, somewhat gun shaped narrowed anterior margin, subrounded posterior margin. **Abdomen:** abdomen broadly sulcate at base; connexiva exposed at repose; ventroanterior margin of abdominal sternite VII narrowly concave, somewhat an inverted V-shaped, subrounded at connexival angles (Fig. 119); genital capsule pilosed with golden hairs; hemelytral membrane passing much beyond apex of abdomen, smaller than scutellum.

Male Genitalia: Pygophore (Fig. 120) about as long as broad, lateral margins produced into prominent dorsolateral lobes, narrowed and rounded at apices; ventroposterior margin concave; dorsal opening broad; paramere (Fig. 121) somewhat L-shaped, blade subtriangular, narrowed at apex, outer margin with two finger like processes, inner margin straight, stem short; aedeagus (Fig. 122, 123) with broad vase like theca, a pair of semisclerotized dorsolateral membranous conjunctival appendages; a pair of sclerotized ventral conjunctival appendages that are not fused basally and a pair of strip like sclerotized medial penial lobes enclosing short vesica.

Population variation: Single specimen studied.

Material Examined

Uttarakhand: Nainital, 20. viii. 2011 - 1♂

Distribution: India (Uttarakhand).

Remarks: The species is characterized in having lateral lobes of the head distinctly upwardly recurved, 1st joint of antennae not reaching apex of head, 2nd joint much longer than 3rd paramere with distinct broad blade with two raised areas on outer margin and theca distinctly suboval, narrowed posteriad.

GENUS *DALPADA* AMYOT AND SERVILLE

Dalpada, Amyot and Serville (1843) *Hém.*, p. 105

Udana, Walker (1868) *Cat. Het.*, 3: p. 549

Dalpada, Ahmad *et al.*, (1974) *Kar. ent. Soc. Suppl.*, 1. p. 54

Type species - *Dalpada aspersa* Amyot and Serville, a Malayan species.

Diagnosis: Body oval or ovate; head very slightly convex, lateral lobes more or less distinctly sinuate at their apices, outwardly or obliquely truncated; bucculae reaching the base of the head, angulated anteriorly; antennae five-jointed, slender, the 1st joint not or very slightly extending beyond the apices of the lateral lobes; eyes globose, prominent; ocelli in a line with the base of the eyes; labium extending beyond the posterior coxae; anterior lateral margins of the pronotum crenulated; membrane with about six simple longitudinal veins; mesosternum carinated; abdomen moderately sulcated on basal area; tibiae furrowed, anterior tibiae sometimes dilated.

Remarks: The genus is represented by 50 species from the World. Its distribution is restricted to Indo-Malayan region including Sylehet (North), Madagascar and Malayan Archipelago. It is closely related to genus *Erthesina* Spinola in having dilated anterior tibiae, bilobed paraclypei and basal antennal segment not reaching apex of head, but can be separated from it by simple posterior tibiae, lateral margins of paraclypei toothed before apex and humeral angles nodulated or subcaute.

Key to the studied species of genus *Dalpada* Amyot and Serville

1. Antennae brownish-red; anterior half of scutellum brownish-red; central lobe of head not nodulated; lateral lobes of head produced into slightly obtuse processes before apex; abdomen beneath with reddish and impunctate disk..... ***nigricollis* (Westwood)**
- Antennae piceous; anterior half of scutellum with pitch black punctures; central lobe of head distinctly nodulated at apex; lateral lobes of head produced into subacute spines before apex; abdominal disk with double series of discal spots, without any reddish tinge..... ***neoclavata* Rider**

***Dalpada nigricollis* (Westwood)**
(Figs. 124, 125, 126, 127, 128, 129, 130, 131, 132)

Halys nigricollis, Westwood (1837) in *Hope Cat. Hem.*, 1: p. 22.

Dalpada nigricollis: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 111.

MALE

Measurements (mm): Head length: 3.90; width across eyes: 3.12; interocular space: 1.50; interocellar space: 0.70; preocular distance: 2.50; length of posterior head including eyes: 1.375; antennal segments lengths: I: 0.80, II: 1.50, III: 1.80, IV: 2.20, V: 2.0; pronotal length: 4.25; width across humeral angles: 8.25; scutellar length: 5.61; width: 5.0; length of abdomen: 6.60; maximum width of abdomen: 8.0; length of rostral segments: I: 1.60, II: 2.96, III: 2.56, IV: 1.45; Distance - base scutellum-apex clavus: 3.795, apex clavus-apex scutellum: 1.815, apex scutellum-apex abdomen including membrane: 4.25; total body length: 16.5.

Dorsal Coloration: Head brownish yellow, thickly punctured with black; eyes black, bordered with brownish yellow; ocelli red; antennae brownish yellow, with reddish tinge; pronotum brownish yellow, moderately punctured with black, lateral areas more densely punctated, humeral angles piceous, with a small dark brownish yellow spot at the tip; anterior pronotal area with two brownish yellow transverse callosities; scutellum brownish yellow, thickly punctured with black, less on apex and medioalateral area, anterior area with distinct reddish tinge, base with three obscure pale small spots (one central, two angular); clavus, corium brownish yellow, with fine black punctures; costa more densely punctured, with posterior area reddish; hemelytral membrane hyaline with basal black fascia; connexiva dark brownish yellow, with anterior and posterior broad margins thickly punctured with black.

Ventral Coloration: Head thickly punctured with black, with pale longitudinal brownish yellow fascia, area below 1st labial segment impunctate; area between legs black and brownish yellow alternating; lateral areas of sternum with dense black punctures; metathoracic scent gland peritreme and evaporatorium brownish yellow, with black punctured area; labium brownish yellow, apex black; abdomen dark brownish yellow, lateral areas thickly punctured with black, disk of abdomen somewhat deep reddish, impunctate medially; connexiva brownish yellow, with anterior and posterior black margins; legs pilosed, femora brownish yellow, spotted

with dark brown and red fascia, tibiae scarcely spotted with black and reddish, basal one third black, tarsi black.

STRUCTURE:

Head (Fig. 125): Head slightly declivent, paraclypeal lobes subequal to lobulated clypeus, former slightly sinuous above eyes, anterolaterally reflexed upwards, obtusely spined before apex, narrowed sinuously as obtuse apical angles; 1st antennal segment long, but not reaching apex of head, antennal segmental formula – $I < II < III < V < IV$; labium long reaching middle of fourth abdominal segment; labium lengths formula – $IV < I < III < II$. **Thorax:** Pronotum (Fig. 126) slightly deflected anteriorly, medially depressed, anterior pronotal margin equal to width across eyes, truncate behind eyes, nearly touching latter; anterolateral margins crenulated, humeral angles strongly nodulated, raised, inwardly furrowed; scutellum distinctly sulcate medially, broad at base, narrowed into subrounded apical lobe; metathoracic scent gland osteolar perireme (Fig. 127) long, somewhat banana shaped, concavely sinuous, reaching half way of metapleural margin; evaporatorium thick, broad, with well developed anterior and posterior margins covering about half sternite; legs not modified, tibiae grooved dorsally and pilosed. **Abdomen:** connexiva well exposed at repose; ventroanterior margin of abdominal sternite VII narrowly concave, somewhat an inverted V-shaped (Fig. 128); genital capsule with golden brown pubescence; abdomen slightly convex, laterally flattened, with subacute connexival angles; hemelytral membrane passing much beyond apex of abdomen.

Male Genitalia: Pygophore (Fig. 129) about as long as broad, convex laterally, produced as narrowed truncate dorsolateral lobes; ventroposterior margin sinuate laterally with medial shallow excavation; dorsal opening small; paramere (Fig. 130) with a short stem, blade with broad hump basally, apex narrow and curved upwards, outer margin sinuate, inner margin sinuate with a small medial angulation; aedeagus (Fig. 131, 132) with broad theca, trilobed dorsal membranous conjunctival appendages, one small medial, two lateral elongated lobes, a pair of highly sclerotized medial penial lobes; vesica long passing beyond penial lobes, but not beyond the margins of membranous appendages.

Population Variation: Single specimen studied.

Material Examined:

Himachal Pradesh: Solan, 18. viii. 2010 - 1♂

Distribution: West China; Pakistan; Nepal; India (Himachal Pradesh, Uttarakhand, Punjab, Jammu and Kashmir, Paschim Banga).

Remarks: *D.nigricollis* is distinctly characterized for having broad blade of paramere with a basal hump and aedeagus with distinct trilobed dorsal membranous conjunctival appendages.

***Dalpada neoclavata* Rider**
(Figs. 133, 134, 135, 136, 137, 138, 139)

Cimex clavata Fabricius (1798) *Ent. Syst. Suppl.*, p. 532.

Halys latipes, Westwood (1837). in *Hope Cat.*, 1. p. 23

Halys concinna, Westwood (1837). in *Hope Cat.*, 1. p. 23

Dalpada bulbifera, Walker (1867). *Cat. Het.*, 1, pp. 223, 225

Dalpada consobrina, Walker (1867). *Cat. Het.*, 1, pp. 16, 20

Dalpada clavata, Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 113

Dalpada neoclavata: Rider (1998) *Proc. Entomol. Soc. Wash.*, 100(3): p. 452.

FEMALE:

Measurements (mm): Head length: 3.90; width across eyes: 3.20; interocular space: 1.60; interocellar space: 0.65; preocular distance: 2.75; length of posterior head including eyes: 1.125; antennal segments lengths: I: 0.70, II: 2.0, III: 1.90, IV: 3.50, V: 2.88; pronotal length: 4.0; width across humeral angles: 8.50; scutellar length: 6.105; width: 5.28; length of abdomen: 7.0; maximum width of abdomen: 8.0; length of rostral segments: I: 1.70, II: 2.72, III: 3.50, IV: 1.90; Distance - base scutellum-apex clavus: 4.25, apex clavus-apex scutellum: 1.815, apex scutellum-apex abdomen including membrane: 4.7025; total body length: 19.125.

Dorsal Coloration: Head brownish yellow, thickly punctured with black, pilosed with short silver hairs; area behind eyes with two posterior brownish yellow spots; eyes dark brown, bordered with pale; ocelli reddish; 1st antennal segment black, apex of 2nd, base and apex of 3rd, base of 5th pale yellow, rest black; pronotum brownish yellow, densely punctured with black, anterolateral margins pale yellowish, anterior pronotal margin with two transverse brownish yellow blackly punctate callosities, anteromedial area pale, humeral angles pilosed and black, tip of angle with two brownish yellow spots; scutellum brownish yellow, punctured with black, base with three pale spots (one central, two angular), apex pale scarcely punctate; clavus,

corium and costa brownish yellow, moderately punctate with black and reddish, anteriormost part of costal margin pale and pilosed; connexiva with alternating brownish yellow and thick black punctures at anterior and posterior margins, connexival posterior angles black; hemelytral membrane brownish yellow, suffused with black; veins darker.

Ventral Coloration: Lateral area of head black punctate, pilosed with short silver hairs, with two longitudinal maculate brownish yellow fascia behind 1st antennal segment, posterior margin pale; area between legs black alternating with brownish yellow; lateral area of prosternum densely punctured, with three maculate brownish yellow spots, humeral angles ventrally pilosed with silver hairs, rest sternum brownish yellow, blackly punctured; costal margin impunctate; evaporatorium greyish black; legs paler, femora spotted with black, apices and bases of tibiae, apices of tarsi black and pilosed; abdomen brownish yellow, centrally impunctate, lateral area punctured more with reddish brown tinge, margins with black; connexiva brownish yellow with semicircular black punctured boundaries, posterior angles acute; abdominal disk with black fascia on anterior margin of each segment and with double series of discal spots; genital capsule darker with melanic suffusions.

STRUCTURE:

Head (Fig. 134): Head moderately declivent, paraclypeal lobes subequal to lobulated clypeus, concavely sinuous above eyes, tuberculate, strongly spined before apex; 1st antennal segment distinctly smaller than apex of head, antennal segmental formula – I<III<II<V<IV; bucculae strongly angulated, reaching posterior of head, labium distinctly long, reaching about middle of fifth abdominal segment, labial lengths formula: I<IV<II<III. **Thorax:** Pronotum (Fig. 135) slightly deflected anteraid, anterior pronotal margins concave, subequal to width across eyes, anterolateral margins concavely sinuous, irregularly crenulated, humeral angles strongly nodulated and inwardly furrowed, pronotum with medial concavity; scutellum somewhat depressed medially, broad at base, beyond frena narrowed distinctly into elongated apical lobe; metathoracic scent gland osteolar peritreme (Fig. 136) long, uniformly thick, concave medially, slightly raised at apex, reaching about half way to metapleural margin; evaporatorium distinctly broad, thick with subprominent anterior and posterior margins, obliquely sinuous medially, covering about two-third of sternite; legs

pilosed, tibiae furrowed prominently. **Abdomen:** longitudinal disk of abdomen grooved medially and impunctate; connexiva well exposed at repose, ventroanterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped, with prominent acutely directed connexival angles (Fig. 137); genital capsule pilosed with golden brown hairs; hemelytral membrane passing moderately beyond apex of abdomen; abdominal segment III not exactly tuberculate but with an obscure convexity anteriorly.

Female Genitalia: 1st gonocoxae medially placed wide apart, subquadrate, inner margin sinuate, posterior margin broadly concave; 2nd gonocoxae medially fused, posterior margin convex; 8th paratergites triangular, posterior margin convex; 9th paratergites lobe like, rounded at apices, passing much beyond the fused posterior margin of 8th paratergites (Fig. 138); spermatheca (Fig. 139) with distinct distal and proximal flanges; pump region short, dilated distinctly smaller than distal spermathecal duct; bulb rounded with two small finger like processes directed downwards; medial dilation spindle like with a narrow small proximal dilation; posterior spermathecal duct distinctly shorter than distal spermathecal duct.

Population variation: Single specimen studied.

Material Examined

Uttarakhand: Dehradun, 25. vi. 2010 - 1♀

Distribution: India (Uttarakhand, Maharashtra, Assam).

Remarks: This species closely resembles *D. nigricollis* in having humeral angles nodulated and inwardly furrowed, but can be easily separated from the same in having antennae piceous; anterior half of scutellum with pitch black punctures; central lobe of head distinctly nodulated at apex; lateral lobes of head produced into subacute spines before apex and abdominal disk with double series of discal spots, without any reddish tinge.

GENUS CAHARA GHOURI

Cahara, Ghauri (1978) *J. Nat Hist* 12(2): p. 163

Type species – *Dalpada brevivitta* Walker

Diagnosis: Head except eyes, ocelli and antennae, pronotum except lateral margins, scutellum except three basal spots, corium and clavus, dull brownish yellow, thickly punctate with black or dark brown tinge and streaked with light and dark; clypeus mostly black with brownish yellow fascia; outer margins of paraclypei mostly dark; eyes brown with outer border yellow; ocelli red; antennae brownish yellow or brown; lateral margins of pronotum and three basal spots on scutellum yellow; connexiva brownish yellow or dull with both ending black; hemelytral membrane usually with veins and basal and apical spots dark; head distinctly longer than broad, slightly tapering at apex; paraclypei distinctly longer than clypeus, mostly not touching apically, but in some species enclosing clypeus, outer lobes of paraclypei acute or subacute and at wide obtuse angle to inner lobe, inner lobes round or pointed apically, lateral margins slightly sinuate and truncate at apex; antecular region more than remainder of head; basal joint not reaching apex of head, 2nd antennal segment straight; anteroventral angle of bucculae but not produced; labium reaching beyond posterior coxae, in some even reaching upto posterior margin of fifth abdominal segment; pronotum longer than broad, lateral margins slightly or distinctly concave and crenulated, humeral angles more or less horny, not raised vertically but diverging outwardly; scutellum longer than wide at base; metathoracic scent gland opening narrow and long; connexiva exposed at repose.

Remarks: This genus was described by Ghauri with *Dalpada brevivitta* Walker, as its type species. The genus is known to exist in the subhimalayan region of India, Pakistan and Nepal. Members of this genus have been reported as serious pests of deciduous trees, apple, walnut, fir, deodar, Bauhinia, etc. It resembles *Dalpada* but can be separated from it based on few characters like the shape of the head, the simple 2nd antennal segment and more particularly on the basis of female genitalia with 1st gonocoaxe broadly lobulate; 9th paratergites elongate lobe like, extending much beyond the fused posterior margins of 8th paratergites; spermatheca with pump region about one-third of distal spermathecal.

Key to the studied species of genus *Cahara* Ghauri

1. Lateral margins of pronotum moderately serrated; humeral angles of pronotum more or less nodulose, inwardly furrowed; labium just passing the posterior coxae; antennae piceous; apex of scutellum relatively narrowed; 9th paratergites just reaching the fused posterior margin of 8th paratergites..... *jugatoria* (Lethierry)
- Lateral margins of pronotum distinctly serrated; humeral angles of pronotum not nodulated, subprominent, subacute; labium at least passing 3rd abdominal segment; antennae yellowish brown; apex of scutellum relatively broad; 9th paratergites narrow, elongated passing beyond the posterior margin of 8th paratergites..... 2
2. Pronotal disk with a broad longitudinal impunctate yellowish-brown fascia; lateral lobes of head sinuate before apex; spermathecal bulb without any protuberances; 1st gonocoxae produced posteriorly as short subrounded processes..... *brevivitta* (Walker)
- Pronotal disk without any distinct fascia; lateral lobes of head with subacute protuberances before apex; spermathecal bulb with two finger-like irregular processes; 1st gonocoxae produced as elongate finger-like processes posteriorly..... *confusa* (Distant)

***Cahara jugatoria* (Lethierry)
(Figs. 140, 141, 142, 143, 144, 145, 146)**

Dalpada jugatoria, Lethierry (1891) *Ann. Soc. Ent. Belg., Bull.*: p. 143.

Cahara jugatoria: Ghauri (1978) *J. Nat Hist* **12**(2): p. 164.

FEMALE:

Measurements (mm): Head length: 3.20; width across eyes: 2.88; interocular space: 1.40; interocellar space: 0.70; preocular distance: 1.76; length of posterior head including eyes: 1.44; antennal segments lengths: I: 0.70, II: 1.80, III: 1.50, IV: 2.0, V:

2.0; pronotal length: 3.60; width across humeral angles: 6.93; scutellar length: 2.56; width: 5.0; length of abdomen: 6.60; maximum width of abdomen: 7.0; length of rostral segments: I: 1.40, II: 2.10, III: 2.10, IV: 0.95; Distance - base scutellum-apex clavus: 1.92, apex clavus-apex scutellum: 0.64, apex scutellum-apex abdomen including membrane : 4.25; total body length: 16.0..

Dorsal Coloration: Head brownish yellow, thickly punctured with black and scattered irregular levigate callosities; two levigate brownish yellow fascia just in front and two minute spots above eyes; eyes reddish black; ocelli red; antennae black except bases of 3rd, 4th and 5th segments brownish yellow; pronotum brownish yellow with coarse thick black punctures, broad fascia sparingly punctured, reaching only one fourth way to posterior margins and series of four transverse minute spots, brownish yellow; anterior area with two dark greyish black transverse callosities, humeral angles shining black; scutellum, brownish yellow, thickly punctured with black, basal scutellar angles with two large levigate pale spots; clavus and corium concolorous with irregular punctured fascia; costa with slight orange tinge; hemelytral membrane fuliginous, veins darker, outer margins paler; connexiva dark brown, anterior and posterior margins with broad coarse black punctures.

Ventral Coloration: Labium brownish yellow, except dorsal surface black; lateral areas of head pilosed, black; area between pro and meso legs brownish black, meso and meta legs brownish yellow; sternum brownish yellow, lateral areas thickly punctured; metathoracic scent gland opening and evaporatorium brownish yellow, with black suffusion; abdomen dark brownish yellow, lateral area darkly punctate with black and metallic green tinge, central longitudinal abdominal disk paler, impunctate, abdominal segment VII with elongated black spot; spiracles, transverse line to each spiracle and connexival angles black; legs brownish yellow spotted with black, bases and apices of tibiae and tarsi black; genital capsule brownish black, pilosed.

STRUCTURE:

Head (Fig. 141): Head pilosed, truncated at apex, slightly declivent, convex; paraclypeal lobes longer than clypeus, latter raised medially; former slightly sinuous above eyes, angulated antiapically, strongly sinuous and not fusing at apex; two small acute spines recurved upwards arising laterad, just above eyes; basal antennal segment

long, slender just reaching paraclypeal lobe; antennal segmental formula – I<III<II<IV=V; labium long, just passing posterior coxae, bucculae angulated at apex; labial length formula – IV<I<II=III. **Thorax:** Pronotum (Fig. 142) with anterior margin concave, truncated behind eyes, anterolateral margins moderately serrated, laterally strongly sinuate and pilosed, humeral angles prominent, somewhat nodulated, slightly recurved inwards with two furrows, posterior margin raised; scutellum sulcate medially, beyond frena, narrowed as subrounded apical lobe; metathoracic scent gland osteolar opening (Fig. 143) elongated, strongly curved, concave and narrow at apex reaching more than half way to metapleural margin; evaporatorium broad, thick, well developed, covering three-fourth of sternite; legs with tibiae furrowed. **Abdomen:** connexiva exposed at repose with acute posterior connexival angles; ventroanterior margin of abdominal sternite VII broad and triangular, ventroposterior margin broadly concave (Fig. 144); genital capsule pilosed; hemelytral membrane paasing considerably beyond abdominal apex.

Female Genitalia: 1st gonocoxae medially placed, not wide apart, sinuate on outer margin, posterior margin deeply concave produced as long lobules; 2nd gonocoxae medially fused, posterior margin concave; 8th paratergites broadly triangular, posterior margin convex; 9th paratergites moderately long, lobe like, outer margins straight, inner margin convex, extending beyond the fused posterior margin of 8th paratergites (Fig. 145); spermatheca (Fig. 146) with distinct distal and proximal flanges; pump region short, dilated, distinctly smaller than distal spermathecal duct; bulb rounded with three finger like processes; medial dilation balloon like with a small proximal dilation; posterior spermathecal duct distinctly shorter than distal duct.

Population Variation: Single specimen studied.

Material Examined:

Himachal Pradesh: Shimla, 16. viii. 2010 - 1♀

Distribution: India (Himachal Pradesh, Sikkim, Meghalaya, Nagaland).

Remarks: This species is closely allied to *Cahara confusa* and *Cahara brevivitta* superficially, except for its moderately serrated lateral pronotal margins; humeral angles nodulated, inwardly furrowed; labium just passing the posterior coxae and 9th

paratergites just reaching the fused posterior margin of 8th paratergites. It is a new record from North India.

***Cahara brevivitta* (Walker)**
(Figs. 147, 148, 149, 150, 151, 152, 153)

Dalpada brevivitta, Walker (1867) *Cat. Het.*, **1**, p. 224.

Cahara brevivitta: Ghauri (1978) *J. Nat Hist* **12**(2): p. 165.

FEMALE:

Measurements (mm): Head length: 3.60; width across eyes: 3.40; interocular space: 1.70; interocellar space: 0.80; preocular distance: 2.20; length of posterior head including eyes: 1.40; antennal segments lengths: I: 0.80, II: 1.90, III: 1.90, IV: 2.80, V: 2.31; pronotal length: 3.90; width across humeral angles: 7.25; scutellar length: 6.022; width: 4.95; length of abdomen: 8.0; maximum width of abdomen: 8.375; length of rostral segments: I: 1.50, II: 2.66, III: 1.40, IV: 0.70; Distance: base scutellum-apex clavus: 4.867, apex clavus-apex scutellum: 1.155, apex scutellum-apex abdomen including membrane: 5.445; total body length: 18.

Dorsal Coloration: Head brownish yellow, thickly and darkly punctured with black; two impunctate similar spots just in front of eyes; eyes black, bordered with brownish yellow; ocelli red; antennae brownish yellow, except inner margin of 1st segment and 4th segment (excluding base) black; pronotum brownish yellow, thickly punctured with black, anterior area with two impunctate callosities, disk with a broad longitudinal impunctate fascia, narrowing anteriorly, with few black punctures; scutellum brownish yellow, thick black punctures more pronounced on lateral and medial regions; basal angle narrowly levigate, brownish yellow; clavus, corium and costal margin concolorous to scutellum, with greenish tinge; anteriormost portion of costal margin pale; hemelytral membrane smoky brown, veins dark brown, with obscured margined spots; connexiva thickly punctured on anterior and posterior margins, spotted with brownish yellow and green tinge.

Ventral Coloration: Labium brownish yellow, dorsal surface of 2nd, 3rd and 4th segments black; head punctured with black on lateral margins, region below 1st labial segment levigate; head and prosternum pilosed with silver hairs; area between legs reddish brown; legs brownish yellow, femora finely spotted with black, bases and

apices of tibiae and tarsi (excluding base) black; metathoracic scent gland peritreme brownish yellow, impunctate, evaporatorium reddish black; lateral area of sternum darkly punctate; abdomen brownish yellow, black punctured more pronounced on lateral areas, a narrow longitudinal central line on disk black; spiracles, apical and inner margin of each abdominal segment black; genital capsule, pilosed and punctate.

STRUCTURE:

Head (Fig. 148): Head deflected downwards; paraclypeal lobes longer than clypeus, lateral margins slightly sinuous above eyes, angulated before apex, narrowed at apex, not fusing beyond clypeus, latter slightly raised medially; 1st antennal segment reaching angulation of head, antennal segmental formula – I<II=III<V<IV; labium passing abdominal segment III, bucculae angulated anteriorly, reaching base of head; labial length formula - IV<III<I<II. **Thorax:** Pronotum (Fig. 149) declivent anteriorly, raised posteriorly, anterior margin concave, truncate behind eyes, anterolateral margins serrated, lateral margins strongly sinuated, humeral angles subprominent, recurved and subacute; scutellum slightly sulcate anteriorly, broad at base, narrowed as subtriangular apical lobe; metathoracic scent gland osteolar opening (Fig. 150) long, uniformly thick, strongly curved, concave medially, rounded at apex reaching half way distance to metapleural margin; evaporatorium broad, thickened, well developed, with subequal anterior and posterior margins; legs dilated, tibiae furrowed. **Abdomen:** sulcate along longitudinal medial area, convex laterally; connexiva well exposed at repose with subacute posterior angles; ventroanterior margin of abdominal sternite VII concave, sinuous laterally (Fig. 151); hemelytral membrane passing much beyond apex of abdomen.

Female Genitalia: 1st gonocoxae with posterior margin produced as slightly broad lobules; 2nd gonocoxae medially fused, convex on posterior margin; 8th paratergites triangular, convex with a small angulation on posterior margin; 9th paratergites elongate, lobe like, outer margin straight, inner margin medially produced, narrowly rounded at apices, extending much beyond the fused posterior margins of 8th paratergites (Fig. 152); spermatheca (Fig. 153) with distinct distal and proximal flanges; pump region sclerotized, tube like, about more than 3x shorter than distal spermathecal duct; bulb rounded without any processes; medial dilation elongate with

a small proximal oval dilation; posterior spermathecal duct distinctly shorter than distal spermathecal duct.

Population Variation: Single specimen studied.

Material Examined:

Himachal Pradesh: Manali, 23. vii. 2010 - 1♀

Distribution: India (Himachal Pradesh, Assam).

Remarks: This species closely resembles *Cahara confusa* in having lateral margins of pronotum distinctly serrated; humeral angles of pronotum subacute; labium at least passing 3rd abdominal segment and 9th paratergites narrow, elongated, passing beyond the posterior margin of 8th paratergites. However, it can be easily separated from the same in having pronotal disk with a broad longitudinal impunctate yellowish brown fascia; lateral lobes of head sinuate before apex; spermathecal bulb without any protuberances and 1st gonocoxae produced posteriorly as short subrounded processes. It has been reported as serious pest of deciduous trees like, apple, walnut, fir, deodar, Bauhinia etc. It is a new record from North India.

***Cahara confusa* (Distant)**
(Figs. 154, 155, 156, 157, 158, 159, 160)

Dalpada confusa, Distant (1879) *Tr. E. S.*: p. 121.

Cahara confusa: Ghauri (1978) *J. Nat Hist* 12(2): p. 165.

FEMALE:

Measurements (mm): Head length: 3.60; width across eyes: 3.20; interocular space: 1.70; interocellar space: 0.80; preocular distance: 2.08; length of posterior head including eyes: 1.12; antennal segments lengths: I: 0.80, II: 1.30, III: 1.80, IV: 2.56, V: 2.09; pronotal length: 4.25; width across humeral angles: 7.875; scutellar length: 6.105; width: 5.0; length of abdomen: 7.50; maximum width of abdomen: 8.75; length of rostral segments: I: 1.40, II: 2.20, III: 2.20, IV: 1.30; Distance: base scutellum-apex clavus: 4.62, apex clavus-apex scutellum: 1.485, apex scutellum-apex abdomen including membrane: 5.445; total body length: 18.

Dorsal Coloration: Head brownish yellow, thickly punctured with black, area around and below eyes impunctate, brownish yellow; eyes shining black; ocelli dark red; 1st

antennal segment brownish yellow, black ventrally, 2nd and 3rd segments red with black tinge, apex and base of 3rd, base of 4th brownish yellow, base of 5th pale, 4th and 5th black and pilosed; pronotum brownish yellow, with thick black punctures, with few irregular brownish yellow spots, anterior area with similar two transverse callosities; anterior concave margin impunctate, pale; humeral angles black, tip brownish yellow; scutellum brownish yellow anteriorly, densely punctured, pale at apex; basal scutellar angles with irregular arc shaped impunctate spots, brownish yellow; clavus, corium and costa brownish yellow, blackly punctured, corium with reddish brown tinge; anteriormost portion of costa plae, impunctate; connexival segments brownish yellow with anterior and posterior margins thickly punctured with black; hemelytral membrane hyaline, with black suffusions, veins darker.

Ventral Coloration: Head pilosed with silver hairs, punctured with black, area below 1st labial segment impunctate, posteriorly pale, apex with dark streaks; labium pale brownish yellow, dorsally and apex black; lateral area of prosternite pale brownish yellow, densely punctured and pilosed, with few irregular scattered brownish yellow rugosities; rest sternum darkly punctate with golden tinge at some places; metathoracic scent gland peritreme impunctate, evaporatorium hazy blackly punctured, with small silver hairs; femora paler with light reddish tinge, spotted with black; apex and base of tibiae, entire tarsi black; abdomen brownish yellow, with dark brown fascia, pale medially, finely punctate longitudinally, lateral areas paler, densely punctured with small black punctures; anteriormost margin of each abdominal segment on lateral sides pale brownish yellow, impunctate; VI and VII abdominal segments with a triangular black longitudinal spots; spiracles black; connexival segments pale with anterior and posterior margins black; genital capsule pilosed with golden hairs, blackly punctured.

STRUCTURE:

Head (Fig. 155): Head moderately declivent, somewhat subrounded, paraclypeal lobes distinctly larger than clypeal lobe, slightly sinuous above eyes, anterolaterally reflexed upwards, minutely protruded as tubercles just above eyes, obtusely spinosed before apex; clypeus slightly raised medially; antennal segmental formula – I<II<III<V<IV; labium just reaching anterior margin of fourth abdominal segment, labium lengths formula – IV<I<II=III. **Thorax:** Pronotum (Fig. 156) slightly

deflected, coarsely punctate with thick black punctures, anterior margins concave, truncate behind eyes; anterolateral margins dentate, humeral angles prominent obtuse and grooved inwardly, slightly produced beyond costal margins, but smaller than maximum width of abdomen; scutellum broader at base, narrowed distinctly into subrounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 157) long, curved, slightly raised, concavely sinuous medially, reaching half way to metapleural margin; evaporatorium well defined; legs with tibiae grooved dorsally. **Abdomen:** ampliate, laterally depressed; connexiva exposed at repose; ventroanterior margin of abdominal sternite VII concave, sinuous laterally, with acute posterior connexival angles, ventroposterior margin somewhat an inverted U-shaped (Fig. 158); genital capsule pubescent; hemelytral membrane passing considerably beyond abdominal apex.

Female Genitalia: 1st gonocoxae with posterior margins produced into long lobules; 2nd gonocoxae fused medially, posterior margins convex; 8th paratergites broad, convex, toothed on posterior margin; 9th paratergites elongate, lobe like and narrowed at base, outer margin straight, inner margins slightly produced medially, narrowly rounded at apices, extending much beyond the fused posterior margins of 8th paratergites (Fig. 159); spermatheca (Fig. 160) with distinct distal and proximal flanges; pump region sclerotized, tube like, distinctly smaller than distal spermathecal duct; bulb rounded with two finger like lobules directed downwards; medial dilation balloon like with a narrow elongated proximal dilation; posterior spermathecal duct distinctly shorter than distal spermathecal duct.

Population Variation: Single specimen studied.

Material examined

Uttarakhand: Dehradun, 25. vi. 2010 - 1♀

Distribution: India (Punjab, Uttarakhand).

Remarks: This species is closely allied to *C. brevivitta* except pronotal disk without any distinct fascia; lateral lobes of head with subacute protuberances before apex; spermathecal bulb with two finger like irregular processes and 1st gonocoxae produced as elongate finger like projection posteriorly.

GENUS *NEZARA* AMYOT AND SRVILLE

Nezara, Amy. & Serv. (1843) *Hém.*, p. 143 s
Rhaphigaster, Dall. (1851) *List Hem.*, **1**, p. 274
Acrosternum, Fieber (1861) *Eur. Hem.*, pp. 78 & 329
Subg. Pellæa, Stål, (1871) *En. Hem.*, **2**: p. 40
Nezara, Kirkaldy (1909) *Cat. Hem.*, **1**: p.115.

Type species – *Nezara viridula* Linnaeus

Diagnosis: Colour normally green, with a variable amount of yellow intermixed and sometimes red or brown; body oval or obovate; head somewhat laterally sinuate, lobes of equal length; antennae five jointed, basal joint not reaching apex of head; pronotum with the lateral margins not or very rarely slightly reflexed, truncate behind the eyes; mesosternum moderately carinate; abdomen tuberculately spinous at base.

Remarks: The genus is represented by 23 species from the World. The members are usually polyphagous pests, infesting more than 30 families of plants, particularly legumes and cereal crops. Species belonging to this genus are characterized by green in color and abdomen tuberculosly spinosed at base.

Key to the studied species of genus *Nezara* Amyot & Serville

1. Body length: 16 mm; head subroundish; blade of paramere not curved at apex; ejaculatory reservoir area large; inner margin of paramere nearly straight; 9th paratergites elongate, narrowly rounded posteriorly..... *viridula* (Linnaeus)

- Body length: 14 mm, head triangular; blade of paramere curved subacutely downwards at apex; ejaculatory reservoir area small; inner margin of paramere sinuous; 9th paratergites broadly rounded at posterior margin..... *antennata* Scott

Nezara viridula* (Linnaeus)*(Figs. 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172)**

- Cimex viridulus*, Linnaeus (1758) *Syst. Nat.* **10**: p. 444.
Cimex torquatus, Fabricius (1775) *Syst. Ent.*: p. 710.
Cimex smaragdulus, Fabricius (1775) *Syst. Ent.*: p. 711.
Cimex transverses, Thunberg (1783) *Nov. Ins. Spec.* **2**: p. 40
Cimex spirans, Fabricius (1798) *Ent. Syst.*: p. 533.
Cimex viridissimus, Wolff (1801) *Ico. Cim. Desc. Illus.*: p. 55.
Pentatoma torquatus, Latreille (1804) in *Hist. Nat. gen.*: p. 190.
Pentatoma viridulum, Billberg (1820) *Enumeratio insectorum* : p. 70.
Rhaphigaster smaragdulus, Herrich-Schäffer (1835) *Synops.* **1**: pp. 57 & 94.
Rhaphigaster torquatus, Herrich-Schäffer (1835) *Synops.* **1**: pp. 57 & 94.
Pentatoma oblonga, Westwood (1837) in *Hope Cat.* **1**: pp. 9 & 37-38.
Pentatoma unicolor, Westwood (1837) in *Hope Cat.* **1**: pp. 9 & 38.
Pentatoma beryline, Westwood (1837) in *Hope Cat.* **1**: pp. 9 & 38.
Pentatoma subsericea, Westwood (1837) in *Hope Cat.* **1**: pp. 9 & 38.
Pentatoma lei, Westwood (1837) in *Hope Cat.* **1**: pp. 9 & 38.
Pentatoma tripunctigera, Westwood (1837) in *Hope Cat.* **1**: p. 9 & 38.
Pentatoma chinensis, Westwood (1837) in *Hope Cat.* **1**: p. 9 & 38.
Pentatoma proxima, Westwood (1837) in *Hope Cat.* **1**: p. 9 & 38.
Pentatoma viridissima, Westwood (1837) in *Hope Cat.* **1**: p. 9.
Pentatoma chlorocephala Westwood (1837) in *Hope Cat.* **1**: p. 9 & 38.
Pentatoma propinqua Westwood (1837) in *Hope Cat.* **1**: p. 9 & 39.
Cimex hemichloris Germar (1838): p. 166.
Nezara smaragdula: Amyot & Serville (1843) *Hist. Nat. des Ins.*: pp. 144-145.
Rhaphigaster prasinus Dallas (1851) *List Hem.* **1**: p. 274.
Rhaphigaster subsericeus: Dallas (1851) *List Hem.* **1**: p. 274.
Nezara viridula: Stål (1865) *Hem. Afr.* **2**: pp. 193-195.

MALE:

Measurements (mm): Head length: 2.0; width across eyes: 2.72; interocular space: 1.50; interocellar space: 0.95; preocular distance: 1.0; length of posterior head including eyes: 1.0; antennal segments lengths: I: 0.45, II: 1.20, III: 0.90, IV: 1.30, V: 1.30; pronotal length: 3.50; width across humeral angles: 7.50; scutellar length: 5.28; scutellar width: 4.875; length of abdomen: 6.93; maximum width of abdomen: 8.0; length of rostral segments: I: 0.90, II: 1.40, III: 1.05, IV 0.85; Distance - base scutellum-apex clavus: 3.795; apex clavus-apex scutellum: 1.485; apex scutellum-apex abdomen including membrane: 4.25; total body length: 15.30.

Dorsal Coloration: Head rugulose, apex green, posterior margin slightly pale and impunctate, margins above eyes brownish yellow; eyes reddish black with brownish yellow suffusion; ocelli reddish yellow; antennae green, apex of 3rd apical area of 4th and 5th dark brownish; pronotum green, densely and finely punctured, subrugulose, lateral margins dark brownish yellow with reddish tinge, anterior area with two transverse green impunctate callosities; scutellum green, subrugulose; base of

scutellum with three distinct pale yellowish spots; clavus, corium and costa concolorous to scutellum, anteriormost portion of costal margin paler; connexiva greenish, laterally speckled with more yellowish tinge, posterior angles black; hemelytral membrane hyaline.

Ventral Coloration: Labium yellowish green with apex black; lateral margins of head black, rest greenish; lateral areas of sternum yellowish green, rugulose, streaked with pale green thick punctures, metathoracic scent gland peritreme green; abdominal tubercle yellowish green with reddish tinge; area between legs reddish green; an obscure medial longitudinal line yellow, impunctate; connexiva greenish yellow, posterior angles black; legs yellowish green, tibiae and tarsi speckled with brownish red; genital capsule pilosed with yellow hairs.

STRUCTURE:

Head (Fig. 162): Head strongly declivent, subrounded at apex, paraclypeal lobes as long as clypeal; former slightly sinuous above eyes, inner margins parallel, anterolaterally reflexed upwards; antennal segmental formula – I<III<II<IV=V; labium long, reaching anterior margin of 3rd abdominal segment; labial length formula – IV<I<III<II. **Thorax:** Pronotum (Fig. 163) deflected downwards, anterior margins concave, angles subquadrate, minutely tuberculate, lateral margins slightly sinuate medially, reflexed upwards, humeral angles subprominent, with rounded apices, posterior angles well defined and margins slightly convex; scutellum subrugulose, beyond frena markedly narrowed as subtriangular apical lobe; metathoracic scent gland osteolar opening (Fig. 164) oblong, uniformly thickened, subrounded at apex, reaching less than one third way to metapleural margin, evaporatorium broad, with well defined anterior and posterior margins; legs pilosed without any modifications. **Abdomen:** convex medially, moderately punctured; connexiva exposed at repose dorsally and ventrally; genital capsule pilosed; hemelytral membrane slightly passing beyond abdominal apex; ventroanterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped with acute posterior connexival angles, ventroposterior margin arc shaped (Fig. 165).

FEMALE:

Measurements (mm): Head length: 2.145; width across eyes: 2.88; interocular space: 1.60; interocellar space: 0.95 preocular distance: 1.10; length of posterior head including eyes: 1.045; antennal segments lengths: I: 0.50, II: 1.40, III: 1.10, IV: 1.45, V: 1.425; pronotal length: 3.75; width across humeral angles: 8.0; scutellar length: 5.94; scutellar width: 5.61; length of abdomen: 7.50; maximum width of abdomen: 8.0; length of rostral segments: I: 1.05, II: 1.60, III: 1.20, IV: 0.95; Distance - base scutellum-apex clavus: 4.125; apex clavus-apex scutellum: 1.815; apex scutellum-apex abdomen including membrane: 4.75; total body length: 16.0.

Coloration and Structure: Body form and coloration similar to males except: hemelytral membrane passing slightly beyond abdominal apex; abdominal disk paler, with moderately punctured; Abdomen more ampliate; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an arc shaped, with acute posterior connexival angles (Fig. 166).

Male Genitalia: Pygophore (Fig. 169) quadrate, longer than broad, lateral margins sinuate; dorsolateral lobes narrowly truncate posteriad, beset with long spines; ventroposterior margin concave; dorsomedial surface broadly concave; paramere (Fig. 170) with short stem, broad and lamellately punctate blade, outer margin sinuately convex with a distinct medial hump, inner margin somewhat straight, apex narrowed; aedeagus (Fig. 171, 172) with elongate theca, a pair of bag like small dorsolateral membranous conjunctival appendages; a pair of sclerotized lobe like medial penial lobes, apically acute that are fused medially and free apically, vesica short, not passing beyond the apex of penial lobes; ejaculatory reservoir large.

Female Genitalia: 1st gonocoxae medially placed, not distinctly wide apart, broadly triangular with posterior margin slightly concave; 2nd gonocoxae medially fused with posterior margin concave; 8th paratergites distinctly broadly triangular, posterior margin convex; 9th paratergites elongate, lobe like, narrowly rounded at posterior margin, inner margin sinuate, projecting medially, passing beyond the fused posterior margins of 8th paratergites (Fig. 167); spermatheca (Fig. 168) with distinct distal and proximal flanges; pump region short, tube like, shorter than distal spermathecal duct; bulb rounded with two small, curved, finger like processes; medial dilation balloon

like with small proximal sclerotization; posterior spermathecal duct longer than distal spermathecal duct.

Population Variation: Color of entire body varies from being yellowish green to paler; color and thickness of punctures variable; abdominal disk, legs and lateral area of sternum vary from being shining impunctate to sparingly punctate. Some Population variation has also been discussed under the remarks section.

Material Examined :

Punjab: Pathankot, 23. iv. 2009 - 32♀♀, 31♂♂; Patiala, 1-19. vii. 2009 - 7♀, 8♂

Himachal Pradesh: Solan, 18. viii. 2010 - 1♂

Uttarakhand: Dehradun, 14. ix. 2010 - 7♀♀, 6♂♂

Distribution: Pakistan; Galapagos Islands; India (Punjab, Himachal Pradesh, Uttarakhand, Karnataka, Maharashtra).

Remarks: *N. viridula* is a polyphagous pest infesting plant species of more than 30 families, particularly legumes and brassicas like castor beans, soybeans, corn, cotton, sorghum, tomato, eggplant, bermese plant, wheat and many other economically important food plants and trees. Members are known to show significant polymorphism with a total of ten color morphs reported from Neotropical region (Salini, 2011). Two color morphs were observed in the field during the present studies, one with head and anterior area and lateral margins of pronotum pale yellowish and the other with orangish collar.

***Nezara antennata* Scott**

(Figs. 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184)

Nezara antennata, Scott (1874) *A. M. N. H.*, **14**: p. 299.

Var. *Nezara icterica* Horv. (1889) *Termesz. Fuzetek.*, **12**: p. 31.

Var. *Nezara balteata* Horv. *loc. cit.*: p. 32.

MALE:

Measurements (mm): Head length: 1.90; width across eyes: 2.80 interocular space: 1.10; interocellar space: 0.60 preocular distance: 1.15; length of posterior head including eyes: 0.80; antennal segments lengths: I: 0.40, II: 1.30, III: 0.90, IV: 1.25, V: 1.35; pronotal length: 3.20; width across humeral angles: 7.37; scutellar length:

5.125; scutellar width: 4.85; length of abdomen: 5.25; maximum width of abdomen: 7.379; length of rostral segments: I: 1.0, II: 1.50, III: 1.30, IV: 1.0; Distance - base scutellum-apex clavus: 2.10; apex clavus-apex scutellum: 1.30; apex scutellum-apex abdomen including membrane: 0.425; total body length: 14.0.

Dorsal Coloration: Head green, with dark green punctures; eyes reddish brown, area surrounding eyes pale yellow, an impunctate green somewhat kidney shaped fascia just in front of eye; ocelli red; antennae green, apex of 3rd, apical area of 4th and 5th dark brownish; pronotum green, densely punctured, subrugose, lateral margins yellow, anterior area with two transverse green impunctate callosities; scutellum green, subrugose, thickly punctured; base of scutellum with two minute black spots, three distinct equidistant yellowish spots; clavus and corium concolorous to scutellum, corium slightly pale and punctate, anteriormost portion of costal margin paler, impunctate; connexiva greenish across the articulation of segments, laterally speckled with more yellowish and reddish tinge, posterior angles black; hemelytral membrane hyaline.

Ventral Coloration: Labium green with apex black; lateral margins of head yellow, area surrounding 1st labial segment greenish yellow; lateral areas of sternum, rugulose, sparingly punctate; metathoracic scent gland peritreme green; abdomen light green, moderately punctate; area between prolegs yellow, meso and metalegs reddish yellow; abdominal disk green, shining; abdominal tubercle and connexiva yellow, posterior angles black; legs pale yellowish green, apices of tibiae and tarsi brown; genital capsule pilosed with greenish hairs.

STRUCTURE:

Body somewhat subovate, distinctly longer. **Head** (Fig. 174): Head distinctly broad at base, strongly declivent, subrounded at apex, paraclypeal lobes as long as slightly medially raised clypeal lobe; former slightly sinuous above eyes, inner margins parallel, anterolaterally reflexed upwards; antennal segmental formula – I<III<IV<II<V; labium long, reaching metatcoxae; labial length formula – I=IV<III<II. **Thorax:** Pronotum (Fig. 175) rugulose, deflected downwards, anterior margins concave, angles subquadrate, minutely tuberculate, lateral margins slightly sinuate medially, reflexed upwards, humeral angles subprominent, with rounded apices, posterior angles subprominent and margins slightly calloused; scutellum

subrugulose, beyond frena markedly narrowed as subtriangular apical lobe; metathoracic scent gland osteolar peritreme (Fig. 176) oblong, uniformly thickened, slightly curved, subrounded at apex, reaching less than one third way to metapleural margin, evaporatorium broad, with well defined anterior and posterior margins; legs pilose without any modifications. **Abdomen:** broadly convex medially, moderately punctured medially, thickly laterally; connexiva exposed at repose dorsally and ventrally; genital capsule pilose; hemelytral membrane slightly passing beyond abdominal apex; ventroanterior margin of abdominal sternite VII concave, somewhat subsquare, with subacute posterior connexival angles, ventroposterior margin inverted U-shaped (Fig. 177).

FEMALE:

Measurements (mm): Head length: 2.145; width across eyes: 2.88; interocular space: 1.60; interocellar space: 0.95 preocular distance: 1.10; length of posterior head including eyes: 1.045; antennal segments lengths: I: 0.50, II: 1.50, III: 1.20, IV: 1.45, V: 1.60; pronotal length: 3.75; width across humeral angles: 8.0; scutellar length: 5.94; scutellar width: 5.61; length of abdomen: 7.50; maximum width of abdomen: 8.0; length of rostral segments: I: 1.05, II: 1.60, III: 1.20, IV: 1.05; Distance - base scutellum-apex clavus: 4.125; apex clavus-apex scutellum: 1.815; apex scutellum-apex abdomen including membrane: 4.75; total body length: 16.0.

Coloration and Structure: Body form and coloration similar to males except: Abdomen more ampliate; hemelytral membrane passing slightly beyond abdominal apex; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an arc shaped, with subacute posterior connexival angles (Fig. 178); abdominal disk paler, moderately punctured.

Male Genitalia: Pygophore (Fig. 181) longer than broad, quadrate, lateral margins sinuate; dorsolateral lobes narrowly truncated posteriad; ventroposterior margin concave; dorsomedial surface broadly concave; paramere (Fig. 182) with a short stem, narrow and lamellately punctured broad blade, outer margin convex with a distinct medial hump, inner margin strongly sinuately concave, apex narrowed and slightly curved downwards; aedeagus (Fig. 183, 184) with elongate theca, a pair of bag like dorsolateral membranous conjunctival appendages, a pair of sclerotized lobe like

medial penial lobes that are fused medially, free apically; vesica short, not passing apex of penial lobes; ejaculatory reservoir large.

Female Genitalia: 1st gonocoxae medially placed wide apart, broadly triangular with posterior margin slightly concave; 2nd gonocoxae medially fused, posterior margin concave; 8th paratergites distinctly broad and triangular, posterior margin concave with short tooth like process; 9th paratergites lobe like, broadly rounded at posterior margin, reaching fused posterior margins of 8th paratergites with inner margin sinuate and medially produced (Fig. 179); spermatheca (Fig. 180) with distinct distal and proximal flanges; pump region short, tube like, narrowed proximally, shorter than distal spermathecal duct; bulb rounded with two curved finger like processes; medial dilation long, balloon like with somewhat pen like proximal sclerotization; posterior spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Color of entire body varies from being yellowish green to paler; color and thickness of punctures variable; abdominal disk, legs and lateral area of sternum vary from being shining impunctate to sparingly punctate.

Material Examined

Punjab: Hoshiarpur, 17. viii. 09 - 24♀♀, 15♂♂; 11. iv. 10 - 1♀; Pathankot, 20. viii. 09 - 17♀♀, 13♂♂; Tarantaran, 8. iv. 10 - 3♀♀, 1♂; Gurdaspur, 10 .iv. 10 - 1♀, 2♂♂; Ropar, 6. viii. 10 - 5♀♀, 6♂♂; Patiala, 1. x. 10 - 1♀, 1♂

Himachal Pradesh: Nagwain, 22. vii. 10 - 1♀, 5♂♂; Mandi, 23. vii. 10 - 1♀, 4♂♂

Distribution: Czechoslovakia; France; Germany; Russia; Yugoslavia; India (Punjab, Himachal Pradesh).

Remarks: This species closely resembles *Nezara viridula* in general body and shape but can be easily separated in being smaller and broader form, head, pronotum and scutellum subrugulose, blade of paramere curved subacutely downwards at apex; ejaculatory reservoir area large; posterior margin of paramere sinuous and 9th paratergites broadly rounded at posterior margin. It is also a polyphagous pest infesting multiple plant species, particularly legumes and brassicas like castor beans, soyabeans, corn, cotton, sorghum, tomato, eggplant, bermese plant, wheat and many other economically important food palnts and trees. Similar color morphs were obtained for this species as in *N. viridula*. It is a new record from North India.

GENUS *GLAUCIAS* KIRKALDY

Zangis, Stål (1867 *Öfv. Vet.-Ak. Förh.*, **24**: p. 514

Glaucias, Distant (1908) *Faun. Brit. Ind. Rh.*, **4**: p. 444

Type species - *Zangis beryllus* Fabricius

Diagnosis: Abdominal basal tubercle very distinctly elevated, anteriorly angulated and somewhat compressed, about reaching the metasternum, which is elevated and usually sinuated posteriorly; hemelytra above and beneath green; membrane entirely colourless; body more robust, a little less broadly obovate; abdomen aciculate subrugose, not punctate; head less punctate; colour of the species is also usually of a more intense and shining character.

Remarks: The genus includes 24 species from the World, widely distributed in Ethiopian, Oriental and Australian regions. It was 1st reported as *Zangis* by Stål (1868). Later Kirkaldy (1908) proposed a new name for this with type species *Pentatoma crassa* Westwood, not *Cimex beryllus* Fabricius as designated by Distant (1902). The valid type designation was published in article 69.2.2. in Code of Zoological nomenclature.

Glaucias albomaculata (Distant)

(Figs. 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196)

Zangis albomaculata, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 223

Glaucias albomaculata: Distant (1908) *Faun. Brit. Ind. Rh.*, **4**: p. 444

MALE:

Measurements (mm): Head length: 2.88; width across eyes: 3.70; interocular space: 1.95; interocellar space: 1.10; preocular distance: 1.44; length of posterior head including eyes: 1.20; antennal segments lengths: I: 0.70, II: 1.30, III: 1.80, IV: 2.0, V: 2.0; pronotal length: 4.50; width across humeral angles: 9.50; scutellar length: 6.50; scutellar width: 6.25; length of abdomen: 8.0; maximum width of abdomen: 9.25; length of abdominal spine: 0.25; length of rostral segments: I: 1.25, II: 1.98, III: 2.20, IV: 1.40; Distance - base scutellum-apex clavus: 5.0; apex clavus-apex scutellum: 1.50; apex scutellum-apex abdomen including membrane: 5.44; total body length: 18.

Dorsal Coloration: Pale yellowish green, area around eyes yellow, impunctate; lateral margins of head black; eyes dark red with black tinge; ocelli dark red; 1st three antennal segments greenish, 4th and 5th brownish green, hairy; pronotum greenish suffused with light brown fascia and green punctures; anterior and lateral margins pale green, impunctate; lateral edges dark green; anterior pronotal area with two transverse impunctate brownish green callosities; scutellum yellowish green, coarsely punctured with brown; two yellow subapical marginal spots and two black spots just above it; clavus and corium yellowish green, with brown tinge; costa green, densely punctate, anteriormost portion of costal margin impunctate, shining yellow; posterior angle of corium reddish brown; hemelytral membrane hyaline.

Ventral Coloration: Labium brownish yellow, apex black; head yellowish green, area between legs brownish yellow; lateral area of sternum green and punctate; legs yellowish green, apices of tibiae and tarsi brownish; evaporatorium green, impunctate; pleural margins distinctly pale green; abdominal tubercle brownish yellow; abdomen dark yellow medially, greenish laterally, with some large dark green fascia on intersegmental sutures, punctate; connexiva greenish with black connexival posterior angles; genital capsule yellowish green with brown suffusions and pilosed with golden pubescence.

STRUCTURE:

Head (Fig. 186): Head rugulose, distinctly wider, deflected anteriorly, subrounded at apex; paraclypeal lobes equal to clypeal, slightly sinuous above eyes, narrowed at apex; clypeus with inner margins parallel; antennal segmental formula – I<II<III<IV=V; labium just reaching fourth abdominal segment, labial lengths formula – I<IV<II<III. **Thorax:** pronotum (Fig. 187) with anterior margin strongly concave, truncate behind eyes, produced as small outwardly directed subacute tubercles; lateral margins obliquely straight, humeral angles subprominent, obtuse, width equivalent to maximum width of abdomen; scutellum convex anteriorly broad at base, beyond frena slightly sinuous, narrowed as broad subrounded apical lobe; metathoracic scent gland osteolar opening (Fig. 188) elongated slightly sinuous medially, curved, narrowed acutely at apex extending more than half way distance to metapleural margin; evaporatorium broad; legs hairy, punctate, tibiae strongly pubescent. **Abdomen:** abdomen ampliate medially, slightly depressed laterally;

abdominal tubercle blunt at apex, arising from base of 3rd abdominal segment, not reaching metacoxae; connexiva well exposed at repose with posterior subacute angles; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted broad V-shaped (Fig. 189); spiracles visible from 3rd to 7th segments, and a pair of superficial trichobothria below each spiracle with dark green transverse line in between.

FEMALE:

Measurements (mm): Head length: 2.80; width across eyes: 3.95; interocular space: 2.0; interocellar space: 1.10; preocular distance: 1.45; length of posterior head including eyes: 1.20; antennal segments lengths: I: 0.60, II: 1.20, III: 1.80, IV: 2.09, V: 2.09; pronotal length: 4.25; width across humeral angles: 9.25; scutellar length: 6.60; scutellar width: 6.25; length of abdomen: 8.25; maximum width of abdomen: 9.25; length of abdominal spine: 0.25; length of rostral segments: I: 1.30, II: 1.90, III: 2.09, IV: 1.40; Distance - base scutellum-apex clavus: 5.10; apex clavus-apex scutellum: 1.48; apex scutellum-apex abdomen including membrane: 5.94; total body length: 18.75.

Coloration and Structure: In general body form and coloration, similar to males, except little variation as: ventroanterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped (Fig. 190).

Male Genitalia: Pygophore (Fig. 193) slightly longer than broad, lateral margins slightly convex; dorsolateral lobes prominently narrowed at apices; dorsomedial surface broadly concave; dorsal opening inverted U-shaped, ventroposterior margin laterally sinuate, concave medially; paramere (Fig. 194) somewhat gun shaped, with a short stem, blade narrowed at apex, outer margin sinuate with a medial hump, inner margin slightly angulated medially; aedeagus (Fig. 195, 196) with elongate theca, a pair of sclerotized dorsolateral membranous conjunctival appendages, acute at apices, directed anteriorly; a pair of finger like sclerotized medial penial lobes that are not fused basally; vesica short, sclerotized distally, not passing beyond the posterior margins of membranous appendages.

Female Genitalia: 1st gonocoxae placed medially, close to each other, not curved downwards; 2nd gonocoxae medially fused with posterior margins slightly concave; 8th

paratergites broadly triangular with posterior margins convex; 9th paratergites elongate, lobe like, rounded at posterior margins, not reaching fused posterior margin of 8th paratergites (Fig. 191); spermatheca (Fig. 192) with distinct distal and proximal flanges; pump region semisclerotized, tube like, about more than 3X shorter than distal spermathecal duct; bulb with three acute processes of variable sizes; medial dilation somewhat spindle shaped; posterior spermathecal duct distinctly shorter than distal spermathecal duct.

Population Variation: Single male and female specimens studied.

Material Examined

Himachal Pradesh: Solan, 18. viii. 2010 - 1♀, 1♂

Distribution: India (Himachal Pradesh, Maharashtra).

Remarks: The species is characterized by having 9th paratergites lobe like, rounded at apices, not reaching fused posterior margin of 8th paratergites; spermatheca with distal spermathecal duct more than 3X longer than pump region; bulb with three acute processes of variable sizes and proximal spermathecal duct distinctly shorter than distal duct. It is a new record from North India, with detailed descriptions, illustrations of male and female genitalia attributes done for the first time in taxonomy.

GENUS ACROSTERNUM FIEBER

Acrosternum, Fieber (1860) *Eur. Hem.*, p. 79.

Type Species: *Acrosternum heegeri* Fieber

Species of *Acrosternum* are smaller, more pale green in color; head moderately deflected; head distinctly twice wider than its length; antecular distance shorter than remaining head including eyes; antennae with 2nd segment always shorter than 3rd; labium usually reaching or extending beyond metacoxae; length of pronotum anteriorly deflected, slightly more than half longer than head length, humeral angles subprominent, not produced; metathoracic scent gland osteolar peritreme long, extending beyond half way distance towards metapleural margin; base of abdomen ventrally with a small tubercle; connexiva slightly to moderately exposed at repose;

ventroposterior margin of VII abdominal segment in females slightly to moderately concave medially with acute connexival angles.

Remarks: The genus has a confusing taxonomic history. It is closely allied to *Nezara*, wherein most of its species were placed and were later shifted to *Chinavia*. Species under this genus are generally paler green and less punctate. The genus is also closely allied to *Glaucias* in various morphological characters and metathoracic scent gland peritreme long and acuminate, covering more than half of sternite but can be separated from the same in having anteocular distance shorter than posterior of head including eyes and abdomen not rugulose or subrugulose. Members of this genus have been reported as serious pests of different plants such as *Capparis* sp., *Cistus* sp., *Crataegus* sp., *Cupressus* sp., *Daucus* sp., *Juniperus* sp., *Morus* sp., *Paliurus* sp., *Platanus* sp., *Pistacia* sp., *Poterium* sp., *Punica* sp., *Vitex* sp. and *Vitis* sp.

***Acrosternum graminea* (Fabricius)**

(Figs. 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208)

Cimex gramineus, Fabricius (1787) *Mant. Inst.*, 2: p. 295.

Pentatoma lemur, Dohrn (1860) *Stett. E. Z.* 70: p. 401.

Acrosternum graminea, Stal (1868) *Hem. Fabr.*, 7(11): p. 31.

Cimex seladonius, Fabricius (1894) *Ent. Syst.* 4: 170.

Nezara graminea, Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 221.

Acrosternum graminea: Kirkaldy (1909) *Cat. Hem.*, 1: p. 115.

MALE:

Measurements (mm): Head length: 1.60; width across eyes: 2.48; interocular space: 1.30; interocellar space: 0.80 preocular distance: 0.65; length of posterior head including eyes: 0.95; antennal segments lengths: I: 0.40, II: 0.80, III: 1.0, IV: 1.05 V: 1.10; pronotal length: 3.95 width across humeral angles: 5.445; scutellar length: 3.36; scutellar width: 3.625; length of abdomen: 4.125; maximum width of abdomen: 5.125; length of rostral segments: I: 0.65, II: 1.10, III: 0.75, IV: 0.70; Distance - base scutellum-apex clavus: 0.64; apex clavus-apex scutellum: 2.88; apex scutellum-apex abdomen including membrane: 2.72; total body length: 5.0.

Dorsal Coloration: Head yellowish green, thickly punctured with green; eyes brown with yellow tinge; ocelli red, outer edge with two distinct maculate wine colored spots; antennae pale green, apex of 3rd, 4th and 5th darker and pilosed; pronotum yellowish green, thickly and densely punctured, lateral; margins pale green,

impunctate; Anterior half with two transverse yellowish green callosities; scutellum, clavus, corium and costa concolorous to pronotum; anteriormost portion of costa pale yellowish green; hemelytral membrane hyaline; connexiva green with with black subacute posterior angles.

Ventral Coloration: Labium dark green; legs yellowish green, apices of tibiae and tarsi black and fluorescence pubescence; head pale green and green punctures; area between pro and meso legs yellow, between meso and meta legs reddish brown; metathoracic scent gland peritreme greenish yellow, impunctate; abdominal disk yellowish with tinge of green and brown, and fine dark green punctures, lateral margins darkly punctured; connexiva concolorous to abdomen, posterior angles black.

STRUCTURE:

Head (Fig. 198): Head distinctly broad, subrounded at apex, paraclypeal lobes equal to clypeus, strongly sinuate above eyes, area between ocelli distinctly elevated; antennal segmental formula – I<II<III<IV<V; labium long slightly beyond metacoxae, labial lengths formula – I<IV<III<II. **Thorax:** Pronotum (Fig. 199) deflected anteriorly, anterior margin concave, protruded as minute tubercles, lateral margins straight, humeral angles subrounded; scutellum beyond frena distinctly narrowed into subrounded concave apical lobe; metathoracic scent gland osteolar perireme (Fig. 200) long, acuminate, extending more than half way to metapleural margin, evaporatorium broad, well defined, covering about three fourth of sternite; legs pubescent. **Abdomen:** Abdomen base with minute tubercle; connexiva exposed at repose; ventroanterior margin and ventroposterior of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subacute posterior connexival angles (Fig. 201); hemelytral membrane just passing abdominal apex.

FEMALE:

Measurements (mm): Head length: 1.60; width across eyes: 2.80; interocular space: 1.30; interocellar space: 0.80 preocular distance: 0.70; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.40, II: 0.80, III: 0.95, IV: 1.15 V: 1.20; pronotal length: 2.20; width across humeral angles: 5.94; scutellar length: 3.85; scutellar width: 3.85; length of abdomen: 5.77; maximum width of abdomen: 5.6; length of rostral segments: I: 0.75, II: 1.10, III: 0.875, IV: 0.80; Distance - base

scutellum-apex clavus: 0.96; apex clavus-apex scutellum: 2.76; apex scutellum-apex abdomen including membrane: 2.56; total body length: 9.50.

Coloration and Structure: Body form and coloration similar to males except, females slightly darker; punctures more dense on venter, medial area sparingly punctate; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped with subacute posterior connexival angles (Fig. 202).

Male Genitalia: Pygophore (Fig. 205) as long as broad, lateral sides sinuate; dorsolateral lobes prominent, truncated, and directed posteriad; dorsomedial surface slightly sinuate; dorsal opening small; ventroposterior margin deeply concave, arched medially; paramere (Fig. 206) with moderately long vertical stem, blade broad basally, acute at apex, outer margin convex and sinuate, with a small medial hump; aedeagus (Fig. 207, 208) with suboval theca, dorsomedial thecal surface membranous and concave; a pair of elongated dorsolateral membranous conjunctival appendages, directed anteriad, not sclerotized at apices; a pair of sclerotized medial penial lobes; vesica thin, short, not reaching posterior margin of membranous appendages; ejaculatory reservoir small.

Femalae Genitalia: 1st gonocoxae placed medially wide apart, not curved downwards, posterior margins convex; 2nd gonocoxae medially fused, posterior margin straight; 8th paratergites triangular; 9th paratergites broad and lobe like, slightly concave on inner margin, not reaching the fused posterior margin of 8th paratergites (Fig. 203); spermatheca (Fig. 204) with distinct proximal and distal flanges; pump region semisclerotized, tube like, shorter than distal spermathecal duct; latter dilated as bulb like rounded process distally; bulb small, finger like; medial dilation balloon like without any extended dilation; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population variation: Color varies from dark yellowish green to pale green; size, color and thickness of punctures variable; abdominal disk shows distinct variation in being paler and impunctate entirely or reduced to broad punctate central area.

Material Examined:

Punjab: Patiala, 2-15. vii. 2009 - 21♀♀, 31♂♂; Harike, 12. ix. 2009 - 18♀♀, 7♂♂

Distribution: Srilanka; Pakistan; India (Punjab, Paschim Banga).

Remarks: The species is distinctly characterized in having spermatheca with finger like small bulb and distal spermathecal duct coiled, dilated into bulb like rounded process distally as compared to long finger like process on spermathecal bulb and simple distal spermathecal duct in closely allied species of this genus. It is usually collected in abundance from light traps, however, it has been recorded as a minor pest of *Xanthium strumarium* Linnaeus (rough cocklebur).

GENUS *PRIASSUS* STÅL

Priassus, Stål (1867) *Öfv. Vet.-Ak. Förh.*, p. 518.

Type species – *Priassus spiniger* Haglund

Diagnosis: Head somewhat narrowed anteriorly, the portion in front of eyes about as long as broad, the lobes equal in length or clypeal lobes a little longer than the clypeus and slightly separate at their apices, basal joint of antennae not reaching apex of head; labium about reaching posterior coxae; pronotum with the lateral margins concavely sinuate, finely serrate, behind eyes truncate, anterior angles acute, lateral angles prominent, acutely or subacutely produced; scutellum more than half the length of abdomen, its apex subacute; apical angle of corium a little produced; mesosternum carinate, the carination elevated and somewhat laminate; base of abdomen armed with a long spine, which reaches the intermediate coxae.

Remarks: The genus is represented by 4 species from the World. It is more restricted to the Indo-Malayan subregion and is closely similar to *Tropicoris*, but can be easily separated from it by having anterior pronotal margins straight with acute or subacute apices and distinct red carmine coloration on head and pronotum.

Key to the studied species of genus *Priassus* Stål

1. Body length: 22.5 mm; lateral margins of corium marked with black spots; humeral angles of pronotum prominent, subacute; lateral lobes of head sinuous, not produced into any kind of projection; spermathecal bulb with three finger-like processes (two long, one

- short); 1st gonocoxae angulated at outer margin..... *spiniger* Haglund
- Body length: 12.5 mm; lateral margins of corium without black spots; humeral angles of pronotum subprominent, somewhat roundish; lateral lobes of head with slight protuberances before apex; spermathecal bulb with two long finger-like processes; 1st gonocoxae rounded at outer margin..... *exemptus* (Walker)

***Priassus spiniger* Haglund**

(Figs. 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220)

Priassus spiniger: Haglund (1868) *Stett. Ent. Zeit.*, 24: p. 160.

MALE:

Measurements (mm): Head length: 2.40; width across eyes: 3.28; interocular space: 1.60; interocellar space: 1.075; preocular distance: 1.10; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.50, II: 1.30, III: 2.0, IV: 2.64, V: 2.68; pronotal length: 4.50; width across humeral angles: 9.60; scutellar length: 7.75; scutellar width: 6.27; length of abdomen: 9.25; maximum width of abdomen: 9.75; length of abdominal spine: 1.40; length of rostral segments: I: 1.35 II: 1.60, III: 1.90, IV: 1.40; Distance - base scutellum-apex clavus: 2.19; apex clavus-apex scutellum: 5.94; apex scutellum-apex abdomen including membrane: 5.61; total body length: 22.50.

Dorsal Coloration: Head with lateral margins and apical one third yellow with pale carmine red fascia, finely punctured with black, rest dark yellow and impunctate; eyes dark red with melanic suffusions; ocelli dark red; antennae yellow, apical two segments infused with brown; pronotum yellow, anterolateral area, pronotal angles pale carmine red with black punctures, posterior with scattered punctures, two transverse yellow callosities infused with red and black punctures; scutellum yellow, finely punctured with concolorous spots; clavus and corium concolorous, costal margin with series of small black punctures; hemelytral membrane hyaline with brown suffusions on lateral sides; connexiva yellow finely punctate along with reddish infusion.

Ventral Coloration: Labium dark yellow, apex black; lateral areas of head impunctate, bright yellow; legs yellow, apical portion of tibiae and entire tarsi pale yellowish brown, area between legs, metathoracic scent gland peritreme, evaporatorium and lateral area of sternum shining yellow, impunctate, with few scattered black spots on pro and mesosternum; abdomen and genital capsule dark yellow with brown suffusions, disk impunctate; connexiva with lateral margins brownish yellow; spiracles distinct bordered with black.

STRUCTURE:

Head (Fig. 210): Head broad, moderately declivent, subrounded at apex; paraclypei equal to clypeus; apical one third of latter depressed, rest raised medially; paraclypeal lobes slightly sinuous, reflexed anterolaterally; antennal segmental formula – I<II<III<IV<V; labium long, reaching metacoxae, labial lengths formula – I<IV<II<III. **Thorax:** Pronotum (Fig. 211) deflected anteriorly, anterior margin greater than width across eyes, concave, truncate behind eyes, with small subacute angles directed anteriorly, lateral margins finely serrated, humeral angles prominent, subacute; scutellum raised anteriorly, broad at base, beyond frena narrowed as snake headed apical lobe; metathoracic scent gland osteolar peritreme (Fig. 212) long, somewhat banana shaped, raised, narrowly rounded at apex extending half way to metapleural margin; evaporatorium distinctly broad, with well defined anterior and posterior margins, covering almost entire sternite; legs hairy. **Abdomen:** medially convex, laterally flattened; abdominal venter with a long spine reaching mesocoxae; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped, with subacute angles (Fig. 213); hemelytral membrane slightly passing beyond abdominal apex; genital capsule pilosed.

FEMALE:

Measurements (mm): Head length: 3.04; width across eyes: 3.80; interocular space: 1.8; interocellar space: 1.15; preocular distance: 1.30; length of posterior head including eyes: 1.50; antennal segments lengths: I: 0.70, II: 1.0, III: 1.30, IV: 2.80, V: 2.90; pronotal length: 4.75; width across humeral angles: 10.8; scutellar length: 8.25; scutellar width: 6.62; length of abdomen: 10.50; maximum width of abdomen: 11.10; length of abdominal spine: 1.80; length of rostral segments: I: 1.20, II: 1.90, III: 2.0, IV: 1.30; Distance - base scutellum-apex clavus: 5.94; apex clavus-apex scutellum:

2.05; apex scutellum-apex abdomen including membrane: 6.105; total body length: 22.50.

Coloration and Structure: Coloration and body form similar to males except, darker in colour; 5th antennal segment paler; abdominal venter calloused; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped, with acute posterior angles (Fig. 214).

Male Genitalia: Pygophore (Fig. 217) distinctly longer than broad, lateral margins convex, with prominent acutely pointed dorsolateral lobes, slightly bent inwards; ventroposterior margin laterally sinuate, medially V-shaped; dorsal opening small inverted U-shaped; paramere (Fig. 218) elongated L-shaped, with a small process at base, apex of blade acute, outer margin with two angulated ridges; aedeagus (Fig. 219, 220) with slightly elongate theca, a pair of ventral membranous conjunctival appendages, a pair of sclerotized beak like medial penial lobes; vesica moderately long, reaching apical margins of appendages; ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae not wide apart, triangular, outer margin raised, posterior margin convex; 2nd gonocoxae medially fused, posterior margin straight; 8th paratergites subquadrate, posterior margins angulated; 9th paratergites elongate, lobe like, narrowed at posterior margins, extending much beyond the fused posterior margin of 8th paratergites with outer margins medially concave (Fig. 215); spermatheca (Fig. 216) with distinct distal and proximal flanges; pump region sclerotized, tube like, distinctly smaller than distal spermathecal duct; bulb rounded with three finger like elongate processes (one short); medial dilation long with a small proximal dilation; posterior spermathecal duct distinctly shorter than distal spermathecal duct.

Population Variation: Only variation in color of antennae, legs, abdomen exists from being paler to darker.

Material Examined:

Himachal Pradesh : Andhretta, 13. vii. 2010 - 3♀, 1♂; Bilaspur, 21. x. 2010 - 1♂

Distribution: Myanmar; India (Himachal Pradesh, Meghalaya).

Remarks: This species is closely resembles *Priassus exemptus*, but can be easily separated from the same in having lateral margins of corium marked with black spots; humeral angles of pronotum prominent and subacute; spermathecal bulb with three finger-like processes (two long, one short) and 1st gonocoxae angulated at outer margin. *Priassus spiniger* is usually collected in abundance from light trap as compared to wild vegetation. It is a new record from North India.

***Priassus exemptus* (Walker)**
(Figs. 221, 222, 223, 224, 225, 226, 227)

Prionaca exemptus, Walker (1868) *Cat. Het.*, 3: p. 569.

Priassus exemptus: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 206.

FEMALE:

Measurements (mm): Head length: 1.90; width across eyes: 2.20; interocular space: 1.40; interocellar space: 0.65; preocular distance: 1.0; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.40, II: 0.70, III: 1.0, IV: 1.15, V: 1.10; pronotal length: 2.56; width across humeral angles: 5.61; scutellar length: 4.753; scutellar width: 3.75; length of abdomen: 5.61; maximum width of abdomen: 5.28; length of abdominal spine: 0.40; length of rostral segments: I: 0.90, II: 1.0, III: 1.0, IV: 0.80; Distance - base scutellum-apex clavus: 3.25; apex clavus-apex scutellum: 1.125; apex scutellum-apex abdomen including membrane: 4.50; total body length: 12.75.

Dorsal Coloration: Head brownish yellow, with reddish brown punctures; eyes black with red tinge, area around eyes pale, impunctate; ocelli red; antennal segments brownish yellow, apical two segments darker; pronotum brownish yellow, anterior portion darker, medial area pale, posterior with greyish black tinge, finely punctured with dark brown; anterior pronotal area with two transverse yellow impunctate callosities; scutellum punctured with dark brown, base and apex pale, impunctate; clavus, corium and costa concolorous to scutellum; anteriormost area of costal margin pale, impunctate; hemelytral membrane transparent; connexiva brownish yellow, anterior and posterior margins spotted with dark brown punctures.

Ventral Coloration: Labium brownish yellow, apex black; head and sternum pale, less punctate; some spots on sternum in close proximity to legs black; legs brownish

yellow, tarsi darker; abdomen, metathoracic scent gland peritreme, connexiva, genital capsule brownish yellow; abdomen slightly paler, centrally impunctate, laterally scarcely punctured with light brown; spiracles reddish brown.

STRUCTURE:

Head (Fig. 222): Head somewhat convex, moderately deflected, paraclypeal and clypeal lobes equal, lateral margins of former sinuate before eyes, narrowed apically; antennal segment I not reaching apex of head, antennal segmental formula – I<II<III<V<IV; labium long, reaching posterior coxae, labial lengths formula – IV<I<III<II. **Thorax:** Pronotum (Fig. 223) slightly raised posteriorly, anterior pronotal margin concave, truncate behind eyes, with subacute tubercles directed anteriorly; anterolateral margins concave, finely serrated; humeral angles subprominent, obtuse, posterior margin straight; scutellar width subequal to total abdominal length, apex shorter than corium, broad at base, beyond frena, narrowed distinctly subacutely at apex; metathoracic scent gland osteolar peritreme (Fig. 224) short, of uniform length, reaching only one fourth way to metapleural margin; evaporatorium broad, with well developed anterior margin, covering about half of sternite. **Abdomen:** convex, depressed laterally; connexiva exposed at repose with posterior acute connexival angles; spiracles large; legs pubescent; ventroanterior margin of abdominal sternite VII somewhat straight medially, oblique laterally, ventroposterior margin broadly concave (Fig. 225); hemelytra membrane passing beyond abdominal apex.

Female Genitalia: 1st gonocoxae small, plate like, curved downwards, medially placed but not wide apart; 2nd gonocoxae fused medially, posterior margin slightly concave; 8th paratergites small, posterior margins with acute processes; 9th paratergites elongate, lobe like, placed widely apart, narrowly rounded at apices, passing beyond the fused posterior margins of 8th paratergites (Fig. 226); spermatheca (Fig. 227) with distinct distal and proximal flanges; pump region narrow, tube like about 2X shorter than distal spermathecal duct; bulb rounded with two downwardly directed acute processes; medial dilation rounded, with proximal small semisclerotized dilation directed posteriorly; posterior spermathecal duct subequal to distal spermathecal duct.

Population Variation: Single specimen studied.

Material Examined:

Punjab: Patiala, 13. ix. 2010 - 1♀

Distribution: India (Punjab, Uttarakhand, Sikkim, Nagaland)

Remarks: This species is allied to *P. spiniger* in having 9th paratergites distinctly passing beyond fused posterior margins of 8th paratergites, but can be separated from the same with the help of characters as discussed in keys and descriptions discussed earlier.

GENUS *TROPICORIS* HAHN

Tropicoris, Hahn (1834) *Wanz. Ins.*, 2: p. 52.

Type species – *Tropicoris rufipes* Linnaeus, a Palearctic species.

Diagnosis: Head more or less narrowed to apex, sometimes gradually, in other species apically narrowed, the lateral margins not sinuate; antennae somewhat long, five-jointed, basal joint not reaching apex of head; pronotum with the lateral angles irregularly produced, either acutely or truncately, the lateral margins finely serrate, truncate behind the eyes, with the anterior angles acutely produced; scutellum somewhat long, attenuated posteriorly; mesosternum prominently carinate; abdomen either tuberculate at base or armed with a spine of variable length.

Remarks: The genus is represented by 34 species from the World, distributed in Palearctic and Oriental regions. It resembles genus *Priassus* in having carinate mesosternum, not raised and produced anteriorly pointedly, metasternum not carinate, and lateral margins serrated but can be easily separated from the same in having anterior margins of pronotal angles rounded or forming an angle towards apex, spermatheca with two small finger like processes and pygophore with subcute dorsolateral lobes.

***Tropicoris laeviventris* Stål**

(Figs. 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239)

Tropicoris laeviventris: Stål (1876) *En. Hem.*, 5: p. 105.

MALE:

Measurements (mm): Head length: 2.45; width across eyes: 3.70 interocular space: 1.90; interocellar space: 1.10; preocular distance: 1.35; length of posterior head including eyes: 1.10; antennal segments lengths: I: 0.80, II: 1.72, III: 2.66, IV: 3.04, V: 1.98 pronotal length: 4.75; width across humeral angles: 10.35; scutellar length: 7.25; scutellar width: 6.43; length of abdomen: 9.50; maximum width of abdomen: 10.50; length of rostral segments: I: 1.40, II: 2.05, III: 1.95, IV: 1.30; Distance - base scutellum-apex clavus: 1.50; apex clavus-apex scutellum: 6.435; apex scutellum-apex abdomen including membrane: 5.94; total body length: 21.37.

Dorsal Coloration: Head brownish yellow, with thick dark brown punctures, two impunctate brown spots just in front of eyes, two oblong impunctate areas in posterior area; eyes dark red with melanic suffusion; ocelli red; 1st and 2nd antennal segments yellowish brown, apex of 3rd, one third apical 4th and entire 5th darker; pronotum yellowish brown, thickly brownly punctate, lateral edges black, two impunctate brown transverse callosities on anterior area; scutellum, clavus and corium yellowish brown, with brown punctures and fascia; costal margin yellowish, with maculate chocolate brown fascia; membrane of hemelytra brownish, veins darker; connexiva dark yellow, with dark brown punctured at anterior and posterior margins of each segment, lateral edges dark brown; abdominal spine dark yellow, shining.

Ventral Coloration: Labium brownish yellow, apex black; area around labium impunctate, dark yellow; area between legs, metathoracic scent gland peritreme, legs brownish yellow, lateral margins darker; abdomen venter yellow with reddish tinge, sparingly punctate; a dark brownish yellow levigate line in middle of venter, abdominal segment VII with brownish black oval spot; lateral area dark yellow and impunctate; abdominal spine wine color; spiracles bordered with dark brown, a sperm shaped distinct line above trichobothria brown; genital capsule yellow with brown pubescence.

STRUCTURE:

Head (Fig. 229): Head anteriorly deflected, somewhat truncate at apex, paraclypeal lobes equal to slightly medial raised clypeus, former slightly sinuate above eyes, strongly reflexed anterolaterally upwards; antennal segmental formula –

I<II<V<III<IV; labium slender, labial lengths formula – I<IV<III<II. **Thorax:** Pronotum (Fig. 230) anteriorly deflected, anterior margin concave, more than width across eyes, truncate behind eyes, acutely produced, anterolateral margins serrate, concavely sinuate, humeral angles produced as broad apically truncated angulation; scutellum elevated anteriorly, beyond frena distinctly narrowed as subrounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 231) oblong, strongly curved, uniformly thick, subrounded at apex, reaching about half way to metapleural margin, evaporatorium distinctly broad, reaching near pleural margin; legs slender, hairy. **Abdomen:** raised medially, lateral margins flattened, base with a distinct long spine, crossing metacoxae in opposition, ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subacute posterior connexival angles and ventroposterior margin broadly concave (Fig. 232); hemelytral membrane just passing abdominal apex.

FEMALE:

Measurements (mm): Head length: 2.72; width across eyes: 3.70; interocular space: 2.0; interocellar space: 1.20 preocular distance: 1.20; length of posterior head including eyes: 1.20; antennal segments lengths: I: 0.80, II: 1.70, III: 2.70, IV: 2.96, V: 2.20; pronotal length: 4.50; width across humeral angles: 11.40; scutellar length: 8.0; scutellar width: 6.60; length of abdomen: 9.50; maximum width of abdomen: 11.40; length of rostral segments: I: 1.35, II: 2.20, III: 2.0, IV: 1.40; Distance - base scutellum-apex clavus: 5.94; apex clavus-apex scutellum: 1.90; apex scutellum-apex abdomen including membrane: 6.60; total body length: 22.50.

Coloration and Structure: Body form and coloration similar to males except, females paler dorsally, darker ventrally; abdomen dark yellow with few scattered brown punctures; abdomen less flattened laterally; ventroanterior and ventroposterior margin of abdominal sternite VII sinuate and concave, somewhat an inverted U-shaped with acute posterior connexival angles (Fig. 233); hemelytral membrane slightly shorter.

Male Genitalia: Pygophore (Fig. 236) distinctly longer than broad, convex laterally, with lobulated and narrowed dorsolateral lobes, directed inwards; dorsal opening small; ventroposterior margin with ridges on lateral sides; paramere (Fig. 237) with short stem, blade narrowed apically, bent medially, outer margin convex, inner

margin with a small angulation near apex; aedeagus (Fig. 238, 239) with somewhat cylindrical theca, a pair of sclerotized dorsolateral membranous conjunctival appendages, directed inwards; a pair of bag like semisclerotized ventral membranous conjunctival appendages; a pair of small sclerotized medial penial lobes that are not fused basally; vesica short not even reaching the apical margins of penial lobes; ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae placed medially wide apart, not curved downward, inner margin straight, posterior margin slightly convex; 2nd gonocoxae fused medially, posterior margin straight; 8th paratergites large and triangular, posterior margins convex; 9th paratergites lobulate, narrowly rounded at apices, passing beyond the fused posterior margins of 8th paratergites (Fig. 234); spermatheca (Fig. 235) with distinct distal and proximal flanges; pump region short and tube like, distinctly smaller than distal spermathecal duct; bulb small, rounded with two small processes; medial dilation long with a small proximal dilation; proximal spermathecal duct distinctly shorter than distal spermathecal duct.

Population Variation: Color of abdomen, legs, antennae, abdominal tubercle, connexiva varies from being dark brownish yellow to paler; color and thickness of punctures variable, especially on pronotum.

Material Examined:

Himachal Pradesh: Shimla, 13-16. viii. 2010 - 14♀♀, 10♂♂

Distribution: India (Himachal Pradesh).

Remarks: The species is distinctly characterized by having humeral angles produced as broad apically truncated angulation; 9th paratergites lobulate, narrowly rounded at apices, passing beyond the fused posterior margin of 8th paratergites; spermatheca with pump region distinctly smaller than distal spermathecal duct; bulb rounded with two small processes; posterior spermathecal duct distinctly shorter than distal spermathecal duct and paramere somewhat L-shaped. *Tropicoris laeviventris* was specifically collected in abundance from light traps as compared to wild vegetation.

GENUS *MENIDA* MOTSCHULSKY

Menida, Motsch. (1861) *Et. Ent.*, **10**: p. 23.

Stromatocoris, Jakovl. (1876) *Bull. Soc. Nat. Mosc.*, p. 92.

Pygomenida, Bredd. (1898) *Ent. Nachr.*, **24**: p. 119.

Menida, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 226.

Type species - *Menida violacea* Motschulsky, from Eastern Siberia and Japan.

Diagnosis: Head broad, not much narrowed anteriorly, lateral margins scarcely sinuate; basal joint of antennae not reaching apex of head; labium about extending to posterior coxae; pronotum with the lateral margins nearly straight, the anterior and posterior margins very slightly sinuate; scutellum broad, subtriangular; base of abdomen with a well-developed spine or tubercle arising from the 2nd abdominal segment.

Remarks: It is a large, highly variable genus, universally distributed and represented by 79 species from the world. Rider (2006-2012) in his catalogue provided key to West and Central African species of *Menida*.

Key to the studied species of genus *Menida* Motschulsky

1. Body length: 8 mm; apex of scutellum distinctly narrowed; corium with visible castaneous spots at apex and one before apex; central area of pronotum with transverse wavy fascia..... *formosa* (Westwood)
- Body length: 5.5 mm; apex of scutellum relatively broad; corium without any spots; pronotum without wavy fascia, with only irregular punctuation..... *labecula* Distant

Menida Formosa (Westwood)

(Figs. 240, 241, 242, 243, 244, 245, 246)

Pentatoma formosa, Westwood (1837) in *Hope Cat.*, **1**: p. 34.

Rhaphigaster spectandus, Stål (1859) *Freg. Eug. Resa, Ins. Hem.*, p. 230.

Rhaphigaster albidens, Ellenr. (1862) *Nat. Tijdschr. Nederl. Ind.*, **24**: p. 159.

Rhaphigaster nitens, Vollenhoven (1868) *Eassai*, **3**: p. 187.

Menida Formosa: Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 226.

FEMALE:

Measurements (mm): Head length: 1.10; width across eyes: 1.80; interocular space: 0.95; interocellar space: 0.60; preocular distance: 0.45; length of posterior head including eyes: 0.65; antennal segments lengths: I: 0.30, II: 0.50, III: 0.80, IV: 0.90, V: 0.90; pronotal length: 1.70; width across humeral angles: 4.50; scutellar length: 3.04; scutellar width: 3.20; length of abdomen: 3.75; maximum width of abdomen: 5.0; length of rostral segments: I: 0.50, II: 0.75, III: 0.55, IV: 0.65; Distance - base scutellum-apex clavus: 2.40; apex clavus-apex scutellum: 0.64; apex scutellum-apex abdomen including membrane: 2.20; length of abdominal spine: 0.90; total body length: 8.

Dorsal Coloration: Head variably colored, anteriorly reddish brown, posteriorly black, three levigate longitudinal lines (one central and two laterally dislocated), a spot before each eye brownish yellow; antennae brownish yellow, apex of 3rd, 4th and 5th infuscated, with bases brownish yellow; pronotum with anterior and anterolateral margins levigate, brownish yellow, with inner dark reddish brown boundary; anterior pronotal area with two transverse centrally broken dark reddish brown annulations, a wavy brownish yellow fascia below, posterior area with sinuous reddish-brown fascia, thickly punctured; scutellum with a long obliquely shaped levigate spot at each scutellar angle connected at base and a large anchor shaped apical spot, sometimes connected with basal spots, brownish yellow; calvus, corium with basal lateral margin, discal spot levigate brownish yellow, remaining area reddish brown; anteriormost area of costa paler; hemelytral membrane translucent; connexiva brownish yellow, alternating with reddish brown patches.

Ventral Coloration: Labium brownish yellow, apex black; head coarsely punctured with black, levigate posteriorly; legs brownish yellow, apices and bases of tibiae, posterior femora, entire tarsi dark reddish brown; lateral margin of prosternum pale yellow, levigate, rest sternum brownish yellow, punctured with black and brown; area between legs reddish black; abdominal spine and abdomen brownish yellow, central maculate reddish brown disk and extreme lateral margin levigate, impunctate, lateral areas thickly punctured with reddish brown; abdominal segment VII with central prominent black patch extending from anterior to posterior margin; connexiva

brownish yellow, alternating with reddish brown; abdomen laterally punctured with dark brown; genital capsule brownish yellow; spiracles chocolate brown.

STRUCTURE:

Head (Fig. 241): Head distinctly broad at apex, strongly declivent; paraclypei and clypeus equal in length, slightly sinuous above eyes; clypeus slightly raised medially and lobulated; antennal segmental formula – I<II<III<IV<V; labium long, slender, just reaching metacoxae; labial lengths formula – I<III<IV<II. **Thorax:** Pronotum (Fig. 242) deflected anteriorly, elevated posteriorly about 2.5X wider, anterior pronotal margins calloused, truncated behind eyes, lateral margins obliquely straight, humeral angles subprominent, obtuse; width of anterior margin subequal to width of head including eyes; scutellum somewhat rugulose, coarsely punctured, broader at base, narrowed into subrounded apical lobe; abdominal basal spine long arising from base of abdominal segment II, passing metacoxae; metathoracic scent gland osteolar peritreme (Fig. 243) dorsoventrally flattened, leaf like, broad, acute and narrow at apex, reaching more than half way to metapleural margin; evaporatorium broad, with well developed anterior narrow margin. **Abdomen:** somewhat flattened; connexiva well exposed at repose; ventroanterior margin of abdominal sternite VII broadly concave, somewhat subsquarish with acute posterior angles (Fig. 244); genital capsule with golden pubescence.

Female Genitalia: 1st gonocoxae quadrangular, distally wide apart, posterior margins sinuate, subrounded at apices; 2nd gonocoxae reduced, posterior margin straight, anterior margin concavely sinuate; 8th paratergites triangular; 9th paratergites oblong, lobe like, broadly rounded at apices, reaching the fused posterior margins of 8th paratergites (Fig. 245); spermatheca (Fig. 246) with distinct proximal and distal flanges; pump region sclerotized, thin, tube like, longer than distal proximal duct; bulb rounded; medial dilation long; proximal spermathecal duct about 2X longer than distal spermathecal duct.

Population Variation: Body coloration overall varies from reddish brown to more shining and darker. Basal scutellar angular spots may not be connected at base; ventrally punctation on sternum and abdomen denser and dark; abdominal segment VII entirely black; humeral angles on ventral side dark reddish brown.

Material Examined:

Uttarakhand: Dehradun, 23. vii. 2009 - 1♀; 24. vi. 2010 - 1♀

Distribution: Myanmar; Pakistan; India (Uttarakhand, Sikkim, Meghalaya).

Remarks: The species resembles *M. labecula*, but can be easily separated from the same in having apex of scutellum distinctly narrowed; corium with visible castaneous spots at apex and one before apex and central area of pronotum with transverse wavy fascia. It has been recorded as a pest of mulberry tree in Formosa. It is a new record from North India.

***Menida labecula* Distant**
(Figs. 247, 248, 249, 250, 251, 252, 253, 254, 255)

Menida labecula: Distant (1900) *A. M. N. H.*, 5(7): p. 396.

labecula var. *simplificata* Breddin (1909) *Annales de la Société Entomologique de Belgique*, 53.

MALE

Measurements (mm): Head length: 0.90; width across eyes: 1.55; interocular space: 0.85; interocellar space: 0.55; preocular distance: 0.35; length of posterior head including eyes: 0.55; antennal segments lengths: I: 0.20, II: 0.30, III: 0.50, IV: 0.60, V: 0.65; pronotal length: 1.50; width across humeral angles: 3.75; scutellar length: 2.20; width: 2.56; length of abdomen: 2.09; maximum width of abdomen: 3.85; length of abdominal spine: 0.70; length of rostral segments: I: 0.45, II: 0.60, III: 0.40, IV: 0.50; Distance - base scutellum-apex clavus: 1.485, apex clavus-apex scutellum: 0.715, apex scutellum-apex abdomen including membrane: 1.50; total body length: 5.30.

Dorsal Coloration: Head yellowish-brown, punctured with bright reddish brown, with an impression of longitudinal striation; eyes reddish black bordered with yellowish-brown; ocelli bright red; antennae yellowish brown, apical segment darker; pronotum yellowish brown with reddish brown punctures and brown fascia, more on posterior half, anterior area with two yellowish brown transverse foveate impressions; scutellum yellowish brown, apex less punctured with subapical punctures darker, basal margin with thick reddish brown line, basal scutellar angles with foveate reddish brown spots; clavus, corium and costal margin yellowish-brown, thickly punctured

with reddish brown (except narrow subapical area of corium impunctate); hemelytral membrane translucent.

Ventral Coloration: Labium yellowish brown, apex black; ventral and lateral margins of head paler with few immaculate reddish brown spots; lateral area of sternum thickly punctured; metathoracic scent gland peritreme yellowish-brown with reddish brown tinge; evaporatorium darker; legs, area between legs, abdominal spine, yellowish-brown; abdominal disk impunctate, paler; abdominal segment VII with broad U-shaped reddish brown fascia; lateral area punctured with reddish brown; genital capsule with basal area reddish brown, pilosed with golden brown; spiracles bordered with reddish brown.

STRUCTURE:

Head (Fig. 248): Head distinctly wider at base and apex, strongly declivent; paraclypei equal to clypeal lobe, former sinuous above eyes, slightly reflexed anterolaterally; antennal segment I slightly shorter than apex of head, antennal segmental formula – I<II<III<IV<V; labium long reaching metacoxae; labial lengths formula – III<I<IV<II; **Thorax:** Pronotum (Fig. 249) convex, deflected anteriorly, calloused posteriorly, anterior margin concave, distinctly elevated subquadrate behind eyes with minute tubercles, lateral margins obliquely straight, posterior margin concavely sinuous; anterior pronotal area with two transverse callosities, humeral angles subprominent, obtuse; scutellum sinuous after base, narrowed medially, produced somewhat as snake-headed apical lobe; frenal region 2X post frenal; metathoracic scent gland osteolar peritreme (Fig. 250) dorsoventrally flattened, long, acute at apex, reaching more than half way to metapleural margin; evaporatorium broad with well defined posterior margin, covering half of sternite; abdominal spine long, extending beyond metacoxae, arising at base of II abdominal segment; legs without any modifications of spines and dilations. **Abdomen:** dorsoventrally flattened; connexiva moderately exposed at repose; abdominal intersegmental sutures thickened; ventroanterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped, with subrounded posterior angles (Fig. 251); hemelytral membrane passing much beyond apex of abdomen.

Male Genitalia: Pygophore (Fig. 252) distinctly broad and U-shaped, with prominent anterolateral directed narrow dorsolateral lobes; dorsal opening broad; ventroposterior

margin sinuate; paramere (Fig. 253) L-shaped, long vertical stem, blade narrow, acute and curved upwards at apex, with a small angulation at edge; aedeagus (Fig. 254, 255) bilobed, sclerotized proximally, membranous distally; conjunctiva with a pair of dorsolateral membranous conjunctival appendages, sclerotized at apices; a pair of sclerotized apical appendages, lobe like; a pair of small leaf like sclerotized medial penial lobes, vesica long, twisted inside theca, just reaching margins of appendages; ejaculatory reservoir small.

Population variation: Single specimen studied.

Material Examined:

Punjab: Patiala, 30. ix. 2009 - 1♂♂

Himachal Pradesh: Shimla, 14. viii. 2010 - 1♂

Distribution: Sri Lanka; India (Punjab, Himachal Pradesh, South India).

Remarks: This species is characterized by being extremely small in size, abdominal segment VII with a broad reddish brown fascia in middle, pygophoyre distinctly U-shaped, L-shaped paramere, theca bilobed, sclerotized proximally, membranous distally and long vesica twisted inside theca. The illustrations of its external genitalic features have been done for the first time. It has been recorded as a serious pest of cotton. It is a new record from North India.

GENUS *CHAUBATTIANA* DISTANT

Chaubattiana, Distant (1912) *A. M. N. H.*, **10**(8): p. 603.

Type species - *Chaubattiana rubrovittata* Distant

Diagnosis: Subelongate; head longer than width between eyes, narrowed towards apex, the lateral margins distinctly sinuate, somewhat angulated before the eyes; lobes of equal length, the apex subtruncate; eyes large, somewhat strongly produced, reaching the apices of the anterior pronotal angles, ocelli near base of head and close to inner margins of eyes; antennae five-jointed, basal joint short, not nearly reaching apex of head, remaining joints almost subequal in length, 2nd and 3rd slightly longest; labium slender, reaching the posterior coxae, 1st joint not reaching base of head, 2nd about reaching anterior coxae; pronotum about half as long as broad at base, posterior

angles not produced, anterior margin concave, lateral margins oblique, entire, neither serrate nor crenulated, basal margin truncate before scutellum, thence oblique to lateral angles; scutellum passing the middle of abdomen, about as long as broad at base, sinuate beyond middle and near inner angle of corium and prominently narrowed to apex, which is rounded, apical margin of corium moderately sinuate; connexiva exposed from about one-third from basal margin of corium; membrane not or only slightly passing the abdominal apex; abdomen beneath acutely spined at base, the spine about reaching the apex of posterior coxae, abdominal spiracles prominent.

Remarks: The genus represents only a single species from Bengal Uttarakhand and Himachal Pradesh. The members belonging to this genus are characterized by having labium reaching metacoxae; lateral pronotal margins oblique, entire, neither serrate nor crenulated and abdomen base acutely spined, reaching the apex of posterior coxae.

***Chaubattiana rubrovittata* Distant**
(Figs. 256, 257, 258, 259, 260, 261, 262)

Chaubattiana rubrovittata: Distant (1912) *A. M. N. H.*, **10**(8): p. 604.

FEMALE:

Measurements (mm): Head length: 1.40; width across eyes: 1.975; interocular space: 1.00; interocellar space: 0.65; preocular distance: 0.65; length of posterior head including eyes: 0.75; antennal segments lengths: I 0.40, II 0.70, III 0.90, IV 0.90, V 0.90; pronotal length: 2.0; width across humeral angles: 5.0; scutellar length: 3.50; width: 3.50; length of abdomen: 4.375; maximum width of abdomen: 5.28; length of rostral segments: I 0.60, II 1.1, III 1.1, IV 0.40; Distance - base scutellum-apex clavus: 2.75, apex clavus-apex scutellum: 1.0, apex scutellum-apex abdomen including membrane: 2.75; total body length: 9.50; length of abdominal spine: 0.40.

Dorsal Coloration: Head reddish brown, punctured with brown; eyes dark reddish brown, posterior margins of eyes with pale yellow border; ocelli crimson red; antennae with 1st and 2nd segments brownish yellow, rest with more reddish tinge; pronotum brownish red, moderately punctured irregularly with brown, anterior pronotal area with two impunctate reddish brown callosities, lateral and anterior boundaries blackish, margins paler; somewhat Z-shaped pale yellow fascia located

medially; scutellum concolorous to head and pronotum but paler, with more golden brown tinge, base more reddish, with a broad central longitudinal bright deep red fascia; lateral margins of base of scutellum impunctate, pale whitish; clavus, corium and costa paler, with more coarser and dense punctures, anteriormost portion of costal margin, pale whitish, impunctate; hemelytral membrane translucent with mild brown suffusions.

Ventral Coloration: Labium brownish red, apex black; lateral margins of head black, lateral areas admixture of reddish brown and yellow, punctate; area between legs bright reddish brown with yellow tinge, impunctate; sternum bright reddish brown, punctured with brown; metathoracic scent gland opening pale yellowish; evaporatorium reddish brown; abdomen yellowish brown punctured with dark brown; abdominal spine brownish yellow; lateral areas of abdomen paler; connexiva somewhat creamish, dark brown punctate; genital capsule greyish black, pilosed with golden hairs; spiracles brown, surrounded by pale yellowish red boundaries; abdomen with a longitudinal central impunctate bright reddish brown line; legs yellowish brown, tarsi reddish.

STRUCTURE:

Head (Fig. 257): Head distinctly wider, minutely pilosed, declivent, subtriangular; paraclypeal lobes slightly longer than clypeus, sinuous above eyes, depressed anterolaterally, narrowed into subacute apices; clypeus slightly raised medially; antennal segment I not reaching apex of head, antennal segmental formula – $I < II < III = IV = V$; labial lengths formula – $IV < I < II - III$; **Thorax:** Pronotum (Fig. 258) moderately deflected anteriorly, anterior pronotal margins distinctly concave, anterior pronotal angles subrounded behind eyes, equivalent to width of head across eyes; lateral margins smooth, obliquely straight, humeral angles subprominent, obtuse; scutellum flattened, beyond frena, narrowed into a somewhat “snake-headed” apical lobe; metathoracic scent gland osteolar peritreme (Fig. 259) long, somewhat spindle shaped, concavely sinuous, produced acutely at apex, reaching about three-fourth way to metapleural margin; evaporatorium well developed, broad, somewhat Y shaped, uniformly thick, covering most of sternite; legs finely punctate. **Abdomen:** abdominal spine arising from ventroanterior margins of 3rd abdominal segment; abdomen flattened; ventroanterior margin of abdominal sternite VII broadly concave, indicating

some kind of medial bifurcation (Fig. 260); connexival segments with subacute posterior angles; hemelytral membrane passing moderately beyond apex of abdomen.

Female Genitalia: 1st gonocoxae moderately broad, not wide apart; 2nd gonocoxae with posterior margin convex; 8th paratergites triangular, with slight acute angulation at posterior margin; 9th paratergites elongated, lobe like, narrowed at apex, inner and outer margins straight, passing beyond the fused posterior margins of 8th paratergites (Fig. 261); spermatheca (Fig. 262) with distinct proximal and distal flanges; pump region narrow, tube like, distinctly shorter than membranous distal spermathecal duct; bulb rounded with a small lateral lobe like process; medial dilation long; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Single specimen studied.

Material Examined:

Himachal Pradesh: Bilaspur, 21. vii. 2010 - 1♀

Distribution: India (Paschim Banga, Himachal Pradesh, Uttarakhand).

Remarks: The species is characterized by having distinct reddish brown body coloration, 8th paratergites triangular with slight acute angulation at posterior margin; 9th paratergites elongated, lobe like, passing beyond the fused posterior margins of 8th paratergites; spermatheca with pump region distinctly shorter than membranous distal spermathecal duct and bulb rounded with a small lateral lobe like process. It has not been recorded as a pest until now. The illustrations of its external genitalic features have been done for the first time.

GENUS *PIEZODORUS* STÅL

Piezodorus, Fieber (1861) *Eur. Hem.*, pp. 78 & 329

Type species - *Piezodorus incarnatus* Germar., a Palearctic species.

Diagnosis: Body oblong, ovate; head short, slightly narrowed anteriorly, lateral margins moderately sinuate; antennae five jointed, basal joint not reaching apex of head; labium reaching or passing the intermediate coxae; basal spine of abdomen acute and moderately long; extreme apex of clavus with a punctiform black or fuscous spot.

Remarks: The genus was proposed on the basis of type species *P. incarnatus* Germ., a Palaearctic species. It is represented in India by a single species *P. rubrofasciatus* Fabricius. It is closely related to the genus *Chaubattiana* in having non dilated anterior tibiae, lateral margins of pronotum not reflexed and 1st gonocoxae placed very close to each other.

***Piezodorus rubrofasciatus* (Fabricius)**
(Figs. 263, 264, 265, 266, 267, 268, 269)

Cimex rubrofasciatus, Fabricius (1787) *Mant. Ins.*, **2**: p. 293
Cimex hybneri, Gmel. (1788) *Syst. Nat.*, **1** (4) p. 2151
Cimex flavescens, Fabricius (1798) *Ent. Syst. Suppl.*, p. 534
Rhaphigaster flavolineatus, Westw. (1837) *In Hope Cat.*, **1**, p. 31
Rhaphigaster virescens, Amy. & Serv. (1843) *Hem.*, p. 148
Nezara pellucid, Ellenr. (1862) *Nat. Tijdschr. Nederl. Ind.*, **24**: p. 157
Rhaphigaster oceanus, Montr. (1864) *Ann. Soc. Linn. Lyon*, **11**(2): p. 224
Rhaphigaster extenuates, Walker (1867) *Cat. Het.*, **2**: p. 371
Rhaphigaster pallescens, Walker (1868) *Cat. Het.*, **2**: p. 568
Piezodorus rubrofasciatus: Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 224.

FEMALE:

Measurements (mm): Head length: 1.50; width across eyes: 2.06; interocular space: 1.25; interocellar space: 0.70; preocular distance: 0.70; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.325, II: 0.70, III: 0.80, IV: 0.92, V: 0.80; pronotal length: 1.85; width across humeral angles: 5.44; scutellar length: 4.62; scutellar width: 4.62; length of abdomen: 7.75; maximum width of abdomen: 5.44 length of abdominal spine: 1.20; length of rostral segments: I: 0.50, II: 0.70, III: 0.82, IV: 0.62; Distance - base scutellum-apex clavus: 3.37; apex clavus-apex scutellum: 1.25; apex scutellum-apex abdomen including membrane: 3.80; total body length: 10.50.

Dorsal Coloration: Head dark brownish yellow, thickly and coarsely punctured, marked with maculate brown fascia anteriorly on clypeus; eyes brownish yellow; ocelli red; lateral margins of head, area around and before eyes and ocelli levigate, pale yellow; antennae brownish yellow, except apex of 2nd, entire 4th and 5th purplish; pronotum dark brownish yellow with red tinge in posterior margin, lateral margins and two levigate transverse impunctate fascia on anterior margins paler, thickly punctured, humeral angles darker; scutellum, clavus and corium somewhat shining

yellow, coarsely punctate, clavus with a small black apical spot; costa darker, except anterior one fourth region reddish; membrane of hemelytra transparent.

Ventral Coloration: Labium brownish yellow, apical one third black; head, sternum brownish yellow; extreme lateral area of prosternum with brown fascia; legs pale, apices darker; metathoracic scent gland opening yellow, evaporatorium impunctate; abdominal pale brownish yellow, shining; abdomen and connexiva paler; spiracles distinct, black; genital capsule with brown suffusions.

STRUCTURE:

Head (Fig. 264): Head strongly declivent, narrowed and subrounded at apex; paraclypei equal to clypeus, slightly sinuous above eyes, not reflexed; antennal segmental formula – I<II<III<V<IV; labium just reaching mesocoxae, labium lengths formula – I<IV<II<III. **Thorax:** Pronotum (Fig. 265) anteriorly deflected, elevated posteriad; anterior pronotal margins truncate behind eyes, equivalent to width of head across eyes, produced as small acute tubercles directed anterolaterad, lateral margins obliquely straight; posterior margin sinuous; humeral angles subprominent, obtuse; scutellum slightly concave, coarsely punctured with yellow, beyond frena, narrowed as subtriangular snake headed apical lobe; abdominal spine long, subacute, reaching mesocoxae; metathoracic scent gland osteolar peritreme (Fig. 266) long, concavely sinuous, tapering thread like extending halfway to metapleural margin; evaporatorium broad, well developed, prominent anterior margin, subrounded posterior margin. **Abdomen:** moderately calloused; connexiva exposed at repose, depressed laterally; a longitudinal maculate impunctate fascial line in center of abdominal venter; ventroanterior margin of abdominal sternite VII broadly concave, slightly sinuous and ventroposterior margin slightly concave laterally and medially, with subacute posterior angles (Fig. 267); hemelytral membrane passing considerably beyond abdominal apex.

Female Genitalia: 1st gonocoxae medially placed, slightly wide apart; 2nd gonocoxae broad, reaching towards posterior margins of 1st gonocoxae; 8th paratergites longer and triangular, posterior margins slightly convex; 9th paratergites lobe like, outer margins straight, not passing beyond the fused posterior margins of 8th paratergites (Fig. 268); spermatheca (Fig. 269) with distinct proximal and distal flanges; pump region thick, tube like, subequal to distal spermathecal duct; bulb rounded with a

small apical rounded process; medial dilation long; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Body color varies from being dark yellow to pale yellow with green tinge; transverse levigate line on pronotum with or without distinct reddish tinge; first three antennal segments darker.

Material Examined:

Himachal Pradesh: Mandi, 22. vii. 2010 - 1♀; Bilaspur, 21. x. 2010 - 1♀

Distribution: Sri Lanka; Myanmar; Japan; India (Himachal Pradesh, Sikkim, Assam, Paschim Banga, Maharashtra).

Remarks: The species is characterized by having 8th paratergites longer and triangular with convex posterior margins; 9th paratergites lobe like, not passing beyond the fused posterior margins of 8th paratergites; spermatheca with pump region subequal to distal proximal duct and bulb rounded with a small apical rounded process. The species can be collected from light trap more as compared to wild vegetation. Other than being a pest of *Indigofera arrecta* (Indigo), it has also been recorded as a pest of soyabean in India.

GENUS *BAGRADA* STÅL

Bagrada, Stål (1862) *Stett. Ent. Zeit.*, **23**: p. 105

Nitilia, Mulsant and Ray (1866) *Pun. France, Pent.*, p. 197

Bagrada, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 193.

Type species – *Bagrada picta* Fabricius

Diagnosis: Body subovate; head triangular, lateral lobes a little longer than the central, converging forward and separated between their apices; margins reflexed; eyes moderately stylate; basal joint of antennae not reaching apex of head; pronotum obscurely sexangular, anterior margin somewhat truncate, not distinctly elevated and callous; mesosternum carinate; abdomen unarmed.

Remarks: The genus is distributed in Palearctic, Ethiopian and Oriental regions. It closely resembles *Eurydema*, except pronotum with anterior margin moderately truncate, neither elevated nor calloused, slightly stylate eyes, metathoracic scent gland peritreme reduced, and dorsal membranous conjunctival appendages unilobed.

***Bagrada picta* (Fabricius)**
(Figs. 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281)

Cimex picta, Fabricius (1775) *Syst. Ent.*, p. 715.

Strachia picta, Dallas (1851) *List Hemi.*, 1: p. 259.

Bagrada picta: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: pp. 193 & 194.

MALE:

Measurements (mm): Head length: 0.90; width across eyes: 1.40; interocular space: 0.70; interocellar space: 0.40; preocular distance: 0.35; length of posterior head including eyes: 0.40; antennal segments lengths: I: 0.30, II: 0.60, III: 0.40 IV: 0.25 V: 0.65; pronotal length: 0.90; width across humeral angles: 2.80; scutellar length: 1.70; scutellar width: 1.40; length of abdomen: 1.60; maximum width of abdomen: 2.80; length of rostral segments: I: 0.50, II: 0.70, III: 0.30, IV: 0.42; Distance - base scutellum-apex clavus: 1.25 apex clavus-apex scutellum: 0.60; apex scutellum-apex abdomen including membrane: 1.60; total body length: 5.28.

Dorsal Coloration: Head black, with black punctures, lateral lobes just before eyes pale yellow with orangish suffusion, impunctate, lateral margins black; eyes reddish black, bordered with pale yellow; ocelli dark red; antennae black; pronotum black, except anterior, lateral and medial area pale yellow with orange suffusion, anterior and anterolateral margins, two transverse callosities black; two spots on each basal scutellar angle, one medially lateral margins before apex, spoon shaped fascia extending towards apex, pale yellow with orange suffusion, impunctate; clavus black; corium black except submarginal fascia terminating as rounded discal spot before apex pale orangish yellow; hemelytral membrane black, opaque on outer margin; connexiva orangish yellow spotted with black at intersegmental sutures.

Ventral Coloration: Labium black; head pale yellow, except lateral area around labium; legs pale yellow with black streaks; metathoracic scent gland peritreme orangish yellow with black border; anterior and lateral margins of each sternite pale yellow, with distinct black margins; abdomen yellow, lateral marginal spots, transverse intersegmental lines and segmental spots becoming larger towards apex, black; genital capsule yellow with black suffusion; abdominal sternite VII with central broad dark brownish fascia.

STRUCTURE:

Head (Fig. 271): Head distinctly broad, deflected downwards, tapering anteriorly; paraclypeal lobes longer than clypeal, converging in front, slightly sinuate above eyes, reflexed anterolaterally; antennal segmental formula – I<III<II<IV<V; labium reaching metacoxae, labial lengths formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 272) deflected anteriorly, anterior margins concave, subrounded behind eyes, anterolateral margins obliquely straight, humeral angles subrounded, posterior margin concave; scutellum distinctly narrowed beyond frena as triangular subacute apex; metathoracic scent gland osteolar peritreme (Fig. 273) extremely small, indistinct; evaporatorium obscure; legs pubescent, femora slightly thickened. **Abdomen:** unarmed, somewhat flattened; distance between successive abdominal segments small; ventroanterior margin of abdominal sternite VII distinctly deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles, and ventroposterior margins broadly concave, inverted U-shaped (Fig. 274); hemelytral membrane passing considerably beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 1.0; width across eyes: 1.55; interocular space: 0.80; interocellar space: 0.60; preocular distance: 0.55; length of posterior head including eyes: 0.50; antennal segments lengths: I: 0.30, II: 0.60, III: 0.50, IV: 0.65, V: 0.70; pronotal length: 1.40; width across humeral angles: 3.28; scutellar length: 2.0; scutellar width: 1.70; length of abdomen: 2.96; maximum width of abdomen: 3.50; length of rostral segments: I: 0.60, II: 0.80, III: 0.35, IV: 0.42; Distance - base scutellum-apex clavus: 1.25; apex clavus-apex scutellum: 0.60; apex scutellum-apex abdomen including membrane: 1.60; total body length: 6.60.

Coloration and Structure: Body form and coloration similar to males except, females larger in size; ventroanterior and ventroposterior margin of abdominal sternite VII deeply concave forming a distinct broad V-shaped (Fig. 275) with subacute posterior connexival angles; abdominal sternite VII with central broad dark brownish fascia and two rounded black spots on lateral sides; abdomen less flattened.

Male Genitalia: Pygophore (Fig. 278) distinctly broader than long, pilosed laterally; dorsolateral lobes subrounded, curved and acute on inner margin; paramere (Fig.

279) beak shaped, apex downwardly curved; theca (Fig. 280, 281) bilobed, with unilobed dorsal membranous conjunctival appendage, a pair of sclerotized medial penial lobes; vesica short, not extending beyond penial lobes.

Female Genitalia: 1st gonocoxae broad, beset with acute spines, placed wide apart; 2nd gonocoxae medially fused; 8th paratergites somewhat trapezoidal; 9th paratergites lobe like, much shorter than fused posterior margins of 8th paratergites (Fig. 276); spermatheca (Fig. 277) with distinct proximal and distal flanges; pump region tube like; bulb elongated, without any processes; median dilation with proximal sclerotized ring.

Population Variation: Coloration of insect varies from being shining black to slightly rough; orange suffusion in various parts varies in thickness; coloration of punctures especially on abdominal venter also varies; irregular maculate black fascia on abdominal segment VII vary in broadness and color from darkest brown to black.

Material Examined:

Punjab: Patiala, 16-28. iv. 2009 - 36♀♀, 41♂♂; Hoshiarpur, 18. viii. 2009 - 2♀♀, 5♂♂; Ludhiana, 12. iv. 2010 - 2♂♂

Himachal Pradesh: Solan, 11. vi. 2009 - 6♀♀, 8♂♂

Distribution: Sri Lanka; India (Punjab, Himachal Pradesh, Uttarakhand, Maharashtra, Paschim Banga).

Remarks: This species is characterized by having pronotum with anterior margin moderately truncate, neither elevated nor calloused, metathoracic scent gland peritreme reduced; labium passing beyond metacoxae and dorsal membranous conjunctival appendages unilobed. *Bagrada picta* is reported as major pest of important crop plants, especially crucifers, which includes important food plants like cabbage, turnip, cauliflower, mustard, broccoli, raddish, papaya, potato, maize, sorghum, cotton, capers and some legumes. The adults and nymphs are about same the size and have a similar bright coloration except 4 segmented antennae in nymphs. In India, it has been reported as a serious pest of cauliflower, mustard and maize. It is also eaten by Ao-Naga tribal populations in Assam as Tsungi for animal flesh supplements.

GENUS *AGONOSCELIS* SPINOLA

Agonoscelis, Spinola (1837) *Ess.*, p. 327

Nevroschia, Amyot and Serville (1843) *Hém.*, p. 109

Agonoscelis, Dallas (1851) *List Hem.*, **1**, p. 152

Type species - *Agonoscelis nubila* Fabricius

Diagnosis: Body elongately ovate, remotely pilose; head generally narrowed in front, rounded at apex, lobes of equal length; anterior lateral margins of pronotum entire, straight, somewhat acute, anterior margin somewhat callous centrally; scutellum long, triangular, narrowed to apex, much longer than broad at base; mesosternum centrally moderately carinate; abdomen sometimes moderately sulcate and unarmed at base.

Remarks: The genus is distributed in Ethiopian, Oriental and Australian regions, represented by 26 species. Distant (1902) gave an account of only two species., *A. nubila* (Fabricius) and *A. femoralis* Walker from British India. Rider (2006-2012) provided keys to ten species under this genus from Madagascar, Sudan, Ethiopia and key to 4 species from West Africa. This genus is represented by 4 species from India - *A. nubila*, *A. femoralis*, *A. tamilnadensis* and *A. campbelli*.

Agonoscelis nubila (Fabricius) (Figs. 282, 283, 284, 285, 286, 287, 288, 289, 290)

Cimex nubilus, Fabricius (1775) *Syst. Ent.*, p. 712.

Cimex nubilus, Wolf (1801) *Ik. Cim.*, p. 57.

Pentatoma grata, Poliset Beauv (1805) *Ik. Cim.*, p. 129.

Aelia nubila, Hahn (1836) *Wanz.*, **3**: p. 29.

Agonoscelis indica, Spinola (1837) *Essai.*, p. 329.

Aelia crucifera, Westwood (1837) *Essai.*, p. 32.

Nevroschia sulciventris, Ellenrieder (1862) *Nat. Tijdschr. Ned. Ind.*, **26**: p. 144.

Agonoscelis nubila, Stål (1876) *Svensk. Vet. Handl.*, **14**(4): p. 85.

MALE:

Measurements (mm): Head length: 1.60; width across eyes: 1.70; interocular space: 1.10; interocellar space: 0.80; preocular distance: 0.85; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.40, II: 0.75, III: 0.70, IV: 1.10, V: 1.0; pronotal length: 1.925; width across humeral angles: 4.625; scutellar length: 4.50; scutellar width: 2.88; length of abdomen: 4.125; maximum width of abdomen: 4.50; length of rostral segments: I: 0.80, II: 1.00, III: 0.90, IV: 0.825; Distance - base

scutellum-apex clavus: 3.0; apex clavus-apex scutellum: 1.50; apex scutellum-apex abdomen including membrane: 2.75; total body length: 9.75.

Dorsal Coloration: Head brownish yellow with coarse black punctures (except lateral margins), central fascia to head orange yellow impunctate; eyes blackish; ocelli red, area around eyes orange yellow; antennae piceous; pronotum pubescent, brownish yellow, thickly punctured with black except anterior, lateral and irregular central longitudinal fascia, orange yellow, levigate; anterior area of pronotum with two yellowish transverse callosities, posterior margin yellow, central longitudinal fascia extending entire pronotum orange yellow; scutellum pubescent, concolorous to pronotum, with black punctures, base of scutellum with one central and two angular orange yellow spots; anteriormost portion of costal margin orange yellow, rest yellow and blackly punctured; hemelytral membrane pale fuliginous, veins piceous.

Ventral Coloration: Labium yellow with segments II, III and apex black; head, sternum, metathoracic scent gland peritreme yellow; pleural margin of sternum orange yellow, impunctate, with double lateral series of black spots; abdomen yellow, lateral margins with black tinge; double series of spots at centre and lateral sides of abdomen black; legs yellow, pubescent, except tarsi, apex of femora, apex and base of tibia black, femora with anteapical irregular spots black; abdomen not hairy; genital capsule yellow, hairy; spiracles black.

STRUCTURE:

Head (Fig. 283): Head slightly declivent, subtriangular; paraclypeal and clypeal lobe equal in length, former sinuous above eyes, anterolaterally reflexed upwards slightly, narrowed at apex; clypeus lobulated; antennal segmental formula – I<II<III<V<IV; labium long, just passing mesocoxae; labial lengths formula – I<IV<III<II. **Thorax:** Anterior margin of pronotum (Fig. 284) narrowly concave with subacute spines behind eyes directed anteriorly, anterolateral margins entire, straight, humeral angles subprominently obtuse; scutellum calloused anteriorly, broad at base, beyond frena, narrowed into subtriangular apex; metathoracic scent gland osteolar peritreme (Fig. 285) superficial, long, sinuous, narrowed apically, reaching just one fourth way to metapleural margin; evaporatorium moderately broad, anterior and posterior margins subprominent. **Abdomen:** ampliate; conexiva not exposed at repose; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped

with posterior subrounded angles (Fig. 286); genital capsule pilosed; hemelytral membrane passing much beyond abdominal apex.

Male Genitalia: Pygophore (Fig. 287) somewhat quadrangular with lateral margins slightly sinuate; well defined narrowly rounded dorsolateral lobes; dorsomedian surface concave; ventroposterior margin with irregular processes and medially rounded; paramere (Fig. 288) somewhat F-shaped, inner process short and rounded at apex, outer margin humped, inner margin shallowly concave, apex of blade truncated; aedeagus (Fig. 289, 290) with theca broad, narrowed distally, with bilobed dorsolateral membranous conjunctival appendages, bifurcated distally, sclerotized and sharply pointed at inner margins; vesica long and twisted; ejaculatory reservoir broad.

Population variation: Single specimen studied.

Material Examined

Himachal Pradesh: Shimla, 14. viii. 2010 - 1♂

Distribution: Sri Lanka; Myanmar; China; Japan; Indonesia; Myanmar; Pakistan; Philippines; Taiwan; Thailand; Vietnam; India (Himachal Pradesh, Jammu and Kashmir, Meghalaya, Uttarakhand, Maharashtra, Paschim Banga, Uttar Pradesh, Bihar, Karnataka, Madhya Pradesh, Meghalaya, Odisha, Tamil Nadu).

Remarks: The species is characterized by having distinctly pilosed body. *A. nubila* has been reported as an important pest of rice and *Sechium edule* from Nepal.

GENUS *EURYDEMA* LAPORTE

Pentatoma, subg. *Eurydema*, pt., Lap (1832) *Ess. Hem.*, p. 61.

Strachia, pt. *Hahn* (1831) *Wanz.*, **1**: p. 180.

Eurydema, Stål (1872) *Öfv. Vet.-Ak. Förh.*, **3**: p. 39.

Type species - *Eurydema oleraceum* Linnaeus, a Palearctic species.

Diagnosis: Body ovate; head with the lateral margins distinctly reflexed, eyes sessile, basal joint of antennae not reaching apex of head; pronotum with the anterior and anterior lateral margins elevated, callous, the lateral angles neither produced nor prominent; scutellum triangular, longer than broad at base, narrowed to apex which is subacute; mesosternum centrally carinate; abdomen unarmed at base.

Remarks: The genus is represented by 33 species from the Oriental and Palaearctic regions. It is closely similar to genus *Stenozygum* except sessile eyes, anterior and anterolateral margins of pronotum elevated and calloused, posterior margin of 2nd gonocoxae in female genital plate convex and inner margins of 1st gonocoxae almost straight as compared to concave margin of 2nd gonocoxae and sinuate margins of 1st gonocoxae in *Stenozygum*. Members of this genus have been reported as serious pest of some economically important plant species viz., *Capparis* sp., *Sinapis* sp., *Spinacia oleracea*, *Alhagi* sp., *Alyssum murale*, *Cirsium* sp., *Fagus* sp., *Medicago sativa*, *Onobrychis sativa*, *Ononis* sp., *Onopordum* sp., *Pirus malus*, *Rorippa* sp., *Sinapis* sp., *Spinacia oleracea*, *Triticum sativa*, *Verbascum* sp., *Veronica* sp., *Vicia cracca*, cruciferous and umbelliferous plants and different species of weeds.

***Eurydema pulchrum* (Westwood)**

(Figs. 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302)

Pentatoma pulchrum, Westwood (1837) in *Hope Cat.*, 1: p. 34.

Strachia pulchrum, Dallas (1851) *List Hem.*, 1: p. 258.

Eurydema sumatrana, Ellenr (1862) *Net. Tejdschr. Nederl. Ind.*, 24: p. 152.

Eurydema designata, Walker (1867) *Cat. Het.*, 2: p. 327.

Eurydema amoenum, Horvath (1879) *Termesz. fuzet.*, 3: p. 144.

Eurydema pulchrum: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: pp. 190 & 191.

MALE:

Measurements (mm): Head length: 1.30; width across eyes: 2.0; interocular space: 1.30; interocellar space: 0.60; preocular distance: 0.70; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.40, II: 0.95, III: 0.80 IV: 0.90, V: 0.85 pronotal length: 1.80; width across humeral angles: 1.37; scutellar length: 3.20; scutellar width: 2.88; length of abdomen: 4.125; maximum width of abdomen: 4.75; length of rostral segments: I: 1.40, II: 2.05, III: 1.95, IV: 1.30; Distance - base scutellum-apex clavus: 2.24; apex clavus-apex scutellum: 0.96; apex scutellum-apex abdomen including membrane: 2.48; total body length: 8.50.

Dorsal Coloration: Head shining black, except lateral margins and lower one third area above eyes yellowish orange, a distinct leaf shaped orange spot between eyes; eyes black with reddish tinge; ocelli dark red; antennae black, hairy; pronotum reddish orange with six black spots (two anterior, transverse and four longitudinal posterior); scutellum with a large spot at base and two spots on subapical margin black; clavus and corium black, except two large dark red irregular spots, anterior

area of costa red, posterior with greyish tinge, with a medial black fascial spot; hemelytral membrane black, apices transparent; connexiva alternating with red and black.

Ventral Coloration: Labum pale yellow, rest black; legs pale yellow, apices of femora, tibiae and tarsi black; metathoracic scent gland peritreme yellowish orange with black borders; abdomen pale yellow, lateral areas orangish yellow with a series of lateral transverse large black spots; connexiva marked with large black spots alternating with orange brown; genital capsule yellowish brown.

STRUCTURE:

Head (Fig. 292): Head distinctly broad at base, subrounded at apex, declivent; paraclypeal lobes longer than anteriorly depressed clypeus, meeting in front; former distinctly sinuate above eyes, slightly reflexed upwards; antennal segmental formula – I<III<V<IV<II; labium small, reaching mesocoxae, labial lengths formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 293) deflected anteriorly, anterior margin calloused (collar), concave, subrounded behind eyes, lateral margins slightly calloused, straight, humeral angles subprominent, obtuse, posterior margin concave; scutellum triangular, straight beyond frena, subacute at apex; metathoracic scent gland osteolar peritreme (Fig. 294) reduced, somewhat crenulated, covering only one fifth way to metapleural margin; evaporatorium moderate, not well developed. **Abdomen:** connexiva well exposed at repose; abdomen armed; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles and ventroposterior margin broadly concave (Fig. 295); hemelytral membrane passing beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 1.40; width across eyes: 2.09; interocular space: 1.30; interocellar space: 0.65 preocular distance: 0.70; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.40, II: 0.95, III: 0.60, IV: 0.90, V: 0.85; pronotal length: 0.20; width across humeral angles: 5.0; scutellar length: 3.52; scutellar width: 3.12; length of abdomen: 4.50; maximum width of abdomen: 5.11; length of rostral segments: I: 0.60, II: 0.80, III: 0.40, IV: 0.50; Distance - base

scutellum-apex clavus: 2.56; apex clavus-apex scutellum: 0.96; apex scutellum-apex abdomen including membrane: 3.12; total body length: 9.25

Coloration and Structure: Body form and coloration similar to males except, females slightly paler dorsally, darker ventrally; size of discal spots on pronotum, corium and between eyes usually larger; membrane slightly less darker and longer; black fascial medial spot on anterior margin of abdominal segment VII narrow; abdomen less ampliate; ventroanterior margin of abdominal sternite VII distinctly concave, somewhat an inverted U-shaped with subrounded posterior connexival angles, and ventroposterior margins straight medially, sinuate laterally (Fig. 296).

Male Genitalia: Pygophore (Fig. 299) somewhat quadrangular, slightly broader than long, with well developed, lobe like dorsolateral lobes that are subrounded at apex with small inner lobes; dorsomedian surface concave medially; ventroposterior margin slightly sinuate; paramere (Fig. 300) somewhat sickle shaped, apex of blade acute, humped and concave outer margin, stem short; aedeagus (Fig. 301, 302) with theca bilobed, dorsal membranous conjunctival lobe with distally produced acute sclerotized curved apex; penial lobes sclerotized, X-shaped; vesica long, broad proximally, passing slightly beyond penial lobes.

Female Genitalia: 1st gonocoxae rectangular, plate like with distinct sinuous posterior margin; 2nd gonocoxae distinctly broad with convex posterior margin; 9th paratergites elongated, flipper like with subrounded narrowed apex, shorter than fused posterior margins of eighth 8th paratergites (Fig. 297); spermatheca (Fig. 298) with distinct proximal and distal flanges; pump region elongated, tube like, sclerotized medially; bulb without any additional process; medial duct proximally slightly dilated; distal spermathecal duct distinctly short and twisted, about one third of proximal spermathecal duct.

Population Variation: Color varies from yellowish orange to pale yellow, with tinges of orange and reddish; distinct six black apical spots on pronotum, subapical spots on scutellum, subapical spot on costal margin vary in size; connexiva shows more color variation from being pale yellow to even close to reddish; black spots on abdominal disk may be well defined, reduced or absent in some.

Material Examined:

Punjab: Patiala, 16. iv. 2009 - 3♀♀, 2♂♂; Pathankot, 23. iv. 2009 - 31♀♀, 30♂♂; Hoshiarpur, 11. iv. 2010 - 5♀♀, 11♂♂; Ludhiana, 12. iv. 2010 - 3♀♀, 2♂♂

Himachal Pradesh: Solan, 10-11. vi. 2009 - 19♀♀, 22♂♂

Distribution: India (Punjab, Himachal Pradesh, Sikkim, Assam, Meghalaya).

Remarks: Commonly known as cabbage shield bug. This species has been reported as a serious pest of *Brassica* spp. in Asia. This species is characterized by having sessile eyes, paraclypeal lobes larger than clypeus, enclosing the latter; lateral margins of pronotum straight; posterior margin of 2nd gonocoxae in female genital plate convex and inner margins of 1st gonocoxae almost straight.

GENUS *STENOZYGUM* FIEBER

Stenozygum, Fieber (1861) *Eur. Hem.*, p. 345

Nitilia, subg. *Minodia*, Mulsant and Ray (1866) *Pun. France, Pent.*, p. 199

Stenozygum, Puton (1899) *Cat. Hem. Pal.*, 4: p. 17

Type species - *Stenozygum variegatum* Fieber, a Palearctic species.

Diagnosis: Body oval, shining, somewhat convex; head a little deflected; eyes moderately stylate; lateral margins rounded, sinuate near base; pronotum transversely impressed, with the anterior margin a little concave, elevated and callous, lateral margins entire; scutellum longer than broad, narrowed to apex, a little elevated at base; abdomen unarmed; basal joint of antennae not extending beyond apex of head, usually not reaching that point.

Remarks: The genus was proposed by Fieber (1861) based on type species *S. variegatum* from Palearctic region. According to Distant (1902) this genus is represented by only single species *S. speciosum* Dallas from British India, which was earlier described under genus *Strachia*. The genus is represented by 43 species from Southern Palearctic, Ethiopian, Oriental and Australian-Melanesian regions. It was revised by Ahmad and Khan (1983) from the Oriental and Australian regions with reference to their zoogeography and phylogeny that also redescribed *S. speciosum* (Dallas) from the Oriental region. Some members have been reported as minor pest of *Capparis* sp. and *Sinapis* sp.

***Stenozygum speciosum* (Dallas)**
(Figs. 303, 304, 305, 306, 307, 308, 309)

Strachia speciosum, Dallas (1851) *List Hem.*, **1**: p. 261.

Strachia inornata, Walker (1867) *Cat. Het.*, **2**: p. 331-66.

Stenozygum speciosum: Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 193.

FEMALE:

Measurements (mm): Head length: 1.20; width across eyes: 2.0; interocular space: 1.20; interocellar space: 0.70; preocular distance: 0.55; length of posterior head including eyes: 0.65; antennal segments lengths: I: 0.35, II: 0.40, III: 0.80, IV: 0.80, V: 0.90; pronotal length: 1.50; width across humeral angles: 4.0; scutellar length: 2.88; scutellar width: 2.40; length of abdomen: 3.20; maximum width of abdomen: 4.0; length of rostral segments: I: 0.65, II: 0.70, III: 0.50, IV: 0.50; Distance - base scutellum-apex clavus: 2.125; apex clavus-apex scutellum: 1.0; apex scutellum-apex abdomen including membrane: 1.87; total body length: 7..

Dorsal Coloration: Head black with large central pale yellowish spot, two small central orangish yellow spots on paraclypei impunctate; eyes black bordered with brown; ocelli red; antennae black, hairy; pronotum blackish, scarcely punctured on posterior margin, anterior margin black, anterolateral margin (except anterior most portion), large central fascia, spot behind each humeral angle pale yellowish; anterior pronotal area with two indistinct transverse black callosities; scutellum black, scarcely punctate; scutellar angle with small reddish spots; a central longitudinal fascia and subapical triangular patch pale yellowish with reddish tinge; apex of scutellum impunctate; clavus and corium black; a discal spot and transverse subapical fascia yellowish red; anterolateral margin and posterior margin of costa pale yellow, punctate; hemelytral membrane black; connexiva slightly exposed dorsally with alternate anterior black and pale yellowish posterior connexival angles.

Ventral Coloration: Labium pale yellow marked with chocolate brown, apex black; head black except extremities pale yellow; sternum and abdomen pale yellow impunctate; lateral area of sternum dark chocolate brown; metathoracic scent gland osteolar peritreme pale yellow; abdomen entirely impunctate, lateral margin of abdomen bordered with brownish black spots infused with yellowish red, chocolate brown spots inner to it; penultimate abdominal segment with two large chocolate brown spots facing horizontally; connexiva black with pale brownish spots at

connexival angles; legs pale yellow with black streaks, apices of femora, base of tibia, tarsi black; connexiva orangish with broad black fascia; spiracles black; genital capsule pale yellow, with black patches on outer margin of 1st gonocoxae.

STRUCTURE:

Head (Fig. 304): Head distinctly broader than long, strongly declivent; paraclypei length equal to clypeus, anterolaterally reflexed, slightly sinuous above eyes, narrowed towards apex, clypeus depressed medially; 1st antennal segment slightly robust, not reaching apex of head; antennal segmental formula – I<II<III=IV<V; labium just crossing mesocoxae, labial lengths formula – III=IV<I<II. **Thorax:** Pronotum (Fig. 305) distinctly wider than long, moderately deflected anteriorly; anterior and posterior margin somewhat calloused; anterolateral margin straight; humeral angles subprominent; scutellum longer than broad, slightly elevated at base; frenal region greater than post frenal, beyond frena narrowed at apex; metathoracic scent gland osteolar peritreme (Fig. 306) very small, reaching about one tenth way to metapleural margin; evaporatorium broad, covering about one third area of sternite with well marked anterior and posterior margins, anterior margin narrowly extended beyond posterior one. **Abdomen:** uniformly convex; connexiva not exposed at repose; ventroanterior margin of abdominal sternite VII broadly concave, inverted U-shaped, ventroposterior margin sinuous, somewhat bifurcated, with posterior surrounded angles (Fig. 307); genital capsule pilosed and punctate; hemelytral membrane passing slightly beyond apex of abdominal segment.

Female Genitalia: 1st gonocoxae large, plate like, distinctly sinuate on inner and posterior margins, placed wide apart; 2nd gonocoxae medially fused, sinuate anteriorly, convex posteriorly; 9th paratergites broad, lobe like, not reaching posterior fused margins of 8th paratergites (Fig. 308); spermatheca (Fig. 309) with distinct proximal and distal flanges; pump region tube like, sclerotized proximally, membranous distally; bulb elongated, finger like, without any additional processes; distal spermathecal duct distinctly short, about one third of proximal duct; medial dilation proximally slightly dilated.

Population Variation: Single specimen studied.

Material Examined

Himachal Pradesh: Shimla, 13. viii. 2010 - 1♀.

Distribution: Sri Lanka; India (Himachal Pradesh, Maharashtra, Uttar Pradesh, Paschim Banga).

Remarks: The species is characterized in being shining and brilliantly coloured; 1st gonocoxae large, distinctly sinuate on inner and posterior margins, 9th paratergites lobular, not reaching posterior fused margins of 8th paratergites; spermatheca with pump region sclerotized proximally, membranous distally; bulb elongated, finger like, without any additional processes; distal spermathecal duct distinctly short, about one third of proximal duct and medial dilation proximally slightly dilated. It has been reported for the first time from North India.

GENUS *HALYABBAS* DISTANT

Halyabbas, Distant (1900) *Tr. E. S.*, p. 164.

Type species - *Halyabbas unicolor* Distant

Diagnosis: Body ovate, narrowing to apex, depressed towards head from near base of pronotum; head large, triangular, almost in a line with lateral margins of pronotum, lateral lobes very broad at base, narrowing towards apex and meeting a little in front of central lobe; labium reaching base of abdomen; antennae five jointed, 1st joint not nearly reaching apex of head; pronotum about twice as broad as long, lateral margins obliquely straight, very slightly crenulate near eyes, lateral angles obtusely subprominent; scutellum broad at base, somewhat suddenly narrowed at about one-third before apex, which is rounded and reaches base of membrane; corium with the apical margins convexly rounded; membrane with longitudinal veins; 2nd abdominal segment centrally sulcated.

Remarks: This genus represents a new record to Indian fauna. It is represented only by a single species, *H. unicolor* from Myanmar and China on bamboo tree.

***Halyabbas unicolor* Distant**
(Figs. 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321)

Halyabbas unicolor: Distant (1900) *Tr. E. S.*, 1: p. 164.

MALE:

Measurements (mm): Head length: 2.0; width across eyes: 2.59; interocular space: 1.45; interocellar space: 0.80; preocular distance: 1.10; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.50, II: 0.95, III: 0.85, IV: 1.25, V: 1.60; pronotal length: 3.20; width across humeral angles: 6.93; scutellar length: 4.50; scutellar width: 4.20; length of abdomen: 5.94; maximum width of abdomen: 6.60; length of rostral segments: I: 0.80, II: 1.35, III: 1.0, IV: 0.90; Distance - base scutellum-apex clavus: 3.0; apex clavus-apex scutellum: 1.50; apex scutellum-apex abdomen including membrane: 3.52; total body length: 13.10.

Dorsal Coloration: Head pale greenish, coarsely and darkly punctured with black; eyes brownish black; ocelli brown; boundaries of eyes and posterior margin pale yellowish green, area before eyes impunctate and green; 1st and 2nd antennal segments green, 3rd and 4th darker, 5th somewhat infuscated; pronotum greenish, darkly punctate, anterior margin dark green, impunctate, anterior pronotal area with two green transverse callosities, humeral angles yellowish green, darkly punctured, more pronounced laterally; scutellum green darkly punctured with black; calvus and corium yellowish green, sparingly punctured, costal margin densely punctate, anteriormost portion of costa pale, impunctate; connexiva yellowish green, suffused with black and brown and black punctures; hemelytral membrane brown.

Ventral Coloration: Labium yellowish green, apex black; legs yellowish green, apex of tibiae and tarsi darker with brown suffusions; head green, punctate; area between legs paler; lateral areas of sternum green, thickly punctured with series of irregularly scattered black punctures, margins distinctly black; and metathoracic scent gland opening yellowish green with brown punctures, evaporatorium impunctate; abdomen dark green with brown fascia, lateral area impunctate, green, an elongated brown spot on sternite VII medially, with dark green lines in between; genital capsule admixture of brown and green, pilosed with golden brown.

STRUCTURE:

Head (Fig. 311): distinctly wide, strongly declivent downwards, rugulose; paraclypeal lobes slightly longer, meeting in front of clypeus, lateral margins marginally sinuous above eyes, reflexed anterlaterally, narrowed and subrounded at apex; clypeus slightly

raised medially; antennal segmental formula – I<III<II<IV<V; labium reaching metacoxae, labial lengths formula – IV<I<III<II. **Thorax:** Pronotum (Fig. 312) with anterior margin concave, truncate behind eyes, produced as small subacute tubercles directed anterolaterad, anterolateral margins crenulate, posterolateral margin obliquely straight, lateral margins upwardly reflexed, humeral angles subrounded, obtuse, posterior margin straight; scutellum broad at base, beyond frena slightly sinuous, narrowed as subtriangular apical lobe; connexiva well exposed at repose; metathoracic scent gland osteolar peritreme (Fig. 313) small, raised, slightly sinuous, narrowed at apex, reaching only one fourth way to metapleural margin; evaporatorium moderately large, distinctly broad, with well defined anterior and posterior margins, slightly concave medially, covering about two third sternite; legs hairy. **Abdomen:** ampliate medially, flattened laterally; inner margins of spiracular boundaries spotted with black; hemelytral membrane passing beyond abdominal apex; ventroanterior margin of abdominal sternite VII concave, somewhat dome shaped with subacute posterior angles and ventroposterior angles broadly concave, somewhat an inverted U-shaped (Fig. 314).

FEMALE:

Measurements (mm): Head length: 1.90; width across eyes: 2.80; interocular space: 1.70; interocellar space: 0.90; preocular distance: 1.05; length of posterior head including eyes: 0.85; antennal segments lengths: I: 0.50, II: 1.0, III: 0.80, IV: 1.05, V: 1.30; pronotal length: 3.20; width across humeral angles: 7.25; scutellar length: 5.0; scutellar width: 4.50; length of abdomen: 6.10; maximum width of abdomen: 6.93; length of rostral segments: I: 0.90, II: 1.60, III: 1.10, IV: 0.75; Distance - base scutellum-apex clavus: 3.10; apex clavus-apex scutellum: 1.85; apex scutellum-apex abdomen including membrane: 4.75; total body length: 13.50.

Coloration and Structure: Body form and coloration similar to males except, females being comparatively paler and with less dense black punctures; ventroanterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped, with acute posterior angles (Fig. 315).

Male Genitalia: Pygophore (Fig. 318) as long as broad, lateral margin straight, with prominent narrowly rounded dorsolateral lobes; dorsal opening small; dorsomedial surface broadly concave; ventroposterior margin sinuate; paramere (Fig. 319)

somewhat sickle shaped, apex of blade oar like, outer margin convex with medial hump, inner margin with a small nodule near base; aedeagus (Fig. 320, 321) with theca broad at base, narrowed apically, a pair of elongate dorsolateral membranous conjunctival appendages, sclerotized at apices, directed laterad; a pair of ventral conjunctival appendages, fused basally; a pair of elongate spindle like sclerotized medial penial lobes, not fused basally; vesica distinctly long, passing much beyond margins of medial penial lobes; ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae medially placed wide apart, quadrangular, posterior margins straight, inner margins parallel; 2nd gonocoxae fused medially, slightly concave; 8th paratergites broadly triangular, posterior margins with a tooth like angulation; 9th paratergites elongate, lobe like, inner margin medially produced, passing beyond fused posterior margin of 8th paratergites (Fig. 316); spermatheca (Fig. 317) with distinct distal and proximal flanges; pump region distinctly short, smaller than distal spermathecal duct; bulb small, flattened with two finger like lobules; medial dilation balloon like; proximal spermathecal duct sclerotized, subequal to distal spermathecal duct.

Population Variation: Single male and female specimens studied.

Material Examined:

Uttarakhand: Nainital, 20. viii. 2011 - 1♀, 1♂

Distribution: Myanmar; Hong Kong; India (Uttarakhand).

Remarks: This species represents a new record from India with detailed morphological and genitalic attributes have been studied for the first time. It has been recorded as a pest of *Bambusa* sp., *Phyllostachys pubescens* and *Santalum album* (sandalwood) from Myanmar.

GENUS *DOLYCORIS* MULSANT AND RAY

Carpocoris, subg. *Dolycoris*, Muls. & Ray (1866) *Pun. France, Pent.*, p. 238

Dolycoris, Stål (1872) *Öfv. Vet.-Ak. Förh.*, 3: p. 38.

Type species – *Dolycoris baccharum* Linnaeus

Diagnosis: Usually as long as broad, anteocular distance almost as long as remainder of head; labium passing beyond hind coxae; anterior margin of pronotum usually concave, scutellum always longer than broad; metathoracic scent gland ostiole usually long, peritreme usually short, evaporatoria well developed.

Remarks: The genus is represented by 10 species from the World. It is widely distributed in Palaearctic and Oriental regions. The genus is characterized by having metathoracic scent gland peritreme abruptly abbreviated and frena extending distinctly beyond the middle of scutellum.

Key to the studied species of genus *Dolycoris* Mulsant and Rey

1. Head, pronotum and scutellum less punctate; proximal spermathecal duct about 3X longer than distal spermathecal duct; 9th paratergites broad, reaching fused posterior margin of 8th paratergites; ventral membranous conjuncival appendages broad and curved downwards with sclerotized apices..... *indicus* Stål
- Head, pronotum and scutellum thickly punctured; proximal spermathecal duct about 2X longer than distal spermathecal duct; 9th paratergites elongate, passing beyond posterior margin of 8th paratergites; ventral membranous conjuncival appendages sclerotized, spine like and directed anteriorad..... *baccarum* (Linnaeus)

***Dolycoris indicus* Stål**

(Figs. 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333)

Dolycoris indicus: Stål (1876) *En. Hem.*, 5: p. 76

MALE:

Measurements (mm): Head length: 2.0; width across eyes: 2.0; interocular space: 1.40; interocellar space: 0.80; preocular distance: 1.05; length of posterior head including eyes: 0.99; antennal segments lengths: I: 0.50, II: 1.0, III: 0.80, IV: 1.0, V: 1.15; pronotal length: 2.20; width across humeral angles: 5.445; scutellar length: 4.0;

scutellar width: 3.625; length of abdomen: 4.375; maximum width of abdomen: 5.445; length of rostral segments: I: 0.90, II: 1.35 III: 0.85, IV: 0.75; Distance - base scutellum-apex clavus: 3.0; apex clavus-apex scutellum: 1.0; apex scutellum-apex abdomen including membrane: 3.28; total body length: 10.50.

Dorsal Coloration: Head brownish yellow, spotted with thick black punctures sparsely, lateral margins black, apex impunctate; eyes red with black tinge; ocelli dark red; antennae black, except apices and bases brownish yellow; pronotum brownish yellow, sparingly punctate with black; anterior small central area impunctate, anterior collar and lateral margin impunctate with orangish tinge, two irregular anterior transverse impunctate callosities; scutellum brownish yellow, sparingly punctate with black, apex impunctate, basal scutellar angles giving an impression of maculate brownish yellow spots; clavus and corium brownish yellow with purplish red tinge, and fine black punctures; anteriormost portion of costal margin orangish yellow, rest pale; connexiva bicolorous, outer margin orangish yellow, inner pale, with anterior and posterior margins narrowly black; hemelytral membrane admixture of light and dark brown.

Ventral Coloration: Labium pale yellow, apex black; lateral margins of head black, rest pale, impunctate; lateral area of sternum orangish yellow, impunctate; base of coxae spotted with black, a small black spot just below anterior margin of mesosternite; legs pale yellow, spotted with dark brown, densely pilosed with long golden yellow hairs, femora with a distinct black spot subapically, tarsi black; abdominal disk slightly dark yellow, lateral and medial areas sparsely spotted with black; spiracles distinct, black; connexiva orangish yellow, with black spots at insicures; genital capsule pale yellow.

STRUCTURE:

Head (Fig. 323): Head moderately deflected and pilosed, paraclypeal lobes slightly longer than medially raised clypeus; former anterolaterally reflexed upwards, almost entire, narrowed and subrounded at apex; antennal segmental formula – I<III<II<IV<V; labium long, passing beyond metacoxae, labial lengths formula – IV<III<I<II. **Thorax:** Pronotum (Fig. 324) slightly declivent anteriorly, calloused posteriad, anterior margin concave, U-shaped, subquadrate behind eyes, produced as minute tubercles directed anteriorly, lateral margins straight, slightly reflexed upwards,

humeral angles subprominent, obtuse; scutellum somewhat subrugulose, beyond frena distinctly narrowed into a snake headed subtriangular apical lobe; basal scutellar angles with fovea; metathoracic scent gland osteolar peritreme (Fig. 325) small, slightly raised, sinuate medially, narrowed subacutely at apex extending upto one fourth way to metapleural margin, evaporatorium broad, with well defined anterior and posterior margins covering about half sternite; legs pilosed. **Abdomen:** broad, ampliate, laterally pilosed; connexiva well exposed at repose dorsally and ventrally; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles; ventroposterior margins broadly concave; membrane of hemelytra passing much beyond abdominal apex (Fig. 326).

FEMALE:

Measurements (mm): Head length: 2.09; width across eyes: 2.035; interocular space: 1.40; interocellar space: 0.85; preocular distance: 1.10; length of posterior head including eyes: 0.99; antennal segments lengths: I: 0.40, II: 0.80, III: 0.60, IV: 1.20, V: 1.10; pronotal length: 2.56; width across humeral angles: 5.94; scutellar length: 4.50; scutellar width: 3.75; length of abdomen: 4.95; maximum width of abdomen: 5.775; length of rostral segments: I: 1.10, II: 1.55 III: 0.90, IV: 0.80; Distance - base scutellum-apex clavus: 2.875; apex clavus-apex scutellum: 1.625; apex scutellum-apex abdomen including membrane: 3.875; total body length: 10.80.

Coloration and Structure: Body form and coloration similar to males except, females are slightly darker; hemelytral membrane comparatively shorter; ventroanterior margin of abdominal sternite VII broadly concave, somewhat lunar shaped, with subacute posterior connexival angles, ventroposterior margin somewhat U-shaped (**Fig. 327**).

Male Genitalia: Pygophore (Fig. 330) about as long as broad, lateral margins sinuate, with subprominent acutely narrowed dorsolateral lobes; dorsal opening small; dorsomedial surface broadly concave; ventroposterior margin with lateral small invaginations and a medial evagination; paramere (Fig. 331) F-shaped, blade broad with pointed apex, outer margin with a small hump, inner margin with a small thumb like process near base; aedeagus (Fig. 332, 333) with long theca, a pair of node like lateral thecal appendages; a pair of distinctly broad and elongate ventral membranous

conjuncival appendages curved downwards with sclerotized apices; a pair of sclerotized medial penial lobes, apically pointed, not fused medially and basally; vesica long and curved, passing beyond ventral membranous appendages.

Female Genitalia: 1st gonocoxae medially placed wide apart; 2nd gonocoxae medially fused, longer than broad, posterior margin concave; 8th paratergites broadly triangular, posterior margin sinuate; 9th paratergites slightly broad, lobular, outer margin slightly sinuate, just reaching the fused posterior margin of 8th paratergites (Fig. 328); spermatheca (Fig. 329) with distinct distal and proximal flanges; pump region short, tube like, proximally sclerotized, shorter than distal spermathecal duct; bulb rounded; medial dilation small and narrowed; proximal spermathecal duct about 3X longer than distal duct.

Population Variation: Color of entire body varies from being dark brownish yellow to paler; color and thickness of punctures variable. Corium shows variations from being brownish yellow, with levels of reddish suffusions or even blackish grey in some; membrane entirely black or with apex transparent; density of pilosity varies on head, pronotum and legs.

Material Examined:

Punjab: Pathankot, 22. iv. 2009 - 1♀; Talwara, 20. viii. 2009 - 1♂; Hoshiarpur, 11. iv. 2010 - 1♂; Ropar, 7.viii. 2010 - 2♀♀

Himachal Pradesh: Solan, 12. vi. 2009 - 2♂♂; Andhretta, 12-13. vii. 2010 - 4♀♀, 2♂♂

Distribution: India (Punjab, Himachal Pradesh, Uttar Pradesh, Paschim Banga, Maharashtra, Karnataka, Jammu and Kashmir, Nagaland).

Remarks: This species is closely allied to *Dolycoris baccarum* in general body and shape except being narrower form, head, pronotum and scutellum less densely punctured, membrane slightly longer, anterolateral margins of pronotum more broadly pallid, sparingly punctate. It can also be easily separated from the same in having 9th paratergites lobe like, not passing beyond fused posterior margin of 8th paratergites; proximal spermathecal duct about 3X longer than distal spermathecal duct and ventral membranous conjuncival appendages broad, curved downwards with sclerotized apices. It has been recorded as a serious pest of some fodder crops like berseem

(*Trifolium alexandrium*, *Trifolium alexandrinum*), wheat, *Oryza sativa* and some wild plants do serve as the alternate host plants.

***Dolycoris baccarum* (Linnaeus)**

(Figs. 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345)

Cimex baccarum, Linnaeus (1761) *Faun. Suec.*, 2: p. 249 & 928.

Cimex nebulosa, Poda (1761) *Ind. Mus. Graec.*, 56: p. 8

Cimex verbasci, DeGeer (1773) *Mem.*, 3: p. 257.

Cimex subater, Harris (1781) *Exp. Engl. Ins.*, p. 90.

Cimex albidus, Gmelin (1789) *Syst. Nat.*, 13: p. 2161.

Aelia depressa, Westwood (1837) in *Hope Cat.*, p. 32.

Pentatoma inconcisa, Walker (1867) *Cat. Hem.*, 2: p. 301.

Dolycoris baccarum Reuter (1880) *Ent. Tidskr.*, 1: p. 128.

Dolycoris baccarum: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 159.

MALE:

Measurements (mm): Head length: 2.0; width across eyes: 2.0; interocular space: 1.40; interocellar space: 0.90; preocular distance: 1.05; length of posterior head including eyes: 0.95; antennal segments lengths: I: 0.40, II: 0.95, III: 0.80, IV: 1.0, V: 1.20; pronotal length: 2.09; width across humeral angles: 5.281; scutellar length: 3.875; scutellar width: 3.20; length of abdomen: 3.875; maximum width of abdomen: 5.445; length of rostral segments: I: 0.90, II: 1.35 III: 0.80, IV: 0.80; Distance - base scutellum-apex clavus: 2.50; apex clavus-apex scutellum: 1.375; apex scutellum-apex abdomen including membrane: 3.20; total body length: 10.20.

Dorsal Coloration: Head brownish yellow, pilosed and spotted with thick black punctures, lateral margins prominently black; eyes brownish red with yellowish border; ocelli dark red; antennae black, except bases of all segments brownish yellow; pronotum brownish yellow, densely punctate with black, except central area strongly pilosed with long golden yellowish hairs; anterior collar and lateral margins impunctate with dark brownish yellow, two concolorous irregular anterior transverse impunctate callosities; scutellum brownish yellow, densely punctate with black at base, except angulations and apex pale and impunctate; clavus and corium brownish yellow with purplish red tinge and dense black punctures more pronounced towards apex; anteriormost portion of costal margin pale yellow; connexiva bicolorous

brownish yellow with anterior and posterior margins narrowly black; hemelytral membrane admixture of light and dark brown.

Ventral Coloration: Labium pale yellow, apex black; lateral margins of head black, rest pale, impunctate; lateral area of sternum pale yellow, impunctate, outer boundaries black; base of coxae spotted with black, a small black spot just below anterior margin of mesosternite; legs brownish yellow, spotted with dark brown, densely pilosed with long golden yellow hairs, femora with a distinct black spot subapically, tarsi black; abdominal disk dark brownish yellow, lateral and medial areas sparsely spotted with black, pilosed with golden yellow hairs; spiracles distinct, black; connexiva dark brownish yellow spotted with black at insicures; genital capsule bright yellow, pilosed with long golden yellow hairs.

STRUCTURE:

Head (Fig. 335): Head moderately deflected and pilosed, somewhat subsquarish, paraclypei equal to medially raised clypeus; former anterolaterally reflexed upwards, almost entire, narrowed and subrounded at apex; antennal segmental formula – I<III<II<IV<V; labium long, reaching metacoxae, labial lengths formula – III=IV<I<II. **Thorax:** Pronotum (Fig. 336) slightly declivent anteriorly, calloused posteriad, anterior margin concave, U-shaped, subquadrate behind eyes, produced as minute tubercles directed anteriorly, lateral margins straight, slightly reflexed upwards, humeral angles subprominent, obtuse; scutellum somewhat subrugulose, beyond frena distinctly narrowed into a subtriangular apical lobe; basal scutellar angles with fovea; metathoracic scent gland osteolar peritreme (Fig. 337) small, slightly raised, sinuate medially, narrowed subacutely at apex extending upto one fourth way to metapleural margin, evaporatorium broad with well defined equally produced anterior and posterior margins covering about half sternite; legs pilosed. **Abdomen:** broad, ampliate, laterally pilosed; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles, ventroposterior margin broadly concave, somewhat an inverted U-shaped; membrane of hemelytra passing much beyond abdominal apex (Fig. 338); genital capsule with long pubescence; connexiva well exposed at repose dorsally and ventrally.

FEMALE:

Measurements (mm): Head length: 2.09; width across eyes: 2.0; interocular space: 1.45; interocellar space: 0.85; preocular distance: 1.10; length of posterior head including eyes: 0.99; antennal segments lengths: I: 0.50, II: 1.0, III: 0.85, IV: 1.10, V: 1.20; pronotal length: 2.56; width across humeral angles: 5.94; scutellar length: 4.50; scutellar width: 3.75; length of abdomen: 5.0; maximum width of abdomen: 5.775; length of rostral segments: I: 0.90, II: 1.40, III: 0.85, IV: 0.80; Distance - base scutellum-apex clavus: 2.875; apex clavus-apex scutellum: 1.625; apex scutellum-apex abdomen including membrane: 3.875; total body length: 11.10.

Coloration and Structure: Body form and coloration similar to males except, females slightly darker; hemelytral membrane short; ventroanterior margin of abdominal sternite VII narrowly concave with subacute posterior connexival angles, ventroposterior margin broadly concave (Fig. 339).

Male Genitalia: Pygophore (Fig. 342) usually as long as broad, lateral margins sinuate, with subprominent acutely narrowed dorsolateral lobes; dorsal opening small; dorsomedial surface broadly concave; ventroposterior margin with lateral small invaginations and a medial evagination; paramere (Fig. 343) F-shaped, blade broad with blunt apex, outer margin slightly raised on upper margin, inner margin straight medially concave near apex, with a small thumb like process near base, directed downwards; aedeagus (Fig. 344, 345) with long theca, a pair of node like lateral thecal appendages; a pair of sclerotized ventral membranous conjunctival appendages; a pair of sclerotized medial penial lobes that are not fused medially and basally; vesica long, not passing beyond ventral membranous appendages.

Female Genitalia: 1st gonocoxae medially placed wide apart, somewhat quadrangular; 2nd gonocoxae medially fused, slightly longer than broad, posterior margin concave; 8th paratergites broadly triangular, posterior margin straight; 9th paratergites elongate, lobe like, outer margin sinuate, distinctly passing beyond fused posterior margin of 8th paratergites (Fig. 340); spermatheca (Fig. 341) with distinct distal and proximal flanges; pump region short, tube like, proximally sclerotized, membranous distally, shorter than distal spermathecal duct; bulb rounded; medial dilation distinctly small and narrowed; proximal spermathecal duct about 2X longer than distal spermathecal duct.

Population Variation: Color of entire body varies from being dark brownish yellow to paler; color and thickness of punctures also variable. Corium shows variations from being brownish yellow, with reddish suffusions or even blackish grey in some; membrane entirely black or with transparent apex; density of pilosity varies on head, pronotum and legs.

Material Examined:

Punjab: Patiala, 16. iv. 2009 - 2♀♀, 1♂; 8-19. vii. 2009 - 3♂, 1♀; 6. viii. 2010 - 2♀, 1♂; Pathankot, 22. iv. 2009 - 48♀♀, 48♂♂; 21. viii. 2009 - 3♀♀, 2♂♂; Hoshiarpur, 17. viii. 2009 - 1♀; 11-12. iv. 2010 - 10♀♀, 7♂♂; Talwara, 20. viii. 2009 - 4♀♀, 4♂♂; Ferozepur, 11. ix. 2009 - 10♀♀, 10♂♂; Tarantaran, 8. iv. 2010 - 2♀♀; Gurdaspur, 10. iv. 2010 - 10♀♀, 5♂♂; Ropar, 1. x. 2010 - 2♀♀, 3♂♂

Himachal Pradesh: Solan, 10-12. vi. 2009 - 9♀♀, 16♂♂; Palampur, 12-13. vii. 2010 - 5♀♀, 3♂; Sundernagar, 25. vii. 2010 - 2♂♂; Paonta Sahib, 3. x. 2009 - 1♂.

Uttarakhand: Dehradun, 26. vii. 2009 - 1♂ - 1♀

Jammu and Kashmir: Kathua, 21. viii. 2009 - 1♀

Distribution: Pakistan; India (Punjab, Himachal Pradesh, Uttarakhand, Jammu and Kashmir, Karnataka).

Remarks: The species is closely resembles *D. indicus* as discussed in keys and remarks of *D. indicus* species. It has been recorded as a polyphagous pest of many crops like cereals, sunflower, tobacco, Pistachio and some medicinal plants. Studies have revealed that the mass population of this berry bug has been controlled in fields by using globe thistle *Echinops viscosus* (Compositae) as a trap plant to aggregate the population.

GENUS *TOLUMNIA* STÅL

Tolumnia, Stål (1867) Öfv. VetAk. Förh., p. 515.

Type species – *Tolumnia trinotata* Westwood, a species found in Cambodia and the Malay Archipelago.

Diagnosis: Pronotum with the anterior and the anterior-lateral margins elevated, the anterior margin concave, slightly truncate behind the eyes, the lateral angles subprominent; head forwardly narrowed, the apex rounded, lateral margins slightly sinuate near middle, central lobe slightly longer than the lateral lobes; labium passing metacoxae; corium with the apical margin very slightly sinuate near the apical angle,

which is somewhat rounded at extremity; mesosternum distinctly carinate; abdominal segmental angles slightly acutely prominent; anterior tibiae sometimes moderately dilated.

Remarks: The genus is represented by 13 species from the world. Rider (2006-2012) provided keys to only 6 species collected from India, China, Phillipines, Thailand, Java, Southeast Asia, Malaysia and western Indonesia. No pest status has been recorded for its species till now.

Key to the studied species of genus *Tolumnia* Stål

- 1 Scutellum with distinct pale basal angular spots; antennae piceous with bases of joints paler; spermathecal bulb without distinct finger-like processes; 1st gonocoxae quadrangular, straight on inner margin..... 2
 - Scutellar base with transverse extensive pale fascia forming distinct irregular band; antennae with 1st and 2nd segments brownish yellow; spermathecal bulb with two distinct finger-like processes; 1st gonocoxae somewhat triangular, slightly concave at inner margin..... ***basalis* (Dallas)**
2. Body length: 12mm; five distinct small yellowish-brown spots across base of scutellum; spermathecal bulb somewhat trapezoidal, extended downwardly with single curved process, 9th paratergites broad, less wide apart, not passing beyond the posterior margin of 8th paratergites..... ***maxima* Distant**
 - Body length: 9 mm; two distinct oval or roundish yellowish-brown spots at each basal angle of scutellum; spermathecal bulb squarish with two tuberculate processes opposite in direction; 9th paratergites elongated passing beyond the posterior margin of 8th paratergites..... ***latipes* (Dallas)**

***Tolumnia basalis* Dallas (Figs. 346, 347, 348, 349, 350, 351, 352)**

Tolumnia basalis: Dallas (1851) *List.*, p. 237

FEMALE:

Measurements (mm): Head length: 1.70; width across eyes: 1.12; interocular space: 1.10; interocellar space: 0.60; preocular distance: 0.92; length of posterior head including eyes: 0.77; antennal segments lengths: I: 0.50, II: 0.90, III: 1.05, IV: 1.20, V: 1.57; pronotal length: 2.0; width across humeral angles: 5.28; scutellar length: 3.60; scutellar width: 3.30; length of abdomen: 4.50; maximum width of abdomen: 5.28; length of rostral segments: I: 0.80, II: 1.20, III: 1.00, IV: 0.85; Distance - base scutellum-apex clavus: 2.87; apex clavus-apex scutellum: 0.68; apex scutellum-apex abdomen including membrane: 2.75; total body length: 10.

Dorsal Coloration: Head brownish yellow, punctured with black; inner and outer margin of paraclypei and posterior margin of head black, medial clypeal area scarcely punctate, area around eyes brownish yellow; eyes blackish-red; ocelli pink; antennal segments 1st, 2nd and 3rd brownish yellow, basal one-third of 4th, and half 5th pale whitish, rest black; pronotum brownish yellow, coarsely and densely punctured with black; anterior and lateral two-thirds margin of pronotum and humeral angles brownish yellow, rest black; anterior margin of pronotum with two transverse brownish yellow callosities, bordered with black punctures; scutellum brownish, punctured densely with dark black punctures; scutellar base with irregular maculate pale yellow patch, apex pale yellow and impunctate; clavus, corium and costal margin, admixture of red, green and yellowish tinge; costal margin thickly punctured with black, except anteriormost costal margin pale yellow; connexiva pale yellowish brown, anterior and posterior margins marked with black patch; hemelytral membrane suffused with black and brown, outer margin translucent.

Ventral Coloration: Labium pale yellow, central area dark brown, apex black; head pale yellow, except lateral margins and below antennal segment black; sternum yellow, punctate with double series of four black spots, one on anterior margin of sternite, one on base of coxae, metasternite with additional pair on lateral margin; metathoracic scent gland opening pale yellow, impunctate, evaporatorium pale whitish; abdomen finely punctured, admixture of pale brownish yellow with green tinge; genital capsule brownish yellow; spiracles yellow; lateral margin of abdomen pale; connexiva concolorous to dorsal surface; legs brownish yellow, finely spotted with black, tarsi darker.

STRUCTURE:

Head (Fig. 347): Head longer than broad, moderately declivent, subrounded at apex; paraclypei subequal to clypeus, latter slightly lobulated and raised medially; lateral margins of paraclypei slightly sinuous above eyes, reflexed anterolaterally, narrowed at apex; antennal segment I not reaching apex of head; antennal segmental formula – I<II<III<IV<V; labium long, slender just reaching metacoxae; labial length formula – I<IV<III<II; **Thorax:** Pronotum (Fig. 348) about 2.5X wider than long, moderately deflected anteriad, calloused posteriad, anterior margin concave, subtruncate behind eyes, protruding as small tuberculate obtuse angles anterolaterad, lateral margins smooth, obliquely straight; humeral angles subprominent, obtuse; frenal region distinctly greater than post frenal, beyond frena narrowed as subtriangular apical lobe; connexiva well exposed at repose dorsally; metathoracic scent gland osteolar peritreme (Fig. 349) long, elongated, sinuously concave, narrowed acutely at apex, reaching about three fourth way to metapleural margin; evaporatorium with well developed equally extended anterior and posterior margins, concave medially forming V-shaped structure covering two-third area of sternite; legs without any modifications, femora slightly pilosed, tarsi and posterior end of tibiae pilosed with golden pubescence; abdomen medially convex, depressed laterally; connexiva exposed at repose; genital capsule with golden pubescence; ventroanterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped, with acute posterior angles (Fig. 350); hemelytral membrane passing moderately beyond apex of abdomen.

Female Genitalia: 1st gonocoxae subtriangular, sinuate on inner margin; 2nd gonocoxae somewhat rectangular, anterior margin sinuate; 8th paratergites elongate, triangular; 9th paratergites broad, lobulate, subrounded at posterior margin, not passing beyond fused posterior margins of 8th paratergites (Fig. 351); spermatheca (Fig. 352) with distinct distal and proximal flanges; pump region small, spiral tube like, distinctly shorter than distal spermathecal duct; bulb elongate with two finger like processes; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Punctation on head, pronotum and scutellum vary in density, infused with more brownish tinge; sternum with double series of black spots larger in

size; legs paler; anteriormost portion of costa and lateral margin of pronotum brownish yellow with orangish tinge.

Material Examined

Himachal Pradesh: Paonta Sahib, 04. x. 2009 - 1♀

Uttarakhand: Sahastradhara, 16. ix. 2010 - 1♀

Distribution: India (Uttarakhand, Himachal Pradesh, Meghalaya).

Remarks: The species closely resembles *T. maxima* and *T. latipes* in general body form, but can be easily separated from the two in having scutellar base with transverse extensive pale fascia forming distinct irregular band; antennae with 1st and 2nd segments brownish yellow and spermathecal bulb with two distinct finger like processes as compared to scutellum with distinct pale basal angular spots; antennae piceous with bases of joints paler and spermathecal bulb without distinct finger like processes in the mentioned species. It is a new record from North India.

Tolumnia maxima Distant (Figs. 353, 354, 355, 356, 357, 358, 359)

Tolumnia maxima: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: pp: 154 & 155.

FEMALE:

Measurements (mm): Head length: 2.09; width across eyes: 2.09; interocular space: 1.20; interocellar space: 0.75; preocular distance: 1.10; length of posterior head including eyes: 0.99; antennal segments lengths: I: 0.50, II: 1.05, III: 1.20, IV: 1.20 V: 1.90; pronotal length: 2.88; width across humeral angles: 6.60; scutellar length: 4.60; width: 4.20; length of abdomen: 5.0; maximum width of abdomen: 6.435; length of rostral segments: I: 0.85, II: 1.40, III: 1.0, IV: 0.85; Distance - base scutellum-apex clavus: 2.875, apex clavus-apex scutellum: 1.375, apex scutellum-apex abdomen including membrane: 3.25; total body length: 12.0.

Dorsal Coloration: Head pale chocolate brown, thickly punctured with coarse black punctures, with yellowish-brown irrorations, more pronounced on clypeal lobe; eyes reddish brown, bordered with yellowish brown, a distinct yellowish brown patch below eye; ocelli deep red; antennae yellowish brown, speckled with black, base of 4th

pale brownish yellow, base of 5th darker; pronotum chocolate brown, coarsely punctured with black, more pronounced on anterolateral and posterior area, along with broad black fascia on posterior area; anterior pronotal area with two chocolate brown callosities, impunctate; scutellum paler, thickly punctured with dark brown, base of scutellum with five brownish yellow spots, apex pale, lateral area with chocolate brown fascia; clavus, corium and costa slightly fainted, with black punctures, speckled with greyish black fascia; anteriormost region of costal margin pale, levigate; connexiva alternating with black and brownish yellow fascia; hemelytral membrane hyaline.

Ventral Coloration: Labium pale brownish yellow, apex black; head with lateral area pale brownish yellow, scarcely punctured with black, area below 1st labial segment impunctate; area between legs paler with reddish tinge, impunctate; sternum pale brownish yellow, with a double series of black punctures, some tinged with green; metathoracic scent gland opening black, rest concolorous; abdomen centrally pale, punctured with light brown; lateral area blackly punctured; spiracles black; connexivum with black anterior and posterior margins, and central broad pale area; VII abdominal segment with an elongate central black spot on disk; genital capsule light greenish, pilosed; legs pale brownish yellow, apices of femora spotted with black, apex of tarsi, base and apices of tibiae speckled with black.

STRUCTURE:

Head (Fig. 354): Head moderately deflected, subrounded at apex; clypeal lobe slightly raised medially, marginally longer than paraclypei, later sinuous above eyes, distinctly reflexed anterolaterally; antennal segmental formula – I<II<III=IV<V; labium long, just reaching base of metacoxae, labial lengths formula – I=IV<III<II.

Thorax: Pronotum (Fig. 355) declivent, slightly raised posteriorly; anterior pronotal margin concave, with subacute tubercles directed anteriorly, lateral margins calloused, slightly concave medially, humeral angles prominent, subacute, posterior margin straight; scutellum beyond frena, narrowed into subrounded apical lobe; connexiva well exposed at repose dorsally and ventrally with acute connexival angles; metathoracic scent gland osteolar peritreme (Fig. 356) long, medially concave, narrowed apically, covering more than half way to metapleural margin, evaporatorium broad, with subprominent anterior and posterior margins, covering two-third of

sternite; legs with tibiae and tarsi and genital capsule pilosed with golden hairs. **Abdomen:** callosed medially, flattened laterally; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped (Fig. 357); hemelytral membrane passing beyond apex of abdomen.

Female Genitalia: 1st gonocoxae quadrangular; 2nd gonocoxae with sinuate anterior margin; 9th paratergites broad, less wide apart, subrounded at apex, not reaching fused posterior margins of 8th paratergites; 8th paratergites triangular without any spine on posterior margins (Fig. 358); spermatheca (Fig. 359) with distinct distal and proximal flanges; pump region small, slightly broad, tube like, distinctly 3X shorter than thin distal spermathecal duct; bulb trapezoidal, curved and pointed at apex; proximal spermathecal duct distinctly longer than distal spermathecal duct

Population Variation: Color of entire body shows slight variation from being pale chocolate brown to slightly darker; black punctures on entire body vary in thickness and size.

Material Examined:

Uttarakhand: Nainital, 20. viii. 2011 - 1 ♀

Himachal Pradesh: Solan, 14. x. 2011 - 1 ♀

Distribution: Myanmar; India (Uttarakhand, Himachal Pradesh, Paschim Banga).

Remarks: This species closely resembles *T. latipes* in body form and general coloration, but can be easily separated from it in having five distinct small spots across base of scutellum; spermathecal bulb somewhat trapezoidal, extended downwardly with single curved process and 9th paratergites broad, not passing beyond the posterior margin of 8th paratergites. It is a new record from North India.

***Tolumnia latipes* (Dallas)**

(Figs. 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371)

Pentatoma latipes, Dallas (1851) *List Hem.*, 1: p. 238.

Dalpada obtusicollis, Ellenr. (1862) *Nat. Tijdschr. Ind.*, 24: p. 143.

Pentatoma trispila, Walker (1867) *Cat. Het.*, 2: p. 302.

Var. *Pentatoma contingens*, Walker. *loc. cit.* p. 302.

Tolumnia latipes: Breddin (1900) *Abh. Naturforsch. Ges. Halle.*, 24: p. 298.

MALE:

Measurements (mm): Head length: 1.70; width across eyes: 1.90; interocular space: 1.90; interocellar space: 0.90; preocular distance: 0.60; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.50, II: 0.90, III: 1.0, IV: 1.20, V: 1.65; pronotal length: 2.20; width across humeral angles: 5.61; scutellar length: 4.0; scutellar width: 3.60; length of abdomen: 4.375; maximum width of abdomen: 5.61; length of rostral segments: I: 0.85, II: 1.20, III: 0.95, IV: 0.85; Distance - base scutellum-apex clavus: 2.50; apex clavus-apex scutellum: 1.25; apex scutellum-apex abdomen including membrane: 3.0; total body length: 8.50.

Dorsal Coloration: Head shining black, with irregular obscure brownish yellow spots, thickly punctured with lamelliform black; a median longitudinal line, levigate deep brownish yellow; concolorous small spots just behind eye; eyes reddish black; ocelli bright red; antennae multicoloured, 1st segment brownish black, 2nd and 3rd yellowish brown, 4th and 5th black, except base of 4th and basal half of 5th deep brownish yellow; pronotum dark chocolate brown, thickly punctured with black and obscure brownish yellow irrorations, anterior area with two yellowish brown impunctate transverse callosities, anterolateral margins levigate, brownish yellow, rest black, humeral angle tip pale yellow; scutellum chocolate brown punctured with black, and few brownish yellow irrorations, base of scutellum with three levigate pale spots (one central, two angular), apex broadly levigate, deep brownish yellow; clavus and corium slightly paler than scutellum with maculate similar spots, a large brownish yellow spot just at the tip of suture between corium and costa, anteriormost portion of costa pale, impunctate; connexiva paler, impunctate with anterior and posterior margins blackly punctate; hemelytral membrane brownish, outer margins transparent, veins darker.

Ventral Coloration: Labium pale brownish yellow, apex black; head with lateral edges black, lateral areas pale yellowish white; sternum with three black spots, each at base of coxae one small black spot just below anterior margin of mesosternite; humeral angles black; metathoracic scent gland peritreme and evaporatorium pale brownish yellow, finely punctate; abdomen deep brownish yellow, scarcely punctured with fine punctures; connexiva pale brownish yellow alternating with broad impunctate black anterior and posterior margins, posterior connexival angles black;

spiracles yellow bordered with dark brown; legs deep brownish yellow, spotted with black, apex of femora, base and apex of tibiae and entire tarsi black; genital capsule brownish yellow.

STRUCTURE:

Head (Fig. 361): Head slightly wider than long, moderately deflected, subrounded at apex; paraclypeal lobes subequal to slightly lobulated clypeus; former very slightly sinuate above eyes, anterolaterally reflexed upwards, narrowed at apex; 1st antennal segment not reaching apex of head. Antennal segmental formula – I<II<III<IV<V; labium long, reaching metacoxae, labial lengths formula – I=IV<III<II. **Thorax:** Pronotum (Fig. 362) slightly deflected anteriorly, raised medially, anterior margin concave, truncate behind eyes, produced as small tuberculate spines directed anterolaterad, lateral margins obscurely sinuate, humeral angles subprominent, obtuse; scutellum as long as broad, raised anteriorly, apically flattened, beyond frena distinctly narrowed as subrounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 363) long, broad at orifice, narrowed acutely at apex, reaching three fourth way to metapleural margin; evaporatorium well defined, broad, subequally extended anterior and posterior margins, deeply concave medially, covering large area of sternite. **Abdomen:** slightly calloused, flattened laterally; conxivum well exposed at repose dorsally and ventrally; legs with tibiae and tarsi pilosed; genital capsule with golden pubescence; ventroanterior and ventroposterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subacute angles (Fig. 364); hemelytral membrane passing moderately beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 1.70; width across eyes: 1.90; interocular space: 1.90; interocellar space: 0.60; preocular distance: 0.80; length of posterior head including eyes: 0.90; antennal segments lengths: I: 0.50, II: 0.90, III: 1.0, IV: 1.20, V: 1.65; pronotal length: 2.20; width across humeral angles: 5.61; scutellar length: 4.0; scutellar width: 3.60; length of abdomen: 4.37; maximum width of abdomen: 5.61; length of rostral segments: I: 0.85, II: 1.20, III: 0.95, IV: 0.85; Distance - base scutellum-apex clavus: 2.50; apex clavus-apex scutellum: 1.25; apex scutellum-apex abdomen including membrane: 3.0; total body length: 9.0.

Coloration and Structure: Body coloration and form similar to males except, ventroanterior margin of abdominal sternite VII concave with acute posterior connexival angles and ventroposterior margin broadly concave (Fig. 365).

Male Genitalia: Pygophore (Fig. 368) broader than long, somewhat U-shaped, with well developed dorsolateral lobes, broadly rounded at apex; ventroposterior margin sinuate and concave; dorsal opening extremely large; paramere (Fig. 369) L-shaped, without any projection, inner margin concave with small notch near base; aedeagus (Fig. 370, 371) with theca unilobed, rectangular, with elongated nod like medial penial lobes, dorsal membranous conjunctival appendages; vesica moderately long, not passing beyond distal appendages; ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae broad, quadrangular, 2nd gonocoxae short, anterior and posterior margin concave; 8th paratergites triangular with small acute spines at posterior margin; 9th paratergites lobulate, rounded at posterior margin, reaching fused posterior margin of 8th paratergites (Fig. 366); spermatheca (Fig. 367) with distinct distal and proximal flanges; pump region small, tube like, spiral; bulb squarish with two small finger like processes; proximal spermathecal duct slightly longer than distal spermathecal duct.

Population Variation: Anterior and posterior margins of connexival segments vary from being broad to narrow; humeral angles dorsally and ventrally may or may not be completely black; abdominal disk may show reddish tinge.

Material Examined:

Uttarakhand: Dehradun, 24. vi. 2010 - 1♀, Sahastradhara, 16.ix. 2010 - 1♀, Mussoorie, 16. ix. 2010 - 1♂

Distribution: Myanmar; India (Uttarakhand, Paschim Banga, Sikkim, Meghalaya, Nagaland).

Remarks: This species closely resembles to *T. maxima* in having humeral angles not produced and in general body shape, but can be easily separated on the basis of few morphological and female genitalic attributes as discussed earlier. It is a new record from North India.

GENUS *HALYOMORPHA* MAYR

Halyomorpha, Mayr (1864) *Verh. Z.-b. Ges. Wien.*, **24**: p. 911

Type species - *Halyomorpha picus* Fabricius

Diagnosis: Head broad at apex, lateral margins narrowed reflexed and a little sinuate, lobes of about equal length; antennae five-jointed, 1st joint not reaching apex of head; eyes large, sessile; labium reaching the 2nd or 3rd abdominal segment; pronotum with a short tooth at each anterior angle, lateral margins oblique and slightly reflexed, lateral angles subprominent; scutellum with the apical third much narrowed, and with a small rounded impression at each basal angle; tibiae externally broadly sulcate.

Remarks: The genus was proposed with type species *H. picus* Fabricius. It is distributed in Ethiopian and Oriental regions, represented by 37 species. It is closely similar to genus *Tolumnia* in having basal scutellar angles with oblong prominent impression, metathoracic scent gland peritreme acuminate, connexiva spotted with black punctures and head not longer than pronotum, but can be easily separated from the same in having pronotal margins neither elevated nor calloused as compared to calloused in *Tolumnia*.

Halyomorpha picus (Fabricius)

(Figs. 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383)

Cimex picus, Fabricius (1794) *Ent. Syst.*, **4**: p. 115.

Cimex marmoreus, Fabricius (1798) *Ent. Syst. Suppl.*, p. 534.

Cimex cinnamomeus, Wolff (1802) *Ic.*, **3**: p. 153.

Halys timorensis, Westwood (1837) *in. Hope. Cat.*, **1**: p. 22.

Pentatoma timorensis, Dallas (1851) *List Hem.*, **1**: p. 242.

Pentatoma halys, Stal (1855) *Ofv. Vet.-Ak. Forh.*, p. 182.

Pentatoma trivialis, Dohrn (1860) *Stett. Ent. Zeit.*, **21**: p. 400.

Poecilometis mistus, Uhler (1860) *Proc. Ac. Phil.*, p. 223.

Halyomorpha timorensis, Mayr (1866) *Reise Nov., Hem.*; p. 50.

Dalpada brevis, Walker (1867) *Cat. Het.* **1**: pp. 226-7.

Dalpada remota, Walker (1867) *Cat. Het.*, **1**: p. 226.

Dalpada proxima, Walker (1867) *Cat. Het.*, **1**: p. 227.

Halyomorpha picus: Atkinson (1888) *J. Asiat. Soc. Beng.*, **57**: p. 23.

MALE:

Measurements (mm): Head length: 2.88; width across eyes: 3.20; interocular space: 1.70; interocellar space: 1.10; preocular distance: 1.12; length of posterior head including eyes: 1.76; antennal segments lengths: I: 0.70, II: 1.20, III: 2.70, IV: 2.60, V: 2.80; pronotal length: 3.70; width across humeral angles: 8.0; scutellar length: 5.61; scutellar width: 5.28; length of abdomen: 6.50; maximum width of abdomen: 8.25; length of rostral segments: I: 1.50, II: 2.0, III: 1.70, IV: 1.40; Distance - base scutellum-apex clavus: 3.96; apex clavus-apex scutellum: 1.65; apex scutellum-apex abdomen including membrane: 4.5; total body length: 16.87.

Dorsal Coloration: Head brownish yellow, coarsely punctured with black with few scattered brownish yellow rugosities; eyes black, posterior boundary of eyes brownish yellow, impunctate; ocelli red; antennae brownish yellow spotted with distinct dark brown, apices of 3rd, 4th and 5th segments black, base of 4th and 5th paler and hairy; pronotum brownish yellow, an obscure levigate medial longitudinal line, four irregular maculate transverse spots on anterior area and apex of humeral angle pale brownish yellow; scutellum concolorous to pronotum, apex sparingly punctured; two oblique oval spots at each basal scutellar angles and three transverse spots in line with basal spots pale brownish yellow; clavus, corium and costa paler with dark brown punctures and few scattered levigate areas; anteriormost portion of costal margin pale yellow; connexiva medially pale brownish yellow alternating with black anterior and posterior punctated margins; hemelytral membrane yellowish with brown and black suffusions, veins darker.

Ventral Coloration: Labium pale brownish yellow, apex black; head pale brownish yellow, lateral areas blackly punctate; area between pro and meso legs yellow with reddish tinge, between meso and meta legs black; lateral area of sternum pale; black fascia on anterior margin of VII abdominal segment limited to central area; spiracles black; connexiva as dorsal; genital capsule brownish yellow, punctured with dark brown and golden pubescence; legs brownish yellow freckled with black spots, apices of femora, tibia and base of tibiae and tarsi black.

STRUCTURE:

Head (Fig. 373): Head somewhat subtruncate at apex, moderately deflected, paraclypeal lobes subequal to medially raised clypeal lobe; former sinuous above

eyes, slightly reflexed anterolaterally, narrowed at apex; antennal segmental formula – I<II<III<V<IV; labium reaching 3rd abdominal segment, labial lengths formula – I=IV<II<III. **Thorax:** Pronotum (Fig. 374) slightly depressed anteriorly, anterior margin slightly longer than width across eyes, truncate behind eyes, produced as small tuberculate angles; lateral margins obliquely straight, humeral angles subprominent obtuse, suequal to maximum width of abdomen; scutellum long and rugulose, beyond frena, narrowed as subrounded apical lobe; metathoracic scent gland osteolar opening (Fig. 375) long, tapering apically, reaching about three fourth way to metapleural margin, evaporatorium broad, well developed with anterior margin produced more towards pleural margin, concave medially covering two-third of sternite; legs with tibiae simple. **Abdomen:** ampliate, slightly sulcate centrally; connexiva exposed at repose; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped, subacutely produced posteriorly (Fig. 376); hemelytral membrane passing beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 3.50; width across eyes: 3.20; interocular space: 1.70; interocellar space: 1.10; preocular distance: 2.0; length of posterior head including eyes: 1.50; antennal segments lengths: I: 0.60, II: 1.40, III: 1.90, IV: 2.80, V: 2.60; pronotal length: 3.80; width across humeral angles: 8.50; scutellar length: 5.94; scutellar width: 5.61; length of abdomen: 7.75; maximum width of abdomen: 8.75; length of rostral segments: I: 1.40, II: 1.80, III: 2.0, IV: 1.40; Distance - base scutellum-apex clavus: 4.29; apex clavus-apex scutellum: 1.65; apex scutellum-apex abdomen including membrane: 5.0; total body length: 24.

Coloration and Structure: Coloration and body form similar to males except, abdomen brownish yellow, impunctate medially, finely punctate laterally; tibiae slightly dilated in females; ventroanterior margin of abdominal sternite VII broadly concave somewhat arc shaped with subacute posterior connexival angles (Fig. 377);

Male Genitalia: Pygophore (Fig. 380) about as long as broad; dorsomedian surface concave; dorsal opening narrowly concave, an inverted V-shaped; dorsolateral lobes acutely produced; ventroposterior margin sinuate; paramere (Fig. 381) somewhat L-shaped, broad rounded apex, outer margin humped, sinuate, inner margin sinuate without any protuberance; aedeagus (Fig. 382, 383) with oval theca, narrowed

distally, with a pair of dorsolateral membranous conjunctival appendage, a pair of ventral conjunctival appendages and a pair of sclerotized medial penial lobes; vesica long and thick, rolled inside theca, passing slightly beyond margins of membranous appendage.

Female Genitalia: 1st gonocoxae quadrangular, 2nd gonocoxae short, with concave anterior and posterior margins; 8th paratergites broadly triangular, posterior margin slightly sinuate; 9th paratergites elongate, lobe like, reaching fused posterior margins of 8th paratergites (Fig. 378); spermatheca (Fig. 379) with distinct distal and proximal flanges; pump region sinuate, tube like, distinctly more than 3X shorter than thin distal spermathecal duct; bulb rounded with two long acute processes; median dilation distinctly long; proximal spermathecal duct subequal to distal spermathecal duct.

Population Variation: Overall body form is not variable, but coloration vary a lot from being brownish yellow to darker or even reddish brown; punctations and irrorations vary in size and thickness.

Material Examined:

Uttarakhand: Dehradun, 25. vi. 2010 - 3♀♀

Himachal Pradesh: Bilaspur, 21. x. 2010 - 1♀

Distribution: China; South Korea; Japan; Taiwan; United States; Srilanka; Pakistan; India (Uttarakhand, Himachal Pradesh, Maharashtra, Paschim Banga, Karnataka, Tamil Nadu, Meghalaya, Kerala).

Remarks: The species is characterized by having humeral angles subprominently obtuse, subequal to maximum width of abdomen; 9th paratergites elongate, lobe like, reaching fused posterior margins of 8th paratergites; spermatheca with thin distal spermathecal duct about 3X longer than pump region; bulb rounded with two long acute processes; dorsolateral lobes of pygophore acutely produced and paramere somewhat L-shaped. This species has been collected by light trap only. Recently, it has been reported as a major pest of vanilla (*V. planifolia* Andrews) in Tamil Nadu, causing intense damage to its shoot tips and inflorescence. It is a new record from North India.

GENUS *PLAUTIA* STÅL

Plautia, Stål (1867) *Öfv. Vet.-Ak. Förh.*, p. 514.

Type species - *Plautia fimbriata* Fabricius

Diagnosis: Body broadly obovate; head rounded at the apex, emarginated in front of eyes, lobes of equal length; labium extending beyond the posterior coxae; 1st joint of antennae not reaching apex of head; pronotum with the lateral angles rounded, not prominent; scutellum moderately short and broad, more or less distinctly narrowed towards apex, about as long as broad at base; mesosternum centrally carinate; abdomen centrally obscurely tuberculate but not spined at base.

Remarks: The genus is represented by 26 species from the World and is characterized by having centrally carinate mesosternum and anterolateral pronotal margins entire. Members belonging to this genus have been reported as a serious pest of fruit trees like mulberry, peach, plum, persimmon, cherry, grape and pomegranate.

Key to the studied species of genus *Plautia* Stål

- 1 Body length: 11 mm; corium thickly punctured; theca elongated; penial lobes less sclerotized, with two finger-like processes at apex or U-shaped; ejaculatory reservoir elongated; paramere with blade acute at apex..... *crossota* (Dallas)
- Body length: 7.5 mm; corium moderately punctured; theca oval; penial lobes distinctly sclerotized, lobule-like; ejaculatory reservoir broad and small; paramere with blade broad at apex..... *viridicollis* (Westwood)

Plautia crossota (Dallas)

(Figs. 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395)

Cimex fimbriata, Fabricius (1787) *Mant. Ins.*, 2: p. 295.

Pentatoma fimbriolatum, Herrich-Schäffer (1844) *Wanz. Ins.*, 7: p. 102.

Pentatoma crossota, Dallas (1851) *List Hem.*, 1: p. 252.

Rhaphigaster rufoviridis, Walker (1867) *Cat. Het.*, 2: p. 364.

Nezara rubripennis Jakovlev, 1890: 544-545. (syn. by Kiritshenko, 1912)

Strachia fimbriata: Kirby, (1891) *J. Linn. Soc. London*, **24**: p. 85.

Plautia fimbriata, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 181.

Plautia crossota: Kirkaldy, (1909) *Cat. Hem.*, **1**: p.124, 381.

MALE:

Measurements (mm): Head length: 1.50; width across eyes: 2.20; interocular space: 1.40 interocellar space: 0.90 preocular distance: 0.80; length of posterior head including eyes: 0.70; antennal segments lengths: I: 0.40, II: 0.85, III: 1.10, IV: 1.35 V: 1.10; pronotal length: 2.20; width across humeral angles: 5.94; scutellar length: 4.0; scutellar width: 4.0; length of abdomen: 4.25; maximum width of abdomen: 5.94; length of rostral segments: I: 0.80 II: 1.30, III: 1.05, IV: 0.90; Distance - base scutellum-apex clavus: 2.64; apex clavus-apex scutellum: 1.74; apex scutellum-apex abdomen including membrane: 2.72; total body length: 10.0.

Dorsal Coloration: Head green, moderately punctured with green, lateral edges black; eyes reddish brown; ocelli red; 1st and 2nd antennal segments green, 4th, 5th and apex of 3rd with reddish brown tinge; pronotum green, sparingly punctured with brownish red, anterior portion with two green impunctate irregular transverse callosities; posterolateral margins and posterior area marked with brownish rusty red suffusions; scutellum green, densely punctured, apex pale; clavus and corium thickly punctate with brownish red suffusions; costal margin green; hemelytral membrane smoky brown; connexiva green, blackly punctate at sutures.

Ventral Coloration: Labium green, apex black; area between legs pale green with reddish brown fascia; lateral area of sternum, metathoracic scent gland peritreme and legs green with brown suffusions; abdomen yellowish green, sparingly punctate medially, more pronounced on lateral margins; genital capsule brownish green.

STRUCTURE:

General body subovate or egg shaped, elevated medially, deflected at both ends, not pilosed; **Head** (Fig. 385): Head distinctly broad, moderately deflected, subrounded at apex; paraclypeal lobes as long as lobulated clypeus; former slightly sinuate above eyes, anterolaterally reflexed downwards, inner margins parallel; antennal segmental formula – I<II<III<V<IV; labium passing metacoaxae, reaching middle of 3rd abdominal segment, labial lengths formula – I<IV<III<II. **Thorax:** Pronotum (Fig. 386) anteriorly deflected, calloused posteriorly, anterior margins calloused, produced

as small tubercles, lateral margins obliquely straight, humeral angles subrounded, posterior margin straight; scutellum concave anteriorly, beyond frena, slightly sinuate, narrowed and subrounded at apex; metathoracic scent gland osteolar peritreme (Fig. 387) long, acuminate, extending more than half way to metapleural margin; evaporatorium distinctly broad, with well defined anterior and posterior margins, concave medially, covering two third sternite; legs strongly pilosed. **Abdominal:** venter with a subprominent tubercle directed anteriorly; connexiva well exposed at repose broadly impunctate, except black subquadrate fascia at sutures; hemelytral membrane moderately passing beyond abdominal apex; ventroanterior margin of abdominal sternite VII narrowly concave, sinuous laterally, somewhat an inverted V-shaped with subacute posterior connexival angles (Fig. 388).

FEMALE:

Measurements (mm): Head length: 1.80; width across eyes: 2.80; interocular space: 1.60; interocellar space: 1.05; preocular distance: 1.05; length of posterior head including eyes: 0.80; antennal segments lengths: I: 0.40, II: 0.90, III: 1.10, IV: 1.40 V: 1.35; pronotal length: 3.04; width across humeral angles: 6.875; scutellar length: 4.62; scutellar width: 4.62; length of abdomen: 5.25; maximum width of abdomen: 6.75; length of rostral segments: I: 0.80, II: 1.30, III: 1.10, IV: 0.95; Distance - base scutellum-apex clavus: 3.465; apex clavus-apex scutellum: 1.155; apex scutellum-apex abdomen including membrane: 3.20; total body length: 11.0.

Coloration and Structure: Body form and coloration similar to males except, females are comparatively paler; abdominal disk slightly more ampliate; distance between abdominal segments comparatively large; antennae green, apices of 3rd, 4th and 5th infuscated; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped with acute posterior connexival angles (Fig. 389).

Male Genitalia: Pygophore (Fig. 392) depressed, slightly longer than broad, with prominent subacute dorsolateral lobes; lateral margins and ventroposterior margin slightly sinuate; paramere (Fig. 393) somewhat L-shaped, apex of blade acutely pointed, outer margin straight, slightly humped posteriorly, inner margin with three lobe like processes; aedeagus (Fig. 394, 395) with elongated theca, a pair of dorsolateral membranous conjunctival appendages that are fused basally, slightly

curved, narrow and acutely sclerotized at apices; a pair of sclerotized medial penial lobes that are fused basally, and U-shaped; vesica short, not passing beyond the margins of membranous appendages; ejaculatory reservoir elongated, covering large area of theca.

Female Genitalia: 1st gonocoxae placed distally wide apart, triangular, inner and posterior margins sinuate, obtuse at apices; 2nd gonocoxae with anterior and posterior margins straight; 8th paratergites triangular, acute at apices; 9th paratergites elongated, lobe like, sinuate on inner margin, reaching fused posterior margins of 8th paratergites (Fig. 390); spermatheca (Fig. 391) with distinct distal and proximal flanges; pump region slender, distinctly shorter than distal spermathecal duct; bulb oval, with beak like pointed process on one side; distal spermathecal duct distinctly longer than proximal spermathecal duct.

Population Variation: Color varies from dark greenish to pale green; size, color and thickness of punctures variable on pronotum and connexiva especially; color of antennae varies from green to purplish brown or dark brown; corium sometimes shows varied shades of purple.

Material Examined:

Punjab: Ropar, 7. ix. 10 - 1♂

Himachal Pradesh: Paonta Sahib, 3. x. 2009 - 5♀♀; Palampur, 12. vii. 2010 - 1♀, 1♂; Bilaspur, 21. vii. 2010 - 1♀, 1♂; Mandi, 22. vii. 2010 - 1♀; Solan, 19. viii. 2010 - 1♂; Hamirpur, 21. x. 2010 - 2♀♀, 1♂

Uttarakhand: Dehradun, 25. vi. 2010 - 2♀♀; 14-16. ix. 2010 - 4♀♀, 3♂♂

Distribution: Sri Lanka; Myanmar; Pakistan; China; Afghanistan; Gambia; Indonesia; Madagascar; Malaysia; Myanmar; Philippines; Singapore; Thailand; India (Punjab, Himachal Pradesh, Uttarakhand, Sikkim, Meghalaya, Maharashtra, Paschim Banga, Kerala, Assam, Nagaland, Odisha, Tamil Nadu).

Remarks: The species is similar to *P. viridicollis* in general body form but can be easily separated from the same in having large body length; corium thickly punctured; theca elongated; penial lobes less sclerotized, with two finger like processes at apex or U-shaped; ejaculatory reservoir elongated and paramere with blade acute at apex. *P.*

crossota has been recorded as a pest of legume crops and economically important trees like mulberry, infesting usually plant parts and pods. The species can be collected in abundance from light traps as well as wild vegetations.

***Plautia viridicollis* (Westwood)**
(Figs. 396, 397, 398, 399, 400, 401, 402, 403, 404)

Pentatoma viridicollis, Westwood (1837) in *Hope Cat.*, 1: p. 35.

Pentatoma inconspicua, Dallas (1851) *List Hem.*, 1: p. 250.

Plautia viridicollis: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 182.

MALE

Measurements (mm): Head length: 1.40; width across eyes: 1.85; interocular space: 1.10; interocellar space: 0.70; preocular distance: 0.65; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.40, II: 0.60, III: 0.90, IV: 1.05, V: 1.10; pronotal length: 1.80; width across humeral angles: 4.50; scutellar length: 2.64; width: 2.64; length of abdomen: 2.96; maximum width of abdomen: 4.25; length of rostral segments: I: 0.55, II: 1.05, III: 0.80, IV: 0.70; Distance - base scutellum-apex clavus: 2.08, apex clavus-apex scutellum: 0.56, apex scutellum-apex abdomen including membrane: 2.24; total body length: 7.50.

Dorsal Coloration: Head green, very scarcely punctured with black; eyes black, bordered with pale yellowish; ocelli reddish black; antennae with with 1st, 2nd and 3rd segments yellowish brown, rest infused with blackish; pronotum green, coarsely punctate; humeral angles with black spots and punctures; anterior pronotal area with light greenish callosities; scutellum green, coarsely punctured with black, apex somewhat broadly greyish green; clavus and corium brownish rusty red, less thickly punctate with black; costal margin pale greenish, anteriormost portion impunctate; hemelytral membrane smoky brown, apex blackish.

Ventral Coloration: Head pale green, margin darker; labium brownish green; sternum, abdomen, area between legs, metathoracic scent gland peritreme, legs brownish green; posterior angles of connexiva reddish black; abdomen and sternum finely punctate; genital capsule pilosed with short brown hairs.

STRUCTURE:

Head (Fig. 397): Head wider than long, deflected anteriorly, apically subrounded; paraclypei as long as clypeus, former concavely sinuate above eyes, narrowed distinctly at apex, slightly reflexed anterolaterally, inner margins of clypeus parallel; antennal segmental formula – I<II<III<IV<V; labium long, slender reaching anterior margin of abdominal segment IV, labial length formula - I<IV<III<II. **Thorax** (Fig. 398): pronotum with anterior margin strongly concave, anterior pronotal angles subquadrate produced as minute tubercles; anterolateral margins obliquely straight, humeral angles prominent, subrounded, posterior margin slightly sinuate; scutellum beyond frena distinctly narrowed into subrounded apex; metathoracic scent gland osteolar peritreme (Fig. 399) long, narrow, concavely sinuate medially, narrowed laterad, extending about two third distance to metapleural margin, evaporatorium with well developed anterior and posterior margins covering large area of sternite. **Abdomen:** Base without any tuberculate prominence; connexiva exposed at repose, impunctate laterally; ventroanterior margin of abdominal sternite VII moderately concave, somewhat an inverted U-shaped with acute posterior connexival angles (Fig. 400); hemelytral membrane passing moderately beyond the abdominal apex; legs pilosed.

Male Genitalia: Pygophore (Fig. 401) about as long as broad, prominently narrowed into rounded dorsolateral lobes; dorsomedial surface deeply concave, somewhat V-shaped; ventroposterior margin concave; paramere (Fig. 402) J-shaped, beset with long spines, apex distinctly narrowed, inner margin shallowly concave, with a broad lobule near stem; aedeagus (Fig. 403, 404) with theca oval, bearing a pair of dorsolateral membranous conjunctival appendages, leaf like medial penial lobes apically broad; vesica short and thick, just reaching the margins of dorsal membranous appendages; ejaculatory reservoir small, placed medially.

Population Variation: Single specimen studied.

Material Examined

Himachal Pradesh: Baijnath, 12. vii. 2010 - 1♂

Distribution: Sri Lanka; Indonesia; Singapore; India (Himachal Pradesh, Assam).

Remarks: This species is closely allied to *P. crossota* in general body coloration and can be easily separated from the same in having distinct characters as discussed earlier in keys and descriptions. It has not been reported as a pest till now. It is a new record from North India.

GENUS HOPLISTODERA WESTWOOD

Hoplistodera, Westwood (1837) in *Hope Cat.*, 1: p. 18.

Type species – *Hoplistodera testacea* Westwood, a Javan species.

Diagnosis: Head and anterior area of pronotum obliquely, not perpendicularly, deflected; pronotal spines being acuminate, scutellum shorter, membrane larger or more exposed, with longitudinal veins; corium about as long as scutellum.

Remarks: The genus is distributed only in the Oriental region, represented by 11 species. All the members under this genus are recognized by spinosely and acutely produced humeral angles.

Hoplistodera recurva Distant

(Figs. 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416)

Hoplistodera recurva: Distant (1900) *Tr. E. S.*, p. 170.

MALE:

Measurements (mm): Head length: 1.60; width across eyes: 1.85; interocular space: 1.10; interocellar space: 0.65; preocular distance: 0.90; length of posterior head including eyes: 0.70; antennal segments lengths: I: 0.40, II: 0.65, III: 0.60, IV: 0.80, V: 1.05; pronotal length: 2.88; width across humeral angles: 8.0; scutellar length: 4.25; scutellar width: 4.25; length of abdomen: 3.20; maximum width of abdomen: 5.28; length of rostral segments: I: 0.65, II: 1.20, III: 0.60, IV: 0.70; Distance - base scutellum-apex clavus: 1.50; apex clavus-apex scutellum: 2.75; apex scutellum-apex abdomen including membrane: 1.25; total body length: 7.5.

Dorsal Coloration: Head brownish yellow at base, most of the area impunctate and pale yellow; lateral margins dark brown, inner margin of paraclypeal lobe reddish brown; eyes blackish red, area surrounding eyes brownish yellow with golden tinge;

ocelli red; antennae brownish yellow, apical two segments darker; pronotum anteriorly pale greenish, with pale yellow and brown tinge, moderately punctured, except humeral angles; anterior pronotal area with two transverse greenish brown callosities; scutellum pale yellowish with golden brown patches in between, with fine dark brown punctures and few impunctate levigate areas; clavus and corium pale green with grey suffusions and impunctate levigate patches, costa pale brownish yellow and brownly punctate; posterior area of pronotum greyish with brown punctures, posterior edge pale, medial pronotal area scarcely punctured pale yellow with an obscure pale yellow transverse line across humeral angles; hemelytral membrane hyaline.

Ventral Coloration: Labium brownish yellow, apex black; lateral area of head pale green impunctate; prosternum pale yellowish green, rest sternum brownish yellow; metathoracic scent gland peritreme yellow; anteriormost portion of costal margin pale, impunctate; area between legs brownish yellow and pilosed, legs pale greenish yellow, tarsi with brown suffusions; abdomen pale yellowish green, 3rd and 4th segments with brown fascia; lateral area of abdomen with a longitudinal chocolate brown fascia; connexiva with impunctate pale yellowish green margin; spiracles light brown with greyish fascia; genital capsule pale greenish, pilosed with small golden hairs.

STRUCTURE:

Head (Fig. 406): Head strongly declivent downwards; paraclypeal lobes slightly smaller than clypeal lobe, latter strongly lobulated; lateral margins of paraclypei sinuous above eyes, narrowed subacutely at apex; antennae with 1st segment very short not reaching apex of head, antennal segmental formula – I<III<II<IV<V; labium long; crossing posterior coxae, labial lengths formula – III<I<IV<II. **Thorax:** Pronotum (Fig. 407) with anterior margin broadly concave, subtruncate behind eyes, not touching the latter, lateral margins obliquely straight, humeral angles prominently produced acutely, slightly recurved and directed upwards, subequal to total body length; scutellum distinctly longer than corium, frenal region distinctly shorter than post frenal, beyond frena, slightly narrowed into broad subrounded apex; metathoracic scent gland osteolar peritreme (Fig. 408) moderately long, concave medially, narrowed apically, reaching halfway distance to metapleural margin; evaporatorium

narrowly surrounding peritreme opening, covering about half sternite; legs neither spinosed nor dialted. **Abdomen:** flattened medially, very finely punctured; connexiva not exposed at repose with subacute posterior angles; ventroanterior margin of abdominal sternite VII somewhat narrowly concave inverted V-shaped (Fig. 409); membrane of hemelytra passing much beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 1.50; width across eyes: 1.85; interocular space: 1.20; interocellar space: 0.80; preocular distance: 0.65; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.40, II: 1.65, III: 1.60, IV: 0.80, V: 1.10; pronotal length: 2.88; width across humeral angles: 7.87; scutellar length: 4.35; scutellar width: 4.35; length of abdomen: 3.75; maximum width of abdomen: 5.44; length of rostral segments: I: 0.70, II: 1.20, III: 0.60, IV: 0.75; Distance - base scutellum-apex clavus: 1.35; apex clavus-apex scutellum: 3.0; apex scutellum-apex abdomen including membrane: 1.20; total body length: 7.6.

Coloration and Structure: Body form and coloration similar to males except, colouration vary in being slightly darker, with dark punctation; ventroanterior margin of abdominal sternite VII somewhat broadly concave, inverted U-shaped, ventroposterior margin broadly squarish (Fig. 410).

Male Genitalia: Pygophore (Fig. 413) longer than broad, distinctly U-shaped, with indistinct dorsolateral lobes; dorsal opening large, inverted U-shaped; ventroposterior margins straight laterally, with a distinct medial invagination; dorsomedial surface sinuate laterally, straight medially; paramere (Fig. 414) somewhat sickle shaped, blade acutely pointed, directed anteriorly, outer margins convex, inner margin shallowly convex with a broad, hairy subtriangular process; aedeagus (Fig. 415, 416) with lobular theca, lateral margins sinuate, with a broad single medial dorsolateral membranous conjunctival appendage, a pair of dorsolateral membranous conjunctival appendages distinctly sclerotized at apices, a pair of strongly sclerotized elongate medial penial lobes that are not fused medially; vesica long, not reaching the margin of membranous appendage; ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae quadrangular, medially placed wide apart; 2nd gonocoxae fused medially, posterior margin concave; 8th paratergites small,

triangular, posterior margin straight without any processes; 9th paratergites broad, lobular, outer margin convex, much smaller than fused posterior margins of 8th paratergites (Fig. 411); spermatheca (Fig. 412) with distinct distal and proximal flanges; pump region short, tube like, shorter than distal spermathecal duct; bulb rounded, with two small finger like processes laterally; medial dilation long; posterior spermathecal duct longer than distal spermathecal duct.

Population Variation: Single male and female specimens studied.

Material Examined

Himachal Pradesh: Solan, 15. x. 2011 - 1♀, 1♂

Distribution: India (Uttarakhand, Himachal Pradesh).

Remarks: The species is characterized by having spinosely produced acute humeral angles. *Hoplistodera recurva* was described by Distant (1900) from Chakrata (North West Himalayas). No morphological descriptions, illustrations, male and female genitalia for this species was available until now. It has been reported for the first time from Himachal Pradesh.

GENUS *SCIOCORIS* FALLEN

Sciocoris, Fallén (1829) *Hem. Suec.*, p. 20.

Type species - *Sciocoris terreus* Schrank, a Palearctic species.

Diagnosis: Body oval, depressed, slightly convex beneath; head large, flattened, rounded in front, the lateral lobes a little the longest and meeting just in front of the central lobe, the margins laminate; labium about reaching the posterior coxae; pronotum with the lateral margins laminate and with a more or less distinct transverse discal impression; scutellum gradually narrowed posteriorly, margins very slightly sinuate; membrane with the veins simple; pro and mesosterna furrowed.

Remarks: This genus is represented by 24 species from the World, well distributed in Oriental, Ethiopian and Palaeartic regions. The members are recognized by having lateral margins of pronotum laminate and with more or less distinct transverse discal impression and pro and mesosterna furrowed. Members of this genus have been reported as serious pests of various plants viz., *Astragalus* sp., *Euphorbia* sp., *Verbascum* sp., *Salvia* sp., *Sideritis* sp., *Quercus* sp., *Vitis vinifera*, gramineous plants and different species of weeds.

***Sciocoris lateralis* Fieber**
(Figs. 417, 418, 419, 420, 421, 422, 423)

Sciocoris lateralis: Fieber (1851) *Rhynch.*, p. 21

FEMALE:

Measurements (mm): Head length: 1.10; width across eyes: 1.60; interocular space: 0.90; interocellar space: 0.55; preocular distance: 0.45; length of posterior head including eyes: 0.65; antennal segments lengths: I: 0.20, II: 0.35, III: 0.40, IV: 0.60, V: 0.65; pronotal length: 1.0; width across humeral angles: 1.70; scutellar length: 2.72; width: 2.72; length of abdomen: 3.50 maximum width of abdomen: 4.0; length of rostral segments: I: 0.50, II: 0.70, III: 0.50, IV: 0.50; Distance - base scutellum-apex clavus: 0.90, apex clavus-apex scutellum: 1.82, apex scutellum-apex abdomen including membrane: 1.92; total body length: 7.25.

Dorsal Coloration: Head pale brownish yellow, coarsely punctured at base with dark brown, with slight greenish tinge; disk striated with three lines (one central longitudinal, two arc shaped laterally); eyes reddish brown, similar striations close to inner margin; ocelli bright red; antennae brownish yellow, fifth segment darker; pronotum paler anteriorly with two black callosities, shining chocolate brown posteriorly, with brownish-black punctures; lateral curved margins with somewhat Y-shaped longitudinal pale striation, posterior margin of same reaching humeral angle, inner margin reaching border of transverse callosity, impunctate; scutellum pale brownish yellow punctured with brownish black, apex impunctately pale, with greyish tinge; base with three rounded levigate pale spots (one central, two angular); basal scutellar margin with distinct black impression; connexiva pale with black spots; corium pale, coarsely punctured with dark brownish, posterior margin profused with brown; hemelytral membrane hyaline with medial light brown suffusion.

Ventral Coloration: Labium brownish yellow, segments III and IV black; apex of head impunctate, brownish yellow, lateral and central area densely punctured with black and greenish tinge; area between legs black; lateral margins of sternum lamellately punctured with black; legs yellow without spots, apices of tibiae and tarsi pilosed with brownish tinge; metathoracic scent gland oeteolar peritreme brownish yellow, with greyish tinge; abdominal disk black, finely punctured with black except central longitudinal area impunctate, shiny; connexiva with distinct central

submarginal pale brownish yellow U-shaped fascia on each abdominal segment; genital capsule black.

STRUCTURE:

Head (Fig. 418): Head broad, declivent, flattened, subrugulose and subrounded at apex; paraclypei subequal to clypeus, slightly sinuous above eyes; longitudinal margins of clypeus parallel; antennae short, segment I not reaching apex of head; antennal segmental formula – I<II<III<IV<V; labium just passing mesocoxae, segment I not reaching apex of head, labial lengths formula – I=III=IV<II. **Thorax:** Pronotum (Fig. 419) slightly greater than width across eyes, latter touching anterior pronotal margins; anterior and lateral pronotal margins distinctly calloused; anterior pronotal margin concave with minute subacute spine directed laterad; posterior margin sinuously concave; humeral angles subprominent; scutellum narrowed at apex beyond frena; frenal region shorter than post frenal; metathoracic scent gland osteolar peritreme (Fig. 420) long, acuminate, distinctly narrowed at apex, covering half of sternite; evaporatorium well developed, with anterior margin reaching metapleural margin; legs without any modifications; tibiae and tarsi pilosed. **Abdomen:** slightly convex, flattened laterally; genital capsule pilosed; hemelytral membrane passing considerable beyond apex of abdomen; abdominal tubercle acute, long, reaching intermediate coxae in apposition to metasternum; prosternum and mesosternum furrowed; ventroanterior margin of abdominal sternite VII concave, inverted U-shaped, with subacute posterior angles (Fig. 421).

Female Genitalia: 1st gonocoxae medially placed, wide apart distally, posterior margins convex, obtuse at apices; 2nd gonocoxae distinctly short, with sinuate anterior and posterior margins; 8th paratergites long, triangular, posterior margins straight; 9th paratergites small, lobe like, not reaching fused posterior margins of 8th paratergites (Fig. 422); spermatheca (Fig. 423) with distinct proximal and distal flanges; pump region sclerotized and tube like, distinctly longer than distal spermathecal duct; bulb oblong, well developed; medial dilation long; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Single specimen studied.

Material Examined:

Himachal Pradesh: Bilaspur, 21. x. 2010 - 1♀

Distribution: India (Himachal Pradesh, South India).

Remarks: The species is distinctly recognized in having clypeated and follaciously dilated head; 9th paratergites small, lobe like, not reaching the fused posterior margins of 8th paratergites; spermathecal bulb without any processes, pump region sclerotized and distinctly longer than distal spermathecal duct. It has not been reported as a pest till now. It is a new record from North India.

GENUS *HERMOLAUS* DISTANT

Hermolaus, Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 169

Type species – *Hermolaus typicus* Distant

Diagnosis: Head long, narrow, tapering anteriorly; central lobe somewhat raised and prominent, its apex slightly projecting beyond the lateral lobes; lateral areas deflected, lateral margins slightly sinuate in front of eyes; antennae five-jointed, basal joint not reaching apex of head; labium long, reaching the fourth abdominal segment; 2nd joint shorter than 3rd and 4th together; pronotum anteriorly deflected, anterior margin concave, centrally truncate, lateral angles subprominent; scutellum broad, a little more than half the length of abdomen, narrowed about centre, its apex broadly rounded; corium somewhat short, its apical angle extending but little beyond apex of scutellum; membrane a little longer than abdomen.

Remarks: The genus is represented by only 3 species as per Distant's (1902, 1908, 1918) faunistic studies and is well distributed in India and China.

***Hermolaus typicus* Distant**

(Figs. 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435)

Hermolaus typicus: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 170.

MALE

Measurements (mm): Head length: 1.02; width across eyes: 1.02; interocular space: 0.6; interocellar space: 0.5; preocular distance: 0.45; length of posterior head including eyes: 0.4; antennal segments lengths: I: 0.3, II: 0.3, III: 0.35, IV: 0.52, V: 0.52; pronotal length: 1.1; width across humeral angles: 2.05; scutellar length: 2.0; scutellar width: 2.0; maximum width of abdomen: 2.56; length of labial segments: I: 0.45, II: 0.9, III: 0.3, IV: 0.42; Distance - base scutellum-apex clavus: 1.20, apex clavus-apex

scutellum: 0.80, apex scutellum-apex abdomen including membrane: 1.20; total body length: 5.

Dorsal Coloration: Head brownish yellow with dark brown punctures; eyes black with yellow margin; ocelli dark red; antennae brownish yellow, segments 4th and 5th with reddish tinge; pronotum brownish yellow, coarsely punctured with brown; anterior portion with two brown transverse callosities, middle posterior area with black fascia, anterolateral margins yellow without punctation; scutellum uniformly yellow, brownly punctate; two minute levigate yellow spots at each basal scutellar angle; frenum and corium yellow, marked with brown punctations; anterior part of embolium yellow; hemelytral membrane hyaline; connexiva yellow, spotted with dark brown.

Ventral Coloration: Labium yellowish brown, apical two segments castaneous; head on lateral sides of labium impunctate; legs yellow, marked with dark brown superficial punctures, tips of tarsi brown; central region of sternum between legs dark brown, lateral areas yellowish with brown punctations; metathoracic scent gland ruga yellow, impunctate; entire abdominal disc reddish brown, thickly punctated, more pronounced on lateral areas; central disc impunctate, pubescent; fascia; connexiva yellow, freckled alternatively with dark brown punctation, more prominent on lateral areas; genital plate yellow with large reddish brown spot.

STRUCTURE:

Head (Fig. 425): Head as long as broad, anteriorly deflected, narrowly tapering, slightly rounded at apex; paraclypeus slightly smaller than clypeus, slightly sinuous above eyes, tapering anteriorly, anterolateral margins marginally reflexed upwards; clypeus raised above medially; basal antennal segment not reaching apex of head; antennal segmental formula $I < II = III < IV = V$; labial segment II about 2.5X III; labial segment formula $III < IV \leq I < II$; preocular distance more than length of posterior head including eyes. **Thorax** - Width of pronotum (Fig. 426) about 2.5X length; anterior pronotal margin slightly longer than width across eyes; anterior pronotal angles produced outwardly as minute tubercles; anterolateral margins straight; humeral angles prominent, subrounded at apices; scutellum as long as broad, beyond frena lightly sinuous forming a distinct broad subrounded apical lobe; frenal region moderately longer than post frenal region; metathoracic scent gland osteolar opening

(Fig. 427) small, narrowly raised, slightly curved at apex extending upto only one-third towards metapleural margin; legs pubescent without spines, metatibia longest. **Abdomen**—pilosed with golden pubescence, more longer at tip of last abdominal sternite; a pair of trichobothria located posterior to each spiracle in sternites II to VI; connexiva not well exposed at repose; ventroanterior margin of abdominal sternite VII deeply concave, somewhat inverted V-shaped (Fig. 428); hemelytron membrane passing beyond apex of abdomen.

FEMALE:

Measurements (mm): Head length: 1.25; width across eyes: 1.25; interocular space: 0.7; interocellar space: 0.6; preocular distance: 0.75; length of posterior head including eyes: 0.50; antennal segments lengths: I: 0.3, II: 0.40, III: 0.40, IV: 0.6, V: 0.6; pronotal length: 1.4; width across humeral angles: 3.5; scutellar length: 2.0; width: 2.5; maximum width of abdomen: 3.5; length of labial segments: I: 0.65, II: 0.10, III: 0.40, IV: 0.47; Distance - base scutellum-apex clavus: 1.10, apex clavus-apex scutellum: 0.90, apex scutellum-apex abdomen including membrane: 1.10; total body length: 6.27.

Coloration and Structure: General dorsal body coloration similar to males except, abdomen beneath yellow, thickly punctured with reddish brown, more pronounced on lateral areas; abdomen marked with central maculate dark brown; ventroposterior margin of abdominal sternite VII medially broadly concave, forming subacute angle (Fig. 429).

Male Genitalia: Pygophore (Fig. 432) broader than long, somewhat cup like, with narrowed dorsolateral lobes; dorsal opening inverted U-shaped; ventroposterior margin concavely sinuate; paramere (Fig. 433) somewhat comma shaped, pointed at apex, beset with long spines on inner margin; aedeagus (Fig. 434, 435) with suboval theca, distally narrowed, two pairs of leaf like ventral membranous conjunctival appendages, semisclerotized, placed closer at apices, a pair of sclerotized dorsolateral membranous conjunctival appendages, acute at apices; weakly sclerotized medial penial lobes; vesica short and slender, not passing beyond membranous appendages; ejaculatory reservoir small.

Female Genitalia: 1st gonocoxae distally wide apart, posterior margins sinuate, rounded at apices; 2nd gonocoxae small and reduced; 8th paratergites triangular with posterior margins straight; 9th paratergites lobulate, broadly at apex, not passing beyond fused posterior margins of 8th paratergites, with outer margins convex (Fig. 430); spermatheca (Fig. 431) with small indistinct proximal and distal flanges; pump region small and slender; bulb rounded and well developed; medial dilation with a small proximal sclerotized dilation; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Population Variation: Color of entire body varies from being dark brownish yellow to paler forms; punctures vary in thickness and size.

Material Examined:

Himachal Pradesh: Shimla, 15. viii. 2010 - 1♀

Uttarakhand: Nainital, 20. viii. 2011 - 14♂♂, 12♀♀

Distribution: India (Himachal Pradesh, Uttarakhand).

Remarks: The species is distinctly recognized by having a long and acuminate head, corium somewhat short, extending a little beyond scutellum apex; sickle shaped paramere, distinctly acute apically and irregularly shaped 9th paratergites. It is a new record from North India.

GENUS *EYSARCORIS* HAHN

Eysarcoris, Hahn (1834) *Wanz.*, **2**: p. 66.

Stollia, Ellenried. (1862) *Nat. Tijdschr. Nederl. Ind.*, **24**: p. 149

Eysarcocoris, Stål (1864) *Hem. Afr.*, **1**, p. 135

Eusarcoris, Puton (1866) *Cat.*, p.11.

Analocus, Stål (1872) *Öfv. Vet.-Ak. Förh.*, **3**: p. 36.

Eusarcocoris, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 165.

Eysarcoris, China (1951) *Bull. zool. Nomencl.*, **2**: p. 295

Type species - *Eusarcocoris aeneus* Scopoli, a Palearctic species.

Diagnosis: Body obovate, moderately broad and somewhat strongly convex beneath; head deflected, its apex rounded, the central lobe either as long as lateral lobes or

slightly prominent; antennae with the basal joint not reaching or nearly reaching the apex of head; pronotum anteriorly deflected; scutellum about as long as its breadth at base, or a little longer, frena not extending beyond its middle.

Remarks: Members of this genus are phytophagous, small, mottled brown stink bugs. The members belonging to this genus have been reported to damage various plant species like., *Medicago sativa*, *Urtica* sp., *Verbascum* sp., *Cirsium* sp., *Cistus* sp., *Equestrum* sp., *Inula* sp., *Juniperus* sp., *Laurus nobilis*, *Mentha* sp., *Salix* sp., *Salvia* sp., *Sideritis* sp., *Verbascum* sp., *Tamarix* sp., *Triticum sativa*, gramineous plants and different species of weeds. The genus has a worldwide distribution covering Palaeactic, Oriental, Ethiopian and Australian regions. It is closely allied to genus *Carbula*, in having head long and not acuminate but can be separated from the same in having scutellum about as long as corium as compared to distinctly shorter than corium in *Carbula* species.

Key to the studied species of genus *Eysarcoris* Hahn

- 1 Body oval; head elongated; humeral angles of pronotum prominent, produced laterad; proximal semi-membranous dilation beyond median dilation always longer than broad; 8th paratergites smaller than 9th paratergites..... 2
- Body somewhat elongated; head slightly roundish; humeral angles of pronotum subprominent, not produced; proximal semi-membranous dilation beyond median diation as long as broad; 8th paratergites suequal to 9th paratergites..... ***inconspicuus* (Herrich-Schaefer)**
- 2. Humeral angles of pronotum strongly and robustly protruded, with broad subacute apices..... ***rosaceus* (Distant)**
- Humeral angles of pronotum obtusely produced 3
- 3. Scutellum relatively narrower; entire body

- covered with brown punctures; basal angles of scutellum with roundish or irregular spots; apices of 4th and 5th antennal segments brownish yellow; only central area of abdominal disk covered with irregular black fascia; 8th paratergites triangular, rounded at apices; pump region slender; median dilation distinctly shorter than proximal dilation..... *montivagus* (Distant)
- Scutellum broader; entire body covered with bronzy black punctures; basal angles of scutellum with somewhat oval spots; apices of 4th and 5th antennal segments black; abdominal disk wholly covered with brassy black fascia; 8th paratergites triangular, acute at apices; pump region distinctly bilobed, thick; median dilation subequal to proximal dilation..... *guttiger* (Thunberg)

***Eysarcoris inconspicuus* (Herrich-Schaefer)**
(Figs. 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447)

Pentatoma inconspicuus, Herr.-Sch. (1844) *Wanz. Ins.*, 7: p. 93.

Eysarcoris pusillus, Costa (1847) *Cim. Cent. Sec. decas.*, 6-10: p. 24.

Eysarcoris misella, Stal (1864) *Hem. Afr.*, 1: p. 135.

Eysarcoris epistomalis, Muls. & Rey (1866) *Pun. Fr.*, p. 177.

Eusarcocoris pseudoaeneus, Jakovlev (1869) *Hor. Soc. Ent. Ross.*, 6: p. 117.

Stollia misella, Stal (1876) *En. Hem.*, 5: p. 82.

Var. *Eysarcoris simplex*, Puton (1881) *Synops.*, 2: p. 55.

Eysarcoris inconspicuus, Puton (1881) *Cat. Hem.*, p. 55.

Eusarcocoris inconspicuus, Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 167 & 168.

Eysarcoris inconspicuus: Kirkaldy (1909) *Cat. Hem.*, 1: p.82.

MALE:

Measurements (mm): Head length: 1.10; width across eyes: 0.92; interocular space: 1.55; interocellar space: 0.60; preocular distance: 0.55; length of posterior head

including eyes: 0.60; antennal segments lengths: I: 0.30, II: 0.45, III: 0.40 IV: 0.50, V: 0.70; pronotal length: 1.30; width across humeral angles: 3.90; scutellar length: 2.08; scutellar width: 2.08; length of abdomen: 2.03; maximum width of abdomen: 3.20; length of rostral segments: I: 0.45, II: 0.90, III: 0.30, IV: 0.35; Distance - base scutellum-apex clavus: 0.88; apex clavus-apex scutellum: 1.20; apex scutellum-apex abdomen including membrane: 1.485; total body length: 5.60.

Dorsal Coloration: Head brassy black, with dark brown punctures, except for posterior area yellowish brown; eyes reddish brown; ocelli dark red; antennae brownish yellow, 3rd, 4th and 5th more dark reddish; pronotum brownish yellow, anteriorly paler, posterior with greyish tinge and dark brown punctures; anterior area with two transverse blackish brown callosities; scutellum brownish yellow with two impunctate concolorous spots at each basal scutellar angle, apex with greyish black tinge; clavus, corium and costa concolorous to scutellum with more greyish fascia; hemelytral membrane hyaline.

Ventral Coloration: Labium with 1st two segments yellow, 3rd reddish black, apex black; legs shining yellow, tibiae and tarsi spotted with brown; metathoracic scent gland peritreme orange yellow, with dense punctation on outer margins; abdomen yellow with few reddish punctures on lateral margins, rest punctured with black; central abdominal disk pitch black; connexiva with pale whitish tinge, posterior angles black; genital capsule concolorous to abdomen.

STRUCTURE:

Head (Fig. 437): Head broad at apex, moderately deflected downwards, paraclypei longer than medially raised clypeus, but not fusing in front, former slightly sinuate above eyes, reflexed anterolaterally; antennal segmental formula – I<III<II<IV<V; labium just reaching metacoxae, labial length formula – III<IV<I<II; prosternum beset with small hairs. **Thorax:** Pronotum (Fig. 438) calloused posteriorly, slightly deflected anteriorly, with anterior margins slightly concave, truncate behind eyes protuded as subacute angles directed anterolaterad, lateral margins obliquely straight, humeral angles subprominent, obtuse; scutellum broadly triangular, sinuate beyond frena; metathoracic scent gland osteolar peritreme (Fig. 439) very small, narrow, raised, curved at apex reaching only one fourth way to metapleural margin; evaporatorium subrugulose, with subprominent anterior and posterior margins,

covering less than half sternite; femora and tibia beset with spines and brown spots, foretibiae with tuft of 2-3 short black spines. **Abdomen:** slightly ampliate, connexiva exposed at repose; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles and ventroposterior margin broadly concave (Fig. 440); membrane of hemelytra moderately passing beyond abdominal apex.

FEMALE:

Measurements (mm): Head length: 1.10; width across eyes: 1.42; interocular space: 0.90; interocellar space: 0.55; preocular distance: 0.60; length of posterior head including eyes: 0.50; antennal segments lengths: I: 0.27, II: 0.42, III: 0.30, IV: 0.45, V: 0.50; pronotal length: 1.30; width across humeral angles: 3.04; scutellar length: 2.0; scutellar width: 2.0; length of abdomen: 2.48; maximum width of abdomen: 3.04; length of rostral segments: I: 0.50, II: 0.80, III: 0.25, IV: 0.37; Distance - base scutellum-apex clavus: 0.60; apex clavus-apex scutellum: 1.40; apex scutellum-apex abdomen including membrane: 1.60; total body length: 6.02.

Coloration and Structure: Body form and coloration similar to males except, abdominal venter brownish red, hairy, 1st, 2nd and 3rd antennal segments pale yellow, 4th and 5th dark brownish yellow; ventroanterior and ventroposterior margin of abdominal sternite VII sinuately concave, somewhat an inverted U-shaped with subrounded posterior connexival angles (Fig. 441).

Male Genitalia: Pygophore (Fig. 444) longer than broad, lateral sides slightly sinuate; subprominent truncated and rounded dosolateral lobes, directed posteriad; dorsal opening prominent, oval; ventroposterior margins laterally with inner angulations, medially notched; paramere (Fig. 445) bilobed, inner lobe broad spade like, outer lobe leaf like, acutely pointed at apex with inner margin sinuate; aedeagus (Fig. 446, 447) with cylindrical theca, dorsomedial surface of theca concave, with a semisclerotized flap like collar; a pair of membranous dosrolateral conjunctival appendages, a pair of ventral conjunctival appendages, slightly sclerotized at apices, directed laterad; a pair of sclerotized elongated penial lobes, not fused basally; vesica long and thick, not passing beyond the margins of membranous appendages, ejaculatory reservoir small.

Female Genitalia: 1st gonocoxae elongate, triangular, placed distinctly wide apart, posterior margins straight; 2nd gonocoxae medially fused with anterior margin straight and slightly concave posterior margins; 8th paratergites triangular, posterior margins convex; 9th paratergites with outer margins convex, broadly rounded at apices, subequal to 8th paratergites (Fig. 442); spermatheca (Fig. 443) with distinct proximal and distal flanges; pump region sclerotized, tube like, subequal to distal membranous spermathecal duct; bulb rounded; medial dilation elongate with somewhat onion shaped semisclerotized proximal dilation, directed posteriad; proximal spermathecal duct thick subequal to distal spermathecal duct.

Population Variation: Color of entire body vary from being dark brownish yellow to paler; wavy fascia on pronotum darker; color and thickness of punctures variable; maculate impunctate fascia on abdominal disk vary in thickness and from black to dark reddish brown.

Material Examined:

Punjab: Patiala, 15. vii. 2009 - 2♀; 6. vii. 2010 - 3♀♀, 1♂; 6. ix. 2010 - 4♀♀, 1♂; Talwara, 20. viii. 2009 - 1♀; Ferozepur, 14. ix. 2009 - 5♀♀, 4♂♂; Tarantaran, 8. iv. 2010 - 1♀; Hoshiarpur, 11. iv. 2010 - 2♀♀, 1♂; Ludhiana, 12. iv. 2010 - 1♀, 5♂♂; Ropar, 6-7. viii. 2010 - 4♀♀

Himachal Pradesh: Andhretta, 12. vii. 2010 - 2♀♀; Bilaspur, 21. vii. 2010 - 1♀

Distribution: South Africa; Pakistan; India (Punjab, Himachal Pradesh).

Remarks: The species can be broadly separated from its allied species in having body somewhat elongated; head slightly roundish; humeral angles of pronotum subprominent, not produced; proximal semi-membranous dilation beyond median diation as long as broad and 8th paratergites subequal to 9th paratergites. It has been recorded as a serious pest of wheat, rice and raspberry *Circium* sp., *Cistus* sp., *Equestrum* sp., *Inula* sp., *Juniperus* sp., *Laurus nobilis*, *Mentha* sp., *Salix* sp., *Salvia* sp., *Sideritis* sp., *Verbascum* sp., *Tamarix* sp., *Triticum sativa*, gramineous plants and different species of weeds in Turkey.

***Eysarcoris rosaceus* Distant**
(Figs. 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459)

Eusarcocoris rosaceus, Distant (1901) *T. E. S.*, p. 109.

Eysarcoris rosaceus: Kirkaldy (1909) *Cat. Hem.*, 1: p.85

MALE:

Measurements (mm): Head length: 1.40; width across eyes: 1.60; interocular space: 1.0; interocellar space: 0.75; preocular distance: 0.80; length of posterior head including eyes: 0.60; antennal segments lengths: I: 0.40, II: 0.45, III: 0.75 IV: 0.90, V: 1.0; pronotal length: 1.60; width across humeral angles: 4.95; scutellar length: 2.50; scutellar width: 2.50; length of abdomen: 2.40; maximum width of abdomen: 4.25; length of rostral segments: I: 0.75, II: 1.30, III: 0.40, IV: 0.45; Distance - base scutellum-apex clavus: 0.90 apex clavus-apex scutellum: 1.60; apex scutellum-apex abdomen including membrane: 0.80; total body length: 6.105.

Dorsal Coloration: Head brassy black, punctured with thick black lamelliform punctures, a levigate pale longitudinal line not exactly reaching apex; eyes black; ocelli red; 1st three antennal segments golden yellowish, 4th and basal half of 5th dark, apex of 5th blackish; pronotum brownish yellow, thickly punctured with black on anterior area and humeral angles, rest sparingly punctured; anterior area with two impunctate black transverse callosities, anterior and anterolateral margin yellow; scutellum dark brownish yellow, apex pale, sparingly punctate, two egg shaped yellow impunctate spots at each scutellar angle; clavus, corium and costa dark brownish yellow, with slight green tinge, blackly punctured; anteriormost portion of costal margin pale yellow, impunctate; hemelytral membrane hyaline with brown suffusions.

Ventral Coloration: Labium brownish yellow, apex black; head paler below labial segment, remaining head, sternum and abdomen brownish yellow, darkly punctured with black; legs brownish yellow, spotted with big sized black spots; metathoracic scent gland peritreme and evaporatorium reddish yellow, finely punctured; abdomen with central longitudinal disk black and impunctate; lateral area pale brownish yellow, sparingly punctate with black; connexiva brownish yellow, marked with black patches on anterior and posterior margins; spiracles black; genital capsule brownish yellow, pilosed with golden hairs and black punctures.

STRUCTURE:

Head (Fig. 449): Head broad and subrounded at apex, declivent; paraclypeal lobes as long as slightly medially raised clypeal lobe; former broad at apex, slightly sinuate above eyes, anterolaterally reflexed upwards, lamelliform; antennal segmental formula – I<II<III<IV<V; labium reaching 3rd abdominal segment, labial lengths formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 450) anteriorly deflected, anterior margin concave, truncate behind eyes and protuded as small subacute tubercles; anterolateral margins concavely sinuate, humeral angles prominent, strongly and robustly produced as broad subacute apices directed laterad; scutellum broad at base, frenal region much shorter than post frenal, beyond frena, slightly sinuate forming a broad subrounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 451) short, raised, curved and narrow at apex reaching upto one fourth way to metapleural margin, evaporatorium somewhat leaf like, broad with prominent narrow strip like anterior margin, covering less than half sternite. **Abdomen:** ampliate; connexiva slightly exposed at repose; hemelytral membrane passing beyond abdominal apex; ventroanterior margin of abdominal sternite VII distinctly narrowly concave, somewhat an inverted V-shaped with subrounded posterior connexival angles and ventroposterior margins broadly concave (Fig. 452).

FEMALE:

Measurements (mm): Head length: 1.50; width across eyes: 1.65; interocular space: 1.0; interocellar space: 0.75 preocular distance: 0.90; length of posterior head including eyes: 0.60; antennal segments lengths: I: 0.40, II: 0.50, III: 0.70, IV: 0.85, V: 1.0; pronotal length: 1.90; width across humeral angles: 5.61; scutellar length: 2.70; scutellar width: 2.70; length of abdomen: 2.48; maximum width of abdomen: 4.375; length of rostral segments: I: 0.80, II: 1.10, III: 0.35, IV: 0.50; Distance - base scutellum-apex clavus: 1.10; apex clavus-apex scutellum: 1.60; apex scutellum-apex abdomen including membrane: 0.925; total body length: 6.60.

Coloration and Structure: Body form and coloration similar to males except: ventroanterior and ventroposterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped with rounded posterior connexival angles (Fig. 453).

Male Genitalia: Pygophore (Fig. 456) longer than broad, lateral sides not sinuate with subprominent narrowly rounded dosolateral lobes, directed posteriad; dorsal opening prominent, oval; ventroposterior margins sinuately concave laterally, medially notched; paramere (Fig. 457) bilobed, somewhat F-shaped, inner lobe elongate, rounded at apex, its outer margin concave with medial notch, outer lobe acutely pointed, curved downwards at apex with outer margin humped medially, inner margin deeply convex and angulation; aedeagus (Fig. 458, 459) with broad theca, its dorsomedial surface moderately concave with semisclerotized flap like collar; a pair of membranous dosolateral conjunctival appendages, a pair of bag like ventral conjunctival appendages, directed anteriad, a median dorsal membranous conjunctival appendage; a pair of sclerotized elongated penial lobes, not fused basally; vesica thick, not passing beyond the margins of membranous appendages; ejaculatory reservoir small.

Female Genitalia: 1st gonocoxae narrowly triangular, placed wide apart from each other, posterior margins sinuate; 2nd gonocoxae medially fused, posterior margin straight; 8th paratergites small triangular; 9th paratergites distinctly broad, placed wide apart, outer margins convex, with rounded apices, shorter than fused posterior margins of 8th paratergites (Fig. 454); spermatheca (Fig. 455) with distinct proximal and distal flanges; pump region sclerotized, tube like, subequal to distal spermathecal duct; bulb rounded; medial dilation balloon like with onion shaped semisclerotized proximal dilation, directed posteriad; proximal spermathecal duct thick, distinctly longer than distal spermathecal duct.

Population Variation: Coloration of insect varies from dark brownish yellow to paler; thickness and coloration of punctures also varies with bronzy tinge at some places; size and color of basal scutellar spots show variations; pronotal angles vary in broadness; irregular maculate black fascia on abdominal disk vary in broadness and color from dark brown to black.

Material Examined:

Punjab: Ropar, 6.viii.2010 - 1♀

Himachal Pradesh: Paonta Sahib, 3-4. x. 2009 - 19♀♀, 24♂♂, Andhretta, 12. vii. 2010 - 2♀♀, 2♂♂; Bilaspur, 21. vii. 2010 - 8♀♀, 9♂♂; Solan, 18-19.viii. 2010 - 2♀♀, 1♂; Hamirpur, 21. x. 2010 - 3♀♀, 5♂♂

Uttarakhand: Dehradun, 23-25. vii. 2009 - 4♀♀, 3♂♂; 25. x. 2009 - 3♀♀, 5♂♂; 25. vi. 2010 - 3♀♀, 4♂♂; 15-16. ix. 2010 - 9♀♀, 4♂♂

Distribution: Myanmar; Pakistan; India (Punjab, Himachal Pradesh, Uttarakhand).

Remarks: The species is closely resembles *E. montivagus* and *E. guttiger* in having body oval; head elongated; humeral angles of pronotum prominent; proximal semi-membranous dilation beyond median dilation always longer than broad and 8th paratergites smaller than 9th paratergites. However, it can be easily differentiated from the same in having humeral angles of pronotum strongly and robustly protruded, with broad subacute apices. It is mostly found on wild vegetation on the tips of leaves or in damp places.

Eysarcoris montivagus (Distant)

(Figs.460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471)

Eusarcocoris montivagus, Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 166.

Eysarcoris montivagus: Kirkaldy (1909) *Cat. Hem.*, 1: p. 85

MALE:

Measurements (mm): Head length: 1.20; width across eyes: 1.67; interocular space: 0.95; interocellar space: 0.70; preocular distance: 0.65; length of posterior head including eyes: 0.60; antennal segments lengths: I: 0.30, II: 0.50, III: 0.55 IV: 0.80, V: 0.90; pronotal length: 1.76; width across humeral angles: 4.37; scutellar length: 2.40; scutellar width: 2.40; length of abdomen: 2.40; maximum width of abdomen: 4.0; length of rostral segments: I: 0.65, II: 1.10, III: 3.50, IV: 0.50; Distance - base scutellum-apex clavus: 1.10; apex clavus-apex scutellum: 1.30; apex scutellum-apex abdomen including membrane: 1.20; total body length: 6.10.

Dorsal Coloration: Head brassy black, thickly punctured, except small spot in front of each eye, two at apex and superficial medial linear fascia yellow; eyes dark brown with reddish tinge and yellow border; ocelli red; antennae brownish yellow, hairy,

apical two segments darker; pronotum brownish yellow punctured with dark brown, anteriorly slightly pale, punctures more pronounced anteriorly, humeral angles with greenish tinge, anterior area with two levigate black callosities, anterolateral margins pale; scutellum brownish yellow, densely punctured with brassy black; two large maculate brownish yellow levigate spots at each basal scutellar angle, and somewhat U-shaped similar fascia at apex; corium and costa dark with greenish tinge; anteriormost portion of costal margin pale and impunctate; hemelytral membrane dark brown.

Ventral Coloration: Labium brownish yellow, apex black; head densely brassy black punctures, except for posterior area and around eyes; area between legs black, impunctate; lateral areas of pronotum yellow, thickly blackly punctured; metathoracic scent gland opening yellow, sparingly punctate; legs yellow, irrorated with black spots; abdomen yellow, except central pitch black central disk, mediolateral area yellow, with red fascia, blackly punctured; lateral area of sternum with reddish black punctures; connexiva yellow with rectangular black spots at anterior and posterior margin of each segment; spiracles large, black.

STRUCTURE:

Head (Fig. 461): Head broadly subrounded at apex, deflected anteriorly, lamelliform; paraclypeal lobe subequal to medially raised lobulated clypeal lobe; former sinuate above eyes; antennal segmental formula – I<II<III<IV<V; labium passing metacoxae, labial length formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 462) anteriorly deflected, calloused posteriorly, anterior margin concave, truncate behind eyes produced as small tubercles, lateral margins sinuous, humeral angles rubrounded, obtuse, posterior margins straight; scutellum distinctly broad at base, beyond frena slightly sinuate and narrowed as snake headed apical lobe; metathoracic scent gland osteolar peritreme (Fig. 463) short, raised, curved, rounded and narrowed at apex, reaching only one fourth distance to metapleural margin; evaporatorium broad, convex with subprominent anterior and posterior margins, covering half sternite; legs with short hairs. **Abdomen:** ampliate; connexiva slightly exposed at repose; hemelytral membrane slightly passing beyond abdominal apex; genital capsule with golden pubescence; ventroanterior margin of impunctate abdominal sternite VII

deeply concave, somewhat an inverted V-shaped with subrounded posterior connexival angles (Fig. 464).

FEMALE:

Measurements (mm): Head length: 1.30; width across eyes: 1.70; interocular space: 1.0; interocellar space: 0.70; preocular distance: 0.75; length of posterior head including eyes: 0.60; antennal segments lengths: I: 0.30, II: 0.55, III: 0.60, IV: 0.85, V: 0.85; pronotal length: 2.09; width across humeral angles: 5.11; scutellar length: 2.90; scutellar width: 2.90; length of abdomen: 2.96; maximum width of abdomen: 4.50; length of rostral segments: I: 0.75, II: 1.20, III: 0.40, IV: 0.475; Distance - base scutellum-apex clavus: 1.30; apex clavus-apex scutellum: 1.60; apex scutellum-apex abdomen including membrane: 1.0; total body length: 7.0.

Coloration and Structure: Body form and coloration similar to males except, size of basal scutellar spots vary in size; hemelytral membrane passing slightly beyond abdominal apex; abdominal disk comparatively paler, with black punctures; ventroanterior and ventroposterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped with subrounded posterior connexival angles (Fig. 465).

Male Genitalia: Pygophore (Fig. 468) distinctly longer than broad, lateral sides not sinuate with subprominent narrowly rounded dosolateral lobes, directed posteriad; dorsal opening prominent, somewhat inverted V-shaped; ventroposterior margins angulated laterally, medially notched; paramere (Fig. 469) bilobed, inner lobe broad, nodule like, slightly narrowed at apex, outer lobe broad, acutely pointed and curved downwards with outer margin and inner margin convex; aedeagus (Fig. 470, 471) with broad theca, with its dorsomedial surface moderately concave; a pair of lobe like dosrolateral membranous conjunctival appendages, a pair of bag like semisclerotized ventral conjunctival appendages directed downwards, an elongated lobulated median dorsal membranous conjunctival appendage, a pair of sclerotized elongated penial lobes, not fused basally; vesica thick distally, not passing beyond the margins of membranous appendages; ejaculatory reservoir small.

Female Genitalia: 1st gonocoxae broadly triangular placed wide apart, posterior margins convex and sinuate, 2nd gonocoxae medially fused, posterior margin straight;

8th paratergites small; 9th paratergites distinctly broad, outer margins convex, with rounded apices, shorter than fused posterior margins of 8th paratergites (Fig. 466); spermatheca (Fig. 467) with distinct proximal and distal flanges; pump region sclerotized, tube like, broad distally, subequal to distal spermathecal duct; bulb rounded; medial dilation balloon like with elongate semisclerotized, spindle shaped proximal dilation directed posteriad; proximal spermathecal duct thick subequal to distal spermathecal duct.

Population Variation: Color of entire body varies from being dark brownish yellow to paler; color and thickness of punctures variable; maculate impunctate fascia on abdominal disk vary in thickness and area it covers.

Material Examined:

Punjab: Pathankot, 22. iv. 2009 - 17♀♀, 8♂♂; Patiala, 2-3 .vi. 2009 - 3♀♀, 3♂♂; 6. ix. 2010 - 3♂♂; Talwara, 20. viii. 2009 - 2♀♀, 2♂♂; Tarantaran, 8. iv. 2010 - 1♀; Ropar, 6. viii. 2010 - 6♀♀, 6♂♂

Himachal Pradesh: Paonta Sahib, 3. x. 2009 - 1♀, 1♂; Andhretta, 12. vii. 2010 - 7♀♀; Mandi, 22. vii. 2010 - 1♂; Shimla, 16. viii. 2010 - 1♀; Solan, 18-19. viii. 2010 - 2♀; Hamirpur, 21. x. 2010 - 3♀♀

Uttarakhand: Dehradun, 25. vi. 2010 - 4♀♀

Jammu and Kashmir: Kathua, 21. viii. 2009 - 1♂

Distribution: Pakistan; India (Punjab, Himachal Pradesh, Uttarakhand, Jammu and Kashmir, Sikkim, Assam, Meghalaya, Paschim Banga).

Remarks: *E. montivagus* closely resembles *Eysarcoris guttiger*, but can be easily separated from the same in having scutellum relatively narrower; entire body covered with brown punctures; basal angles of scutellum with roundish or irregular spots; apices of 4th and 5th antennal segments brownish yellow; only central area of abdominal disk covered with irregular black fascia; 8th paratergites triangular, rounded at apices and 9th paratergites distinctly broad and shorter than fused posterior margins of 8th paratergites.

***Eysarcoris guttiger* (Thunberg)**
(Figs. 472, 473, 474, 475, 476, 477, 478)

Cimex guttiger, Thunberg (1783) *Nov. Ins. Sp.*, 2: p. 32.

Pentatoma nepalensis & *punctipes*, Westwood (1837) in *Hope Cat.*, 1: p. 36.

Stollia guttiger, Stal (1876) *En. Hem.*, 5: p. 81.

Eusarcocoris montivagus, Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 165 & 166.

Eysarcoris guttiger: Kirkaldy (1909) *Cat. Hem.*, 1: p.83.

FEMALE:

Measurements (mm): Head length: 1.40; width across eyes: 1.65; interocular space: 1.10; interocellar space: 0.80; preocular distance: 0.90; length of posterior head including eyes: 0.40; antennal segments lengths: I: 0.30, II: 0.47, III: 0.60, IV: 0.70, V: 0.90; pronotal length: 1.70; width across humeral angles: 4.50; scutellar length: 2.40; scutellar width: 2.40; length of abdomen: 2.0; maximum width of abdomen: 3.95; length of rostral segments: I: 0.70, II: 1.15, III: 0.40, IV: 0.42; Distance - base scutellum-apex clavus: 0.80; apex clavus-apex scutellum: 1.60; apex scutellum-apex abdomen including membrane: 0.80; total body length: 6.10.

Dorsal Coloration: Head shining black, with posterior medial yellow fascia, thickly punctured with confluent bronzy black punctures, an impunctate levigate black spot just in front of eye; eyes dark brown with reddish tinge; ocelli obscure, dark red; antennae dark brownish yellow, apices of fourth and fifth segments black; pronotum obscurely brownish yellow, with irregularly scattered few yellow spots, two transverse black callosities in anterior area, dark brown punctations, more pronounced on lateral areas, lateral margins darker; scutellum brownish yellow, apically pale; two egg shaped levigate dark brownish yellow spots at each basal scutellar angle; clavus, corium and costa admixture of yellow and chocolate brown punctures, anteriormost portion of costal margin impunctate; hemelytral membrane hyaline with obscure brown suffusions.

Ventral Coloration: Labium brownish yellow, apex of 2nd, and rest black; lateral area of head densely punctured with black, except lower posterior area below labium; area between legs black, impunctate; metathoracic scent gland peritreme brownish yellow blackly punctured lateral area; legs dark brownish yellow, spotted with black; medial and lateral area of abdomen shining black, opaque, sparingly punctate; connexiva dark brownish yellow, alternating with narrow black fascia;

STRUCTURE:

Head (Fig. 473): Head broad, clypei slightly longer than paraclypeal lobes and raised medially; lateral lobes distinctly sinuous above eyes, laminated anterolateras, deflected downwards; antennal segmental formula – I<II<III<IV<V; -labium long, reaching 3rd abdominal segment, labial lengths formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 474) anteriorly deflected, anterior pronotal angles curved as subacute tubercles, anterolateral margins slightly crenulate, sinuous medially, humeral angles obtusely rounded at apex, produced beyond costal margin; frenal region distinctly shorter than post frenal; scutellum broad at base, beyond frena moderately sinuate, rounded at apex; metathoracic scent gland Osteolar peritreme (Fig. 475) small, pen nib like, raised, curved, acute at apex covering only one fourth distance to metapleural margin; evaporatorium moderately broad, with subprominent anterior and posterior margins, covering about half of sternite. **Abdomen:** ampliate, broad, tapering as subrounded apex; connexiva not distinctly exposed at repose; membrane of hemelytra marginally passing abdominal apex; genital capsule pubescent; ventroanterior margin of abdominal sternite VII concave, an inverted U-shaped, ventroposterior margin broadly concave (Fig. 476).

Female Genitalia: 1st gonocoxae elongate, triangular, posterior margins sinuate, placed distinctly wide apart from each other and from medially fused and reduced 2nd gonocoxae; 8th paratergites small; 9th paratergites distinctly broad, outer margins convex, with rounded apices, subequal to 8th paratergites (Fig. 477); spermatheca (Fig. 478) with distinct proximal and distal flanges; pump region sclerotized, tube like, broad distally, slightly shorter than distal spermathecal duct; bulb rounded; medial dilation balloon like with elongate semisclerotized proximal dilation, directed posteriad; proximal spermathecal duct thick and longer than distal spermathecal duct.

Population Variation: Basal scutellar spots vary from being dark brownish yellow to paler; punctures on head, pronotum, scutellum vary in thickness and color; black spots on legs variable.

Material Examined:

Himachal Pradesh: Shimla, 16. viii. 2010 - 1♀; Solan, 18. viii. 2010 - 3♀♀

Distribution: Sri Lanka; Myanmar; China; Japan; Pakistan; India (Himachal Pradesh, Maharashtra, Sikkim, Meghalaya, Paschim Banga).

Remarks: *E.guttiger*, commonly known as Capsid bug, closely resembles *E. montivagus* as discussed in keys and descriptions earlier. It has been recorded as a pest of passion fruit, *Passiflora edulis* Sims var. *flavicarpa* Degener in Philippines.

GENUS *CARBULA* STAL

Carbula, Stål (1864) *Hem. Afr.*, 1: 140

Type species - *Carbula decorata* Signoret, an African species.

Diagnosis: Body broadly oval or obovate, beneath convex; head rounded or somewhat truncated at apex, lobes about equal in length; labium with the 1st joint equal to or extending a little beyond the bucculae, 2nd joint about equal to or a little longer than the last two joints taken together; antennae with the 1st joint not reaching the apex of the head; pronotum with the anterior lateral margins generally obtuse, never acute, terminated by a levigate edge which is rarely crenulated; scutellum broad, triangular, a little broader at base than long; connexiva moderately exposed.

Remarks: The genus is represented by 76 species from the World, distributed in Oriental and Ethiopian regions. It is similar to the genus *Eysarcoris* except scutellum which is distinctly apically narrowed and distinctly shorter than corium. Members damage plant species throughout their active season, but they have not been recorded damaging any food crops.

Key to the studied species of genus *Carbula* Stål

- 1 Humeral angles of pronotum prominent, with long acute or subscute spines; scutellum yellowish-green, slightly punctured with black, basal angles with yellowish-green spots and apex impunctate; head somewhat subtriangular; pygophore longer than broad; theca vase-like; paramere with lateral process narrow at base, broad and bifurcated at apex..... 2

-
- Humeral angles of pronotum subprominent, either with short acute or without spines; scutellum yellowish-brown with dark brown punctation, basal angles with impunctate brownish yellow spots, apex concolorous and punctatae; head somewhat subsquarish; pygophore as long as broad; theca elongate; paramere with lateral process elongate, subacute at apex without bifurcation; 3
 - 2. Humeral angles of pronotum with long acute spines; 9th paratergites elongate, distinctly passing beyond 8th paratergites; inner margin of blade of paramere slightly convex, obtuse at apex..... *scutellata* Distant
 - Humeral angles of pronotum with slightly obtuse spines; 9th paratergites broad just reaching posterior margin of 8th paratergites; inner margin of blade of paramere strongly convex, subacute at apex..... *socia* (Walker)
 - 3. Humeral angles of pronotum with short subacute spines, slightly directed backwards; 9th paratergites broad, subequal to 8th paratergites, not passing beyond the latter; vesica short, not reaching the middle of penial lobes; outer margin of paramere with a distinct medial hump..... *biguttata* (Fabricius)
 - Humeral angles of pronotum roundish or squarish; 9th paratergites narrowed at base, lobe-like at apex, passing beyond posterior margin of 8th paratergites; vesica longer, reaching middle of leaf-like penial lobes; outer margin of paramere without a medial hump..... *insocia* (Walker)

***Carbula scutellata* Distant**

(Figs. 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490)

Carbula scutellata: Distant (1887) *Tr. E. S.*, p. 347.

MALE:

Measurements (mm): Head length: 1.40; width across eyes: 1.35; interocular space: 0.75; interocellar space: 0.50; preocular distance: 0.75; length of posterior head including eyes: 0.65; antennal segments lengths: I: 0.30, II: 0.60, III: 0.60, IV: 1.10,

V: 1.30; pronotal length: 1.80; width across humeral angles: 6.10; scutellar length: 2.80; scutellar width: 2.80; length of abdomen: 3.50; maximum width of abdomen: 4.25; length of rostral segments: I: 0.80, II: 1.10, III: 0.50, IV: 0.55; Distance - base scutellum-apex clavus: 2.08; apex clavus-apex scutellum: 0.72; apex scutellum-apex abdomen including membrane: 2.40; total body length: 7.75.

Dorsal Coloration: Head brownish yellow, with thick black punctures; eyes reddish brown; ocelli red; antennae yellowish, 4th segment reddish yellow, 5th infuscated; pronotum brownish yellow anteriorly, dark chocolate brown posteriorly, posterior margins and humeral angles black, anterolateral margins pale yellowish green, anterior portion with two transverse brownish callosities; scutellum light yellowish green sparingly punctate medially and on lower lateral margin; clavus and corium purplish with black punctures; anteriormost portion of costa pale, rest chocolate brown; hemelytral membrane black with brown suffusions; connexiva pale greenish with black connexival angles.

Ventral Coloration: Labium golden yellow, apex black; legs yellow spotted with dark brown; metathoracic scent gland peritreme deep yellow, impunctate; abdomen yellow, sparingly punctured with black; connexiva concolorous to dorsal surface; spiracles, trichobothria and transverse line between them obscurely green; genital capsule yellowish with brown suffusions.

STRUCTURE:

Head (Fig. 480): Head deflected anteriorly, paraclypeal lobes slightly longer than medially raised clypeus; former sinuate above eyes, reflexed anterolaterally, narrowed inwardly, somewhat lobulated at apex; antennal segmental formula – I<II=III<IV<V; labial length formula – III<IV<I<II. **Thorax:** Pronotum (Fig. 481) with anterior margin slightly concave and narrow, anterior angles tuberculate, directed anteriorly, lateral margins smooth, concave, humeral angles acutely produced as spines, directed anterolaterad, posterior margin straight with angles subrounded; scutellum broad at base, beyond frena narrowed as levigate rounded apical lobe; metathoracic scent gland osteolar peritreme (Fig. 482) short, narrowed at apex, acutely curved, reaching about one fourth distance to metalpleural margin; evaporatorium broad well developed, with equally extended anterior and posterior margins, covering half sternite; legs hairy. **Abdomen:** unarmed at base; connexiva less exposed at repose;

ventroanterior margin of abdominal sternite VII concave, somewhat an inverted broad V-shaped with subrounded posterior angles, ventroposterior margin somewhat squarish; presence of short series of hairs just above ventroanterior margin of abdominal sternite VII (Fig. 483); hemelytral membrane passing much beyond apex of abdomen.

FEMALE:

Measurements (mm): Head length: 1.30; width across eyes: 1.32; interocular space: 0.66; interocellar space: 0.66; preocular distance: 0.77; length of posterior head including eyes: 0.55; antennal segments lengths: I: 0.35, II: 0.63, III: 0.63, IV: 1.0, V: 1.10; pronotal length: 2.0; width across humeral angles: 6.0; scutellar length: 2.90; scutellar width: 2.90; length of abdomen: 3.62; maximum width of abdomen: 4.62; length of rostral segments: I: 0.75, II: 1.25, III: 0.40, IV: 0.60; Distance - base scutellum-apex clavus: 2.0; apex clavus-apex scutellum: 0.90; apex scutellum-apex abdomen including membrane: 2.70; total body length: 8.

Coloration and Structure: Females with similar body form and coloration except, ventroanterior margin of abdominal sternite VII broadly concave, somewhat an inverted U-shaped, ventroposterior margin somewhat arc shaped with subacute posterior angles (Fig. 484).

Male Genitalia: Pygophore (Fig. 487) distinctly longer, uniformly broad throughout the length, lateral margins slightly sinuate; dorsolateral lobes angulated at apex; dorsomedian surface almost straight; dorsal opening small, inverted V-shaped; ventroposterior margin with a small median concavity, laterally slightly sinuate; paramere (Fig. 488) bilobed, inner lobe small, narrowed at base, broadly sinuate at apex, outer margin concave, outer lobe broad, acute at apex, its outer margin convex, inner margin with concave protusion; aedeagus (Fig. 489, 490) with sclerotized broad theca, bilobed bag like dorsolateral membranous conjunctival appendages, fused basally, a pair of small sclerotized medial penial lobes, placed moderately apart distally that are not fused basally; vesica very short enclosed in theca; ejaculatory reservoir elongate.

Female Genitalia: 1st gonocoxae triangular, medially placed wide apart, posterior margins sinuately convex, acute apices; 2nd gonocoxae fused medially, with posterior

margin sinuately convex; 8th paratergites moderately broad, triangular, posterior margins convex, 9th paratergites elongated, lobulate, outer margins concave, passing beyond fused posterior margins of 8th paratergites (Fig. 485); spermatheca (Fig. 486) with distinct proximal and distal flanges; pump region moderately long, sclerotized, tube like, shorter than distal spermathecal duct; bulb rounded; medial dilation broad, somewhat pumpkin shaped, with small proximal dilation, directed posteriad; proximal spermathecal duct distinctly longer than distal spermathecal duct.

Material Examined:

Himachal Pradesh: Paonta Sahib, 3-26. x. 2009 - 9♀♀, 11♂♂

Population Variation: Coloration of scutellum, legs and abdominal venter varies from being darker to paler forms; similarly punctation on abdomen and scutellum shows distinct variation in thickness; humeral angles may be directed anterolaterad or slightly bent posteriorly, or even directed laterad.

Distribution: Myanmar; Pakistan; India (Himachal Pradesh, Maharashtra, Meghalaya).

Remarks: The species closely resembles *Carbula socia* in having humeral angles of pronotum prominent, with long acute or subscute spines; scutellum yellowish-green, slightly punctured with black, basal angles with yellowish-green spots and apex impunctate; head somewhat subtriangular; pygophore longer than broad; theca vase like and paramere with lateral process narrow at base, broad and bifurcated at apex. However, it can be easily separated from the same in having humeral angles of pronotum with long acute spines; 9th paratergites elongate, distinctly passing beyond 8th paratergites and inner margin of blade of paramere slightly convex, obtuse at apex.

***Carbula socia* (Walker)**

(Figs. 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502)

Mormidea socia, Walker (1867) *Cat. Het.*, 2: p. 262.

Mormidea similis, Kirby (1891) *J. Linn. Soc. Zool.*, 24: p. 82.

Carbula socia: Distant (1902) *Faun. Brit. Ind. Rh.*, 1: p. 172.

MALE:

Measurements (mm): Head length: 1.50; width across eyes: 1.37; interocular space: 0.75; interocellar space: 0.50; preocular distance: 0.80; length of posterior head including eyes: 0.60; antennal segments lengths: I: 0.32, II: 0.60, III: 0.60, IV: 1.10, V: 1.10; pronotal length: 1.80; width across humeral angles: 1.85; scutellar length: 2.70; scutellar width: 2.70; length of abdomen: 3.87; maximum width of abdomen: 4.43; length of rostral segments: I: 0.70, II: 1.10, III: 0.50, IV: 0.60; Distance - base scutellum-apex clavus: 1.70; apex clavus-apex scutellum: 1.0; apex scutellum-apex abdomen including membrane: 5.94; total body length: 7.75.

Dorsal Coloration: Head brownish yellow, with black punctures; eyes brownish red; ocelli red; antennae yellowish, 4th and 5th darker; pronotum brownish yellow anteriorly, suffused with dark brown posteriorly, humeral angles black, lateral margin levigate green, anterior portion with two transverse brownish callosities, punctation on pronotum moderate on anterior area, coarse on posterior; scutellum brownish yellow sparingly punctate medially, dense laterally; two spots on base and one apical on scutellum greenish yellow, impunctate; clavus and corium purplish with black punctures; anteriormost portion of costal margin pale yellow; posterobasal margin of corium with a maculate purplish impunctate fascia; hemelytral membrane hyaline with apical brown suffusions; connexiva green with black connexival angles.

Ventral Coloration: Labium pale yellowish, apex black; legs brownish yellow freckled with black, apices of tibiae and tarsi darker, coxae with a black spot on outer margin; head, lateral areas of sternum pale yellow, sparingly punctured; humeral angles black; metathoracic scent gland peritreme greenish, impunctate; abdomen pale yellowish green, dark green fascia on lateral side thickly punctured with black; lateral edge of connexiva dark green; spiracles, trichobothria and transverse line between them obscurely green; genital capsule pale yellowish green with brown suffusions and golden pubescence.

STRUCTURE:

Head (Fig. 492): Head declivent, subrounded at apex; paraclypeal lobes slightly longer than medially raised clypeus, not fusing in front; former sinuate above eyes, reflexed anterolaterally, narrowed anteriorly; antennal segmental formula –

$I < II = III < IV = V$; labium long, reaching 3rd abdominal segment, labial length formula – $III < IV < I < II$. **Thorax:** Pronotum (Fig. 493) with anterior margin slightly concave and truncate behind eyes touching outer margin of latter, anterior angles tuberculate, directed anteriorly, lateral margins smooth, concave, humeral angles obtusely produced as spines, directed anterolaterally, longer than costal margin, posterior margin straight with angles subrounded; scutellum broad at base, beyond frena slightly sinuate, narrowed as a levigate subrounded apical lobe; metathoracic scent gland ostiole peritreme (Fig. 494) small, raised, narrowed at apex, acutely curved, reaching about one fourth way to metapleural margin; evaporatorium broad well developed, with anterior margin just reaching half sternite; legs hairy. **Abdomen:** ampliate, unarmed at base; connexiva exposed at repose; ventroposterior margin of abdominal sternite VII concave, somewhat an inverted U-shaped with subacute posterior angles (Fig. 495); hemelytral membrane passing much beyond apex of abdomen.

FEMALE:

Measurements (mm): Head length: 1.50; width across eyes: 1.45; interocular space: 0.80; interocellar space: 0.55; preocular distance: 0.80; length of posterior head including eyes: 0.70; antennal segments lengths: I: 0.30, II: 0.60, III: 0.60, IV: 1.10, V: 1.10; pronotal length: 2.0; width across humeral angles: 5.77; scutellar length: 2.88; scutellar width: 2.88; length of abdomen: 3.75; maximum width of abdomen: 4.62; length of rostral segments: I: 0.80, II: 1.30, III: 0.50, IV: 0.60; Distance - base scutellum-apex clavus: 1.84; apex clavus-apex scutellum: 1.04; apex scutellum-apex abdomen including membrane: 2.30; total body length: 8.25.

Coloration and Structure: Females slightly darker than males; costal margin with reddish tinge; head length subequal to width; ventroanterior and ventroposterior margin of abdominal sternite VII concave, somewhat arc shaped with subacute posterior angles (Fig. 496).

Male Genitalia: Pygophore (Fig. 499) distinctly longer than broad, lateral margins slightly sinuate; dorsolateral lobes angulated at apex; dorsomedian surface almost straight; dorsal opening small, inverted V-shaped; ventroposterior margin with a small median concavity, laterally slightly sinuate; paramere (Fig. 500) bilobed, inner lobe small, narrowed at base, broad and sinuate apically, outer margin concave, outer lobe broad, acute at apex, its outer margin convex and inner margin with a concave

protusion; aedeagus (Fig. 501, 502) with sclerotized, somewhat an inverted Vase shaped theca; bilobed and rounded bag like dorsolateral membranous conjunctival appendages that fused basally, apically free; a pair of moderately long leaf like sclerotized medial penial lobes, fused basally; vesica very thin and short, not reaching margins of dorsal membranous appendages.

Female Genitalia: 1st gonocoxae triangular, posterior margins sinuately convex, medially wide apart, apices acute; 2nd gonocoxae fused medially with posterior margin sinuate; 8th paratergites broad, triangular, posterior margins convex; 9th paratergites distinctly broad, lobulate, rounded at posterior margin, outer margins concave, reaching fused posterior margins of 8th paratergites (Fig. 497); spermatheca (Fig. 498) with distinct proximal and distal flanges; pump region moderately sclerotized, tube like, slightly shorter than distal spermathecal duct; bulb rounded; medial dilation broad, somewhat pumpkin shaped, with small proximal dilation, directed posteriad; proximal spermathecal duct distinctly very longer than distal spermathecal duct.

Population Variation: Color of body varies from being darker to pale base color; similarly thickness and color of punctures varies; corium varies from from being purplish to dark purplish, or may be very paler; ventral surface shows various shades of green.

Material Examined:

Himachal Pradesh: Paonta Sahib, 3-25. x. 2009 - 3♀♀, 3♂♂

Uttarakhand: Dehradun, 25. vii. 2009 - 1♀, 2♂♂; 25. vi. 2010 - 2♀♀, 1♂

Distribution: Sri Lanka; Pakistan; India (Himachal Pradesh, Uttarakhand, Maharashtra).

Remarks: The species closely resembles *Carbula scutellata* and can be easily separated from the same as discussed in keys and descriptions earlier. It is a new record from North India.

***Carbula biguttata* (Fabricius)**

(Figs. 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514)

Coreus biguttata, Fabricius (1794) *Ent. Syst.*, 4: p. 129.

Cimex binotatus, Fabricius (1803) *Syst. Rhync.*, p. 165.

Pentatoma obscura, Westwood (1837) in *Hope Cat.*, 1: p. 35.

Carbula biguttata: Distant (1900) *Proc. Zool. Soc. Lond.*, p. 812.

MALE:

Measurements (mm): Head length: 1.60; width across eyes: 1.70; interocular space: 1.05; interocellar space: 0.65; preocular distance: 0.85; length of posterior head including eyes: 0.75; antennal segments lengths: I: 0.35, II: 0.60, III: 0.70, IV: 0.90, V: 1.10; pronotal length: 1.90; width across humeral angles: 1.70; scutellar length: 2.60; scutellar width: 2.60; length of abdomen: 3.20; maximum width of abdomen: 4.75; length of rostral segments: I: 0.72, II: 1.10, III: 0.50, IV: 0.57; Distance - base scutellum-apex clavus: 1.70; apex clavus-apex scutellum: 0.90; apex scutellum-apex abdomen including membrane: 1.95; total body length: 7.5.

Dorsal Coloration: Head brownish yellow, with coarse thick dark brown punctures; eyes dark brown with reddish tinge; ocelli red; antennae brownish yellow, apical three fourth dark brown; pronotum dark brownish yellow with dark brown thick punctures, two distinct impunctate brown callosities on anterior margin, anterolateral margins brownish yellow, humeral angles black; scutellum concolorous to pronotum, two large impunctate yellow spots at each basal scutellar angle; clavus, corium and costa concolorous to body coloration; anteriormost portion of costal margin pale and impunctate; hemelytal membrane hyaline with brown suffusions; connexiva dorsally marked with broad brownish yellow alternating with black at anterior and posterior incisures.

Ventral Coloration: Labium brownish yellow, apex black; legs yellow spotted with dark brown; metathoracic scent gland pertitreme reddish yellow with thick black punctures; abdomen yellow, entire disk densely and uniformly punctured with black and more pilosed; lateral areas of sternum and abdomen densely punctured with dark brown; connexiva as dorsal surface; genital capsule yellow with pronounced black punctures.

STRUCTURE:

Head (Fig. 504): Head broad, somewhat truncate at apex; paraclypei equal to medially raised narrowed clypeus; former broad very slightly sinuous above eyes,

slightly reflexed anterolaterally, inner margins of clypeus parallel; antennal segmental formula – I<II<III<IV<V; labium reaching about mesocoxae, labial lengths formula – III<I=IV<II. **Thorax:** Pronotum (Fig. 505) slightly deflected anteriorly, anterior margins concave equal in length of head across eyes, anterior angles produced outwards as small acute curved spines, lateral margins crenulated, slightly reflexed, humeral angles broad, produced subacutely as moderately long spines, bent posteriad; scutellum slightly broader at base, beyond frena distinctly narrowed to a rounded apical lobe; metathoracic scent gland osteolar opening (Fig. 506) elliptical, small, slightly curved and narrowed at apex, reaching only upto one fourth way to metapleural margin; evaporatorium broad with subprominent anterior and posterior margins, covering two-third of sternite; legs pilosed. **Abdomen:** Abdomen slightly ampliate; connexiva well exposed at repose; hemelytral membrane passing slightly beyond abdominal apex; ventroanterior margin of abdominal sternite VII concave and sinuate, somewhat dome shaped, ventroposterior margin inverted U-shaped with subrounded posterior angles (Fig. 507).

FEMALE:

Measurements (mm): Head length: 1.60; width across eyes: 1.85; interocular space: 1.10; interocellar space: 0.71; preocular distance: 0.96; length of posterior head including eyes: 0.80; antennal segments lengths: I: 0.45, II: 0.70, III: 0.82, IV: 0.85, V: 1.07; pronotal length: 2.30; width across humeral angles: 6.27; scutellar length: 3.50; scutellar width: 3.50; length of abdomen: 4.25; maximum width of abdomen: 5.0; length of rostral segments: I: 0.76, II: 1.28, III: 0.72, IV: 0.76; Distance - base scutellum-apex clavus: 1.90; apex clavus-apex scutellum: 1.60; apex scutellum-apex abdomen including membrane: 2.08; total body length: 8.5.

Coloration and Structure: Body coloration and form similar to males except, paler in color and punctations less dense; abdomen yellow, thickly and densely punctured with black; central longitudinal abdominal disk shining black impunctate; genital capsule brownish yellow punctated and pilosed; ventroanterior and ventroposterior margins of abdominal sternite VII broadly concave, somewhat forming an inverted U-shaped with posterior subacute angles (Fig. 508).

Male Genitalia: Pygophore (Fig. 511) about as long as broad, lateral margins obliquely straight; subprominent dorsolateral lobes, rounded posteriorly; dorsomedian

surface sinuately concave; dorsal opening broadly concave, small; ventroposterior margin medially broadly concave; paramere (Fig. 512) bilobed, inner lobe elongated, spoon like, narrowed at apex, outer margin concave, outer lobe slightly broad, bilobed apically, outer margin convex with a distinct hump; aedeagus (Fig. 513, 514) with sclerotized theca, distally broad; bilobed dorsolateral membranous conjunctival appendages that are fused basally; a pair of small leaf like semisclerotized medial penial lobes, placed widely apart distally and fused medially; vesica very short, not reaching posterior margins of dorsal membranous appendages.

Female Genitalia: 1st gonocoxae somewhat broadly triangular, posterior margins sinuate and convex, placed medially wide apart, outer margins distinctly convex, acute apices; 2nd gonocoxae fused medially, with posterior margin sinuately convex; 8th paratergites broad, triangular, posterior margins sinuately convex; 9th paratergites distinctly lobulate, broadly rounded at posterior margins, placed close to each other, outer margins concave, reaching fused posterior margins of 8th paratergites (Fig. 509); spermatheca (Fig. 510) with distinct proximal and distal flanges; pump region sclerotized, tube like, shorter than distal spermathecal duct; bulb oblong; medial dilation broad, with elongate proximal dilation directed posteriad; proximal spermathecal duct distinctly very longer than distal spermathecal duct.

Population Variation: Coloration of entire body varies from being darker brownish yellow to paler; humeral angles distinctly with less punctation; anterolateral margins of pronotum and basal scutellar spots sometimes with orangish tinge; punctation may also vary from being dense to more thicker, color of punctures may be light brown, dark brown or even black in some.

Material Examined:

Punjab: Patiala, 12. viii. 2009 - 1♀; Hoshiarpur, 19. viii. 2009 - 1♀; Talwara, 20. viii. 2009 - 1♀; Ropar 6-7. ix. 2010 - 6♀♀, 6♂♂

Himachal Pradesh: Solan, 18-19. viii. 2010 - 9♀♀, 5♂♂

Distribution: Pakistan; India (Punjab, Himachal Pradesh, Maharashtra, Paschim Banga, N. W. Himalaya).

Remarks: The species closely resembles *Carbula insocia* in having humeral angles of pronotum subprominent, either with short acute or without spines; scutellum yellowish-brown with dark brown punctation, basal angles with impunctate brownish yellow spots, apex concolorous and punctate; head somewhat subsquare; pygophore as long as broad; theca elongate and paramere with lateral process elongate, subacute at apex without bifurcation. However, it can be easily separated from the same in having humeral angles of pronotum with short subacute spines, slightly directed backwards; 9th paratergites broad, subequal to 8th paratergites, not passing beyond the latter; vesica short, not reaching the middle of penial lobes and outer margin of paramere with a distinct medial hump. It has been recorded as a pest of sesamum in India recently and is a new record from North India.

***Carbula insocia* (Walker)**

(Figs. 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526)

Pentatoma bimaculata, Westwood (1837) in *Hope Cat.*, 1: p. 35.

Eysarcoris insocia, Walker (1868) *Cat. Het.*, 3: p. 556.

Carbula insocia: Distant (1900) *Proc. Zool. Soc. Lond.*, p. 812.

MALE:

Measurements (mm): Head length: 1.55; width across eyes: 1.65; interocular space: 1.40; interocellar space: 0.70; preocular distance: 0.80; length of posterior head including eyes: 0.60; antennal segments lengths: I: 0.50, II: 0.70, III: 0.55, IV: 0.75, V: 1.0; pronotal length: 1.80; width across humeral angles: 4.85; scutellar length: 2.50; scutellar width: 2.50; length of abdomen: 3.20; maximum width of abdomen: 4.60; length of rostral segments: I: 0.70, II: 1.10, III: 0.40, IV: 0.60; Distance - base scutellum-apex clavus: 1.80; apex clavus-apex scutellum: 0.70; apex scutellum-apex abdomen including membrane: 2.08; total body length: 7.6.

Dorsal Coloration: Head dark brownish yellow with confluent moderate size fine brown punctures; eyes dark brown with reddish tinge; ocelli red; antennae brownish yellow, apical segment darker; pronotum brownish yellow with dark brown punctures, two concolorous transverse anterior impunctate levigate callosities, anterolateral margins paler; scutellum with thick dense dark brown punctures, a yellow levigate spot at each scutellar basal angle, apex darker impunctate; clavus, corium and costa

concolorous with similar punctures, anteriormost portion of costal margin paler; hemelytron membrane hyaline.

Ventral Coloration: Labium brownish yellow, apex black; legs pale brownish yellow spotted with brown; metathoracic scent gland peritreme faint yellowish punctated with brown; abdomen longitudinal disk chocolate brown, finely punctate, lateral areas brownish yellow, punctured with dark brown; connexiva brownish yellow with blackly punctured anterior and posterior margins; genital capsule pilosed with short yellow hairs.

STRUCTURE:

Head (Fig. 516): Head strongly deflected; paraclypeal lobes equal to slightly medially raised clypeus; former sinuate above eyes, anterolaterally reflexed upwards, apex distinctly broad and somewhat truncate; antennal segmental formula – I<III<II<IV<V; labium just reaching metacoxae, labial lengths formula – III<IV<I<II.

Thorax: Pronotum (Fig. 517) anteriorly declivent, anterior pronotal angles protruded anteriorly as short subacute tubercles, anterolateral margins crenulated and concave, slightly reflexed upwards, humeral angles subprominent obtusely rounded, posterior margins almost straight; broad at base, beyond frena distinctly narrowed into somewhat V-shaped apical lobe; metathoracic scent gland osteolar peritreme (Fig. 518) short, raised, curved, narrowing at apex, reaching one fourth way to metapleural margin; evaporatorium broad, with well defined subprominent anterior and posterior margins, covering two third of sternite; legs with bristles and a tuft of multiple spines on the lower surface of foretibia. **Abdomen:** somewhat rugulose; hemelytral membrane passing beyond abdominal apex; ventroanterior and ventroposterior margin of abdominal sternite VII broadly concave, somewhat sinuate, an inverted V-shaped with subrounded posterior angles (Fig. 519).

FEMALE:

Measurements (mm): Head length: 1.50; width across eyes: 1.75; interocular space: 1.15; interocellar space: 0.71; preocular distance: 0.82; length of posterior head including eyes: 0.77; antennal segments lengths: I: 0.35, II: 0.68, III: 0.57, IV: 0.79, V: 1.01; pronotal length: 2.30; width across humeral angles: 4.95; scutellar length: 2.80; scutellar width: 2.80; length of abdomen: 3.75; maximum width of abdomen:

4.95; length of rostral segments: I: 0.77, II: 1.10, III: 0.55, IV: 0.63; Distance - base scutellum-apex clavus: 1.90; apex clavus-apex scutellum: 0.90; apex scutellum-apex abdomen including membrane: 1.90; total body length: 8.25 .

Coloration and Structure: Females are slightly darker than males; basal scutellar spots smaller and slightly pale; ventral surface of abdomen sparingly punctated; 5th, 6th and 7th abdominal segments less pilosed; ventroanterior and ventroposterior margin of abdominal sternite VII deeply concave somewhat an inverted V-shaped, with subacute connexival angles (Fig. 520).

Male Genitalia: Pygophore (Fig. 523) about as long as broad, lateral margins concavely sinuate; dorsolateral lobes subprominent, rounded posteriorly; dorsomedian surface sinuately concave; dorsal opening small; ventroposterior margin medially concave; paramere (Fig. 524) bilobed, inner lobe elongated, spoon like, narrowed at apex, outer margin concave; outer lobe slightly broad, bilobed apically, outer margin convex; aedeagus (Fig. 525, 526) with sclerotized theca, broad distally, with bilobed dorsolateral membranous conjunctival appendages that are fused basally, free at apex; a pair of elongated leaf like semisclerotized medial penial lobes, not fused basally; vesica very short and thin, not reaching margin of dorsal membranous appendages.

Female Genitalia: 1st gonocoxae somewhat triangular, posterior margins sinuate and convex, placed medially wide apart, outer margins moderately convex, inner margins straight, apices acute; 2nd gonocoxae fused medially with posterior margin convex; 8th paratergites triangular, posterior margins convex; 9th paratergites lobulate, broadly rounded at posterior margin, placed wide apart, outer margins straight, passing fused posterior margins of 8th paratergites (Fig. 521); spermatheca (Fig. 522) with distinct proximal and distal flanges; pump region sclerotized, tube like, subequal to distal spermathecal duct; bulb rounded; medial dilation long with elongate proximal dilation, directed posteriad; proximal spermathecal duct distinctly very longer than distal spermathecal duct.

Population Variation: Color varies from being dark brownish yellow to more paler and in some with reddish tinge; size and color of basal scutellar spots variable; connexiva sometimes with red tinge; black maculate fascia on abdominal disk may be well developed, or reduced in some; thickness and density of punctures vary a lot.

Material Examined:

Punjab: Ropar, 7. viii. 2010 - 3♀♀, 1♂ ; Patiala, 6. ix. 2010 - 1♀

Himachal Pradesh: Bilaspur, 21. vii. 2010 - 1♀; Solan, 18-19. viii. 2010 - 6♀♀, 2♂♂

Distribution: Pakistan; India (Punjab, Himachal Pradesh, Maharashtra, Karnataka, N. W. Himalaya).

Remarks: *Carbula insocia* closely resembles *Carbula bigutatta* as discussed earlier in keys and descriptions. It has been recorded as a pest of *Medicago sativa* Linnaeus (alfalfa). It is a new record from North India.

SUBFAMILY – PODOPINAE AMYOT AND SERVILLE

Diagnosis: Coloration usually varies from being yellow brown to dark brown to even being black; antenniferous tubercles visible from above;; antennae four or five segmented, pronotum with lateral margins usually toothed or tuberculate; tarsi three segmented; trichobothria paired behind each spiracle near or on spiracular line; scutellum distinctly enlarged, covering most of forewings, often reaching apex of abdomen; frena well developed, distinctly shorter than scutellum; phytophagous in nature, usually found in dump and marshy habitats, some are attracted to light, some species of *Scotinophara* are serious pests of rice and other cereal crops in Asia and Africa.

GENUS *SCOTINOPHARA* STÅL

Scotinophara, Stål (1867) *Öfv. Kongl. Vet. Akad. Forh.*, **24** (7): p. 502.

Podops, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 72.

Scotinophara, Schouteden (1903) *Rh. Aeth.*, **1**: p. 120.

Type species – *Scotinophara fibulata* Germar

Diagnosis: Body oval and moderately convex; head wider across eyes than long and shorter than pronotum; lateral margin of head tapering with basal part of preocular region sinuated; tylus commonly elevated at least from middle portion to posterior part of head; juga never contiguous in front of the tylus, varying in length from longer to shorter than tylus; eyes prominent and pedunculate; from above, antenniferous tubercles conspicuous and pointed anteriorly or obliquely; five segmented antenna,

with a tendency for fusion of the 2nd and 3rd segments, 1st and 2nd segment commonly subequal in length and always shorter than 3rd, terminal segment longest; position of apex of labium varying from near front end of hind coxae to abdomen; pronotum across prehumeral processes at least twice as wide as long, disk of pronotum varies from a sharply to a weakly visible transverse impression near or along the middle; callosities frequently with tubercle like elevations; anterolateral processes toothed, or elongately spine like, with tip projecting in different directions; scutellum frequently as long as abdomen or slightly shorter and contracted before the middle, covering most of abdomen and membranous part of corium, leaving hemelytra free; odoriferous orifices situated closer to posterior coxae than to metapleura, surrounding surfaces wrinkled; spiracles set closer to anterior than to lateral margin; ventral body darker than dorsal side with lateral margins paler than or concolorous with the body; head always black; body color varies from brownish yellow, yellowish brown, reddish brown, dark brown to black.

Remarks: The genus is represented by 63 species from the world. Earlier it has been and is still confused with genus *Podops* Laporte and other closely allied genera. Members have been reported as a serious pest of rice causing severe damage in many countries of Asia. e.g. *S. lurida* (Burmeister), *S. coarctata* (Fabricius) and *S. vermivulata* (Voll.).

Scotinophara ochracea (Distant)

(Figs. 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538)

Podops ochracea, Distant (1901) *Ann. Mag. Nat. Hist.*, **8**(7): p. 241.

Podops ochracea, Distant (1902) *Faun. Brit. Ind. Rh.*, **1**: p. 241.

Scotinophara ochracea: Kirkaldy (1909) *Cat. Hem.*, **1**: p. 235.

MALE

Measurements (mm): Head length: 0.80; width across eyes: 1.40; interocular space: 0.80; interocellar space: 0.50; preocular distance: 0.50; length of posterior head including eyes: 0.40; antennal segments lengths: I: 0.25, II: 0.20, III: 0.40, IV: 0.70, V: 0.70; pronotal length: 1.60; width across humeral angles: 3.60; scutellar length: 4.0; scutellar width: 2.40; length of abdomen: 3.04; maximum width of abdomen: 3.75; length of rostral segments: I: 0.35, II: 0.65, III: 0.45, IV: 0.50; Distance - base

scutellum-apex clavus: 1.0; apex clavus-apex scutellum: 3.0; apex scutellum-apex abdomen including membrane: 4.25; total body length: 6.0.

Dorsal Coloration: Head black with dense golden yellow pubescence, small area in front of eyes black, impunctate, not pilosed; eyes reddish black; ocelli yellow with reddish tinge; antennae dark brownish with yellow tinge, fifth segment speckled with black; pronotum dark yellowish brown, pilosed with golden hairs, thickly punctured with dark brown, more anteriorly; anterior area with two transverse black callosities, anterior pronotal spine black; scutellum concolorous to pronotum, with superficial longitudinal series of dark brown punctures; basal scutellar angle with small black foveate spots and three dark yellowish brown impunctate spots (two angular, one medial); clavus, corium and costa paler, corium with subapical impunctate spot; hemelytral membrane transparent; connexiva darker, posterior angles pale with short hairs.

Ventral Coloration: Labium dark yellowish brown; head, sternum and medial broad abdominal disk black with golden yellow pubescence; lateral margin of sternum yellowish brown; evaporatorium and metathoracic scent gland opening black; abdomen black medially, moderately pilosed with golden yellow hairs, laterally brownish yellow, punctured with dark brown; spiracles chocolate brown; connexiva yellowish brown with reddish tinge; connexiva exposed at repose; genital capsule black with tinges of red, yellow and brown; legs dark yellowish brown, femora with reddish tinge.

STRUCTURE:

Head (Fig. 528): Head broad, strongly declivent, paraclypeal lobes slightly longer than medially raised clypeus, but not meeting in front; former slightly sinuate above eyes, reflexed anterolaterally; antenniferous tubercles prominent, acutely produced, distinctly visible from above, placed below lateral margins of head; antennae short, 1st segment almost reaching apex of head, antennal segmental formula – II<I<III<IV=V; labium reaching metasternum, labial lengths formula – I<III<IV<II;

Thorax: Pronotum (Fig. 529) moderately deflected, with horizontal foveate line anteriorly, a medial depression, anterior pronotal margin distinctly concave, angles produced as long anteriorly directed spines; anterolateral margins obliquely straight; humeral angles subprominent with short obtuse spines; scutellum reaching apex of

abdomen, narrowed beyond base as U-shaped; frenal region distinctly shorter than post frenal; apex of corium shorter than abdomen; sternum furrowed; metathoracic scent gland osteolar opening (Fig. 530) short, narrowed at apex; evaporatorium somewhat finger like, with well defined narrowed anterior margin and short subrounded posterior margin; legs pilosed, foretibiae with apically produced acute projection. **Abdomen:** Abdominal disk medially convex laterally flattened; connexiva slightly exposed at repose; hemelytral membrane passing slightly beyond abdominal apex; ventroanterior margin of abdominal sternite VII deeply concave, somewhat an inverted V-shaped (Fig. 531).

FEMALE:

Measurements (mm): Head length: 0.90; width across eyes: 1.50; interocular space: 0.90; interocellar space: 0.60; preocular distance: 0.50; length of posterior head including eyes: 0.40; antennal segments lengths: I 0.30, II 0.25, III 0.40, IV 0.70, V 0.70; pronotal length: 1.80; width across humeral angles: 3.75; scutellar length: 4.10; scutellar width: 2.56; length of abdomen: 3.20; maximum width of abdomen: 3.87; length of rostral segments: I 0.35, II 0.65, III 0.45, IV 0.50; Distance - base scutellum-apex clavus: 1.12; apex clavus-apex scutellum: 3.0; apex scutellum-apex abdomen including membrane: 4.25; total body length: 6.75.

Coloration and Structure: Females are similar to males in body form and coloration, except being slightly darker; lateral area of abdomen dark yellowish brown with reddish brown punctures; spiracles dark brown; ventroanterior margin of abdominal sternite VII moderately concave, somewhat an inverted U-shaped, ventroposterior margin broadly concave (Fig. 532).

Male Genitalia: Pygophore (Fig. 535) slightly longer than broad with lateral margins straight; dorsolateral lobes, narrowed and truncated posteriad; dorsal opening small; ventroposterior margin concave; paramere (Fig. 536) with short stem, broadly flattened blade with its outer margin convex, inner margin concavely sinuate with distinct ridges; aedeagus (Fig. 537, 538) with somewhat suboval theca, a single trunk like medial dorsal membranous conjunctival appendage, a pair of semisclerotized dorsolateral membranous conjunctival appendages somewhat U-shaped, a pair of sclerotized comma shaped medial penial lobes that are not fused basally; vesica long reaching outer margin of penial lobes; ejaculatory reservoir broad.

Female Genitalia: 1st gonocoxae somewhat rectangular, medially placed wide apart with concave posterior margin; 2nd gonocoxae medially fused, posterior margin concave; 8th paratergites triangular, and large; 9th paratergites elongate, lobe like, rounded at posterior margin, just reaching fused posterior margin of 8th paratergites with medially produced inner margins and straight outer margins (Fig. 533); spermatheca (Fig. 534) with distinct distal and proximal flanges; pump region tube like, subequal to thin distal spermathecal duct; bulb oblong with a small thumb like process; medial dilation balloon like, posterior spermathecal duct slightly longer than distal spermathecal duct.

Population Variation: No structural variations observed, however minor color variations in color of punctures on dorsal surface and abdominal venter are visible.

Material Examined:

Himachal Pradesh: Solan, 15. x. 2011 - 2♀♀, 1♂

Distribution: Myanmar; Thailand; Philippines; India (Punjab, Himachal Pradesh).

Remarks: The species has characteristic rectangular 1st gonocoxae, oblong spermathecal bulb without any process and a pair of comma shaped medial penial lobes. It has been recorded as a serious pest of rice in many countries of Asia, usually found feeding on grasses in active season. It is a new record from North India.