MATERIAL AND METHODS

The discourse of taxonomic identifications in the present work is mainly carried out by the author on the Ichneumon flies collected from the various parts of Maharashtra during 1986-89. In addition, collections of Dr.s P. K. Nikam, K. S. Hable, L. J. Kanhekar, S. M. Nikam, and D. L. Phand were utilized for the present study. Ichneumonids were collected on grass and weed, in the shades of trees, on lucerne grass, near the crops like sugarcane, groundnut, sorghum, cotton, under the orchards, trees and near the light during night from some districts of Maharashtra. A lightweight Malaise Trap (Townes, 1972), an additional device was also used for the collection of huge number of Ichneumon parasitoids during July to March.

The collected specimens were killed in killing bottles and preserved in the 70% alcohol. The killed specimens were pinned, dried and kept in the insect store boxes. Antennae, wings, legs and genitalia were mounted on the slides in Distrene Plasticizer Xylene.
The details of the morphological peculiarities of the collected specimens were examined under monocular and binocular microscopes for taxonomic studies. Drawings were made with the help of binocular Camera Lucida.

Male genitalia were cut from the abdominal tips and treated in the liquid ammonia for about 16 hours to soften the dried material. Afterwards these tips of abdomen with the male genitalia boiled in 7% potassium hydroxide solution for 5 minutes, to dissolve the muscles of genital complex; then tips were washed in distilled water to remove excess of potassium hydroxide. The male genitalia, subgenital plate and gonoring etc. were separated under binocular microscope with the help of fine needles and forceps. The male genitalia and its parts were passed through different alcohol grades for dehydration process. The material finally cleared in xylol and mounted on slides in D.P.X.

The diamensions quoted in the work are in millimeters and were measured with the help of eye-piece micrometer.
The identifications of the taxa to the levels of subfamilies, tribes, subtribes, genera and subgenera were made with the aids of the monumental volumes "The genera of Ichneumonidae" by Townes (Part I to III; 1969a, 1969b, 1969c and Part IV 1971) and "Revision of Gelini (1983). " A catalogue and re-classification of the Indo-Australian Ichneumonidae by Townes, Townes and Gupta (1961) and "Catalogue of the Indo-Australian Ichneumonidae", Part I and II by Gupta (1987) were consulted for species treatments. In addition, the following volumes dealing with tribes, genera, species and subspecies etc., viz., Indo-Australian *Xanthopimpla* (Townes and Chiu 1970); *Ichneumonologia Orientalis* IV (Gupta and Maheshwary, 1977); and *Ichneumono*logia Orientalis V (Gupta and Gupta, 1977) were also followed since these contain almost all information on the concerned taxa studied in this work. Available keys to the species of some genera in the above volumes were consulted for determination of the taxa. The keys, which were not available, have been prepared with the help of scattered keys, literature and available types.
Fig. 2: Head, Thorax and Abdomen of An Ichneumonid.

(a) Head, front view    (b) Head, posterior view,
(c) Thorax, lateral view (d) Abdomen, lateral view.

AREAS OF THORAX

1. Median lobe of mesoscutum, 16. Juxtra coxal area
2. Lateral lobe of mesoscutum,
   1 & 2. Mesoscutum
3. Scutellum
4. Postscutellum
5. Hind margin of metanotum
6. Tegula
7. Subtegular ridge
8. Collar
9, 9, & 10. Pronotum
10. Hind corner of pronotum
11, 12, & 18. Mesopleuron
12. Speculum
13. Mesepimeron
14. Upper division of metapleurum
15. Lower division of metapleurum

CARINAE AND GROOVES OF THORAX

A. Notalus  I. Submetapleural carina,
B. Epomia    J. Pleural carina,
C. Prepectal carina    K. Lateral longitudinal carina of
D. Mesopleural fovea    propodeum
E. Mesopleural suture    L. Median longitudinal carina of
F. Sternaulus    propodeum
G. Postpectal carina    M. Basal transverse carina of
H. Juxtraxcoxal carina    propodeum
   N. Apical transverse carina of
   O. Propodeal apophysis or crest
   P. Costula

ABDOMEN, LATERAL VIEW

1. Petiole
2. Post petiole
3. First tergite
4. First sternite
5. Turgo-sternal suture
6. Ventrolateral carina
7. Dorsolateral carina
8. Median dorsal carina
9. Glymma
10. Spiracle
11. Second tergite
12. Thyridium
13. Apical margin
14. Pygostyle
15. Ovispositor
16. Ovispositor sheath
17. Subgenital plate
Fig. 3: Wings and leg of an Ichneumonid

(a) Fore wing     (b) Hind wing     (c) Leg

VEINS OF WINGS

(a) Fore Wing             (b) Hind wing

AB = Costa                ab = Costella
CD = Subcosta             cde = Subcostella
EF = Metacarpus           ef = Metacarpella
HIJ = Radius              dgh = Radiella
KL = Cubitus              mm = Discoidella
PQ = Discoides            jkl = Cubitella
RS = Subdiscoides         kg = Intercubitella
UP = Submedius            ij = Mediiella
VW = Brachius             OP = Submediella
BE = Stigma               pq = Brachiella
DP = Basal vein           bh = Basal hamulus
IL = First intercubitus   dh = Distal hamuli
JN = Second intercubitus  rs = Axillus
KL = Discocubitus         jmp = Nervellus
K = Ramulus
CK = First recurrent Vein
MS = Second recurrent vein
Y = a bulla
PV = Nervulus
QR = Post nervulus

CELLS OF WINGS

(a) Fore wing             (b) Hind wing

1) Radial cell           12) Costellan cell
2) Median cell           13) Radiellan cell
3) Discocubital cell    14) Mediiellan cell
4) Arolet(2d.cub.cell)  15) Cubitellan cell
5) Third cubital cell   16) Discoidellan cell
6) Second discoidal cell 17) Submediellan cell
7) Third discoidal cell  18) Brachiellan cell
8) Submedian cell       19) Analellan cell
9) First brachial cell  20) Postellan cell
10) Second brachial
11) Anal cell
       BEH = stigma
(c) LEG

1. Coxa
2. First trochanter
3. Second trochanter
4. Femur
5. Tibia
6. Tibial bristles
7. Tibial spurs
8. Tarsus
9. Claw
10. Hairs
Fig. 4: Genitalia of an Ichneumonid

a) Genital capsule of male
b) Subgenital plate,
c) Ovipositor of female.
The literature was consulted from the collection of Dr. P. K. Nikam. Few publications were obtained from the authors and from the Libraries, Mahatma Phule Agricultural University, Rahuri (Maharashtra) and Indian Agricultural Research Institute, New Delhi.

The most of the terminologies adopted here for various structures follows that of Townes (1969). A few terms also have been utilized from the works of Morley (1913) and Peck (1937) (Whenever necessary, certain specialized points require some mention). The wing venation, names of wing cells and morphological peculiarities of other body parts are shown in figures 2 to 4.

Some of the relative measurements recorded and expressed as indices are followed from Gauld (1976) in the description of the new species, explains as under:

1) \( AI \) (Abdominal index) = \( \frac{\text{Length of tergite 2}}{\text{Length of tergite 3}} \)
ii. BAI (Brachio-anal index of fore wing) = 
\[
\frac{\text{Length of PQ (discoideus) between PV (nervulus and QL (discocubitus)}}}{\text{Length of VW (brachius) between PV and RW (discoideus)}}
\]

iii. BI (Brachial index of fore wing) = 
\[
\frac{\text{Length of PV (nervulus)}}{\text{Length of QRW (Postnervulus)}}
\]

iv. DBI (Disco-brachial index of fore wing) 
\[
\frac{\text{Length of PQ (Part of discoideus)}}{\text{Length of QL (discocubitus)}}
\]

v. ICI (Intercubital index of forewing) 
\[
\frac{\text{Length of IL (first intercubitus)}}{\text{Length of JN (second intercubitus)}}
\]

vi. RI (Radial index of forewing) 
\[
\frac{\text{Length of IF (second abscissa of radius)}}{\text{Length of HI (first abscissa of radius)}}
\]

vii. NI (Nervellar index of hind wing) 
\[
\frac{\text{Length of jm (Part of nervellus above discoidella)}}{\text{Length of mp (Part of nervellus below discoidella)}}
\]