Chapter 7

general discussion
7.1 General Discussion:

As regards the population dynamics of rice bugs maximum population was recorded in Boro season followed by Aus and Sali seasons. Out of three study sites viz., Trongmara, Dudhpatil and Sonai, Dudhpatil area witnessed more population as compared to other two sites. It may be due to logged water sustained with warm humid condition which is congenial for the multiplication of pest species. Findings also envisage that only during inflorescence to milky stage of the grains population appears as peak. However, environmental factors play a monitoring role for the dynamics of rice bug population.

Eleven alternative hosts Echinochloa crusgalli (L.) Beauv, Echinochloa colonum (L.) Link, Poa annua L., Dectylotenum aegytiu (L.) Beauv, Cyperus iria L., Eleusine indica (L.) Gaertn., Mangifera indica L, Polygonum hydropiper (L.) Delabre, Euphorbia hirta L., Paspalum scrobiculum L., Leeria haxendia (SW) belong to families Poaceae, Cyperaceae, Euphorbia and Annacardacea has been reported first time from Cachar district. Alternative hosts plant play an important role in supporting the pest population more particularly in absence of the main host in the field. Knowledge of the host range breadth and the mechanisms restricting the host range is important for monitoring bug occurrence and controlling the pest.

The preliminary screening trials of various rice cultivars revealed significant variation of preferences among the various cultivars. As far as season wise varietal preference is concern, Aus season is found to be the most prefered by the pest. In Boro season the most preferred cultivar was Chochalate followed by Aaswati out of the ten varieties tested.
In Aus season the most preferred was IR-36. Second preferred was Sonamukhi. Least preference group was considered as Agni Sali and Ranjit. In Sali season, out of the ten varieties, most preferred one was observed by Aizong followed by Konkus biren and Krishna followed by Joriya and Mohanbhog. No varieties were found to be immune or resistant to *L. acuta*.

*L. acuta* caused various degree of damage in different rice cultivars. During Boro and Aus seasons, out of the varieties studied, maximum damage percent was recorded on HYV (Aaswati) variety in Boro and IR 36 in Aus season. During Sali season local rice variety oriya was found to be most affected with 26.49% damage.

Diurnal activity in three crop seasons revealed that the insect population was higher in Aus and Boro seasons as compared to Sali season. It may be due to seasonal variation. The insect activity was found to be higher in morning and evening time and less in noon and very early morning. Maximum activity was observed at 9 – 10 hours morning in Aus and Sali seasons and 10 -11 hours in Boro season.

As regards the life cycle and morphometry it was observed that there was no much variation among the three seasons. However, Boro season was witnessed as optimum season for its completion of life cycle.

Present findings based on the reduction in pest population, which evident that out of the seven insecticides tested against the gundhi bug it proves that pyrethroid group viz., Fenvalerate (0.005%) and Cypermethrin (0.001%) performed better than any other pesticide tested. Second effective group is a mixture of pyrethroid and chlorinated hydrocarbon. All other treatments also gave effective results. Pyrethroids are photodegradable, short residual life and possess less mammalian toxicity. Therefore, these
chemicals with aforesaid concentration may be recommended for the management of gundhi bug. Malathion was found to be less effective in present study than the other insecticides.

As regards the pathogenicity of five microorganisms tested, it indicated that all the treatments differ significantly among each other i.e they belongs to different groups. From the study, it is seen that both in laboratory and in field conditions, maximum reduction of pest population were found in plot treated with Metarhizium anisopliae and Beauveria bassiana. It can be concluded that Beauveria bassiana (1.0%), Metarhizium anisopliae (1.0%) may be recommended for the control of rice gundhi bug.

Bioeffectiveness of three bio-pesticides were tested each consisted of two concentration against L.acuta in field condition. The study reveals that the use of two concentrations of each product no clear-cut performance is noticed. Although Sonata (0.2%) a plant origin material gave more than 90.90% reduction of pest population on 5th day after application. On 7th day after treatment by Achook (0.6%), a neem product gave highest efficacy. Considering the long term effectiveness, Achook (0.6%) and Sonata (0.4%) may be recommended against the bug population in agro-climatic conditions of Cachar district of Assam.

As far as bio-efficacy of plant extract materials is concern it reveals that C. citrates (petroleum ether solvent) gave very highly satisfactory results up to a week against gundhi bug in second year of trial. Although neem (A. indica) also proved highly satisfactory with 1.5% conc. with petroleum ether solvent in second year but C. citrates is abundantly locally grown in agro-climatic conditions of southern part of Assam. Study also indicates
second year trial was more satisfactory than the first year in all the case of all the plant
products.

Considering the efficacy, C. citrates (1.5%) and A. indica (1.5%) may be
recommended against Lacuta in the agro-climatic condition of Cachar District of Assam.

As regards the use of traditional practices regular monitoring of the pest, hand
picking to killed them is quite common in this valley. Other practices reported were use of
raw cow/goat dung mixed with water and sprayed in the infected field, twigs of Nishi plant
(Melastoma malabatricum Linn.) and Germany bon (Eupatorium odorum) were planted on
the four corner of the field. Dead crab/snails were kept in the corner of the field as a trap.
Wood ash and light trap method were also practices in this valley.

As these practices are community based, age old learnt from forefather, cheaper
and no input of toxic chemicals may be useful for sustainable pest management.

An immediate steps needs to proper documentation of these inherent practices of
farmers practiced in Southern Assam.