Abstract of Ph.D. Thesis

Name of Candidate: Rashmi Gupta

Title: Taxonomic studies on families Coreidae and Lygaeidae (Hemiptera: Heteroptera) from North India supplemented with RAPD markers

The research work has been carried out on an entomological problem entitled, “Taxonomic studies on families Coreidae and Lygaeidae (Hemiptera: Heteroptera) from North India supplemented with RAPD markers”. The thesis has been compiled under the chapters introduction, review of literature, materials and methods, observations and discussion, general conclusions and scope for further research, summary and literature cited. In introduction first of all the importance of biodiversity is discussed and the role of taxonomy for conservation and maintenance of biodiversity has been stressed upon. General and diagnostic characters of families Coreidae and Lygaeidae are discussed. Classification of family given by Schuh and Slater (1995) has been followed. Economic importance of the families has also been discussed followed by need and importance of RAPD technique. An exhaustive review has been provided about the suborder Heteroptera, subfamilies Coreidae and Lygaeidae. It is followed by review of literature for molecular techniques in insect taxonomy in general with particular reference to RAPD.

The present study is based upon the examination of approximately 1100 adult specimens referable to two subfamilies, 12 genera and 38 species belonging to family Coreidae and 900 adult specimens referable to 5 subfamilies, 19 genera and 28 species under the family Lygaeidae. Collection tours were arranged during November, 2008 to October, 2011 covering different states of North India viz., Punjab, Haryana, Himachal Pradesh, Uttarakhand and some parts of Jammu and Kashmir, union territory of Chandigarh and NCR region of New Delhi. Various methods have been used for collection of bugs e. g. by beating vegetation, by sorting leaf litter, sweeping net method, with the help of light trap method etc. Mounting of insects was done in two ways- pin mounting and card mounting. The collection was preserved in air tight boxes which were periodically fumigated. Each specimen was labeled carrying information about the collection locality, date of collection, name of collector and host plant (if known). For dissection of male genitalia methodology given by Pruthi (1925), Ashlock (1957) and for female genitalia methodology given by Scudder (1963) has been followed.
Species were identified mainly on the basis of Fauna of British India given by Distant (1902, 1908, 1910, and 1918). Relevant literature was used for identification of species published afterwards. Genital characters have been employed for correctly differentiating the species which were closely similar. The descriptions have been based on the most typical specimen selected in each case and considered to have the basic characters of form, color, size, abdominal lines, terminal abdominal sterna, antennae etc. Population variations have been mentioned, wherever observed. Diagnostic features of each genus are given along with its first reference, synonymy and type species. For each studied species, the original reference, synonymy (if any), detailed description, material examined, old and new distribution and remarks are provided. Photography of all species has been done both for morphological parts (whole insect, head, pronotum, scent gland, ventral view of male and female abdomen) and genitalic parts (both male and female genitalia). Four new species have been proposed under one genus of family Coreidae. These are *Cletus pathankotensis* sp. nov., *C. pseudotrigonus* sp. nov., *C. tashiae* sp. nov., and *C. pygophorus* sp. nov.

Different techniques for RAPD studies have been discussed and a protocol has been standardized. All the bands and cardiograms for different species and samples of same species from different localities have been provided. Interpretation of RAPD studies has been given, wherever relevant.

It can be concluded from the foregoing discussion that the families Coreidae and Lygaeidae have bee extensively studied taxonomically throughout the world. Research is still going on to update our knowledge about these two families having considerable economic importance. However the scenario is not very encouraging as far as studies on Indian fauna are concerned. After a series of monumental publications by Distant in the pre-independence era, no effort has been made to systematically explore different areas in order to know the latest situation in the country. Though taxonomy had taken a back seat as a whole, bugs have remained totally ignored at the hands of Indian workers. With growing concept about mapping our biodiversity, initiatives have recently been taken in this direction. The present work should also be considered as a contribution in this direction.