

External Scent Efferent System of Pentatomidae (Hemiptera: Pentatomoidea)

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ABSTRACT

Pentatomidae are represented by four subfamilies and 86 genera from south India. Six types of external scent efferent system along with the reduced form are recognised in Pentatomidae. This is important to diagnose higher taxa in Pentatomidae in conjunction with one or two supporting diagnostics.

PENTATOMIDAE, commonly called stink bugs, are known for their powerful repellent odour produced by both nymphs and adults. Nymphs have dorsal abdominal glands (DAG) that open medially between the abdominal tergites III-IV (DAG I), IV-V (DAG II) and V-VI (DAG III) and in adults the scent glands are situated on metathoracic region. The volatile, odoriferous fluid produced by the metathoracic scent glands (MTGs) is known for guarding against predation and also acting as alarm pheromones (Durak and Kalender, 2008). Though the development of MTGs is an autapomorphic trait for Heteroptera, Pentatomidae show considerable variation in external morphology of various structures associated with external scent efferent system. This paper attempts to explore these variations and examine their utility as diagnostics for higher level taxonomy in Pentatomidae.

The MTGs were explicitly referred as thoracic scent efferent system and defined by Kment and Vilímová (2010) as a complex of cuticular structures inside metathorax as well as on thoracic surface, delivering the scent secretion on the body surface. They also reviewed the terminology of thoracic scent efferent system and divided it into internal and external scent efferent system. The external scent efferent system is more recent in evolution and more variable than the internal one (Carayon 1971). The essential parts of external scent efferent system are ostiole, peritreme and evaporatorium and provide useful diagnostic characters at various taxonomic ranks within Heteroptera and also for analysing various phylogenetic hypotheses (Kment and Vilímová, 2010).

Pentatomidae collected under the ICAR Network Project on Insect Biosystematics, in the

Department of Entomology, University of Agricultural Sciences, GKVK, Bengaluru, were used for this study. The external scent efferent system of Pentatomidae were observed under the stereobinocular microscope Leica MZ16 and the photographs were made using Leica M205A Stereomicroscope with DFC 420 camera attachment.

The terminology and definition of various basic types of external scent efferent system are of Kment and Vilímová (2010). Peritreme is a variously shaped area of macroscopically smooth cuticle (the peritremal surface) with characteristic microsculpture on metapleuron, starting at ostiole and different from the evaporatorium and the surrounding unspecialized pleural surface; the peritremal surface of peritreme is usually elevated above the surrounding pleural surface. Various terminologies associated with external scent efferent system are shown in Fig. 1.

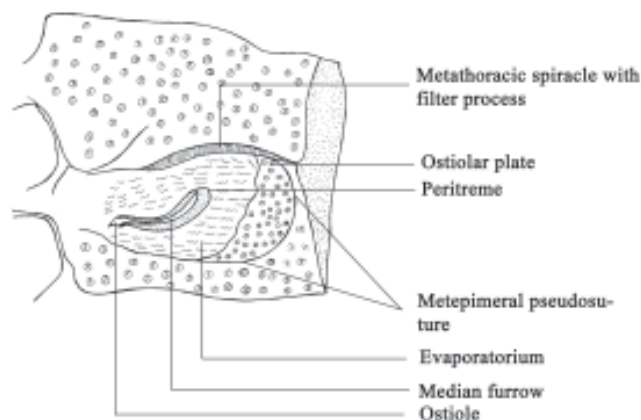


Fig. 1. Pentatomidae-External scent efferent system

The family Pentatomidae is represented by four subfamilies in India namely Asopinae, Pentatominae, Phyllocephalinae and Podopinae (Salini, 2006) and by