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Sternal pore plates (glandular areas) of male Thripidae (Thysanoptera)

LAURENCE A. MOUND
Honorary Research Fellow, CSIRO Entomology, GPO Box 1700, Canberra, ACT 2601 Australia. E-mail laurence.mound@csiro.au

Abstract

Variation is illustrated in the specialized areas known as pore plates (glandular areas or areae porosae) that occur on the sternites of males of many Thysanoptera species, and the occurrence of these structures in genera of Thripidae is tabulated. Pore plates are present in more than 60% of genera in this family, and known to be absent in about 20%; males are not known in a further 20% of the genera. In families of Terebrantia other than Thripidae, pore plates also occur in Fauriellidae, Heterothripidae and Adiheterothripidae, but not in Aeolothripidae, Melanthripidae and Uzelothripidae. Females in a very few species of Thripidae have pore plates apparently similar to those of males.

Key words: glandular areas, areae porosae, pore plates, Thripidae

Introduction

The males of many species of Thysanoptera have, on one or more abdominal sternites, porose structures that have been referred to as “glandular areas” or “areae porosae”. The more precise and descriptive term “pore plate” was used for these structures (Heming, 1970) in a brief account of their cellular structure in the thripid *Frankliniella fusca*. This term was also adopted more recently (El-Ghariani & Kirk, 2008) in morphological studies on another thripid, *Frankliniella occidentalis*, as well as in a taxonomic revision of a large group of Thripidae (Mound & Masumoto, 2009). Pore plates seem to be associated with subcuticular glandular cells that are probably the source of aggregation pheromones secreted by males (Kirk & Hamilton, 2004; Hamilton et al., 2005), and such pheromones are presumably important in sexual behaviour (Milne et al., 2002; Webster et al., 2006). Moreover, pheromones seem likely to hold considerable potential for pest control and pest monitoring through the manipulation of sexual behaviour (Hamilton & Kirk, 2003). Such techniques, based on disruption of chemical communication, hold the prospect of obviating problems associated with insecticide resistance. The limited purpose of this article is to record the distribution of pore plates in males of genera throughout the Thripidae, the family that includes most Thysanoptera pest species, with a view to facilitating future studies on evolutionary patterns in behaviour and body structure.

The pore plates considered here are particularly those found in members of the suborder Terebrantia of the Thysanoptera. In the Tubulifera, the other suborder of Thysanoptera, males of many species in the subfamily Phlaeothripinae have a porous area (Figs 1, 2) occupying much of the eighth sternite (Mound & Walker 1986; Cavallieri & Kaminski, 2007), and some species of Tubulifera have on various sternites reticulate markings that are possibly associated with glandular cells (Okajima, 1981; Mound & Palmer, 1983). In contrast, pore plates among the Terebrantia are usually discrete areas situated medially on one or several sternites. Their superficial appearance often provides character states for species-level taxonomic discrimination (Wilson, 1975; zur Strassen, 2003), but the distribution of pore plates among genera has never been documented. Moreover, details of the internal structure of pore plates have been investigated in very few species (Klocke, 1926; Bode, 1978; Sudo & Tsutsumi, 2002, 2003; Shitatani & Tsutsumi, 2005, 2006; El-Ghariani & Kirk, 2008), and thus questions remain concerning the homology between the wide range of forms illustrated here

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