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Abstract

Plant bugs belonging to the genus *Lygus* Hahn (Hemiptera: Miridae) are important pests of a wide variety of North American crops. Efforts to use biological control as one strategy in an integrated pest management approach have been impeded by a poor understanding of the endoparasitoids, particularly species of the genera *Leiophron* Nees and *Peristenus* Foerster (Hymenoptera: Braconidae) many of which parasitize the nymphal stages of *Lygus*, among other Miridae. The taxonomy of *Leiophron* and *Peristenus* species associated with agricultural habitats is reviewed based on reared material contributed by numerous researchers. Sixteen species of the two genera were found parasitizing *Lygus* nymphs, including the following eight species described as new, *Leiophron australis* Goulet, *L. simoni* Goulet, *Peristenus braunae* Goulet, *P. broadbenti* Goulet, *P. carcamoi* Goulet, *P. dayi* Goulet, *P. gillespiei* Goulet and *P. otaniae* Goulet. The species are differentiated in a key, described and illustrated. Two names are newly placed in synonymy, *L. trigonotylidis* Loan, 1974 under *Leiophron lygivorus* (Loan 1970) and *Brachistes nocturnus* Viereck, 1905 under *P. mellipes* (Cresson 1872). *Euphorus mellipes* Cresson is removed from synonymy with *P. pallipes* (Curtis). Most of the endoparasitoid species are known to be associated only with *Lygus* spp. and appear to be distinct in their distribution and their biology. Analysis of the endoparasitoid complex in southern Quebec shows that of the six species that occur in alfalfa and hay fields, four species use *Lygus lineolaris* (Palisot) as the main host. The introduced *Peristenus digoneutis* Loan has recently established in southern Quebec and although its numbers have increased substantially it has not yet had an evident impact on reducing *L. lineolaris* population levels.

Key words: *Leiophron*, *Peristenus*, biology, economic impact, key, description, *Lygus*, Nearctic

Introduction

Adults and nymphs of *Lygus* spp. cause significant economic damage to stems, leaves, fruits and seeds of a wide variety of crops in North America. Intensive research in Canada and the United States on *Lygus* bug endoparasitoids showed that euphorine braconid wasps play a role in their control (Ashfaq *et al.* 2004; Ball *et al.* 2000; Braun *et al.* 2001; Broadbent *et al.*1999; Carigan *et al.* 1995; Day 1996, 1999; Day *et al.* 1990, 1992, 1996, 1998, 1999, 2000, 2003; Haye *et al.* 2005, 2006 ; Lachance *et al.* 2001; Lim *et al.* 1976; Loan 1965, 1970, 1974a, 1980; Loan *et al.* 1976, 1987; Picket *et al.* 1998, 2000, 2001, 2002, 2003, 2005; Tillmon *et al.* 2000). The endoparasitoids belong to species of *Leiophron* and *Peristenus*. However, there is a great need to clarify the known endoparasitoid species, establish new synonymies, name new species, and produce keys to enable species identification.

In North America, 19 *Leiophron* species and 29 *Peristenus* species are known, and additional species await description. Cresson (1872) described the first Nearctic species, *L. scitulus* and *P. mellipes* under the genus *Euphorus*. Muesebeck (1936) keyed out and characterized nine species in the genera *Euphoriana* Gahan and *Euphorus* Nees. Muesebeck and Walkley (1951) catalogued the same species. Today, seven of these

