

First record of *Quadrastichus mendeli* (Hymenoptera: Eulophidae) in Brazil: the Australian parasitoid of Blue Gum Chalcid wasp not recognize geographical barriers



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Introduction and Aims

The Blue Gum Chalcid wasp *Leptocybe invasa* (Hymenoptera: Eulophidae) is considered one of the major exotic pests in *Eucalyptus* plantations worldwide. The biological control with parasitoids and genetic resistance are considered the most adequate methods of management for this pest. More than ten parasitoid species was found associated with *L. invasa* galls in Australia. The main species used in biological control programs of *L. invasa* are *Quadrastichus mendeli* Kim & La Salle and *Selitrichodes neneri* Kelly & La Salle (Hymenoptera: Eulophidae). The last one was imported to Brazil from South Africa in 2015 and are currently released to control this pest. *Q. mendeli* was recently found in unintentional introductions in Italy (2013), South Africa (2016) and Argentina (2016). In December of 2018 it was found for the first time in Brazil, at São Paulo state. The aim of this work is to report for the first time the presence of *Q. mendeli* in Brazil and to evaluate its impact in the biological control of *L. invasa*.

Material & Methods

Branches of the *Eucalyptus grandis* hybrid clone with mature *L. invasa* galls were collected from a plantation in the municipality of Luís Antônio, in São Paulo State on December 7th, 2018. The branches were taken to the Laboratory of Biological Control of Forest Pests (LCBPF) at FCA/UNESP Campus Botucatu, São Paulo. The branches were maintained in acrylic cages in plastic containers with water. These cages were kept in a controlled temperature and humidity condition, being 25±2 °C, and 60±2% RH respectively. The branches were stored until insect emergence.

Results & Discussion

Along with females of *L. invasa* emerged 30 females of another species (Figure 1), the specimens were sent to Korea National Arboretum to Dr. Il-Kwon Kim for morphological identification, which was confirmed as *Quadrastichus mendeli*. Confirmation was also performed by molecular identification, the genomic DNA of the insect was extracted, PCR was performed and submitted for Sanger sequencing and the sequences compared in the Genbank NCBI database.

After identification, *L. invasa* galls at an advanced stage of development were offered to *Q. mendeli* to observe the occurrence of parasitism, after observations we confirmed the parasitization *L. invasa* galls (Figure 2).

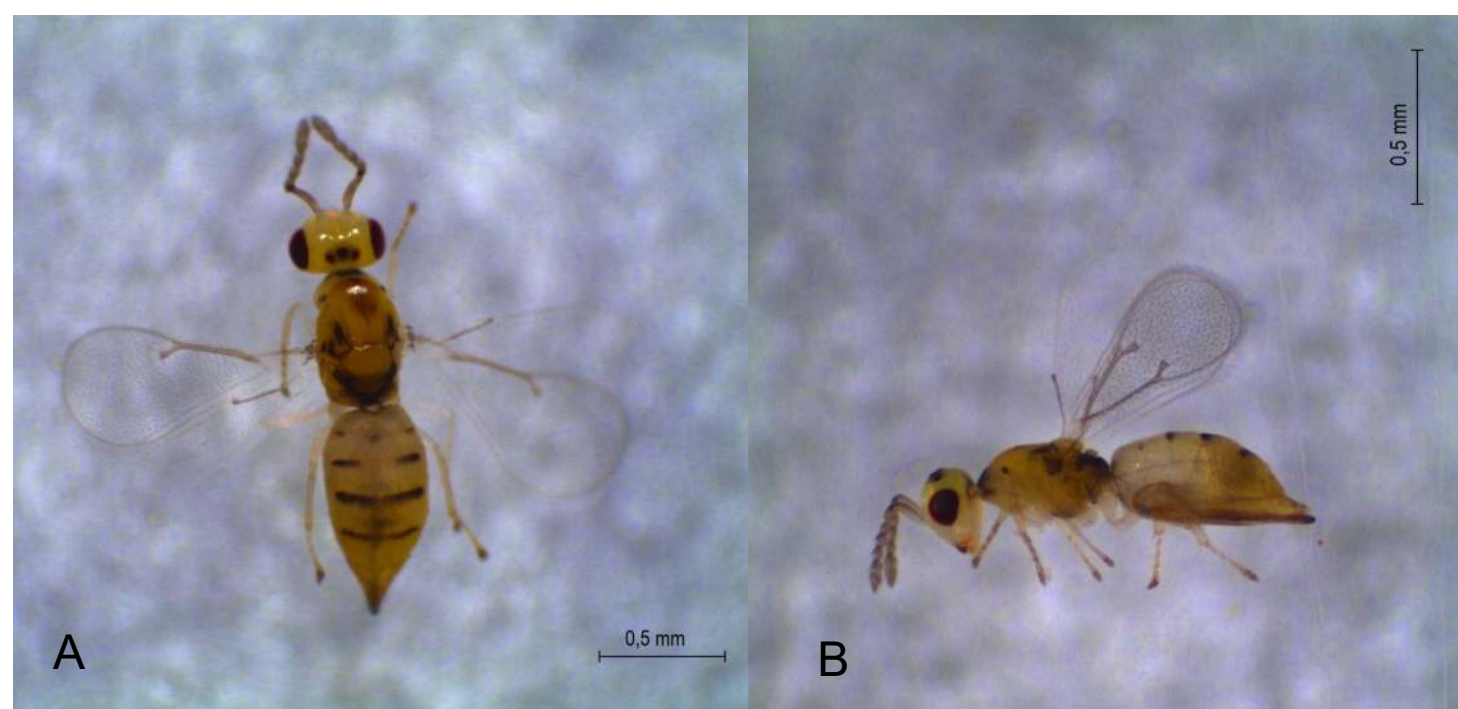


Figure 1. A and B - *Quadrastichus mendeli* females emerged from *Leptocybe invasa* galls.



Figure 2. *Quadrastichus mendeli* females parasitizing *Leptocybe invasa* galls.

Conclusions

The bioecology, field performance, dispersal and parasitism capacity of the *Q. mendeli* on *L. invasa* galls is being studied. Also, possible interaction with the parasitoid *S. neneri*, which has been used as a tool in the biological control of *L. invasa* in Brazil is being considered.