Leptocybe invasa (Hymenoptera: Eulophidae), an Exotic Pest of Eucalyptus, in Minas Gerais State, Brazil

Authors: Fernandes, Bianca V., Barcelos, José Antônio V., Andrade, Hélder B., and Zanuncio, José C.

Source: Florida Entomologist, 97(2) : 824-826

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.097.0270

LEPTOCYBE INVASA (HYMENOPTERA: EULOPHIDAE), AN EXOTIC PEST OF EUCALYPTUS, IN MINAS GERAIS STATE, BRAZIL

BIANCA V. FERNANDES[1], JOSÉ ANTÔNIO V. BARCELOS[1], HÉLDER B. ANDRADE[1] AND JOSÉ C. ZANUNCIO[2*]
[1]Grupo Vallourec. Centro de Competência Florestal - Faz. Itapoã, Zona Rural, Paraopeba, Minas Gerais State, Brazil

[2]Departamento de Entomologia, Universidade Federal de Viçosa. Viçosa, Minas Gerais State, Brazil

[*]Corresponding author; E-mail: zanuncio@ufv.br

The gall-wasp *Leptocybe invasa* Fisher & La-Salle (Hymenoptera: Eulophidae) is an exotic pest native to Australia. Its adults are tiny wasps with shiny dark brown and 1.2 mm long. Only females of this species have been recorded, except one male for Turkey (Doganlar 2005). *Leptocybe invasa* is generally parthenogenetic with females giving birth to females and a huge population growth. The female oviposits in the apical plant buds, where galls are formed and visible in few weeks. The life cycle of this pest lasted approximately 130 days from egg laying to adult emergence in Israel (Mendel et al. 2004). *Leptocybe invasa* females fed with honey solution had 7.67 ± 0.93 days longevity, 158.70 ± 4.62 eggs/female, and 45.96 ± 0.52 days (35-73 days) from egg to adult in Thailand (Sangtonprao 2011).

The relationship between *L. invasa* and altitude in Uganda was negative, being absent from eucalyptus plantations at altitudes between 1,938 to 2,452 m. *Leptocybe invasa* was found on *Eucalyptus camaldulensis*, *E. grandis*, *E. robusta*, and *E. saligna*, but not on *E. maidenii* outside its ecological range. Its incidence is generally higher on hybrid *E. grandis* × *E. camaldulensis*, and *E. grandis* × *E. urophylla*.

Fig. 1. Eucalyptus clone plants infested with *Leptocybe invasa* (Hymenoptera: Eulophidae) in Paraopeba municipality, Minas Gerais State, Brazil.

Fig. 2. Pollinization area with presence of the *Leptocybe invasa* (Hymenoptera: Eulophidae) in Paraopeba municipality, Minas Gerais State, Brazil.

Leptocybe invasa was detected in Brazil in 2008 on *E. camaldulensis* clones as a pest with high reproductive capacity and damage (Wilcken & Berti Filho 2008;). An outbreak of this insect was detected in 29 Nov 2009 in Maranhão State, Brazil on *E. grandis*, *E. propingua*, *E. resinifera*, *E. robusta*, *E. saligna*, *E. tereticornis*, and on the hybrids, *E. urophylla* × *E. grandis*, and *E. pellita* × *E. tereticornis*, and others based on *E. brassiana*, *E. dunnii*, and *E. pellita* and *E. propinqua*. Seedlings for these experiments and the plantations came from Bahia State, Brazil where the insect was present (Wilcken & Berti Filho 2008).

Genetic resistance is a promising and long-term control tactic for *L. invasa* and the level of susceptibility of *E. camaldulensis*, *E. urophylla*, and *E. grandis* to this insect varies with origin of these plants (Thu et al. 2009).

In Minas Gerais State, Brazil, *L. invasa* was detected in Aug 2012 (Fig. 1) in the Itapoã farm, Paraopeba municipality (S 19° 18' 06" -W 44° 30' 13") in research, nursery and field areas, indicating that this insect was present in this region before Aug 2012. Maximum, minimum and ambient temperatures and relative humidity were 23 °C, 14 °C and 21 °C, and 67%, respectively.

The infestation of *L. invasa* was evaluated on nine eucalyptus plants in the field and its galls counted on 100 leaves at lower, middle, and top of each plant. *Leptocybe invasa* galls were found in 33, 36, and 30% of the leaves at lower, middle and top parts of the plants, respectively, with 2.40 galls/leaf. Monitoring in the nursery during pollination was conducted on 5 leaves/plant using severity scale: 0 (no galls/leaf), 1 (low, 1 gall/leaf), 3 (moderate, 3 galls/leaf), and 5 (high, 5 galls/leaf) (Fig. 2). The genetic material with galls (35%) was classified as grade 5 (71.0%), 3 (14%) and 1 (15.0%) (Fig. 3).

Leptocybe invasa is a significant pest problem in Minas Gerais State, Brazil, because this state has 1,400,000 ha of eucalyptus plantations (ABRAF 2012).

To "Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)", "Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)" and "Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)" for financial support. Global Edico Services rewrote and edited this manuscript.

Fig. 3. Galls of *Leptocybe invasa* with different development stages in eucalyptus leaves.

Summary

The gall-wasp, *Leptocybe invasa* Fisher & LaSalle (Hymenoptera: Eulophidae), a pest native to Australia, was introduced into several countries with eucalyptus cultivation. This insect has high damage capacity and reproductive rate. *Leptocybe invasa* was recorded in the Itapoã farm (S 19° 18' 06" -W 44° 30' 13"), Paraopeba municipality, Minas Gerais State, Brazil in areas of research, nursery and in the field. Maximum, minimum, and ambient temperatures and relative humidity were 23 °C, 14 °C and 21 °C and 67%, respectively. *Leptocybe invasa* is a significant pest problem in Minas Gerais State, Brazil, because this state has 1,400,000 ha of the eucalyptus plantations of Brazil.

Key Words: forest plantation, damage infestation, host resistance, invasive species

Resumo

A vespa-da-galha *Leptocybe invasa* Fisher & LaSalle (Hymenoptera: Eulophidae), com levada capacidade de danos e reprodução, é originária da Austrália e introduzida em diversos países com cultivo de eucalipto. *Leptocybe invasa* foi encontrada na fazenda Itapoã (S 19° 18' 06" -W 44° 30' 13"), município de Paraopeba, Minas Gerais, Brasil em área de pesquisa,viveiro e campo. A temperatura máxima, mínima e ambiente e a umidade relativa froma de 23 °C, 14 °C, 21 °C e 67%, respectivamente. A presença de *L. invasa* em Minas Gerais é preocupante, pois este estado tem 1,400,000 ha com plantio de eucalipto e 29% daquele do Brasil.

Palavras-Chave: florestas plantadas, infestação, danos, hospedeiros, espécies invasivas

References Cited

ABRAF (Associação Brasileira De Produtores De Florestas Plantadas). 2012. Anuário estatístico da ABRAF 2012: ano base 2011. Disponível em: <http://www.abraflor. org.br/estatisticas/ABRAF10-BR.asp>. Acesso em: 12 de março.

Doganlar, O. 2005. Occurrence of *Leptocybe invasa* Fisher & LaSalle, 2004. (Hymenoptera: Chalcidoidea: Eulophidae) on *Eucalyptus camaldulensis* in Turkey, with a description of the male sex. Zool. Middle East 35: 112-114.

Mendel, Z., Protasov, A., Fisher, N., and Lasalle, J. 2004. The taxonomy and natural history of *Leptocybe invasa* (Hymenoptera: Eulophidae) gen & sp. nov., an invasive gall inducer on *Eucalyptus*. Australian Journal of Entomology 43: 101-113.

Sangtonprao, W. L, B., Charernsoml, K., and Sirpatanadilok, S. 2011. Longevity, fecundity and development time of Eucalyptus Gall Wasp, *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae) in Kanchanaburi Province, Thailand. Thai J. Agri. Sci. 44(3): 155-163.

Thu, P. Q. Dell, B., and Burgess, T. I . 2009. Susceptibility of 18 eucalypt species to the gall wasp *Leptocybe invasa* in the nursery and young plantations in Vietnam. Sci. Asia 35: 113-117.

Wilcken, C. F., and Berti Filho, E. 2008. Vespa-da-galha do eucalipto (*Leptocybe invasa*) (Hymenoptera: Eulophidae): nova praga de florestas de eucalipto no Brasil. IPEF, 11 pp. Disponível em: <http://www.ipef.br/protecao/alerta-leptocybe.invasa.pdf>. Acessado em: 20/02/2010.