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Pest Alert-a Newly Discovered Invasion of Gall-forming Wasps, *Leptocybe invasa* (Fisher & La Salle), on Eucalyptus Trees in Taiwan 【Scientific note】

台灣新發現的入侵種-桉樹枝癭釉小蜂【科學短訊】

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Abstract

A newly found invasion of gall-making Hymenoptera, *Leptocybe invasa* Fisher & La Salle, that damages Eucalyptus trees is reported here. Since 2000, this wasp has spread throughout most countries of Africa and Europe, causing huge economic losses. In June 2010, this wasp was found on Eucalyptus trees. This pest alert describes the fundamental biological data of adult *Leptocybe invasa*, and presents its existing host plants and its distribution around the world. Also, we report the distribution of this wasp and its host plants in Taiwan. Because of the overwhelming invasion, this article alerts silviculture companies and pest inspection staff to allow them to reduce the impact of this pest.

摘要

一種新近出現的膜翅目造癭昆蟲-桉樹枝癭釉小蜂 (*Leptocybe invasa* Fisher & La Salle) · 危害桉樹屬林木 · 自 2000 年以來肆虐歐洲以及非洲等地 · 造成許多國家與造林公司重大的經濟損失 · 2010 年 6 月 · 台灣首度在桉樹上記錄到本種害蟲 · 本文整理桉樹枝癭釉小蜂的已知世界分布國家以及寄主植物種類 · 描述成蟲的基本生物學等相關資料 · 同時記錄台灣的分布地區以及寄主植物範圍 · 由於其來勢洶湧 · 提醒育林業者與防檢疫人員提高警覺 · 以減輕入侵種害蟲造成造林的重大衝擊 ·

Key words: invasive insect, pest alert, *Leptocybe invasa*, Eucalyptus

關鍵詞: 入侵種昆蟲、蟲害警訊、桉樹枝癭釉小蜂、桉樹屬。

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Pest Alert-a Newly Discovered Invasion of Gall-forming Wasps, *Leptocybe invasa* (Fisher & La Salle), on Eucalyptus Trees in Taiwan

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ABSTRACT

A newly found invasion of gall-making Hymenoptera, *Leptocybe invasa* Fisher & La Salle, that damages *Eucalyptus* trees is reported here. Since 2000, this wasp has spread throughout most countries of Africa and Europe, causing huge economic losses. In June 2010, this wasp was found on *Eucalyptus* trees. This pest alert describes the fundamental biological data of adult *Leptocybe invasa*, and presents its existing host plants and its distribution around the world. Also, we report the distribution of this wasp and its host plants in Taiwan. Because of the overwhelming invasion, this article alerts silviculture companies and pest inspection staff to allow them to reduce the impact of this pest.

Key words: invasive insect, pest alert, *Leptocybe invasa*, *Eucalyptus*

An invasive gall inducing insect, *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae) (桉樹枝癭釉小蜂) was recently found in Taiwan. This species was first discovered in the Middle East in 2000. It subsequently spread throughout the Mediterranean Basin as well as many of the *Eucalyptus* areas in northern and eastern Africa (Mendel *et al.*, 2004). Although this pest came originally from Australia, it has now spread over a wide range, and to many countries on all continents including: Algeria, Brazil,

China, Ethiopia, France, Greece, India, Iran, Israel, Italy, Jordan, Kenya, Morocco, South Africa, Spain, Syria, Portugal, Tanzania, Thailand, Turkey, Uganda, USA (Florida), and Vietnam (Aytar, 2003, 2006; Mendel *et al.*, 2004; Branco *et al.*, 2005; Jacob *et al.*, 2007; Anagnou-Veroniki *et al.*, 2008; Wilcken & Filho, 2008; Costa *et al.*, 2008; Wu *et al.*, 2009).

This phytophagous wasp induces typical bump-shaped galls on the midrib, petiole and stem of *Eucalyptus* (Fig. 1). It mainly infests *Eucalyptus* species in the

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sections *Exsertaria*, *Latoangulata* and *Maidenaria*, which include *Eucalyptus botryoides* (鹽風桉), *E. bridgesiana* (蘋果桉), *E. camaldulensis* (赤桉), *E. globulus* (藍桉), *E. gunii* (雪桉), *E. grandis* (玫瑰桉), *E. robusta* (大葉桉), *E. saligna* (雪梨藍桉), *E. tereticornis* (細葉桉), *E. viminalis* (多枝桉) (Mendel *et al.*, 2004), *E. maidenii* (直幹桉) (Jacob *et al.*, 2007), *E. urograndis* (尾巨桉), and *E. pellita* (粗皮桉) (Prabhu, 2010). A serious infection can cause dieback of the host-plant.



Fig. 1. Galls occurring on the petiole and midrib of leaves after wasp infection.

Adult females oviposit on the shoots and midribs of young leaves. After the eggs hatch, the larvae develop inside the gall. Mature galls usually turn into pink or red color. After the pupal period, adult wasps emerge by chewing exit holes (about 2.7 mm wide) in the gall wall (Mendel *et al.*, 2004; Jacob *et al.*, 2007). The mean development time from oviposition to

emergence is 132.6 days under room temperature. The mean survival time is 6.5 days for wasps fed with honey and water. In Israel, the wasp produces two or three overlapping generations annually. The adult wasps are sexually dimorphic, but only the female was described originally. This species is capable of developing uniparentally (Mendel *et al.*, 2004). The female adult wasp is 1.1-1.4 mm long, and the body is brownish in color with a blue-green metallic sheen. Fore coxa is yellow, while mid and hind coxae are brown. The scape of the antennae is yellow, with the rest of the segments brown (Mendel *et al.*, 2004). Males of this species were subsequently described (Doğanlar, 2005).

Since June 2010, galls have been found on eucalyptus trees in two nursery gardens and three plantation forests in Chiayi City (嘉義市), Taipei City (台北市), Taipei County (台北縣) and Yunling County (雲林縣). Specimens of both sex were reared and identified (Fig. 2).

To date, in Taiwan six host species have been found affected, i.e., *E. dunii* (白桉), *E. tereticornis* (細葉桉), *E. propinqua* (小果灰桉), *E. camaldulensis* (赤桉), *E. robusta* (大葉桉) and several clones of *E. grandis* (玫瑰桉). The pest can spread rapidly and can cause serious host-plant injury, resulting in economic damage. Monitoring and pest control measures are necessary.

Recently, two Australian parasitoid wasps, *Quadrastichus mendeli* Kim & La Salle and *Selitrichodes kryceri* Kim & La Salle (Hymenoptera: Eulophidae: Tetrastichinae) were described and discussed as potential biological control agents (Kim *et al.*, 2008).



Fig. 2. Male adult of *Leptocybe invasa* (left), and the female adult (right).

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台灣新發現的入侵種-桉樹枝癭釉小蜂

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摘 要

一種新近出現的膜翅目造癭昆蟲-桉樹枝癭釉小蜂 (*Leptocybe invasa* Fisher & La Salle)，危害桉樹屬林木，自 2000 年以來肆虐歐洲以及非洲等地，造成許多國家與造林公司重大的經濟損失。2010 年 6 月，台灣首度在桉樹上記錄到本種害蟲。本文整理桉樹枝癭釉小蜂的已知世界分布國家以及寄主植物種類，描述成蟲的基本生物學等相關資料，同時記錄台灣的分布地區以及寄主植物範圍。由於其來勢洶洶，提醒育林業者與防檢疫人員提高警覺，以減輕入侵種害蟲造成造林的重大衝擊。

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