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## Two new species of *Selitrichodes* (Hymenoptera: Eulophidae: Tetrastichinae) inducing galls on *Casuarina* (Casuarinaceae)

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### Abstract

Two new species of gall-inducing wasps, *Selitrichodes casuarinae* Fisher & La Salle **sp. n.** and *Selitrichodes utilis* Fisher & La Salle **sp. n.**, are described from Micronesia (Guam, Rota and Palau Islands) and Australia respectively. These species induce galls on *Casuarina* and can cause extensive damage to the trees. Their status as pest or beneficial species is discussed.

**Key words:** gall induction, invasive species, Micronesia, Guam, Rota, Palau, sheoak

### Introduction

*Casuarina* (Casuarinaceae) is native to Australasia, southeastern Asia, South America and the islands of the western Pacific Ocean. Casuarinas (commonly known as sheoak, ironwood, or beefwood) are commonly grown in tropical and subtropical areas throughout the world. The plants are very tolerant of windswept locations, and are widely planted as windbreaks, although usually not in agricultural situations.

In January 2009, a new species of gall-inducing wasp, described here as *Selitrichodes casuarinae* Fisher & La Salle, was discovered inducing galls on *Casuarina equisetifolia* in Guam. In March and April 2009, a second species, described here as *Selitrichodes utilis* Fisher & La Salle, was found in Australia inducing galls on *Casuarina glauca*.

### Pest/invasive or Beneficial?

*Casuarina* wood has many uses, including fuelwood, poles, posts, beams, oxcart tongues, shingles, panelling, fence rails, furniture, marine pilings, tool handles, and cabinets (Morton 1980). Species such as *Casuarina equisetifolia*, *Casuarina cunninghamiana* and *Casuarina glauca* occur extensively throughout the South Pacific, where they are generally considered to be beneficial and have a variety of uses (Whistler & Elevitch 2006). On Guam, *C. equisetifolia* is widely planted as an agricultural windbreak, as a shade tree in parks, and for erosion control on beaches. These trees are currently in general decline and dying throughout Guam. *Selitrichodes casuarinae* was discovered during surveys aimed at finding the causes of this decline (Schlub *et al.* 2011; Schlub 2013).

occasionally a third seta may be present. Dorsellum rounded posteriorly and very slightly overhanging propodeum. Propodeum with median carina, medially shorter than dorsellum in dorsal view. Propodeal spiracle with entire rim exposed and separated from anterior margin of propodeum by less than half its longest diameter, with shallow groove descending from spiracle to posterior margin of propodeum. Paraspicular carina absent. Propodeal callus with 2 setae.

Metasoma. Gaster equal in length to mesosoma. Hypopygium reaching nearly two-thirds the length of gaster. Cercus with 3 setae, 2 longest subequal in length and slightly curved. Ovipositor sheaths slightly protruding beyond apex of gaster.

**Male.** Unknown.

**Type material.** Holotype ♀: AUSTRALIA: Qld, 5.3km SSW Brisbane, Long Pocket Labs., 27°30.70'S 152°59.81'E, 2 Nov. 2010, B.Brown, em. tip of *Casuarina glauca* ABCL 2009071.V076-100, Database no. 32-059016 (ANIC).

53♀ Paratypes. 20♀: same data as holotype (11♀ ANIC; 3♀ QMB; 3♀ USNM; 3♀ ESUG). 1♀: same data as holotype except 2 Nov. 2010, ABCL 2009071.V075 (ANIC). 18♀: same data as holotype except 21 Oct. 2010, ABCL 2009071.V049-071 (ANIC). 8♀: same data as holotype except 13 Mar. 2009, ABCL 2009029.V012-022 (ANIC). 6♀: same data as holotype except 6 Apr. 2009, ABCL 2009071 V001-007 (ANIC).

**Distribution.** Australia: Queensland (Brisbane) and New South Wales (Byron Bay).

**Etymology.** The Latin word *utilis* indicates the useful or beneficial nature of this species, which is being investigated as a biological control agent against invasive *Casuarina* species in North America.

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## References

- Bouček, Z. (1988) *Australasian Chalcidoidea (Hymenoptera): A Biosystematic Revision of Genera of Fourteen Families, with a Reclassification of Species*. CAB International, Wallingford, UK, 832 pp.
- Gaskin, J.F., Wheeler, G.S., Purcell, M.F. & Taylor, G.S. (2009) Molecular evidence of hybridization in Florida's sheoak (*Casuarina* spp.) invasion. *Molecular Ecology*, 18, 3216–3226.  
<http://dx.doi.org/10.1111/j.1365-294x.2009.04282.x>
- Gibson, G.A.P. (1997) Chapter 2. Morphology and Terminology. In: Gibson, G.A.P., Huber, J.T. & Woolley, J.B. (Eds.), *Annotated Keys to the Genera of Nearctic Chalcidoidea (Hymenoptera)*. National Research Council Research Press, Ottawa, pp. 16–44.
- Girault, A.A. (1913[145]) Some new genera and species of chalcidoid Hymenoptera of the Family Eulophidae from Australia. *Journal of Entomology and Zoology*, 5, 103–112.
- Girault, A.A. (1913[146]) A new gall-inhabiting eulophid genus from Queensland, Australia. *Entomologist*, 46, 177–178.
- Girault, A.A. (1913[156]). New genera and species of chalcidoid Hymenoptera from North Queensland. *Archiv für Naturgeschichte*, 79, Abt. A, H.6, 46–51.
- Graham, M.W.R. de V. (1987) A reclassification of the European Tetrastichinae (Hymenoptera: Eulophidae), with a revision of certain genera. *Bulletin of the British Museum (Natural History) Entomology series*, 55, 1–392.
- Kelly, J., La Salle, J., Harney, M., Dittrich-Schröder, G. & Hurley, B. (2012) *Selitrichodes neseri* n. sp., a new parasitoid of the eucalyptus gall wasp *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae: Tetrastichinae). *Zootaxa*, 3333, 50–57.
- Kim, I.-K., Mendel, Z., Protasov, A., Blumberg, D. & La Salle, J. (2008) Taxonomy, biology and efficacy of two Australian parasitoids of the eucalyptus gall wasp, *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae: Tetrastichinae). *Zootaxa*, 1910, 1–20.
- La Salle, J. (1994) North American genera of Tetrastichinae (Hymenoptera: Eulophidae). *Journal of Natural History*, 28, 109–236.

<http://dx.doi.org/10.1080/00222939400770091>

- La Salle, J., Arakelian, G., Garrison, R.W. & Gates, M.W. (2009) A new species of invasive gall wasp (Hymenoptera: Eulophidae: Tetrastichinae) on blue gum (*Eucalyptus globulus*) in California. *Zootaxa*, 2121, 35–43.
- Morton, J.F. (1980) The Australian pine or beefwood (*Casuarina equisetifolia* L.), an invasive "weed" tree in Florida. *Proceedings, Florida State Horticultural Society*, 93, 87–95.
- Paine, T.D., Millar, J.C. & Daane, K.M. (2010) Accumulation of pest insects on Eucalyptus in California: random process or smoking gun. *Journal of Economic Entomology*, 103, 1943–1949.  
<http://dx.doi.org/10.1603/ec10214>
- Schauff, M.E., LaSalle, J. & Coote, L.D. (1997) Chapter 10. Eulophidae. In: Gibson, G.A.P., Huber, J.T. & Woolley, J.B. (Eds.), *Annotated Keys to the Genera of Nearctic Chalcidoidea (Hymenoptera)*. National Research Council Research Press, Ottawa, pp. 327–429.
- Schlub, R.L., Mersha, Z., Aime, C.M., Badilles, A., Cannon, P.G., Marx, P.G., McConnell, J., Moore, A., Nandwani, D., Nelson, S.C., Pinyopusarek, K., Schlub, K.A., Smith, J.A. & Spaine, P.O. (2011) Guam Ironwood (*Casuarina equisetifolia*) Tree Decline Conference and Follow-up. In: Zhong, C., Pinyopusarek, K., Kalinganire, A. & Franche, C. (Eds.), *Proceedings of the 4th International Casuarina Workshop*, Haikou, China, 21–25 March 2010, pp. 239–246.
- Schlub, R.L. (2013) Gago, Guam ironwood tree, *Casuarina equisetifolia*: Past, present, future. University of Guam Cooperative Extension Service Technical Report. Available from: <https://www.dropbox.com/s/gp9hqgk9gqxbkp/finalreducedwsare%20ironwood%20manual%2003-25.pdf> (accessed 5 March 2014)
- Wheeler, G.S., Taylor, G.S., Gaskin, J.F. & Purcell, M.F. (2011) Ecology and management of sheoak (*Casuarina* spp.), an invader of Coastal Florida, U.S.A.. *Journal of Coastal Research*, 27, 485–492.  
<http://dx.doi.org/10.2112/jcoastres-d-09-00110.1>
- Whistler, W.A. & Elevitch, C.R. (2006) *Casuarina equisetifolia* (beach she-oak), *C. cunninghamiana* (river she-oak). Species Profiles for Pacific Island Agroforestry. Available from: <http://www.clshade.net/agroforestry/tti/Casuarina-she-oak.pdf> (accessed 5 March 2014)