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## Nematodes from galls on Myrtaceae. VII. *Fergusobia* from ‘leafy’ leaf bud galls in Australia, with re-description of *Fergusobia tumifaciens* (Currie 1937) Wachek 1955 and descriptions of *Fergusobia planchoniana* n. sp. and *Fergusobia viminalisae* n. sp.

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### Abstract

*Fergusobia tumifaciens* (Currie 1937) Wachek 1955, the type species for the genus *Fergusobia*, is re-described from specimens collected from ‘leafy’ leaf bud galls on *Eucalyptus bridgesiana* near Albury in New South Wales, Australia. It is morphologically characterized by the combination of an open C-shaped parthenogenetic female with a small broadly conoid tail, a C-shaped infective female with a bluntly rounded tail tip, and an arcuate to J-shaped male with angular spicules, not heavily sclerotised, and short to mid-length peloderan bursa. Two new species of *Fergusobia*, collected from ‘leafy’ leaf bud galls on, respectively, *Eucalyptus planchoniana* in Queensland, and *E. viminalis* in South Australia, Australia, are described. *Fergusobia planchoniana* Davies n. sp. is characterised by the combination of a C-shaped parthenogenetic female with a conoid tail, an arcuate infective female with an hemispherical tail tip, and an almost straight to arcuate to C-shaped male with an angular spicule, a long peloderan bursa and a narrow tail. *Fergusobia viminalisae* Davies n. sp. is characterised by the combination of an open C-shaped parthenogenetic female with a broadly conoid tail, a C-shaped infective female with a bluntly rounded tail tip, and an arcuate to J-shaped male with an angular (not heavily sclerotised) spicule and short to mid-length peloderan bursa. The shield morphologies of the fly larvae associated with the ‘leafy’ leaf bud galls and their possible relationships are outlined. Possible evolutionary relationships of the *Fergusobia* nematodes from these galls are discussed, considering their morphology, DNA sequences, and the relationships of the associated *Fergusonina* flies and host plants.

**Key words:** *Eucalyptus*, Neotylenchidae, *Fergusonina*, flies, taxonomy, DNA sequencing, molecular phylogeny

### Introduction

In a mutualistic association, nematodes of the genus *Fergusobia* Currie 1937 (Tylenchida: Neotylenchidae) and flies of the genus *Fergusonina* Malloch 1924 (Diptera: Fergusoninidae) form galls on some Myrtaceae (Malloch 1932; Morgan 1933; Currie 1937, Giblin-Davis *et al.* 2004a, b, Taylor *et al.* 2005). *Fergusobia* is the only genus of nematodes known to parasitise both an insect and a plant (Maggenti 1981). It has a generation parasitic in galls on Myrtaceae followed by one parasitising fergusoninid flies. The life cycles of the flies and nematodes was described in detail in Giblin-Davis *et al.* (2004b) and Taylor *et al.* (2005). Genera known to be hosts of the mutualism include

feed, ovi- and nema-posit in meristematic tissue of a different plant host, with successful gall initiation and development of both organisms. It is not known, however, if the life cycle of flies and nematodes was successfully completed on *E. aromaphloia* at Blackwood.

In summary, the collections of 'leafy' leaf bud galls described here were associated with *Fergusonina* fly larvae having two shield forms, and *Fergusobia* nematodes apparently from two different clades. This suggests that two lineages of nematodes and their associated flies were examined, and that one induces galls on host plants from subgenus *Eucalyptus*, and the other on plants from subgenus *Symphyomyrtus*. Further collecting is needed to confirm this hypothesis.

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