



# Article

urn:lsid:zoobank.org:pub:AEAA3D16-232B-4307-A1AA-EDF026E7018D

## Nematodes from galls on Myrtaceae. III. *Fergusobia* from flower bud and stigma galls on *Eucalyptus*, with descriptions of four new species

KERRIE DAVIES<sup>1</sup>, ROBIN GIBLIN-DAVIS<sup>2</sup>, WEIMIN YE<sup>3</sup>, GARY TAYLOR<sup>4</sup> & KELLEY THOMAS<sup>5</sup>

<sup>1</sup>Australian Centre for Evolutionary Biology and Biodiversity, and School of Agriculture, Food and Wine, The University of Adelaide, PMB 1, Glen Osmond, South Australia 5064, Australia. Email: kerrie.davies@adelaide.edu.au

<sup>2</sup>Fort Lauderdale Research and Education Center, University of Florida, 3205 College Ave, Davie, Florida 33314–7799, USA. Email: giblin@ufl.edu

<sup>3</sup>Present address: North Carolina Department of Agriculture & Consumer Services, 1040 Mail Service Center, Raleigh, NC 27699-1040, USA. Email: weimin.ye@ncagr.gov

<sup>4</sup>Australian Centre for Evolutionary Biology and Biodiversity, and School of Earth and Environmental Sciences, The University of Adelaide, North Terrace, Adelaide, South Australia 5005, Australia. Email: gary.taylor@adelaide.edu.au

<sup>5</sup>Hubbard Center for Genome Studies, University of New Hampshire, 35 Colovos Rd., Durham, NH, 03824, USA. Email: kelly.thomas@unh.edu

### Abstract

Four new species of *Fergusobia* from flower bud galls and a stigma gall on *Eucalyptus* spp. in Australia are described. *Fergusobia eugenioidae* Davies **n. sp.** is characterised by having an arcuate, open C or C-shaped parthenogenetic female with a conoid tail, an arcuate to open C-shaped infective female with a hooked tail region and a broadly rounded tail tip, and arcuate or open C-shaped males with angular spicules and short bursa. *Fergusobia fasciculosae* Davies **n. sp.** is characterised by the combination of an arcuate parthenogenetic female with a short, broadly conoid tail, an open C-shaped infective female with a hemispherical tail tip, and J-shaped males with angular spicules and short peloderan bursa. This is the first *Fergusobia*/*Fergusonina* association to be described from flower stigma galls. *Fergusobia juliae* Davies **n. sp.** is characterised by the combination of an arcuate to C-shaped parthenogenetic female with a short, broadly conoid tail, a J-shaped infective female with a hooked tail region, a cuticular plate around the vulva, and a broadly rounded tail tip, and J-shaped males with angular spicules and short peloderan bursa. *Fergusobia morrisae* Davies **n. sp.** has a C-shaped parthenogenetic female with a narrowly conoid tail, an arcuate or J-shaped infective female with most curvature behind the vulva and a short tail with an almost hemispherical tip, and arcuate or J-shaped males with strongly sclerotised, angular spicules and a long peloderan bursa. Other known similar forms of *Fergusobia*/*Fergusonina* flower bud galls from *Eucalyptus* spp. are outlined and the larval shield morphology of their associated mutualistic fly species is discussed where known. An inventory of all known *Fergusobia*/*Fergusonina* associations from flower bud galls from *Eucalyptus* spp. is presented. Molecular analysis of *Fergusobia* nematodes was inferred from DNA sequencing of 28S rDNA D2/D3 domains and a portion of mitochondrial DNA cytochrome oxidase subunit I (mtCOI). Possible evolutionary relationships are discussed.

**Key words:** Myrtaceae, galls, Neotylenchidae, *Fergusonina*, nematodes, flies, morphology, taxonomy, DNA sequencing, molecular phylogeny

### Introduction

Together, nematodes of the genus *Fergusobia* Currie 1937 (Christie 1941) (Tylenchida: Neotylenchidae) and flies of the genus *Fergusonina* Malloch 1924 (Diptera: Fergusoninidae) form galls on some Myrtaceae (Currie 1937; Giblin-Davis *et al.* 2004b; Taylor *et al.* 2005). Each species of *Fergusonina* is associated with a particular species of *Fergusobia*, in mutualisms that generally each induce one gall form on one plant host species (Goolsby *et al.* 2000; Giblin-Davis *et al.* 2001; Taylor *et al.* 2005; Ye *et al.* 2007; S. Scheffer unpub. data).

Morphological and sequencing studies have provided evidence for about 20 clades of *Fergusobia* nematodes (Ye *et al.* 2007, Davies *et al.* 2010a). This paper is the third of a series to describe new species of *Fergusobia* from different clades of nematodes associated with particular gall forms, host plant and/or host fly associations.