New gall-inducing species of ormocerine pteromalid (Hymenoptera: Pteromalidae: Ormocerinae) described from New Zealand

Jocelyn A Berry\textsuperscript{1}\textsuperscript{*} and Toni M Withers\textsuperscript{2}

\textsuperscript{1}New Zealand Arthropod Collection, Landcare Research, PB 92170, Auckland, New Zealand.
\textsuperscript{2}Forest Research, Private Bag 3020, Rotorua, New Zealand.

\textbf{Abstract} \textit{Nambouria xanthops} Berry and Withers, a new species of ormocerine pteromalid reared from galls on \textit{Eucalyptus nicholii} Maiden and Blakely, \textit{Eucalyptus glaucescens} Maiden and Blakely, \textit{Eucalyptus cinerea} F. Muell. ex Benth. and \textit{Eucalyptus viminalis} Labill. (Myrtaceae), is described from New Zealand. \textit{Nambouria xanthops} is presumed to be introduced accidentally from Australia. The placement of this new species in the genus \textit{Nambouria} Boucek is discussed.


\section*{INTRODUCTION}

In October 1999, leaf galls were collected from a specimen of \textit{Eucalyptus nicholii} Maiden and Blakely (Myrtaceae) in Mt Wellington, Auckland, New Zealand (Fig. 1). An ormocerine pteromalid was subsequently reared from the galls and was determined to be an undescribed species belonging either to \textit{Nambouria} Boucěk or to an undescribed, closely related genus (Z. Bouček, I. Naumann, pers. comm., 2000). The species appears not to be represented in the Australian National Insect Collection (I. Naumann, pers. comm., 2000). We have described it here in the genus \textit{Nambouria}, rather than create another monotypic genus in a poorly known group. We hope that formally describing and naming the species will facilitate the study of its biology and pest status.

\section*{MATERIALS AND METHODS}

Collection of specimens from \textit{Eucalyptus} species throughout the greater Auckland region was made by Forest Health Surveillance Officers, as part of routine surveillance for the presence of exotic pests and diseases in New Zealand. Gall samples were taken from leaves and in most cases specimens were reared from these galls. Specimens are in the Australian National Insect Collection, Canberra (ANIC), Forest Research collection, Rotorua (FRNZ) or New Zealand Arthropod Collection, Auckland (NZAC).

Most specimens were mounted on points and examined using a Leica MZ12 binocular microscope (Leica, Wetzler, Germany) at up to 100 times magnification. Scanning electron micrographs (SEM) were taken on a Philips 505 scanning electron microscope (Philips, Eindhoven, Netherlands) over a range of 13.5 to 15 kV. Specimens were prepared for SEM by washing in detergent solution, dehydrating through a series of ethanol washes, and air-drying at 21\textdegree C for less than 24 h. Specimens were then sputter-coated with gold and mounted on brass stubs using double-sided tape or silver paint. Sculpture terms are taken from Eady (1968) and Harris (1979).

\section*{BIOLOGY OF THE ORMOCERINAE}

As far as is known, all ormocerine genera represented in Australia are associated with plant galls or (less commonly) with fruit or seeds. Host plants belong mainly to the Myrtaceae, Casuarinaceae, Celastraceae and Fabaceae (Bouček 1988). Some ormocerine species are undoubtedly gall-inducers, for example \textit{Perilampella hecataeus} (Walker) and \textit{Trichilogaster acaciaelongifoliae} (Froggatt). The latter has been successfully introduced into South Africa as a control agent against \textit{Acacia longifolia} (Fabaceae), which it galls so heavily that the plant cannot produce seed (Bouček 1988). However, in many other cases it is not known whether the ormocerine is a parasitoid of a gall-inducer, an inquiline in the gall or a true gall-inducer itself.

\section*{TAXONOMY}

\textit{Nambouria xanthops} Berry and Withers sp. n. (Figs 2–8)


\textsuperscript{*}Author to whom correspondence should be addressed (email: berryj@landcare.cri.nz).
Gall-inducing pteromalid from New Zealand


**Female.** Body length (including head) 2.8–3.5 mm. **Colour.** Scape and pedicel dark brown dorsally, pale yellow ventrally; flagellum dorsally pale to dark brown, basal segments often darker than apical segments, ventrally yellow; club darker brown than funicle dorsally, yellowish brown ventrally. Face yellow; malar area medium brown, yellow adjacent to eye; vertex dark brown; mandibles yellow basally and dark brown apically; palps yellow. Thorax and gaster very dark brown/black, excepting prepectus, which is yellow to dark brown dorsally. Coxae dark brown; legs yellow basally, grading to medium brown distally. Wings hyaline, tegulae yellow. **Antenna** (Fig. 2). 12-segmented, basal segments not anelliform, formula 1173. Scape moderately expanded; short, not reaching anterior ocellus. Flagellar segments mostly transverse, covered in close, moderately long setae and sparsely distributed sensilla. Club with densely distributed sensilla, short setae and a patch of sensory pores on apex. **Head** (Fig. 5). Face alutaceous, covered with short dark close pilosity. Vertex imbricate. Median ocellus in a broad shallow depression. Malar groove complete. Clypeus higher than broad, delimited laterally by shallow grooves, anterior margin slightly produced as a thin lamella, not emarginate. Mandibles bidentate; lower tooth sharply pointed, and upper tooth broad. Scrobes conspicuous, antennae inserted at about centre of face, well above lower ocular line. Eyes with scattered very short pilosity. **Mesosoma** (Fig. 6). Pronotum smooth and glossy medially, alutaceous laterally. Prepectus large, alutaceous, with a thin lamella dorsally and posteriorly. Mesepisternum alutaceous; mese-pimeron smooth. Mesoscutum with scattered short to medium length dark setae; mid lobe imbricate anteriorly, coriaceous posteriorly; side lobes alutaceous/coriaceous. Notauli complete, linear. Axillae slightly advanced, alutaceous/coriaceous; scutellum elongate, coriaceous, without distinct frenum. Setae on scutellum arranged in two irregular sublateral lines. Propodeum (Fig. 7) relatively short, more or less smooth medially; lateral area imbricate laterally with scattered long dark setae; propodeal spiracles large. **Legs.** Fore femur stout; fore tibia about as long as tarsus; hind coxa long, almost bare; hind tibia only slightly broadened basally, 1.4–1.6 times length of tarsus, with one short stout spur. **Forewing** (Fig. 4). Hyaline; bare basally, pilosity and marginal fringe very short. Marginal vein about 1.3–1.4 times length of stigmal vein; postmarginal vein longer than both. Stigmal vein with a distinct uncus. **Metasoma** (Fig. 8). Oval, dorsally collapsing. Hind margins of tergites 1–5 emarginate medially. Hypopygium large, ovipositor extending only just beyond end of metasoma.

**Male.** Body length (including head) 2.5–2.7 mm. As for female except the following: face completely yellow, including malar area; vertex black, excepting a yellow spot adjacent to eye dorsally. **Antenna** (Fig. 3). 12-segmented, formula 1173. Scape more expanded than that of female; outer lateral surface with an area of unevenly distributed sensory pores, some separated by less than their own diameter, and others more widely separated. Flagellar segments 1 and 2 anelliform, 3–7 slightly transverse to square, covered in close setae, longer than those of female. Placoid sensilla distributed sparsely on funicular segments, moderately closely on club, less densely than in female. **Gall** (Fig. 9). Adult wasps arise from two superficially different gall types. The most conspicuous is a protruding oblong gall of dimensions up to 11 mm long by 1.5 mm wide (Fig. 9a). The gall has an uneven surface, and protrudes up to 3 mm
from both sides of the leaf when mature. Colour varies from green to bright red. Adult wasps emerge from a circular exit hole cut from one end of the gall at the plane of the leaf surface. The less conspicuous gall type is that of a pit gall, up to 8 mm long when mature, which does not protrude from the leaf plane (Fig. 9b). Colour varies from white to green. Galls reach a density of 10 per leaf on *E. nicholii*.

**Fecundity.** Adult female wasps commonly each contain up to 600 eggs. Eggs are lageniform in shape and 0.65 mm long by 0.07 mm wide. Eggs are oviposited singly within young expanding host leaves.

**Host records.** Rared from leaf galls of *Eucalyptus nicholii*, *Eucalyptus glaucescens* Maiden and Blakely and *Eucalyptus cinerea* F. Muell. ex Benth. (all subgenus *Symphyomyrtus*)

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**Figs 5–8.** *Nambouria xanthops*, female. (5) Head. (6) Dorsal mesosoma. (7) Dorsal propodeum. (8) Dorsal gaster. Scale bars: Fig. 5 = 1 mm; Fig. 6 = 1 mm; Fig. 7 = 0.1 mm; Fig. 8 = 1 mm.

**Fig. 9.** *Nambouria xanthops* galls on *Eucalyptus nicholii*. (a) Protruding gall. (b) Pit gall. (Photograph by Jonathan Barran (FRI).)
section Maidenaria). Galls were most abundant and dense on *E. nicholii*. The native host range of all three *Eucalyptus* species is south-eastern Australia (New South Wales and Victoria) (Brooker & Kleinig 1999).

**Distribution**. (Fig. 1). Central and South Auckland, North Island, New Zealand. Auckland: Meadowbank, Mt Albert, Mt Wellington, Manukau, Clevedon.

**Etymology.** The specific epithet is feminine, derived from the Greek *xanthos* (yellow) and *ops* (face), referring to the striking yellow face of both male and female of this species.

**Generic placement.** Bouček (1988) described the monotypic genus *Nambouria* Bouček, type species *Nambouria ramulorum* Bouček, from just four female specimens collected from New South Wales and Queensland, Australia. *Nambouria ramulorum* was reared from woody galls on twigs of *Eucalyptus* sp. and *E. camaldulensis* Denhardt.

Table 1 presents the character states used by Bouček to define the new genus *Nambouria*, based on females of the only described species, *N. ramulorum*. Character states were taken from the key to genera and from the generic description. Those states shown in *N. ramulorum* that differ from those in the new species *N. xanthops* are italicised.

**DISCUSSION**

The subfamily Ormocerinae is comprised of three tribes. The two most speciose, Melanosomellini and Systasini, are largely Australasian in distribution while the third small tribe, Ormocerini, is mainly Palearctic (Bouček 1988; Noyes 1998). Prior to this record, the subfamily Ormocerinae was represented in New Zealand only by the systasine *Systasis*.
lelex (Walker), which is presumed to be endemic and its biology is unknown. The genera to which Nambouria xanthops is most closely related, Nambouria, Lincolna and Edgaria, are all melanosomellines known only from Australia.

Its close similarity to described Australian taxa, considered with the available host information, suggest an Australian origin for N. xanthops. We consider that it has most probably been accidentally introduced into New Zealand from Australia very recently. The first collection record is from Mt Wellington, Auckland, an industrial area that, because of the high number of container-importing yards, is designated as a ‘risk site’ by the New Zealand Ministry of Agriculture and Forestry and the Forest Owners’ Association. A possible means of introduction could have been via a branch of Eucalyptus foliage bearing galls caught in a shipping container.

Nambouria xanthops joins a list of chalcidoid species that have been described from and are only known from New Zealand, but are probably Australian in origin, based on phylogenetic and host relationships. Other such species are the encyrtids Alamella mira Noyes, Psyllaephagus acaciae Noyes and P. pilosus Noyes, the eurytomid Bruchophagus acaciae (Cameron), and the eulophids Ophelimus eucalypti (Gahan) and O. maskelli (Ashmead) (Berry, 2002, in press). These examples illustrate the point that extremely poor knowledge of both the New Zealand hymenopteran fauna and that of surrounding regions makes quantitative analysis of endemism at the species level problematic.

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REFERENCES


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