

***Metaphycus zdeneki* sp. nov. (Hymenoptera: Encyrtidae) from Peru, a parasitoid of *Bakerius* sp. (Hemiptera: Aleyrodidae)**

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**Abstract.** *Metaphycus zdeneki* sp.nov, a parasitoid of a whitefly (*Bakerius* sp.) in Peru is described and characters are given to distinguish it from related species.

**Taxonomy, new species, Hymenoptera, Encyrtidae, parasitoid, Hemiptera, Aleyrodidae, Neotropical region**

#### INTRODUCTION

There are few authenticated records of Encyrtidae as parasitoids of whiteflies. To date, species of 11 genera have been recorded as whitefly parasitoids (Noyes 2004a), but many of these are probably either erroneous observations or unusual occurrences. It is possible some species that normally attack diaspidid scales or other small coccoids may develop successfully as parasitoids of aleyrodids when their usual hosts are scarce, e.g. *Metaphycus flavus* (Howard, 1881) (see Guerrieri & Noyes 2000). Other than a few, still undescribed, species of *Metaphycus* Mercet, 1917 occasionally reared from whiteflies in South America (material in BMNH) four species are known that appear to be obligatory endoparasitoids of whiteflies, i.e. *Metaphycus aleyrodis* (Myartseva et Ruiz, 2002) (Myartseva & Ruíz 2002) from Central America, *Metaphycus omega* Noyes, 2004 (Noyes 2004b) from throughout the Neotropics, *Rhopus erianthi* (Myartseva, 1994) (Myartseva 1994) from Central Asia and *Zarhopaloides anaxenor* Noyes, 2001 (Bailey et al. 2001) from Australia. It is thus possible that encyrtids utilise whiteflies as hosts more frequently than was previously thought. Recently another species has been reared in numbers from a whitefly host in Peru. Although also belonging to *Metaphycus* this species appears not to be closely related to any of the known species of this genus that parasitise whitefly hosts and therefore it is described here.

The new species is being named in honour of Zdeněk Bouček in celebration of his 80<sup>th</sup> birthday.

#### ABBREVIATIONS

DEPOSITORIES. BMNH – Natural History Museum, London, United Kingdom; MUSM – Museo de Historia Natural, Lima, Peru.

MORPHOLOGY. AL – aedeagus length, EL – maximum eye length, EW – maximum eye width, FV – minimum frontovertex width, FWL – fore wing length, FWW – fore wing width, GL – gonostylus (=3<sup>rd</sup> valvula) length, HW – maximum head width, HWL – hind wing length, HWW – hind wing width, MS – malar space, MT – mid tibia length, OCL – occipital-ocellar line, OL – ovipositor length, OOL –ocular-ocellar line, POL – post-ocellar line, SL – scape length, SW – maximum scape width.

## TAXONOMY

### *Metaphycus* Mercet, 1917

*Metaphycus* Mercet, 1917: 138 (as subgenus of *Aphycus* Mayr, 1876).

TYPE SPECIES. *Aphycus zebratus* Mercet, 1917.

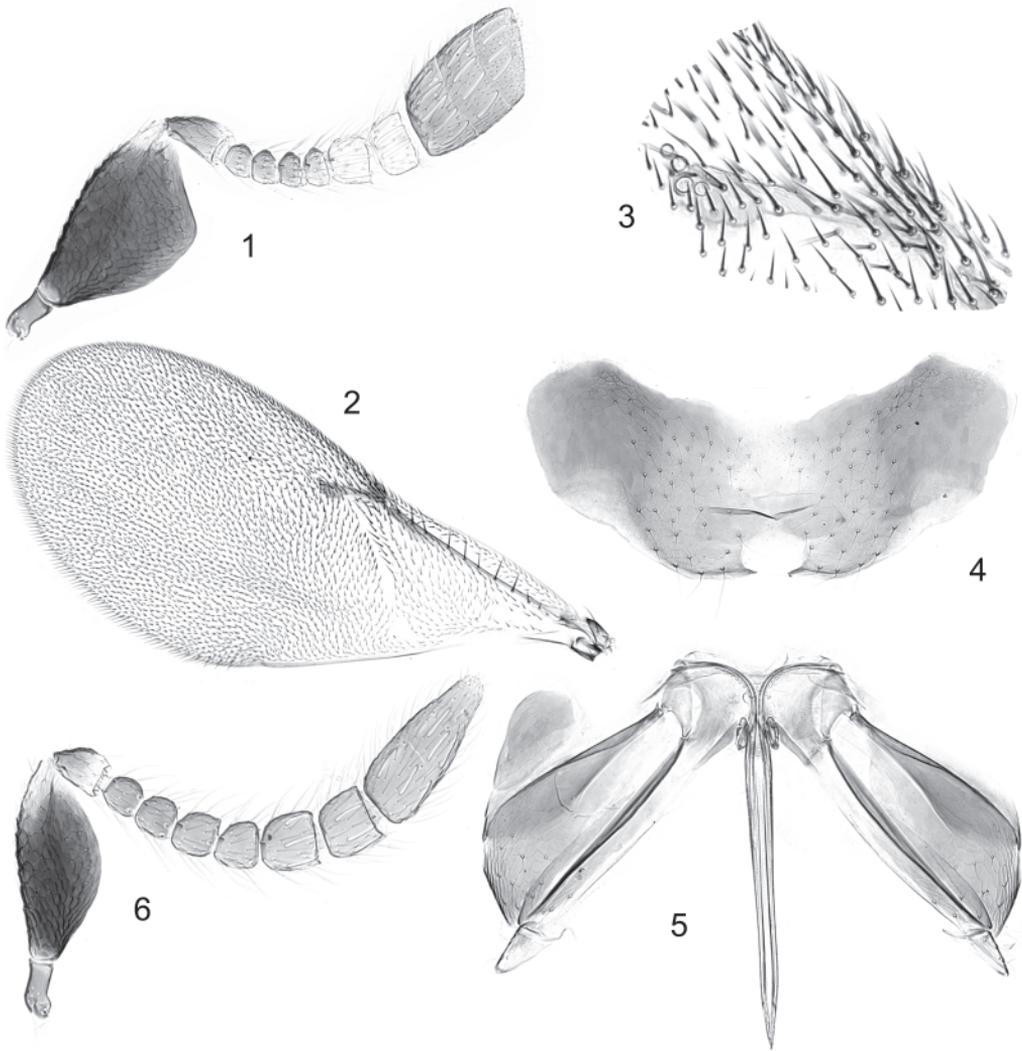
DIAGNOSIS. Length 0.5–1.8 mm. Body largely orange, yellow to brown or black, never with metallic lustre, antenna usually black or dark brown with white or yellow segments; legs yellowish or with brown to black segments, tibiae frequently with dark rings. Head with occipital margin sharp. Pronotum short, broadly triangular in dorsal view; mesoscutum wider than long, notaular lines present, but variable in length from virtually absent to complete and reaching posterior margin of mesoscutum; scutellum never with an apical flange that overhangs the propodeum medially; fore wing usually about 2.5× as long as broad, with uniform setation; submarginal vein extending about half way along wing; marginal and postmarginal veins very short, stigmal vein well developed, longer than marginal and postmarginal veins together; linea calva interrupted by at least a few setae, or completely closed in posterior third; mesopleuron not reaching posterior margin of propodeum so that propodeum is clearly visible in lateral view above hind coxa. Female: antenna usually 11-segmented (1163), rarely with clava 2-segmented; outer plates of ovipositor not reflected upwards posteriorly to connect with syntergum; gonostyli free, usually not exerted or hardly so. Male: generally darker and with more uniform colour than female. Antenna 9-segmented (1161), with setae longer than in female; toruli often with associated pores that may be sensorial or more probably glandular (see Guerrieri & Noyes 2000, Noyes 2004b).

HOSTS. *Metaphycus* species have mainly been reported as solitary or gregarious parasitoids of soft scales or armoured scales, with a few species recorded as parasitoids of Kermesidae, Asterolecaniidae, Kerridae, Eriococcidae, Cerococcidae and Pseudococcidae (Hemiptera: Coccoidea) (see Guerrieri & Noyes 2000). Three species have been reared from triozyids (Hemiptera: Triozidae) and several have been obtained from whiteflies (Hemiptera: Aleyrodidae) (see Guerrieri & Noyes 2000).

DISTRIBUTION. A cosmopolitan genus consisting of over 400 described species. The greatest number of species occur in the Neotropics where there are slightly more than 200 described species, with many more to be discovered (Noyes 2004b). About 80 species are known from each of the Palaearctic (Trjapitzin 1989, Guerrieri & Noyes 2000) and Afrotropical regions (Annecke & Mynhardt 1971, 1972, 1981), 48 from the Nearctic (Gordh 1979, Noyes 2004a), 14 from the Oriental region (Noyes 2004a) and 23 from the Australasian region (Noyes & Hayat 1984, Noyes 2004a).

IDENTIFICATION. Several keys have been published to the species of *Metaphycus*: Timberlake (1916) for North American species (as *Aphycus* Mayr, 1876), Noyes (2004b) for Costa Rican species, Compere (1940) for African species, Annecke & Mynhardt (1971, 1972, 1981) for South African species, Myartseva (1987) for Russian species, Viggiani & Guerrieri (1988) for Italian species, Guerrieri & Noyes (2000) for European species; Trjapitzin (1989) for Palaearctic species and Zeya & Hayat (1993) for Indian species.

COMMENTS. In some respects females of *Metaphycus* that have the ovipositor exerted can be confused with *Aphycus*. In *Aphycus*, the linea calva of the fore wing is always entire and the outer plates of the ovipositor are reflected upward posteriorly to connect loosely with the syntergum. Some species of *Metaphycus* can also be confused with *Ooencyrtus* Ashmead, 1900, but in *Ooencyrtus* the mesopleuron extends a little past the posterior margin of the propodeum so that in profile the side of the propodeum is not visible above the hind coxa. Several other similar genera can be separated using the key provided by Noyes (2004b).



Figs 1–6. *Metaphycus zdeneki* sp. nov. (paratype). (1) antenna, ♀; (2) fore wing, ♀; (3) apex of fore wing venation, ♀; (4) hypopygium; (5) ovipositor; (6) antenna, ♂.

***Metaphycus zdeneki* sp. nov.**

(Figs 1–6)

**MATERIAL EXAMINED.** Holotype ♀: PERU, Huanuco, Santa Isabel, ex *Bakerius* sp. (det. J. Martin) on unknown plant, 22.x.2002 (lgt. G. Solis & P. Lozada). Paratypes, PERU, 35 ♀, 12 ♂, same data as holotype. Holotype in BMNH, paratypes in BMNH and MUSM.

**DESCRIPTION.** Female (holotype); length, including ovipositor, 1.11mm; excluding ovipositor, 1.08mm (air dried).

Head with occipital margin dark brown, paler brown immediately behind ocelli, ocellar area dirty white, remainder of frontovertex white; antennal scrobe dorsally white, dark brown above torulus; interantennal prominence medially white, side dark brown; area immediately around torulus whitish; temple, gena and mouth margin dark brown; eye bordered white along temple; occiput dark brown, paler brown immediately below occipital margin; antennae (Fig. 1) with radicle dark brown, scape black on both surfaces, with extreme apex white, pedicel dark brown with apical quarter pale yellow, F1–F4 dark brown, F5 and F6 white, clava dark brown; thorax mostly very dark brown, virtually black, with posterior margin of pronotum translucent, dusky white, apex of scutellum and metanotum medially pale brown, prepectus and side of pronotum white, rest of side and venter of thorax slightly paler brown than dorsum; fore leg generally very pale yellow with femur and tibia slightly dusky medially, tarsus orange-yellow, pretarsus brown; mid leg generally pale yellow, with a brown subapical mark on femur distally, mid tibia with faint to distinct brown rings at about one-fifth and three-fifths along its length, tarsus slightly darker yellow, pretarsus brown; hind coxa brown-yellow, darker proximally, femur and tibia generally pale yellow, femur broadly slightly dusky subapically, knee brown, tibia with a brown ring at about one-fifth and indication of a very faint ring at about three-fifths, tarsus darker yellow, pretarsus brown; wings hyaline, venation pale brown; propodeum dark brown, paler brown medially; gaster dark brown, visible part of ovipositor sheath pale brown.

Head with fine, punctate-reticulate sculpture on frontovertex of mesh very slightly smaller than eye facet; frontovertex with setae less dense than on dorsum of thorax, and each about as long as diameter of anterior ocellus; ocelli forming an angle of about 45°; eye clothed in dense, fine setae, each clearly shorter than diameter of facet; lateral antennal groove absent; antennal scrobes moderately deep, well-defined, v-shaped and connected dorsally; antenna (Fig. 1) with scape slightly less than 2× as long as broad; funicle with F1–F4 transverse, subequal and clearly smaller than F5 or F6; clava with a very broad, slightly oblique apical truncation which is clearly wider than F6. Relative measurements: HW 59, FV 19, POL 5.5, OCL 5, OOL 2, EL 34, EW 31, MS 23, SL 30, SW 17.

Thorax dorsally with very fine, punctate-reticulate sculpture clearly of smaller mesh than that on frontovertex; fore wing (Fig. 2) with basal cell more or less evenly setose throughout, but a little more sparsely proximally, linea calva interrupted by two lines of setae and closed near posterior wing margin by two lines of setae; marginal vein (Fig. 3) more or less punctiform; propodeum with about 15 fairly evenly distributed, conspicuous, silvery setae below spiracle.

Gaster shorter than thorax; hypopygium reaching about two-thirds along gaster; ovipositor very slightly exerted, the exerted part about 0.25× as long as mid tibial spur.

Paratype. Funicle with linear sensillae only on F5 and F6; mandible with three, very short, subequal teeth; palp formula 4–3; ovipositor as in Fig. 5; hypopygium (Fig. 4) about 2× as broad as long; second valvifer with two subapical setae. Relative measurements: FWL 76, FWW 34.5, HWL 49, HWW 12, OL 26.5, GL 4, MT 27.

Male. Length 0.82–0.98mm (air dried).

Generally very similar in habitus and colour to female but for generally much less conspicuous dark marks on legs; slightly narrower scape, more slender funicle segments, solid clava and structure of genitalia. Legs with dark markings very indistinct, appearing almost completely yellow; toruli without associated pores; antenna (Fig. 6) with scape slightly more than 2× as long as broad; all funicle segments subquadrate and clothed in setae that are about as long as diameter of segments. Relative measurements, card-mounted specimen: HW 56, FV 20, OCL 4, POL 7, OOL 3, SL 26, SW 12; slide-mounted specimen: MT 27, AL 11.5.

VARIATION. Very little in material available, although female varies from 0.84–1.03mm in length.

DISTRIBUTION. Peru.

HOST. The type series was reared from *Bakerius* sp., a relatively large species of aleurodicine whitefly (Hemiptera: Aleyrodidae), on an unknown plant.

COMMENTS. Females of *Metaphycus zdeneki* sp. nov. run to couplet 28 in Noyes (2004b) but differ from those of the three species that key there (*M. lycoris* Noyes, 2004, *M. obstinus* Noyes, 2004 and *M. dyme* Noyes, 2004) by the combination of the 4–3 palp formula and the scape being less than 2× as long as broad. The other species that run to this couplet have a 3–3 or 2–2 palp formula and the scape more than 2× as long as broad.

#### A c k n o w l e d g e m e n t s

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