

Josemiris, a new genus of Orthotylinae (Hemiptera: Miridae) from New Zealand

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Abstract *Josemiris carvalhoi*, a new genus and species of Orthotylinae from New Zealand, is described and figured. The new genus is distinguished from *Fieberocapsus* Carvalho & Southwood, and *Cyrtorhinus* Fieber. The predatory habit and zoogeography of *Cyrtorhinus* is discussed.

Keywords Hemiptera; Miridae; Orthotylinae; *Josemiris*; new genus; new species; *Fieberocapsus*; *Cyrtorhinus*; predacious; zoogeography

INTRODUCTION

Three members of the subfamily Orthotylinae have been recorded from New Zealand, two in the tribe Halticini and one in the tribe Orthotylini (Woodward 1950, 1954; Carvalho 1958; Schuh 1995). In recording *Halticus tibialis* Reuter 1891 from New Zealand, Woodward (1950) stated, "This small bug was described from Java and has since been widely recorded from tropical Africa and Asia (including Ceylon, the Carolines, Amboina and Macassar)". Carvalho (1956) added Mariana Islands and Marshall Islands. *Coridromius variegatus* Montrouzier 1861 occurs in New Caledonia, Australia, and New Zealand (Woodward 1954). The single member of Orthotylini is our endemic species *Cyrtorhinus cumberi* Woodward 1950.

The present paper describes the second species and first endemic genus from New Zealand in the tribe Orthotylini.

In the following descriptions, measurements are

in millimetres, with those of females given in parentheses. The measurements are means of three specimens for macropterous males and brachypterous females. As there is a single male brachypter and female macropter, the actual measurements for these are given. The two-letter area codes (e.g., NN for the Nelson area) are those proposed by Crosby et al. (1976).

Josemiris n. gen. (Fig. 1–6)

Insects of very small size (1.96–4.0 mm). Form: brachypterous ♂ oval; all ♀ elongate oval; macropterous ♂ elongate. Dorsal surface (excluding abdomen) covered with black semi-erect setae of circular cross-section. Remainder with short pale pubescence. Shiny. General colour green, with orange or yellow.

Head relatively large, triangular, smooth; with prominent rounded frons and gentle concave step down to strongly declivous, rounded tylus (Fig. 2). Base of antenna close to eye; antennal sockets just visible from above. Vertex (Fig. 1) looks wide (0.36–0.42 mm in ♂, 0.40–0.51 mm in ♀); with carina across posterior bearing erect black setae. Eyes in side view almost round, not reaching beyond antennal sockets (Fig. 2). Typical ratio of antennal segments 0.40:1.05:0.88:0.50; 1st segment twice as thick as the others, 2nd segment slender and cylindrical. Antennae covered with short semi-adpressed pubescence and (segments 2–4) fine almost erect setae, about as long as width of segment; segment 1 also with stout erect setae about as long as width of segment. Rostrum reaching mid coxae; 1st segment reaching base of head.

Prothorax flattened. Pronotum trapeziform, without collar or lateral carina. Sides straight, rounded in front. Posterior margin concave before scutellum. Calli slightly to moderately elevated, fused in middle (joined over narrower portion in macropters), occupying anterior half to two-thirds of pronotum, and reaching lateral margins. Pronotum mainly smooth; posterior third very finely punctate.

Scutellum smooth, flat to slightly convex, sunken below level of clavus. Mesoscutellum visible.

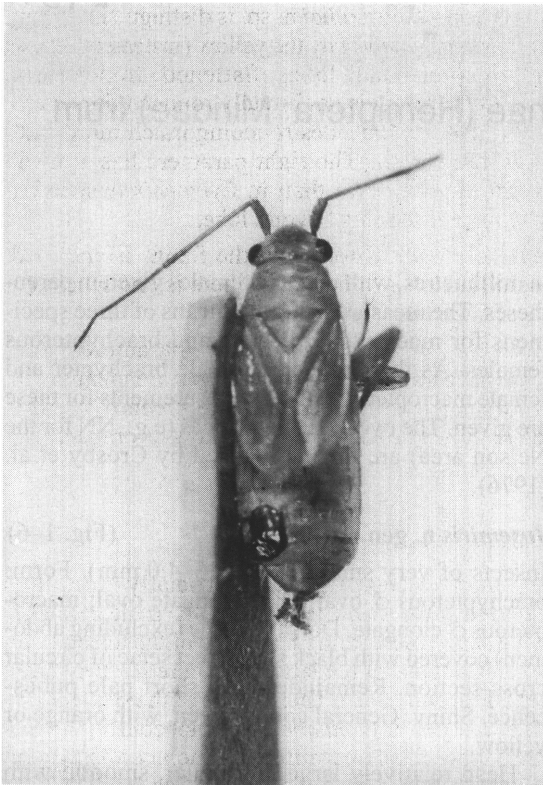


Fig. 1 *Josemiris carvalhoi* n. gen. and sp. allotype ♀. (Photo: Barry Eykel)

Hemelytra with clavus relatively broad; in brachypters cuneus and membrane much reduced, and wing reaching to 5th or 6th abdominal segment. In macropters, membrane extends well beyond abdomen, and cuneus is longer than wide ($2\times$ in ♂, $1.6\times$ in ♀). Clavus, corium, and cuneus with some shallow punctation. Embolium distinct, about $0.7\times$ width of 1st antennal segment. Costal margin convex (slightly in macropterous ♂). Corial vein visible; macropters with 2 membrane cells (absent in brachypters).

Ostiolar peritreme small. Legs short, covered with short adpressed pubescence; femora with a few long fine erect setae underneath; tibiae with stout spines, as long as width of tibia. Ratio of hind tarsomeres $0.20:0.26:0.20$. Claws long and slender. Parempodia free, converging at apices.

Pygophore with rounded posterior on the right, and opening turned slightly to the left. Phallosome (Fig. 4) strongly sclerotised, long, open along full

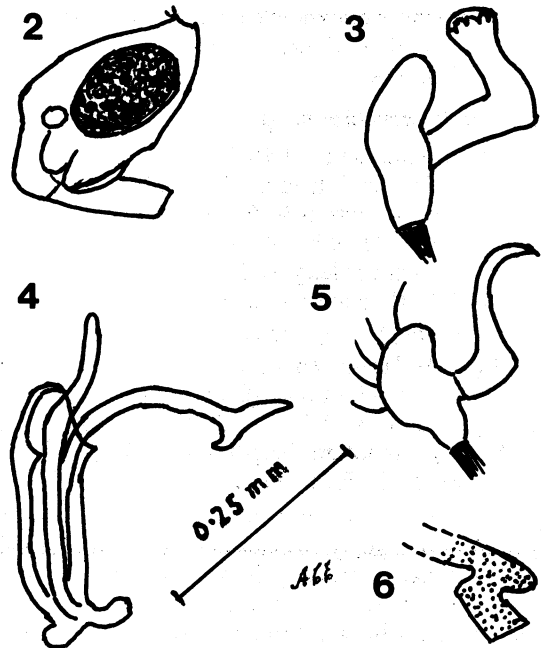


Fig. 2-6 *Josemiris carvalhoi* n. gen. and sp. 2, Head, lateral view of paratype ♀ (Lindis Pass). 3-5, Male genitalia of holotype: 3, right paramere; 4, aedeagus; 5, left paramere. 6, Structure on wall of bursa copulatrix (paratype ♀, Lindis Pass). Fig. 2 not to same scale—measurement in description; Fig. 6 to twice the scale.

length, with 2 sharp projections near apex. Aedeagus as in Fig. 4. Left paramere swan-shaped (Fig. 5). Right paramere (Fig. 3) elbowed, with toothed apex curved over.

Sclerotised flap on posterior wall of bursa copulatrix as in Fig. 6.

In the tribe Orthotylini.

TYPE SPECIES: *Josemiris carvalhoi* n. sp.

DIAGNOSIS: *Josemiris* n. gen. is reminiscent of *Fieberocapsus* Carvalho & Southwood 1955 (Holarctic), but is distinguished by the distinct membrane in brachypters, longer than wide cuneus in macropters, and details of male and female genitalia. The shape of the parameres and structure of the aedeagus are very similar to those of the nearly Cosmopolitan *Cyrtorhinus* Fieber 1858, but *Josemiris* lacks the bell-shaped pronotum, and has a head carina.

REMARKS: This new genus and its type species are named after the late Professor Dr José C. M. Carvalho in recognition of his outstanding

contributions to our knowledge of the Miridae of the world. Etymology: *Josemiris*, from José and miris—gender feminine.

Josemiris carvalhoi n. sp. (Fig. 1–6)

BRACHYPTERS: Length 1.96 (2.44–3.20); width 0.76 (1.02–1.17). Head: length 0.39 (0.50); width 0.70 (0.79); vertex width 0.36 (0.46). Antennae: length of segments 0.33 : 0.84 : 0.80 : — (0.40 : 1.05 : 0.88 : 0.50). Pronotum: length 0.38 (0.46); width at base 0.69 (0.90). Hemelytron: length 1.06 (1.59).

MACROPTERS: Length 3.07–4.00 (3.97); width 1.10–1.19 (1.20). Head: length 0.42 (0.50); width 0.77 (0.84); vertex width 0.41 (0.44). Antennae: length of segments 0.43 : 1.25 : 1.13 : 0.50 (0.40 : 1.00 : 0.95 : —). Pronotum: length 0.49 (0.55); width at base 0.92 (1.10). Hemelytron: length 3.0 (3.07).

COLOUR: Green and pale yellow or orange. Head yellow or orange; tylus black or dark brown. 1st and 2nd antennal segments yellow or light brown (2nd sometimes with narrow brown band basally); 3rd and 4th segments brown. Pronotum with anterior lobe yellow; posterior lobe green or orange. Mesoscutellum yellow. Scutellum green or yellow. Clavus, corium, and cuneus green in freshly collected specimens, otherwise yellow or orange. Legs yellow or orange; 3rd tarsomere brown.

Ventral surface yellow; thorax with sublateral black or brown stripe from behind eye (sometimes extending onto anterior of abdomen, sometimes restricted to prothorax or its anterior half, or to a spot at anterior behind eye). 1 ♀ in addition with green tinge sublaterally on thorax and anterior of abdomen; another ♀ with orange lateral stripe on abdomen.

STRUCTURE AND ♂, ♀ GENITALIA: As described for the genus.

TYPE DATA: **Holotype** ♂ (brachypter) CO, Carrick Range, Watts Rock, 1300 m, sweeping grasses, 13 Feb 1976, L. L. Deitz (New Zealand Arthropod Collection). **Allotype** ♀ (brachypter) NN, Tahunanui, 23 Jan 1927, E. S. Gourlay (NZAC). **Paratypes** (3 ♂ 3 ♀; NZAC): brachypters—1 ♀ OL/CO, Lindis Pass, sweeping, 10 Feb 1982, C. F. Butcher; 1 ♀ AK, Auckland, NW motorway at Te Atatu bridge, sweeping *Salicornia*, 10 Jan 1980, C. F. Butcher & M. F. Tocker; macropters—1 ♂ SL, Orepuki, Longwood Range, sweeping pasture, 8 Feb 1976, L. L. Deitz; 1 ♂ CO, Old Dunstan Rd, Lammermoore Range, 700 m, sweeping grassland, 18 Feb 1976, L.L.D.; 1 ♂ WD, 1 km N of Hokitika, sweeping grass, 27 Feb 1976, L.L.D.; 1 ♀ MC, Banks Peninsula, 4 km E of Akaroa, sweeping pasture, 22 Feb 1976, L.L.D.

DIAGNOSIS: *J. carvalhoi* n. sp. is distinguished from *Cyrtorhinus cumberi* by the yellow (instead of black) anterior pronotal lobe, flattened trapeziform pronotum, which is not broadly rounded dorsoventrally, and has the sides rounding much more suddenly at anterior. The right paramere has a much longer elbowed arm than in *Cyrtorhinus* species, with apex extending beyond lobe.

DISTRIBUTION: Throughout the South Island, and possibly the North Island, as there is one specimen from Auckland.

REMARKS: The shape of the parameres and sclerotised structure in the aedeagus are identical in brachypters and macropters. The green of freshly collected specimens fades to yellow or orange.

DISCUSSION

Although brachypters are superficially more like *Fieberocapsus* than *Cyrtorhinus*, the male genitalia of *Josemiris* are nothing like those of the former, but similar to those of the latter (as figured in Carvalho & Southwood 1955). Their figure of the structure in the aedeagus for *C. cumberi* does not conform to the other species. My own investigation confirms that *C. cumberi* does have the flared “fish tail” apex to this sclerotised structure (or spiculum).

There are more differences between *Josemiris* and *Cyrtorhinus* than are mentioned in the diagnoses above. In lateral view of the head, the eye in *Josemiris* is smaller, narrower, and orientated diagonally (Fig. 2); in *Cyrtorhinus* the orientation is vertical. *Josemiris* has a more prominent frons, a wider vertex, and lacks or has a very shallow transverse impression on the pronotum (very distinct in *Cyrtorhinus*).

There is a need to study the biology of both *J. carvalhoi* and *C. cumberi* to determine if they are phytophagous, predacious, or occasionally predacious. Carvalho & Southwood (1955) reviewed the literature on predation of eggs of some Homoptera by some species of *Cyrtorhinus*—but see also Woodward (1950) and Usinger (1939). The latter author explains that mirids feeding on eggs hidden in stems appear to be feeding on the plant. *J. carvalhoi* occurs in grassland. *C. cumberi* was taken below and in tufts of rushes and grasses with many Delphacids (Woodward 1950). I have taken it on *Carex*. These two New Zealand mirid species may prove to be beneficial.

Interestingly, although *Cyrtorhinus* occurs in the Australasian zoogeographical region and all around

Australia (Micronesia, Melanesia, Indonesia, Polynesia, and New Zealand—Carvalho 1958; Schuh 1995), this genus has not been recorded from Australia. *Cyrtorhinus* is absent only from the Neotropical region.

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