

NAUCORIDAE (HEMIPTERA) OF NEW GUINEA

I. A review of the genus *Nesocricos*, with descriptions of two new species¹

Dan A. Polhemus² and John T. Polhemus³

Abstract. The genus *Nesocricos* is reviewed based on recent collections from Papua New Guinea. Two new species, *N. kukukuku* and *N. montanus*, are described; distributional notes are given for 2 previously described species; and a key to all species is provided.

The genus *Nesocricos*, endemic to the highlands of New Guinea, was proposed by La Rivers (1971) to hold a single species, *N. evops*; a 2nd species, *N. mion*, was added subsequently by the same author (La Rivers 1974). Though placed by La Rivers (1971, 1974) in the subfamily Cheirochelinae, *Nesocricos* lacks the distinctive head modifications, including a strongly projecting anteclypeus and a vertex produced posteriorly behind the eyes, typical of that group (Usinger 1941). In Usinger's (1941) key to subfamilies, this genus runs to Naucorinae but is so apomorphic relative to the other genera held there that the placement seems questionable. It is possible that this genus, along with several other phylogenetically allied genera from New Guinea, will merit placement in a separate subfamily, but such action is deferred pending a more thorough analysis of the Naucoridae on a generic level. In the present paper, 2 new species, *N. kukukuku* and *N. montanus*, are described, additional distribution records are noted for *N. evops* and *N. mion*, and a key to the known species is provided, accompanied by illustrations of the male left parameres and the dorsal habitus of *N. kukukuku*, n. sp.

Nesocricos species are found along the margins of cold upland streams above 800 m (2600'), where they cling to overhanging vegetation, logs, and undercut bank margins, frequently aggregating in favorable sheltered sites. In slower water they may also be found under stones, but usually in close proximity to shore and never in the turbulent, rushing midsections of streams favored by the cheirocheline genera *Idiocarus* and *Tanycricos*, with which they are often sympatric. In general habitus and behavior, *Nesocricos* resembles certain Belostomatidae and may represent ecological equivalents in the New Guinea highlands where the latter have not radiated.

All specimens reported in this paper are held in the J.T. Polhemus collection (JTP) unless otherwise noted; the types are deposited in the Bishop Museum, Honolulu

1. This research supported by a grant from the National Geographic Society, Washington, D.C., USA.
2. Department of Biology, University of Utah, Salt Lake City, Utah 84112, USA.
3. University of Colorado Museum, 3115 S. York St., Englewood, Colorado 80110, USA.

(BPBM). Proportions are given in units: 40 units = 1 mm. CL numbers following locality data refer to codes used by the authors to reference ecological notes.

KEY TO THE SPECIES OF *NESOCRICOS*

1. Small species, overall length 13 mm or less; ♂ left paramere broad, bladelike (see Fig. 4) **mion**
- Larger species, overall length exceeding 13 mm; ♂ left paramere slender, curving (see Fig. 2, 3, 5) 2
2. Lateral margins of pronotum strongly explanate 3
- Lateral margins of pronotum weakly explanate, bearing only a narrow carinate ridge, slightly concave in macropterous individuals; ♂ left paramere slender, curving (see Fig. 5) **montanus, n. sp.**
3. Anterolateral angles of pronotum adjoining eyes acute, sharp, contacting eye margins at oblique angles; ♀ small, overall length less than 14 mm; ♂ left paramere very slender on distal ½, tip pointed (see Fig. 2) **kukukuku, n. sp.**
- Anterolateral angles of pronotum adjoining eyes squared off, blunt, contacting lateral eye margins perpendicularly; ♀ larger, overall length equal to or exceeding 15 mm; ♂ left paramere not narrowing markedly on distal ½ **evops**

Nesocricos kukukuku Polhemus & Polhemus, **new species**

Fig. 1–2

Macropterous ♀. Of moderate size for genus, overall coloration dull brown with scattered dark brown mottling; hemelytra and scutellum dark brown. Length 13.70 mm; maximum width 7.94 mm; general shape broadly ovate, widest across abdomen (see Fig. 1).

Head light brown, darker along midline, width/length = 143/66; anteclypeus barely exceeding base of labrum, apex gently rounded, 2 (1+1) yellowish brown depressions present to either side of apex; maxillary plates small, rounded, yellowish brown; antennae short, slender, not exceeding lateral eye margins; eyes dark brown, frequently with gold sheen, much longer than wide, width/length = 26/72, squared off posteriorly, inner margins weakly sinuate, separated from frons by distinct furrows bearing minute stout pale setae, weakly convergent anteriorly, posterior/anterior interocular = 87/82; vertex with posterior margin weakly curved, barely produced behind posterior eye margins. *Pronotum* light brown, areas centrally and adjoining lateral margins darker, anterior portion dotted with fuscous, width/length (midline) = 256/102; weak sulcus present medially separating 2 anterior lobes; anterolateral angles acute; posterior margin delineated by shallow transverse furrow, weakly sinuate; lateral margins distinctly explanate, weakly convex; entire surface vaguely rugose, set with very short pale erect stout setae. *Scutellum* dark brown, set with short erect pale setae, width/length = 194/107; lateral margins weakly sinuate; mesoscutum partially exposed adjoining pronotum. *Hemelytra* dark brown, with fine pale granular microstructure, set with short erect pale stout setae; clavus clearly defined by deep furrows; embolium well delineated, weakly explanate laterally; membrane black, reaching to tip of abdomen, lacking setae but possessing granular microstructure, venation not evident. *Abdomen* light brown, darker along posterior margins of tergites; tergites I–VI exposed laterally, margins bearing a fringe of gold setae; posterolateral angles squared off, bearing posteriorly directed tufts of gold setae on tergites III–VI. *Ventral surface* brown, abdomen darker; abdomen and areas of thorax adjoining coxal cavities set with thick pile of gold setae; rostrum yellowish, tip embrowned, reaching to fore coxae; ventral keel of head with minute tooth anteriorly; 2 (1+1) static sense organs present at anterolateral prothoracic angles, cupped into small depressions formed by incurving of pronotal margins; posterior portions of propleura distinctly reflexed with sulcus basally, covering anterior basal

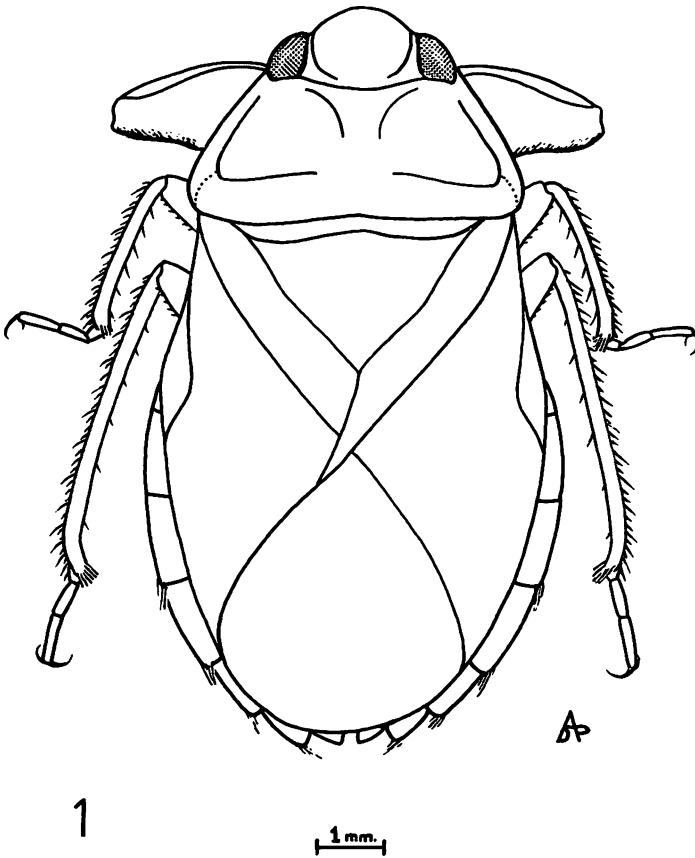


FIG. 1. *Nesocricos kukukuku*, macropterous ♀, dorsal habitus.

portions of mesosternal plate; mesosternal plate with slight medial carina, central portion of anterior margin barely reflexed, posterior margin produced to a medial point. Legs light brown; fore femora dotted with fuscous, fringed with gold setae on anterior and posterior margins, a long sensory seta present on anterior margin adjoining tibia, fore tibia with fringe of short gold setae along inner margin, tip with single tarsal segment bearing a sensory seta, claw minute; fore coxa with a row of ca. 20 tiny dark tubercles along ventral midline, anterior face with a patch of fine gold setae; middle and posterior coxae bearing rows of ca. 10 small dark tubercles along ventral midlines; middle and posterior femora with double rows of stout reddish spines along posterior margins, interspersed with other scattered reddish spines; middle femur with comb of long slender reddish spines near ventral apex; middle and posterior tibiae thickly set with stout reddish spines, 5–6 transverse rows of long stout spines present at apices; middle and posterior tibiae thickly set with stout reddish spines, 5–6 transverse rows of long stout spines present at apices; middle and posterior femora, tibiae, and tarsi with long gold swimming hairs; claws slender, pallid, sharply curved, tips black. *Subgenital plate* trapezoidal, apex gently rounded, bearing a fringe of gold setae.

Macropterous ♂. Similar to ♀ in general structure and coloration, but distinctly larger, form more elongate; wings more fully developed, exceeding tip of abdomen and covering entire

abdominal dorsum; length 15.36 mm; maximum width 8.70 mm. *Parameres* of equal size, asymmetrical; left paramere slender distally, tip pointed (see Fig. 2).

Brachypterous form. Unknown.

Types. Holotype ♀ (ВРВМ 13,400), allotype ♂: PAPUA NEW GUINEA: Morobe Prov, Wampit Riv along Wau road, 10.7 km N of Mumeng, 900 m (2953'), 19.IX.1983 (CL 1833, J.T. & D.A. Polhemus). 3♀ paratypes, same data as types. Holotype in ВРВМ; allotype and paratypes in JTP.

Etymology. The name “kukukuku” refers to the ferocious tribesmen indigenous to the area where these insects were collected.

Remarks. *Nesocricos kukukuku* is similar in general habitus to *N. evops* La Rivers, but may be distinguished by the acute anterolateral angles of the pronotum adjoining the eyes, the slender male left paramere (see Fig. 2), and the smaller size of the females, the sexual dimorphism in size in this species being the most pronounced of any in the genus. The type series was collected in a set of shallow side channels adjoining the main river, with grassy banks, unshaded water, and substrates of pea gravel and small smooth stones in a moderate current.

***Nesocricos montanus* Polhemus & Polhemus, new species**

Fig. 5

Macropterous ♀. Of moderate size for genus, body elongate, pear-shaped; length 14.72 mm; maximum width 8.06 mm. General coloration light yellowish brown, mottled with darker brown on head and pronotum; hemelytra dark brown.

Head yellowish brown, dotted with fuscous, base of vertex, median line of frons, and 2 (1+1) elongate patches parallel to median line on either side darker brown, head width/length = 138/107; eyes gold, black in living specimens, elongate, width/length = 26/78, inner margins weakly sinuate, separated from frons by shallow furrows bearing pale setae, weakly convergent anteriorly, anterior/posterior interocular = 82/92; anteclypeus evenly rounded, barely exceeding base of labrum, bearing 2 (1+1) shallow depressions on either side of apex; labrum subtriangular, yellowish brown, apex rounded; maxillary plates rounded, yellowish brown; antennae light brown, tips barely exceeding lateral eye margins; vertex with posterior margin essentially straight, not produced behind eyes. *Pronotum* yellowish brown, more or less mottled and dotted with darker brown, areas medially and along posterior margin dark brown, a light brown transverse band present adjoining posterior margin, width/length (midline) = 241/102; lateral margins weakly concave, not highly explanate, bearing a thin flattened edge; posterolateral angles acute, rounded; posterior margin defined by shallow transverse furrow, weakly sinuate; anterolateral angles squared off; entire surface set with minute pale erect setae. Scutellum dark brown, lighter to either side of midline, width/length = 195/128; surface set with minute pale erect setae; lateral margins weakly sinuate; apex produced to a distinct point; mesoscutum well exposed. Hemelytra dark brown, mottled with lighter brown, reaching to tip of abdomen; surface bearing fine pale granular microstructure, set with pale erect short stout setae; clavus and embolium well defined, embolium weakly explanate laterally; membrane black, bearing granular microstructure but lacking setae, venation obscure. *Abdomen* yellowish brown, tergites I–VI exposed laterally, posterior portions embrowned, giving margins striped appearance; lateral margins fringed with fine gold setae, posterolateral angles of tergites II–VI with posteriorly directed hair tufts. *Ventral surface* dark brown, head, abdomen, and central portions of thorax thickly covered with a gold hydrofuge pile; rostrum pallid, terminal segment brown, reaching to fore coxae; ventral keel of head with tiny tooth anteriorly; typical static

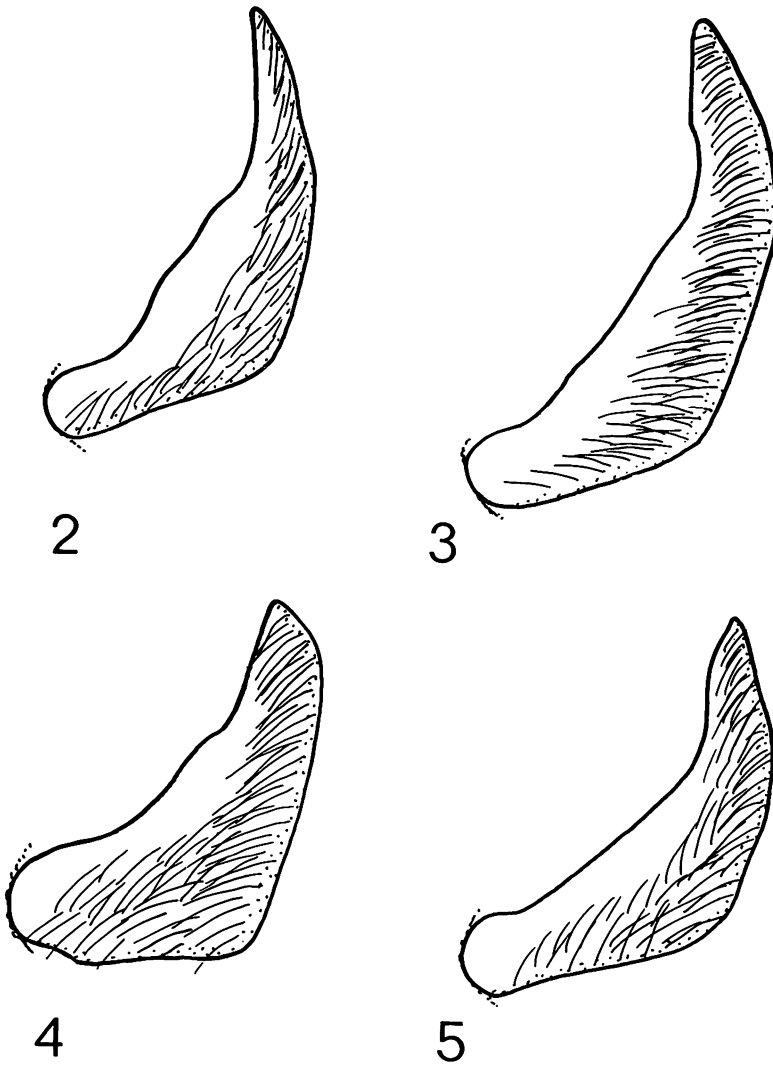


FIG. 2-5. Male left parameres of *Nesocricos* species: 2, *N. kukukuku*; 3, *N. evops*; 4, *N. mion*; 5, *N. montanus*.

sense organ cupped into anterolateral angle of prothorax; propleura not strongly reflexed, not covering basal areas of mesosternal plate; mesosternal plate swollen medially, anterior margin weakly reflexed, posterior margin produced to a distinct point medially. Legs yellowish brown, fore femur heavily dotted with fuscous dorsally, fringed with gold setae on anterior and posterior margins, anterior margin adjoining tibia bearing long sensory seta; fore tibia brown, bearing a sensory seta distally; fore coxa with a row of ca. 20 tiny dark tubercles running lengthwise along ventral midline, anterior face with a patch of fine gold setae; middle and posterior coxae with raised dark tubercles ventrally; middle and posterior femora with 2 parallel rows of reddish brown spines running lengthwise along posterior margin, ventral row much

reduced, anterior margin with scattered small stout spines; middle femora with comb of fine spines near apex ventrally; middle and posterior tibiae set with stout reddish spines, 4–5 transverse rows of long stout spines present distally; middle and posterior tarsi with stout spines running lengthwise, claws sharply bent, tips black. *Subgenital plate* trapezoidal, posterior margin with slight depression centrally, fringed with gold setae.

Macropterous ♂. Similar to ♀ in general structure and coloration, but slightly larger and more robust; length 15.36 mm; maximum width 8.06 mm. Wings covering entire abdomen, tergites not exposed laterally; pronotum broader basally, width/length (midline) = 266/102. *Parameres* of equal size, asymmetrical; left paramere slender, curving, tip coming to a blunt point, shape as in Fig. 5.

Brachypterous form. Similar to macropterous forms in most details of structure and coloration, with following exceptions: coloration lighter, predominantly yellowish brown, including hemelytra; pronotum more quadrate, lateral margins weakly convex; hemelytra shortened, not attaining posterior margins of abdominal tergite VI, clavus and embolium barely defined, membrane much reduced, setae nearly absent; anterior margin of mesosternal plate more sharply reflexed; spination of legs much reduced.

Types. Holotype, macropterous ♀, and allotype, macropterous ♂: PAPUA NEW GUINEA: Morobe Prov, Big Wau Crk at Wau, 1036 m (3400'), 16.IX.1983 (CL 1819, J.T. & D.A. Polhemus) (BPBM 13,401). Paratypes: 1 macropterous ♂, 1 brachypterous ♂, 10 macropterous ♀, 4 brachypterous ♀, 7N, same data as types; 1 macropterous ♀, Morobe Prov, Bulolo Riv at Wau, 899 m (2950'), 16.IX.1983 (CL 1815, Polhemus & Polhemus). Holotype and allotype in BPBM; paratypes in JTP.

Etymology. The name *montanus* (Latin, “pertaining to mountains”) refers to the habitat of this species.

Remarks. *Nesocricos montanus* is similar to *N. evops* La Rivers but can be separated from *evops* on the basis of its male left paramere (see Fig. 5) and nonexplanate pronotal margins. The slender habitus, weakly concave lateral pronotal margins in fully winged individuals, and male genitalia are diagnostic. The type series was taken from a mass of debris and vegetation matted against an undercut bank in deep, rushing water. Although a long section of stream was collected, the bugs were found only in one small area, illustrating the tendency of *Nesocricos* species to aggregate in favorable microhabitats.

***Nesocricos evops* La Rivers, 1971**

Fig. 3

Originally described from near Kainantu, in the Eastern Highlands Province, this species is widespread in the central ranges of New Guinea, preferring high altitude streams with very cold waters. In the vicinity of Wau this species and *N. montanus* occurred in the same drainages, but *N. evops* was found at significantly higher elevations. This species may be recognized by the explanate lateral margins of the pronotum, large size (overall length exceeding 14 mm in both sexes), squared off anterolateral pronotal angles, and male genitalia (see Fig. 2).

Material examined. PAPUA NEW GUINEA. Western Highlands Prov: 1♀, 1N, upper Lai Riv, 15 km W of junction of Wabag and Mendi roads, 7.IX.1983 (CL 1789, J.T. & D.A. Polhemus) (JTP); 1♀, 3N, stream just W of Murrumbidgee Pass summit, 3000 m (9842'), 7.IX.1983 (CL 1784, Polhemus & Polhemus)

(JTP); 14♂, 5♀, 19N, Baiyer Riv, 27 km N of Mt Hagen, 6.IX.1983 (CL 1782, Polhemus & Polhemus) (JTP); 1♀, stream 17 km N of Mt Hagen on Baiyer Riv road, 6.IX.1983 (CL 1780, Polhemus & Polhemus) (JTP). Morobe Prov: 2♀, Poverty Crk, Mt Missim, 1600 m (5249'), 18.IX.1983 (CL 1830, Polhemus & Polhemus) (JTP).

Nesocricos mion La Rivers, 1974

Fig. 4

The smallest species in the genus, *N. mion* may be recognized by its size (overall length less than 13 mm) and wide, bladelike male left paramere (see Fig. 4). Originally described from Goroka, in the Eastern Highlands Province, this species occurs over essentially the same range as *N. evops*, but the 2 species are rarely found in association with each other. These insects were reported by highland tribesmen to be excellent bait for the introduced trout present in many of the mountain streams.

Material examined. PAPUA NEW GUINEA: Western Highlands Prov: 8♂, 14♀, 1N, Ambugla Riv at Tambul, 2240 m (7349'), 7.IX.1983 (CL 1788, J.T. & D.A. Polhemus) (JTP); 6♂, 5♀, 1N, Pindu Riv nr Alkena, 1900 m (6233'), 7.IX.1983 (CL 1785, Polhemus & Polhemus) (JTP); 2♂, 1♀, Baiyer Riv, 27 km N of Mt Hagen, 6.IX.1983 (CL 1782, Polhemus & Polhemus) (JTP).

LITERATURE CITED

- La Rivers, I.** 1971. Studies of Naucoridae (Hemiptera). *Biol. Soc. Nev. Mem.* **2**: 1-120.
1974. Catalogue of taxa described in the family Naucoridae (Hemiptera). Supplement no. 1: corrections, emendations, and additions, with descriptions of new species. *Biol. Soc. Nev. Occas. Pap.* **38**: 1-17.
- Usinger, R.L.** 1941. Key to the subfamilies of Naucoridae with a generic synopsis of the new subfamily Ambrysinæ (Hemiptera). *Ann. Entomol. Soc. Am.* **34**: 5-16.