

***Cyclopsaptera* gen.n., a new apterous genus of Carventinae
(Heteroptera: Aradidae) from New Guinea,
with description of four new species**

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Abstract

The aradid fauna of New Guinea Island remains insufficiently known. The tropical rainforests and neighbouring lowland forests are hotspots for biodiversity and the habitat of numerous endemic animal and plant species. Of the aradid subfamily Carventinae, twelve genera with around 50 species have been described to date. Material collected by Alexander Riedel in West Papua (Papua Barat) and Papua included new taxa of apterous Carventinae that are described and illustrated: *Cyclopsaptera* gen.n., *Cyclopsaptera arfak* sp.n. (type species), *Cyclopsaptera biak* sp.n., *Cyclopsaptera pilosa* sp.n., and *Cyclopsaptera tomentosa* sp.n.

Key words. Hemiptera, Heteroptera, Aradidae, Carventinae, new genus, new species, West Papua, Papua, New Guinea.

Zusammenfassung

Die Aradidenfauna von Neuguinea ist noch sehr lückenhaft erforscht. Die tropischen Regenwälder und angrenzenden Tieflandwälder sind Hotspots der Biodiversität und Lebensraum zahlreicher endemischer Tier- und Pflanzenarten. Von der Aradiden-Unterfamilie Carventinae sind bisher zwölf Gattungen mit rund 50 Arten beschrieben worden. Das von Alexander Riedel in Westpapua (Papua Barat) und Papua gesammelte Material enthielt neue Taxa von apteren Carventinae, die beschrieben und illustriert werden: *Cyclopsaptera* gen.n., *Cyclopsaptera arfak* sp.n. (Typusart), *Cyclopsaptera biak* sp.n., *Cyclopsaptera pilosa* sp.n. und *Cyclopsaptera tomentosa* sp.n.

Introduction

At 786.000 km², New Guinea is the second largest island after Greenland. A central mountain range reaching 4882 m at the highest point (Puncak Jaya) is the backbone of the island. Its slopes are predominantly covered with rainforest followed by lowland forests on alluvial planes.

The mountain regions covered by rainforest in the Cyclops range and the Bird's Head peninsula represent rich and diverse habitats, fostering an unparalleled, yet still insufficiently known, biodiversity. This ecological richness faces significant threats from logging and agricultural expansion.

The aradid fauna of New Guinea Island remains insufficiently known (MONTEITH 1982). The most recent comprehensive Catalogue of the World Aradidae by KORMILEV &

FROESCHNER (1987) listed the following genera of the Aradidae subfamily Carventinae USINGER, 1950 described from the New Guinea territory: *Biroana* KORMILEV, 1957 (6 species), *Camerarius* DISTANT, 1902 (2 species), *Carventus* STÅL, 1865 (14 species), *Drakeida* KORMILEV, 1958 (1 species), *Eurycoris* KORMILEV, 1957 (6 species), *Libiocoris* KORMILEV, 1957 (5 species), *Nesoproxius* USINGER & MATSUDA, 1959 (4 species), *Sibilocoris* BLOETE, 1965 (1 species), *Trigonaptera* MATSUDA & USINGER, 1957 (1 species), and *Zimmermania* USINGER, 1948 (4 species).

Among these, only five genera are represented by apterous taxa. Additional, subsequently published records comprise two more apterous genera: *Papuaptera* HEISS, 1997 and *Riedelaptera* HEISS, 1997, each represented by one species.

The loss of wings in these species typically coincides with the development of protruding structures and dorsal body surface fusions, often of significant generic and taxonomic relevance. As the specimens now available for study cannot be placed into one of the described genera, a new genus is proposed to accommodate the four new species, which are described and pictured herein.

Material and methods

The material upon which this study is based is deposited in the collection of the Staatliches Museum für Naturkunde, Karlsruhe, Germany (SMNK). Holotypes will be deposited at the Bogor Zoology Museum (Museum Zoologicum Bogoriense), Cibinong, Indonesia (MZB), and the aradid collection of the first author at the Tiroler Landesmuseum, Innsbruck, Austria (CEHI) which later will be transferred to the Bavarian State Collection of Zoology in Munich, Germany.

As apterous and micropterous aradid specimens collected and sifted from litter are usually covered by incrustation obscuring the body structures, they were cleaned and remounted for examination.

Measurements were taken with a micrometre eyepiece and are given in millimetres.

When citing the text on the labels of a pin attached to the specimens, / separates the lines and // different labels. Photos were taken with an Olympus OM-5 camera; Helicon Focus 8, along with Adobe Photoshop CS6 software, was utilized for image composition.

Abbreviations used: deltg = dorsal external laterotergite (connexivum), mtg = mediotergite, ptg = paratergite.

Taxonomy

Subfamily Carventinae USINGER, 1950

Genus *Cyclopsaptera* gen.n.

Type species. *Cyclopsaptera arfak* sp.n.

Description. Apterous, of small size, body length 3.10–3.65 mm. Body about twice as long as wide, reddish brown to piceous when cleaned from incrustation usually completely obscuring the body structures. Head, lateral margins with conical obliquely protruding elevations of pro- and mesonotum, of metanotum and deltg II–VII of cleaned specimens are beset with dense brush of yellowish, stiff, erect, apically curved setae.

Head slightly wider than long. Clypeus as short as conical antenniferous tubercles. Antennae about 1.5 times as long as width of head across eyes; segment III longest, II shortest, apex of IV with erect pilosity. Eyes stylate at base, laterally protruding. Postocular lobes converging posteriorly to constricted neck. Rostrum arising from an open atrium, shorter than head.

Thorax. Pronotum attenuated anteriorly; collar ring-like; lateral margins with a conical protuberance densely beset with stiff, erect setae; a smooth and deeply depressed area between these protuberances; posterior margin carinate and convex. Mesonotum with protuberances as on pronotum along lateral margins; scutellum flat or elevated, beset with stiff, erect setae; metanotum, deltg I+II and mtg I+II fused together, their lateral margins raised and carinate, depressed at middle. Legs. Femora and tibiae cylindrical and slender, fore tibiae with a preapical spine.

Abdomen. Tergal plate consisting of mtg III–VI depressed and smooth, deltg II–VII laterally carinate and raised, highest on deltg III, beset with stiff, erect setae; mtg VII of male strongly elevated. Spiracle II placed on a large conical laterally produced tubercle, spiracle III on a smaller one, both visible from above. Tubercles IV–VI ventral, VII lateral and visible from above, VIII terminal on ptg VIII.

Comparative notes. Seven genera of apterous Carventinae are recorded to date from New Guinea. *Cyclopsaptera* gen.n. differs from all of them by the body structures beset with a dense brush of yellowish, stiff, erect, apically curved setae and by the stylate eyes. In addition, *Papuaptera* and *Riedelaptera* are distinguished by their strongly elevated body and differently fused thorax; *Biroana* by meso-, metanotum and mtg I+II inflated into a prominent lobe; *Eurycoris* by its larger size and lamellate pronotal lobes; *Libiocoris*, *Sibilocoris* and *Trigonaptera* by their dorsally flattened body and different structure of tergal plate.

Distribution. Indonesia: West Papua and Papua provinces.

Etymology. The generic name refers to the Cyclops Mountains where the type species was discovered.

Key to species of *Cyclopsaptera* gen.n.

The key is based on cleaned males. Only a single female is known.

- 1 Eyes strongly stylate; eye-stalks twice as long as their diameter. Body wide and oval, about 1.8 times as long as wide across tergite IV. Scutellum triangular and flat. Ratio length of antennae to width of head 1.35. Biak Island. *Cyclopsaptera biak* sp.n.
- Eyes moderately stylate; eye-stalks shorter, at most 1.5 times their diameter. Body elongate and subparallel, at least twice as long as wide across tergite IV. Scutellum bulbously elevated and densely beset with stiff erect setae. Ratio length of antennae to width of head 1.70–2.06. 2
- 2 Antennae long, 2.06 times as long as width of head; segment III longer, 2.2 times as long as II. Eye-stalks more robust, about as long as their diameter. Bird's Head Peninsula. *C. tomentosa* sp.n.
- Antennae shorter, at most 1.78 times as long as width of head; segment III shorter, about twice as long as II. Eye-stalks more slender and longer than their diameter. 3
- 3 Larger species, length 3.45 mm. Body more slender, 2.38 times as long as wide across tergite IV. Ratio length of antennae to width of head 1.78. Arfak Mountains, Bird's Head Peninsula. *C. arfak* sp.n.

- Smaller species, length 3.10–3.20 mm. Body more stout, 2.00–2.13 times as long as wide across tergite IV. Ratio length of antennae to width of head 1.47–1.48. *Cyclops Mountains*. *C. pilosa* sp.n.

***Cyclopsaptera biak* sp.n.** (Figs 1, 2)

Material examined. Holotype (male): W-PAPUA / Biak Isl. S Korim / 12. XII 2007 / sample 1 sifted / Nernu, 165 m / leg. A. Riedel // S00°55,784' / E 136°01,530' // (MZB). Holotype label is attached to this specimen.

Diagnosis. This species is recognized and distinguished from other congeners by the following combination of characters: wide body, oval habitus, short antennae and flat scutellum as given in the key.

Description. Habitus oval. Colouration reddish brown with dense yellowish pilosity on protruding body structures.

Head distinctly wider than long (0.85 : 0.60). Antenna short, 1.35 times as long as width of head; segment II shortest, III longest. Eyes strongly stylate, placed on anterolaterally directed cylindrical eye-stalks.

Thorax. Pro- and mesonotum with lateral, finger-like, upward directed tubercles densely covered by stiff setae. Scutellum triangular, surface flat and granulate with sparse pilosity. Surface between pronotal protrusions smooth.

Abdomen. Lateral margins of deltg II–VII raised and carinate. Spiracle II placed on a longer, that of III on a shorter laterally visible tubercle, surrounded by a patch of stiff, yellowish setae. Terminal segments and pygophore posteriorly raised upward.

Measurements. Body length 3.25; width of abdomen across tergite IV 1.80; length of antenna 1.15; length of antennal segments I : II : III : IV = 0.30 : 0.20 : 0.35 : 0.30.

Etymology. Named after the island of Biak, situated northwest of the main island of New Guinea.

Distribution (Fig. 13). The only record is from Biak Island; presumably endemic.

***Cyclopsaptera tomentosa* sp.n.** (Figs 3, 4)

Material examined. Holotype (male): IRIAN JAYA / Vogelkop pen. / Tetaho area, Kosmena / 1700–1750 m Gesiebe / 25 III 1993 A. Riedel // (CEHI). Holotype label is attached to this specimen.

Diagnosis. This species is recognized and distinguished from other congeners by the following combination of characters: subparallel body, long antennae with segment III 2.2 times as long as II as given in the key.

Description. Habitus elongate oval, posteriorly rounded. Colouration reddish brown to piceous.

Head wider than long (0.72 : 0.65). Antennae long, 2.06 times as long as width of head; segment II shortest, III longest and 2.2 times as long as II. Globular eyes stylate, laterally protruding.

Thorax. Finger-like, lateral tubercles of pro- and mesonotum beset with stiff, erect, yellowish setae. Scutellum bulbously elevated and densely pilose. Surface of pronotum between tubercles smooth and shiny.



Figs 1–2. *Cyclopsaptera biak* sp.n. holotype (male), dorsal (1), lateral (2). © A. Eckelt.



Figs3–4. *Cyclopsaptera tomentosa* sp.n., holotype (male), dorsal (3), lateral (4). © A. Eckelt.



Figs 5–6. *Cyclopsaptera arfak* sp.n., holotype (male), dorsal (5), lateral (6). © A. Eckelt.



Figs 7–8. *Cyclopsaptera arfak* sp.n., uncleaned paratype (male), dorsal (7), lateral (8). © A. Eckelt.

Abdomen. Structures of deltg II–VII, placement of spiracles II and III on laterally produced tubercles as in congeners. Terminal segments and pygophore moderately bent and directed upward.

Measurements. Body length 3.65; width of abdomen 1.70; length of antenna 1.50; length of antennal segments I : II : III : IV = 0.35 : 0.25 : 0.55 : 0.35.

Etymology. The species epithet refers to the particularly long, yellowish, stiff tomentum of the scutellum.

Distribution (Fig. 13). The single record originates from the Bird's Head Peninsula in West Papua, renowned as a hotspot for endemic species.

Cyclopsaptera arfak sp.n. (Figs 5–8)

Material examined. Holotype (male): W-PAPUA / Manokwari, Arfak Mts. / Mokwam, Siyonbrig / 1500 m / leg. A. Riedel // 10.12.2007 / sample 3 sifted / S01°06,086' / E 133°55,027' // (MZB); Paratypes: 2 ♂♂, collected with holotype (uncleaned) (SMNK, CEHI); 1 ♂ (uncleaned) W-PAPUA / Manokwari, Arfak Mts. / Mokwam, Siyonbrig / 1530 m / leg. A. Riedel // 10 XII 2007 / sample 2 sifted / S01°06,086' / E 133°54,888' // (MZB). Type labels are attached to the specimens.

Diagnosis. This species is recognized and distinguished from other congeners by the following combination of characters: body length, slender habitus, and long antennae (see key).

Description. Comparatively large species, habitus elongate with subparallel lateral borders. Body reddish-brown with erect, yellowish setae on protruding body structures.

Head slightly wider than long (0.70 : 0.65). Antenna 1.78 times as long as width of head; segment III longest, twice as long as II. Eyes moderately stylate.

Thorax. Vertically directed protruding structures of pronotum, mesonotum and scutellum with conspicuous pilosity, surface smooth between them.

Abdomen subparallel. Lateral parts of fused deltg I+II and deltg III carinate; deltg II with laterally protruding tubercle bearing at apex spiracle II, deltg III with smaller tubercle and spiracle III, deltg III–VII laterally raised and carinate. Tergal plate depressed with distinct apodemal impressions; tergite VII and conical pygophore strongly directed upward.

Measurements. Body length 3.45; width of abdomen across tergite IV 1.45; length of antenna 1.25; length of segments I : II : III : IV = 0.35 : 0.20 : 0.40 : 0.30.

Etymology. The species name is derived from the Arfak Mountains where it was recorded.

Distribution (Fig. 13). So far, this species is only known from the Arfak Mountain Range of the Vogelkop (Bird's Head) Peninsula.

Cyclopsaptera pilosa sp.n. (Figs 9–12)

Material examined. Holotype (male): W-PAPUA / Jayapura, Santani / Gn. Cyclops, 1065 m / leg. A. Riedel // 2–21 XI 2007 / sample 6 sifted / S02°31,594' / E 140°30,407' // (MZB). Paratypes: 1 ♂ (uncleaned) and 1 ♀, collected with holotype (SNMK); 2 ♂♂ Indonesia-Irian Jaya / Jayapura Prov., Santani / Cyclops Mts. 700 m / 22 XII 2004 A. Riedel // (CEHI). Type labels are attached to the specimens.



Figs 9–10. *Cyclopsaptera pilosa* sp.n., holotype (male), dorsal (9), lateral (10). © A. Eckelt.



Fig. 11. *Cyclopsaptera pilosa* sp.n., paratype (female), dorsal. © A. Eckelt.

Diagnosis. This species is recognized and distinguished from other congeners by the following combination of characters: small body length, stout habitus, and short antennae (see key).

Description of male. Habitus robust. Colouration piceous; stiff, erect setae yellowish. Head distinctly wider than long (0.40 : 0.30); antenna 1.47 times as long as width of head; segment II shortest, III longest. Eyes oval, stalked.



Fig. 12. *Cyclopsaptera pilosa* sp.n., paratype (male), dorsal. © A. Eckelt.

Thorax. Densely pilose, finger-like tubercles present on lateral parts of pro- and mesonotum; scutellum distinctly bulbous and beset with setae.

Abdomen. Body structures and position of spiracles as in congeners; deltg VII straightly converging to pygophore.

Measurements. Body length 3.20; width of abdomen across tergite IV 1.50; length of antenna 1.17; length of antennal segments I : II : III : IV = 0.30 : 0.20 : 0.35 : 0.32.

Description of female. Slightly larger than male. Colouration blackish (may be secondary after treatment with KOH). Basic structures as in male. Measurements. Body

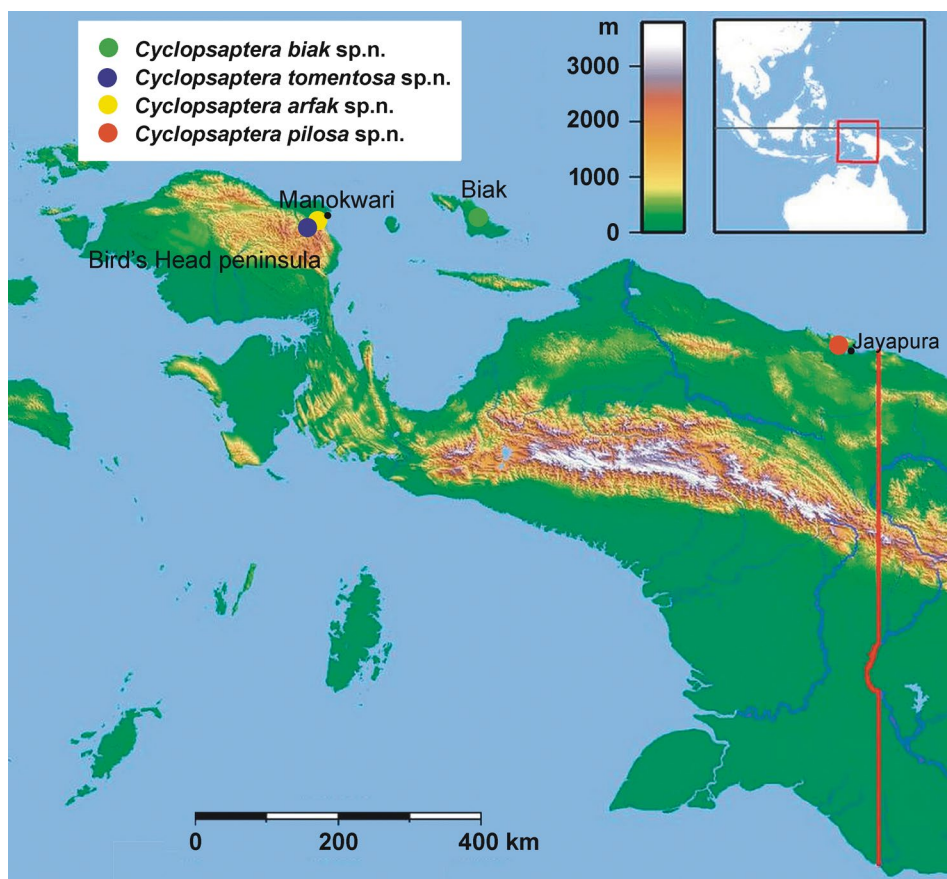


Fig. 13. Distribution of species of *Cyclopsaptera* gen.n. in Western New Guinea (map base from Wikipedia).

length 3.35; width of abdomen 1.75; length of antennae 1.17; length of antennal segments I : II : III : IV = 0.30 : 0.20 : 0.35 : 0.32.

Ety mology. The specific epithet refers to the prominent pilosity covering most body structures

Distribution (Fig. 13). The type specimens were collected in the Cyclops Mountains of Papua, located in the northwest area of the main island of New Guinea.

Acknowledgements

The senior author is greatly indebted to his friend Alexander Riedel (SMNK), who generously donated aradid bycatches of his early New Guinea expeditions for his special collection, and for the loan of the samples of his later expeditions which then were deposited at SMNK, where he was appointed as entomological curator. We are grateful to the editorial team of this journal for the continuous support and advice.

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Zeitschrift/Journal: [Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen](#)

Jahr/Year: 2024

Band/Volume: [76](#)

Autor(en)/Author(s): Heiss Ernst, Eckelt Andreas

Artikel/Article: [Cyclopsaptera gen.n., a new apterous genus of Carventinae \(Heteroptera: Aradidae\) from New Guinea, with description of four new species 131-144](#)