

## New Aradidae (Hemiptera, Heteroptera) from New Caledonia

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### Abstract

Six genera of the flat bug subfamily Carventinae – all of them apterous – are recorded to date from New Caledonia. A small collection of Aradidae presented to the author contained an unknown species which could not be placed in any of the carventine genera; *Noumeaptera spinicephala* gen.n. et sp.n. are proposed. Furthermore a new species of the previously monotypic genus *Kaulocoris* KORMILEV, 1971, *Kaulocoris monteithi* sp.n., is described, illustrated and compared with the type species *Kaulocoris stylatus* KORMILEV, 1971.

Key words: Hemiptera, Heteroptera, Aradidae, Carventinae, new genus, new species, apterous, *Noumeaptera*, *Kaulocoris*, New Caledonia.

### Zusammenfassung

Von der großen Pazifikinsel Neukaledonien sind bisher aus der Unterfamilie Carventinae nur neun Arten in sechs Gattungen beschrieben, welche alle apter sind. Eine kleine rezente Aufsammlung von Aradiden enthielt eine auffällige Art, welche keiner der bisher bekannten Gattungen zuzuordnen war. Dafür wird hier die neue Gattung *Noumeaptera* gen.n. vorgeschlagen und die Art nachstehend als *Noumeaptera spinicephala* sp.n. beschrieben und abgebildet. Weiters wird mit *Kaulocoris monteithi* sp.n. eine neue Art der bisher monotypischen Gattung *Kaulocoris* KORMILEV, 1971 beschrieben und mit der Typusart *Kaulocoris stylatus* KORMILEV, 1971 verglichen.

### Introduction

As a result of the study of Aradidae recently collected by the Austrian coleopterologist Rudolf Schuh and presented to the author, several new taxa were recognised and described (HEISS 2011a, 2011b). Of the subfamily Carventinae only nine species belonging to six genera are recorded to date which are all apterous and endemic to New Caledonia: *Kanakaptera* HEISS, 2011 (4 species); *Kaulocoris* KORMILEV, 1971 (1 species); *Leurocoris* KORMILEV, 1971 (1 species); *Nesiaptera* USINGER & MATSUDA, 1959 (1 species); *Paracaraptera* HEISS, 2011 (1 species); and *Rugicarventus* HEISS, 2011 (1 species).

In this paper a new peculiar apterous Carventinae genus *Noumeaptera* gen.n. with the species *Noumeaptera spinicephala* sp.n. is described and illustrated.

The first Carventinae genus described from New Caledonia was *Kaulocoris* based on the species *K. stylatus* KORMILEV, 1971. No further record of this taxon was published since, and the genus was only listed by KORMILEV & FROESCHNER (1987) and MONTEITH et al.

(2005). Comparison of voucher specimens identified as *K. stylatus* with the types preserved in the Bishop Museum Honolulu has shown, that there is a second species involved, which is here described as *Kaulocoris monteithi* sp.n.

#### Material and methods

This study is based on material which is preserved in the collections of the author at the Tiroler Landesmuseum, Innsbruck (CEHI).

Specimens of Carventinae are usually covered by incrustation. They were cleaned for the study of abdominal structures. Photos were taken through an Olympus SZX 10 binocular microscope with an Olympus E3 digital camera and processed with Helicon Focus 4.3 software and using Adobe Photoshop and Lightroom 2.3.

Measurements were taken with a micrometer eyepiece, 20 units = 1 mm.

When citing the text on the labels of a pin attached to the specimens, / separates the lines and // different labels. Abbreviations used: deltg = dorsal external laterotergite (connexivum), mtg = mediotergite, ptg = paratergite; vltg = ventral laterotergite.

#### Taxonomy

Subfamily Carventinae

##### ***Noumeaptera* gen.n.**

Type species: *Noumeaptera spinicephala* sp.n.

Etymology: Named after Noumea, the capital of New Caledonia, and the apterous condition of this new taxon. Gender: feminine.

Diagnosis: Apterous; body ovate and rather flat, surface granulate or rugose except metanotum and tergal plate which are smooth and glabrous; head with sickle-shaped antenniferous lobes, pro-, meso- and metanotum separated by distinct transverse furrows.

Description: Head longer than wide across eyes but widest across antenniferous lobes; genae projecting over clypeus, their apices not contiguous; antenniferous lobes anterolaterally expanded, with subacute apices exceeding outer margin of eyes; antennae slender, segment I longest, II-IV shorter and thinner; eyes subglobose; postocular lobes straightly converging toward granulate collar; rostrum arising from a slit-like atrium, rostral groove deep, open posteriorly.

Pronotum trapezoidal, about  $2.5 \times$  as wide as long, lateral margins sinuate at middle, anterolateral angles roundedly expanded, humeri knob-like, disk with deep furrows separating ovate sclerites, posterior margin delimited by a distinct transverse carina. Mesonotum strongly transverse, anterolateral angles rounded and slightly produced anteriorly, triangular median disk elevated expanding posteriorly, lateral sclerites irregularly rugose. Metanotum subrectangular, fused to mtg I+II; disk smooth and glabrous, a triangular anterolateral sclerite granulate; lateral margins constricted posteriorly, posterior margin sinuate at middle.

Abdomen: Tergal plate consisting of fused mtg III - VI without visible fusion lines, surface flat smooth and glabrous; pattern of apodemal impressions hardly discernible; deltg II + III fused, anteriorly expanded into a triangular sclerite reaching mesonotum; deltg III - VII distinctly separated by sutures, their surface smooth around apodemal impressions and finely granulate along lateral margin, this seems doubled due to a narrow rim of the dorsally reflexed vltg II - VII which is visible from above.

Venter: Sternum triangularly elevated and rugose at middle, meso- and metasternum separated from prosternum and fused mtg I+II by transverse sutures, flat and depressed at middle; surface of sternites III-VII smooth at middle, granulate on vltgs; spiracles II sublateral, III - VII lateral on reflexed rim of veltg III-VII and visible from above, VIII terminal on ptg VIII. Legs unarmed and slender, claws with long, curved pulvilli.

Discussion: The structure of head – with large curved antenniferous lobes and straight postocular lobes – and that of body in combination with the position of spiracles are unique among Carventinae known from New Caledonia. Therefore *Noumeaptera* gen.n. is easily distinguished.

#### ***Noumeaptera spinicephala* sp.n.** (Photo 4)

Etymology: Referring to the long spine-like expanded antenniferous lobes from Latin „spina“ for spine and Greek „cephalos“ for head.

Type material: Holotype male labelled: New Caledonia, S-Prov. / Parc des Grandes Fougères / Col Ouano – Me Peou creek / 340-440m, 5km NNW Farino / 29 IX 2009 leg. Schuh (20) // Holotype male / *Noumeaptera* n.gen. / *spinicephala* n.sp. / des. E. Heiss 2011 (CEHI).

Description of apterous male: Surface of head, pronotum, lateral parts of meso- and metanotum and deltg II - VII granulate or rugose, that of median part of metanotum and whole tergal plate smooth and glabrous; colouration stramineous with dark brown to blackish areas on head, thorax and abdomen; venter, pro-, meso and metasternum, fused sternites II + III and sternite VII blackish, sternites IV - VI yellowish with blackish median stripe; legs yellowish with dark brown median ring on tibiae, femora blackish at base.

Head longer than wide across eyes (26/23); genae finger-like, straightly produced over clypeus and leaving a cleft at middle; anterior edge of clypeus with distinct, round dorsal tubercle; antenniferous lobes sickle-shaped diverging anterolaterally, apex subacute exceeding outer margin of eyes (25.5/23); antennae 1.43 × as long as width of head across eyes (33/23), segment I longest and club-shaped, II shorter and cylindrical, III second longest and thinner with distinct basal pedicel, IV shortest and fusiform with pilose apex; length of antennal segments I/II/III/IV = 10.0/7.5/8.5/7.0; eyes globose, inner half inserted in head; postocular lobes straight converging toward constricted collar; vertex with row of large round tubercles extending to posterior margin of collar, the latter with 2 (1 + 1) round tubercles anterolaterally on a lower level which are visible from above; two round, depressed callosities placed between vertex and eyes; rostrum arising from a slit-like atrium, shorter than head, rostral groove deep, with carinate lateral borders, open posteriorly.

Pronotum trapezoidal, 2.61 × as wide as long (47/18); lateral margins sinuate at middle, converging anteriorly to rounded anterolaterally expanded angles reaching posterior margin of collar from which they are separated by a deep notch; humeri produced and narrowly rounded; disk with median triangular sclerite posteriorly of collar which is laterally separated by deep grooves from lateral plates; groove continuing medially, reaching transverse carina delimiting posterior margin; surface of lateral plates irregularly rugose and granulate. Mesonotum scutellum-like, triangular median projection elevated, laterally separated by deep grooves from metanotum; lateral sclerites narrow, separated from metanotum by sinuate grooves, anterolateral angles rounded and slightly produced anteriorly. Metanotum fused to mtg I + II, of subrectangular shape, surface smooth and glabrous except for a small, triangular, granulate anterolateral sclerite; lateral margins converging posteriorly, posterior margin sinuate at middle.



Photos 1 - 4: (1) *Kaulocoris stylatus*, female; (2) *Kaulocoris monteithi* sp.n., female paratype; (3) *Kaulocoris monteithi* sp.n., male holotype; (4) *Noumeaptera spinicephala* gen.n. et sp.n., male holotype.

Abdomen: Tergal plate wider than long (39/32), surface like metanotum, pattern of apodemal impressions marked by shallow punctures; posterior margin concave; deltg II + III fused to a triangular sclerite reaching anteriorly to mesonotum; deltg III - VII separated by sutures, their surface smooth on inner half and longitudinally rugose on outer half; lateral margins of deltg II - VII doubled by dorsally reflexed and visible rim of vltg II - VII; venter smooth and glabrous at middle, all vltg longitudinally rugose; spiracles II sub-lateral, III - VII lateral on reflexed rim of veltg III - VII and visible from above, VIII terminal on ptg VIII. Legs: Femora medially slightly incrassate, tibiae cylindrical and straight, claws with thin, curved ulvilli.

Genitalic structures: Pygophore strongly declivous posteriorly, wide and narrow seen from above, with median round ridge; anterolateral margins carinate. The only male was not dissected for the study of parameres.

Measurements: Length 5.9 mm; width of abdomen 2.85 mm, length of antennae 3.3 mm.

Distribution: So far recorded only from the province of Florin in southern New Caledonia.

***Kaulocoris monteithi* sp.n.** (Fig. 2, Photos 2, 3)

Etymology: This interesting new species is dedicated to my friend Geoff Monteith, who collected it and generously donated voucher specimens and in appreciation of his important contributions to the taxonomy, biology and distribution of Heteroptera particularly Australian Aradidae.

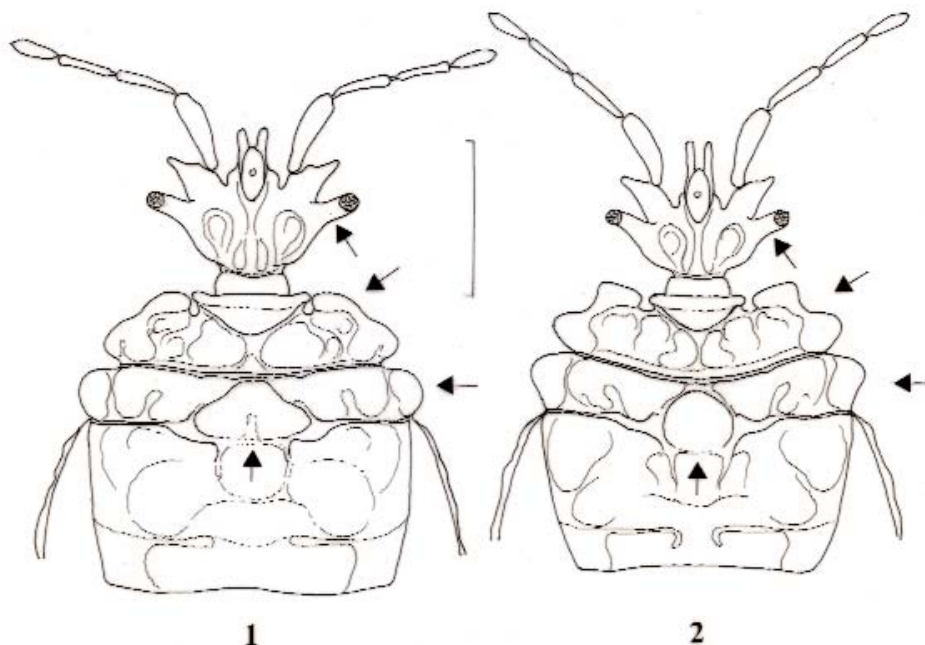
Type material: Holotype male labelled: New Caledonia / Col d'Amieu, 1800-2000<sup>\*</sup> / 12-13 Dec., 1973 / GB. & S.R.Monteith // Holotype male / *Kaulocoris / monteithi* n.sp. / des. E.Heiss 2011// (red label); paratype female labelled: New Caledonia / Col des Roussettes, 2000<sup>\*</sup> / Dec. 15, 1973 / GB. & S.R.Monteith // Paratype female / *Kaulocoris / monteithi* n.sp. / des. E.Heiss 2011// (red label).

Diagnosis: The new species differs from *K. stylatus* (Fig. 1, Photo 1) described from New Caledonia, e.g., by the following characters (characters of *K. stylatus* in brackets): short postocular lobes of head (much longer); distinctly concave lateral margins of pronotum (slightly sinuate); truncate anterolateral angles of pronotum and produced over collar (rounded and not produced); shape and fusion of median elevation on meso-metanotum (more inflated, larger); more rugose sculpture of lateral sclerites of thorax (more smooth); tergal plate with deep polygonal depressions around median apodemal impressions (shallow).

Description of apterous male: Colouration dark brown; surface of thorax and abdomen smooth at middle, irregularly rugose elsewhere; lateral margins of body, legs and antennae beset with long erect setae.

Head distinctly wider than long (28/23); genae long and thin, finger-like, projecting over clypeus leaving a cleft at middle; clypeus elevated, with round dorsal tubercle at middle; antenniferous lobes directed anterolaterally, with parallel sides, apex with conical projection on outer margin; antennae slender, segment I clavate and longest, II much thinner and shorter, III - IV missing; eyes strongly stylate diverging anterolaterally; postocular lobes sinuate and converging toward constricted conical collar; vertex medially raised, flanked laterally by ovate depressions; rostrum arising from slit-like atrium, shorter than head, rostral groove wide and deep, its lateral margins carinate.

Pronotum about 3 × as wide as long (43/14); collar ring-like, with round lateral tubercles, posteriorly triangularly produced; disk with median longitudinal furrow flanked



Figs. 1 - 2: Outline of head and thorax, structural details and pilosity omitted. (1) *Kaulocoris stylatus*; (2) *Kaulocoris monteithi* sp.n. Arrows indicate the most conspicuous differences. Scale: 1 mm.

by 2 (1 + 1) ovate callosities followed by rugose lateral sclerites which are raised along lateral margins; these roundedly projecting at humeri, then concave, anterolateral angles truncate, separated from collar by deep incisions; posterior margin convex. Mesonotum strongly transverse, separated from metanotum by a furrow deepest laterad of round median elevation, this fused posteriorly to round elevation of metanotum and transverse ridge of fused mtg I + II; lateral sclerites first with ovate callosity then longitudinally rugose; lateral margins raised, with roundish lateral projection. Metanotum fused to mesonotum and mtg I + II with ill defined transverse depressions marking fusion lines; median elevated ridge rounded anteriorly then widening to transverse elevation of mtg I followed by narrower, flat elevation extending on mtg II to posterior margin; this separating tergal plate by a deep furrow; lateral sclerites with ovate callosities and rugose structures, lateral margins converging posteriorly.

Abdomen: Tergal plate subrectangular, slightly elevated along midline; lateral margins constricted posteriorly; disk with distinct ovate depressions around median apodemes, slightly higher than level of midlateral apodemes and delimited laterally by sinuate rim; deltg II + III fused and triangularly produced anteriorly reaching mesonotum; deltg III - VII separated by distinct sutures, its surface rugose around apodemes, longitudinally striate along lateral margin; small rim of the dorsally reflexed vltg II - VII is visible from above on posterior half of deltg II - VII and increasing in size from deltg V - VII; tergite VII medially elevated for reception of pygophore.

Venter: Prosternum fused to meso- and metasternum and first ventral segments, fusion lines marked by transverse furrows; prosternum with median posteriorly widening ridge; meso- and metasternum with flat, round depression medially; surface of thoracic segments covered by velvet-like, mat pilosity; pleural parts of sterna separated by deep longitudinal grooves also surrounded by velvet-like pilosity; sternites III - VII separated by deep transverse sutures, surface smooth at middle, lateral parts rugose; spiracles II - IV ventral, progressively approaching lateral margin, V - VII lateral, on small tubercles and visible from above. Legs: Femora only slightly incrassate at middle; tibiae cylindrical but somewhat bent outward on posterior half; protibial comb present; claws thin, with long pulvilli.

Genitalic structures: Pygophore globose, surface with median ridge and ovate rugose structures laterally, ptg VIII slender about as long as pygophore, apex truncate bearing spiracles VIII. The single male was not dissected for the study of parameres.

Measurements: Length = 5.2 mm; width/length of mesonotum = 51/11, width/length of fused metanotum + mtg I + II = 45/17; length of antennal segments I/II/III/IV = 13/10/-/-; width of abdomen across tergite V = 52.

Description of apterous female: Generally as male but of larger size; ptg VIII consisting of a narrow transverse basal ridge and a truncate projection posterolaterally bearing spiracles VIII.

Measurements: Length 6.1 mm; width/length of head = 30/26; width/length of mesonotum = 47/14; width/length of fused metanotum + mtg I + II = 49/19; length of antennal segments I/II/III/IV = 14/10/9.5/8; ratio length of antennae/width of head = 1.38; width of abdomen across tergite IV = 65.

Discussion: The carventine genus *Kaulocoris* was described by KORMILEV (1971: 718) for the species *K. stylatus* based on a male and a female from New Caledonia. No further record was published since except by MONTEITH et al. (2005) who listed it and presented a photo of a *Kaulocoris* sp. in their inventory of the entomofauna of humid forests in New Caledonia. Geoff Monteith, an excellent field researcher, collected several specimens in different localities of New Caledonia already in 1973 and gave a male and a female as voucher specimens identified as *Kaulocoris stylatus* to the author. Comparing a specimen from Mt. Panie (18 V 1998 lg. M. Kralik, 1♀ CEHI) (Fig. 1) with this sample I noted several structural differences without being able to decide which of the two different taxa corresponds to Kormilev's description and to the not very instructive illustrations (KORMILEV 1971: fig. 11-13, p.715). Mr. Dan A. Polhemus was so kind to compare the Photos 1 - 3 with the type specimens preserved in the Bishop Museum (Honolulu) and confirmed that the specimen from Mt. Panie corresponds to the female paratype of *Kaulocoris stylatus*. Hence the other species represents a new taxon and is described in the present paper.

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