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Review of the subfamily Calisiinae from Borneo, with description of two new genera and seven new species (Hemiptera: Heteroptera: Aradidae)

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A b s t r a c t : From the island of Borneo belonging to the states of Malaysia, Indonesia and Brunei Darussalam only two species of the flat bug subfamily Calisiinae are known to date. Two new genera and seven new species are now described and a key for the five species of *Aradosyrtis* is presented.

K e y w o r d s : Heteroptera, Aradidae, Calisiinae, Borneo, new genera, new species

Introduction

Borneo is the largest of the Great Sunda Islands and the third largest of the world (after Greenland and New Guinea). Three countries share an area of 752.000 km² of which the northern part (about 27%) belongs to the Malaysian states of Sarawak and Sabah and Brunei Darussalam, the larger southern part (about 73%) comprises the Indonesian provinces of Kalimantan.

Brunei Darussalam is a sovereign sultanate of about 5765 km² within and surrounded by the Malaysian state of Sarawak and consists itself of two unconnected parts.

The mountainous backbone of Sabah is the Crocker Range with the highest mountain of Southeast Asia Mt. Kinabalu with 4095 m. Most of the Malaysian and Brunei territories are covered by mountain rainforests, which however, in recent times are seriously endangered by extensive wood logging and land use for palm oil plantations. Kinabalu National Park is considered by UNESCO as one of the most important biological sites worldwide with high floral and faunal diversity.

In spite of rich habitats, the fauna of flat bugs (Aradidae) is still insufficiently explored and described. Of the subfamily Calisiinae, which is widely distributed with numerous species in New Guinea and South Pacific Islands (KORMILEV 1967, KORMILEV & FROESCHNER 1987), only two species (*Aradacanthia multicalcarata* A. COSTA, 1864, *Calsisus borneensis* KORMILEV, 1986) are recorded from N-Borneo (Sabah), none from Indonesian Kalimantan.

In general the number of Calisiinae described to date from insular and continental South East Asian countries is rather poor and comprises the following taxa:

- *Calisius borneensis* KORMILEV, 1986 (Sabah, Malaysia)
- *Calisius spinulosus* BLOETE, 1965 (Java, Indonesia)
- *Calisius gressitti* KORMILEV, 1970 (Laos)

- *Calisius orientalis* KORMILEV, 1970 (Vietnam)
- *Aradosyrtis yunnanus* HEISS, 2023 (south China, Yunnan)
- *Aradacanthia multicalcarata* A. COSTA, 1864 (mainland Malaysia, Borneo, Vietnam, Philippines)
- *Aradacanthia heissi* BAI, ZHANG & CAI, 2009 (S-China, Thailand NE-India)

Considering and comparing these species with those now available for study from Sabah and Brunei, we recognized them as belonging to at least two new genera and seven new species, which are described and illustrated in this paper:

- *Calibruneius* gen.nov.
- *Calibruneius micros* nov.sp.
- *Stenocalisius* gen.nov.
- *Stenocalisius temburongensis* nov.sp.
- *Nipponocalisius niger* nov.sp.
- *Aradosyrtis lativentris* nov.sp.
- *Aradosyrtis sabahnus* nov.sp.
- *Aradosyrtis sexmaculatus* nov.sp.
- *Aradosyrtis dyak* nov.sp.

Material and methods

The material upon which this study is based is presently deposited in the 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.

Measurements were taken with a micrometer 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 and Helicon Focus 8 along with Adobe Photoshop CS6 software, utilized for image composition.

Abbreviations used: deltg = dorsal external laterotergite (connexivum), ptg = paratergite, vltg = ventral external laterotergite.

Taxonomy

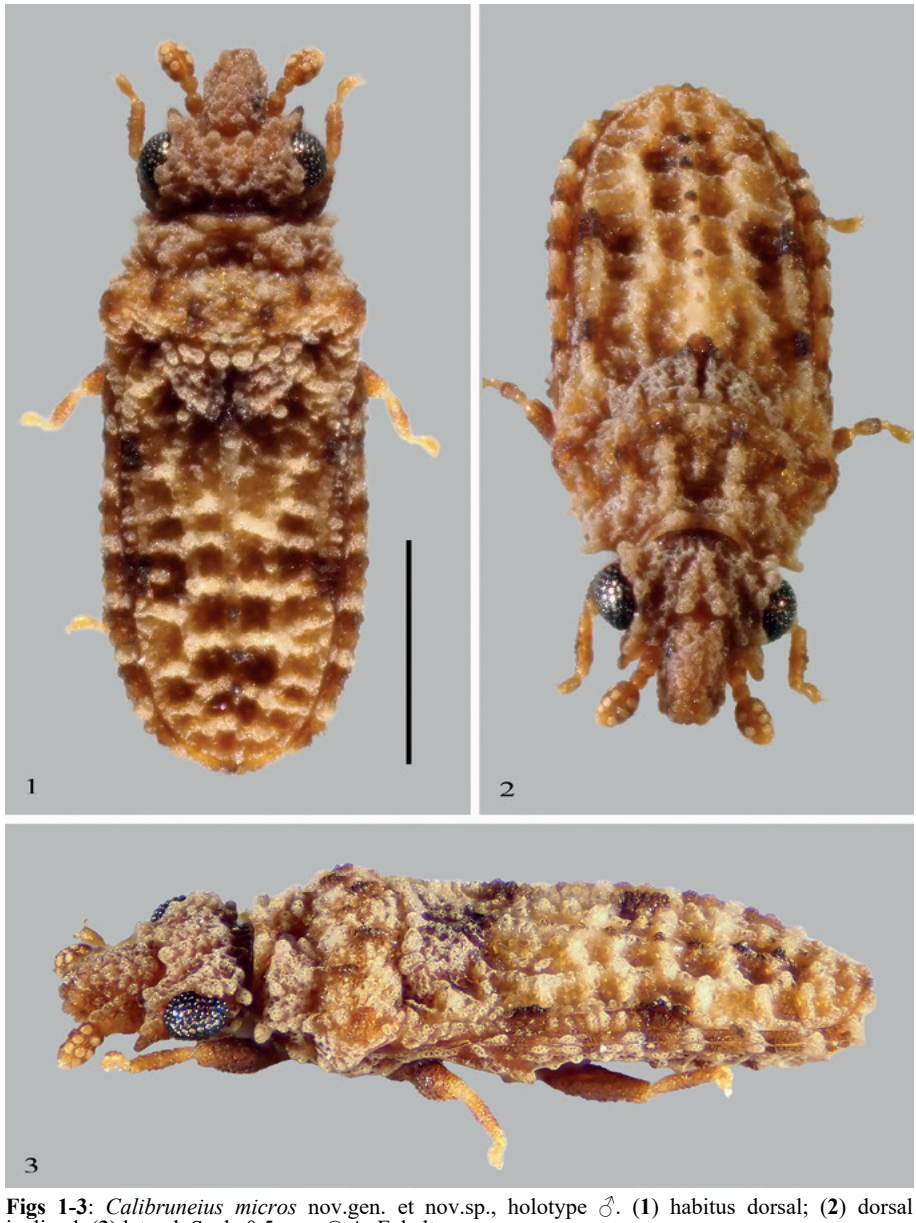
Subfamily C a l i s i i n a e USINGER & MATSUDA, 1959

Genus *Calibruneius* gen.nov.

T y p e s p e c i e s : *Calibruneius micros* nov.sp.

E t y m o l o g y : Named after of Cali-(sius) and Brunei, where it was discovered.

D i a g n o s i s : Differing from all Calisiinae genera described to date and recognized by the smallest size observed within Calisiinae and the unique wafer-like dorsal structure of its scutellum.



Figs 1-3: *Calibruneius micros* nov.gen. et nov.sp., holotype ♂. (**1**) habitus dorsal; (**2**) dorsal inclined; (**3**) lateral. Scale 0.5 mm. © A. Eckelt.

D e s c r i p t i o n : Very small size of about 1.6 mm, body slender subparallel; colouration yellowish brown, ochraceous are tubercles and grid-like carinae of scutellar disk. Due to its small size, the enlarged images show more detail structures than can be described.

H e a d . Wider than long, clypeus anteriorly rounded, densely beset with round tubercles;

antenniferous lobes small, triangular; antennae short, segments I-III moniliform, IV longer and wider beset with distinct plaques; eyes large, inserted in head; vertex and postocular lobes beset with round tubercles; rostrum short, not reaching base of head.

P r o n o t u m . About twice as wide as long, lateral margins sinuate, anteriorly beset with tubercles, anterolateral angles marked by a larger one; collar with two tubercles, followed by clusters of tubercles on anterior and posterior lobes of pronotal disk which are separated by a distinct transverse furrow.

S c u t e l l u m . Basal subtriangular structure with six large tubercles overlapping pronotum, surface irregularly granulate; disk with a wafer like surface consisting of a median and two lateral longitudinal carinae interconnected by transverse carinae forming deep polygonal darker coloured pits; median carina beset with 7 spaced black tubercles; lateral margin of disk beset with tubercles along exposed tuberculate corium, then granulate.

A b d o m e n . Deltg II-VII narrow with a dorsal and the corresponding vltg II-VII each with a row of three oval tubercles, the anterior two of darker colour as the surface of deltg; tergal plate completely covered by scutellum; spiracles II-VI ventral, VII lateral on deltg VII and visible from above; ptg VIII with spiracles VIII; the small globular pygophore obscured by the long scutellum and hardly traceable from above.

Calibruneius micros nov.sp. (Figs 1-3)

Holotype: ♂. BRUNEI - Temburong / Kuala / Belalong Field / Study Centre, 600 m // Dipterocarp forest / 2-8 V 1995 E. Heiss // (CEHI). The holotype is labelled accordingly.

E t y m o l o g y : Refers to its dwarf size, from *micros* (Greek) = small.

D e s c r i p t i o n : As the type species *Calibruneius micros* nov.sp.is the only taxon of this genus, the generic description is also valid for this species and is not repeated here.

M e a s u r e m e n t s . Length of body 1.62; head width/length 0.425/0.375 (ratio 1.13), pronotum width/length 0.60/0.275 (ratio 2.18); width of abdomen across tergite IV 0.50; length of antennae about 0.20.

Genus *Stenocalisius* gen.nov.

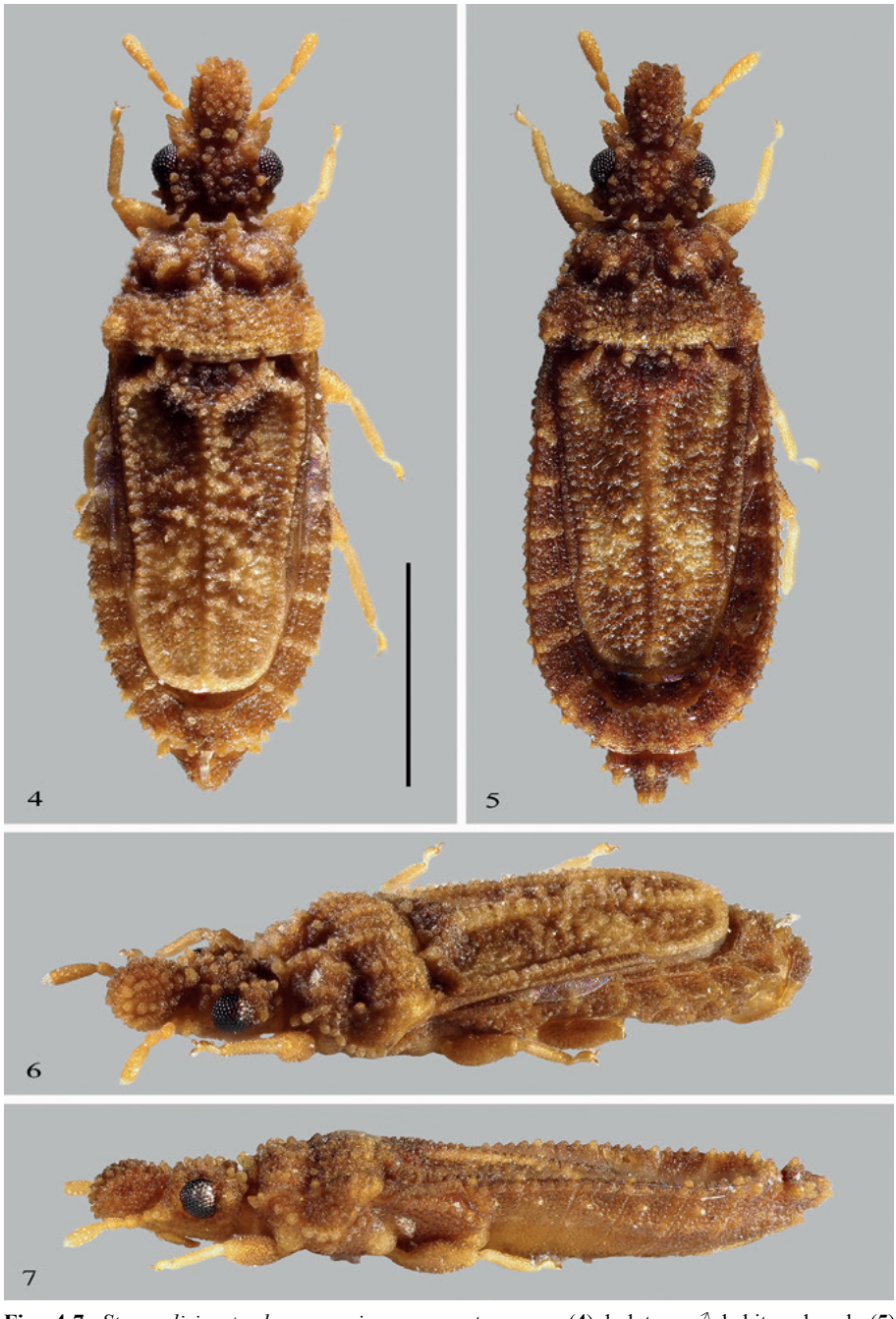
T y p e s p e c i e s : *Stenocalisius temburongensis* nov.sp.

E t y m o l o g y : Refers to its elongate habitus, *stenos* (Greek prefix) = narrow, slender.

D i a g n o s i s : Easily recognized and differing from the other known SE-Asian Calisiinae genera e.g. *Aradacanthia*, by lack of finger-like expansions of the pronotum; from *Aradosyrtis* and *Nipponocalsisus* by the elongate habitus and lateral margins of deltg II-VII and its ventral counterpart vltg with each four tubercles (vs. three!).

D e s c r i p t i o n : Habitus elongate oval, about twice as long as wide; colouration yellowish brown with darker markings; scutellum with two ill defined whitish oval spots.

H e a d . Longer than wide; clypeus globular beset with rows of tubercles, antenniferous lobes small, triangular; antennae about as long as width of head, segments I-III shorter and of equal length, IV longer and cylindrical with plaques; eyes oval, inserted in head; vertex with two rows and postocular lobes with a cluster of tubercles; rostrum short, not reaching base of head.



Figs 4-7: *Stenocalisius temburongensis* gen.nov et nov.sp. (**4**) holotype ♂ habitus dorsal; (**5**) paratype ♀ dorsal; (**6**) holotype sublateral; (**7**) paratype lateral. Scale 1 mm. © A. Eckelt.

P r o n o t u m . Trapezoidal, lateral margins dentate; anterior part with two, posterior part with four rows of tuberculate carinae and carinate humeri; surface granulate.

Scutellum. Basal elevation with four larger and two smaller tubercles, surface granulate; median carina and lateral margins of scutellum along corium densely beset with tubercles, the posterior margin granulate; exposed rim of corium granulate; disk deeply punctured with irregular sparse larger tubercles.

A b d o m e n . Deltg II-VII reflexed, their lateral margins with two rows of four tubercles on deltg and vltg, the anterior three are darker, the posterior one of lighter colour.; tergal disk covered by scutellum, its lateral margin delimited laterally by a granulate carina¸ spiracles II-VI ventral, VII lateral on deltg VII and visible from above.

F e m a l e . Habitus and colouration basically as male; transverse tergite VIII posteriorly exposed, bearing spiracles VIII.

Stenocalisius temburongensis nov.sp. (Figs 4-7)

Holotype: ♂. BRUNEI - Temburong / Kuala / Belalong Field / Study Centre, 600 m // Dipterocarp forest / 2-8 V 1995 E. Heiss //. Paratype: ♀ collected with holotype (CEHI). Types are labelled accordingly.

E t y m o l o g y : Named after the province of Temburong in Brunei, where this taxon was discovered.

D e s c r i p t i o n : As the type species *Calibruneius micros* nov.sp.is the only taxon of this genus, the generic description is also valid for this species and is not repeated here.

M e a s u r e m e n t s . Holotype: ♂. Length of body 3.30; head width/length 0.575/0.70 (ratio 1.22); pronotum width/length 1.00/0.60 (ratio 1.66); width of abdomen across tergite IV 1.10; length of antennae about 1.07. Paratype: ♀. Length of body 3.40; head width/length 0.575/0.70 (ratio 1.22); pronotum width/length 1.00/0.60 (ratio 1.66); width of abdomen across tergite IV 1.15; length of antennae about 1.08.

Nipponocalisius niger nov.sp. (Figs 8-10)

Holotype: ♀. MALAYSIA - Sabah / Kinabalu Nat. Park / Headqu. env. / 8-10 VII 92 E.Heiss //. Paratypes: 2♀♀ collected with holotype (CEHI). Types are labelled accordingly.

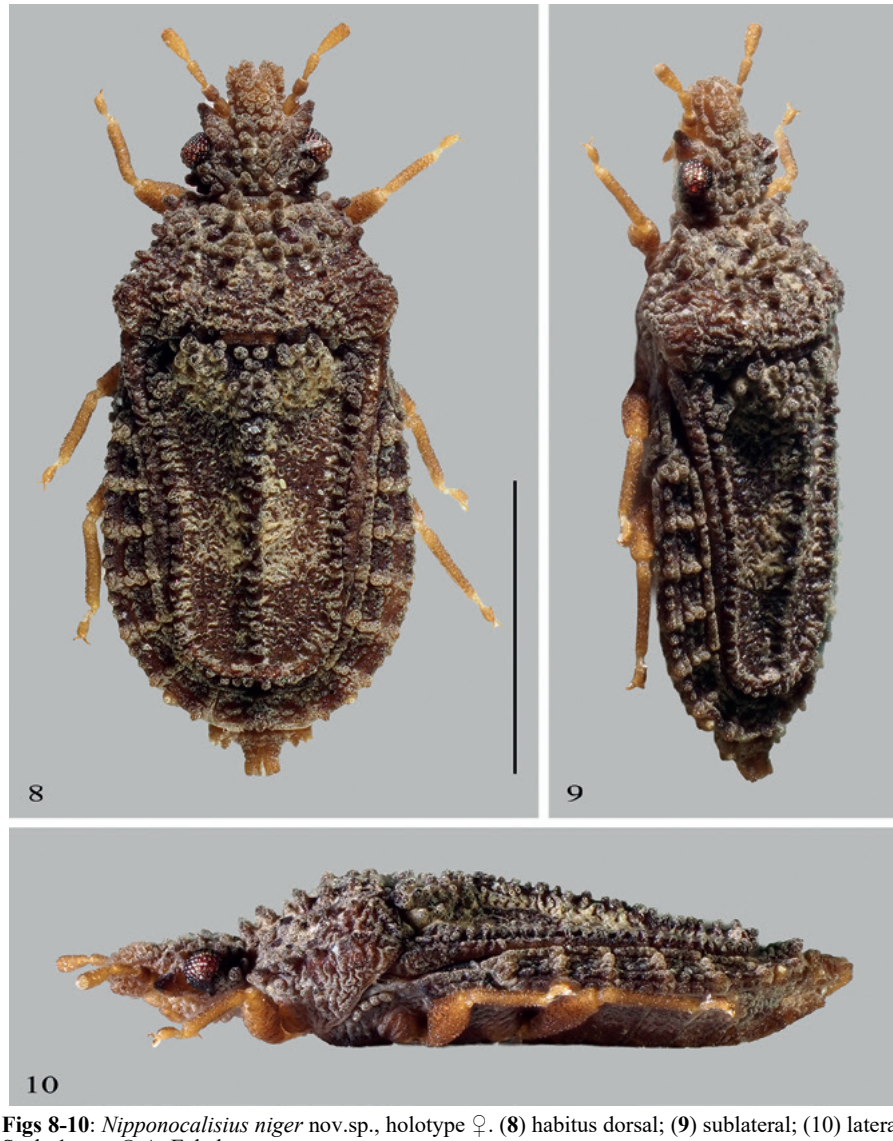
E t y m o l o g y : Refers to its blackish colouration, not yet observed in this genus.

D i a g n o s i s : Distinguished from Japanese congeners *N. ishikawanus* HEISS et al., 2024, *N. tomokunii* HEISS et al., 2024 and *N. dimorphus* HEISS et al., 2024 (HEISS et al. 2024) by the black colouration, dense tuberculation of head, pronotum, abdomen, lateral margins of scutellum, exposed tergal plate and corium, the structure of triangular basal sclerite and dense tubercles of prominent longitudinal scutellar ridge.

D e s c r i p t i o n : Small species of 2.45 mm, body of blackish colouration with yellowish antennae, clypeus, legs and posterior margins of deltg II-VIII.

H e a d . Slightly wider than long; clypeus sub-rectangular, laterally depressed, lamellate genae anteriorly dilated forming a rim-like structure embracing the clypeus, surface tuberculate; antenniferous lobes short and blunt; antennae shorter than width of head, antennal segments I+II shortest, III longer, IV longer than III with spaced plaques; eyes conical, inserted; vertex and postocular lobes beset with round tubercles.

P r o n o t u m . Trapezoidal, twice as wide as long; lateral margins anteriorly with three larger tubercles then granulate, disk on anterior part with rows of larger round tubercles, irregularly granulate posteriorly.



Figs 8-10: *Nipponocalisius niger* nov.sp., holotype ♀. (**8**) habitus dorsal; (**9**) sublateral; (10) lateral. Scale 1 mm. © A. Eckelt.

S c u t e l l u m . Basal triangular elevation beset with larger tubercles which continue on longitudinal scutellar ridge; lateral and rounded posterior margin and exposed corium densely beset with tubercles; disk with shallow punctures.

A b d o m e n . Surface of deltg II-VII tuberculate, their lateral margins with three dorsal and subventral tubercles; tergal disk covered by scutellum, its lateral margin delimited laterally by an exposed granulate carina¸ spiracles II-VI ventral, VII lateral on deltg VII and visible from above; transverse tergite VIII posteriorly exposed, bearing spiracles VIII.

Measurements. Holotype: ♀. Length of body 2.45; head width/length 0.50/0.45 (ratio 1.11); pronotum width/length 1.00/0.50 (ratio 2.00); width of abdomen across tergite IV 1.05; length of antennae about 0.85. Paratypes: 2♀♀. Length 2.45, 2.50; other measurements as holotype.

Remarks: *N. niger* nov.sp. is tentatively assigned to genus *Nipponocalisius*, sharing the rim-like dilated lamellate genae, the main distinguishing character of this genus described from Japan. Differences in body structures of *N. niger* and biogeographical considerations might indicate, that it represents another genus. Future molecular investigations based on new material will proof the assumption.

The identity of the genera *Calisius* STÅL, 1860 and *Aradosyrtis* A. COSTA, 1864

The flat bug subfamily Calisiinae STÅL, 1873 is one of the eight subfamilies of the flat bug family Aradidae BRULLÉ, 1836, showing a worldwide distribution. KORMILEV & FROESCHNER (1987) listed more than 100 species assigned to six genera: *Aradacanthia* A. COSTA, 1864 (3 spp., Oriental); *Calisiopsis* CHAMPION, 1898 (4 spp., Neotropis); *Calisius* STÅL, 1860 (89 extant spp., Old and New World); 1 fossil species from Baltic Amber); *Heissia* KORMILEV, 1986 (2 spp. Afrotropis); *Paracalisiopsis* KORMILEV, 1963 (1 sp., Afrotropis) and *Paracalisius* KORMILEV, 1974 (1 sp. Afrotropis). KORMILEV (1963, 1974, 1986) recognized that some Afrotropical "*Calisius*" were different and erected for them the abovementioned new genera, genus *Calisius* was a catch all for small Aradidae with large scutellum covering tergal plate of abdomen.

The genus *Calisius* STÅL, 1860 was supposed to be of worldwide distribution, predominantly occurring in tropical and subtropical regions. After HEISS (2015) recognized that the type species of the genus *Calisius* STÅL, 1860, *C. pallipes*, is a Neotropical taxon distinctly differing from Old World "*Calisius*", genus *Aradosyrtis* was raised from synonymy for *A. ghiliani* A. COSTA, 1864 and *A. salicis* HORVATH, 1913, both of West-Palaearctic origin. Further studies resulted in the designation of new genera for species from Middle Asia (*Neocalisius* HEISS, 2023, *Pachycalisius* HEISS, 2023) from Japan (*Nipponocalisius* HEISS et al., 2024) and Madagascar (*Microcalisius* HEISS & ECKELT, 2024).

Therefore it can be expected that most species described so far as "*Calisius*" don't belong to *Calisius* sensu STÅL, 1860 but to other genera., which are still to be determined. This needs to be confirmed by examination of further relevant material available for study.

Unless molecular data (barcoding etc.) will show and support true relationship of taxa which implies the assignment to distinct species or genera, undescribed species from Borneo sharing basic characters of *Aradosyrtis* are tentatively assigned to this genus.

Redescription of *Aradosyrtis*: Size 1.90-3.35 mm; macropterous or brachypterous; habitus of ovate outline; clypeus of bulb-like shape and granulate surface; antennal segments I-III of subequal length, IV longest and thickest with a variable number of plaques; pronotum transverse with four larger tubercles medially on collar and anterior lobe and four longitudinal carinae on posterior lobe, the lateral ones shorter joining the median ones on anterior lobe; lateral margins sinuate, with three larger tubercles on anterior lobe; scutellum triangularly elevated at base with at least four large tubercles, the lateral ones overlapping pronotum; lateral margins and median carinate ridge granulate or beset with tubercles; surface punctured with a partly variable but

specific coloration pattern; lateral margins of deltg II-VII with a dorsal and subventral row of three round or conical tubercles on each segment; transverse sclerite of tergite VIII exposed and visible from above in males and females; spiracles II-VI ventral, VII lateral, VIII terminal on ptg VIII.

Key to species of *Aradosyrtis* from Borneo

1 (2) Antennal segments I+II of subequal length, III longest, IV shorter than III; disk of scutellum with deep punctures (Figs 11-14) .....*Aradosyrtis lativentris* nov.sp.

2 (1) Antennal segments I-II and III-IV of subequal length or IV longest; disk of scutellum without deep punctures 3

3 (4) Pronotum with two loop shaped carinae on posterior lobe (Figs 15-17) ....*Aradosyrtis sabahnus* nov.sp.

4 (5) Pronotum with four longitudinal carinae on posterior lobe 5

5 (6) Lateral margins of deltg II-VII densely granulate, disks bicoloured black and yellow brown (Fig. 18).....*Aradosyrtis borneensis* (KORMILEV, 1986)

6 (7) Lateral margins of deltg II-VII with three distinct round tubercles, colouration unicloured yellow brown.....7

7 (8) Larger species with 2.70-3.15 mm, antennae longer than width of head, clypeus reaching apex of segment II, pattern of scutellum consisting of six lighter oval spots, disk of scutellum with flat punctures (Figs 19-22)..... .....*Aradosyrtis sexmaculatus* nov.sp.

8 (7) Smaller species with 2.35-2.80 mm, antennae shorter or at least as long as width of head, clypeus reaching apex of III, pattern of scutellum consisting of four brown spots, disk of scutellum with irregularly fused sculpture (Figs 23-26)..... ..... *Aradosyrtis dyak* nov.sp.

***Aradosyrtis lativentris* nov.sp. (Figs 11-14)**

Holotype: ♂. MALAYSIA - Sabah / Kinabalu Nat. Park / Headqu. env. / 8-10 VII 92 E.Heiss //. Paratype: ♀ collected with holotype (CEHI). Types are labelled accordingly.

E t y m o l o g y : From *lativentris* (Latin) meaning wide abdomen.

D i a g n o s i s : Distinguished from congeners by the long antennae and the deeply punctured disk of scutellum.

D e s c r i p t i o n : Larger species, 3.25 mm, body widely rounded, colouration ochraceous.

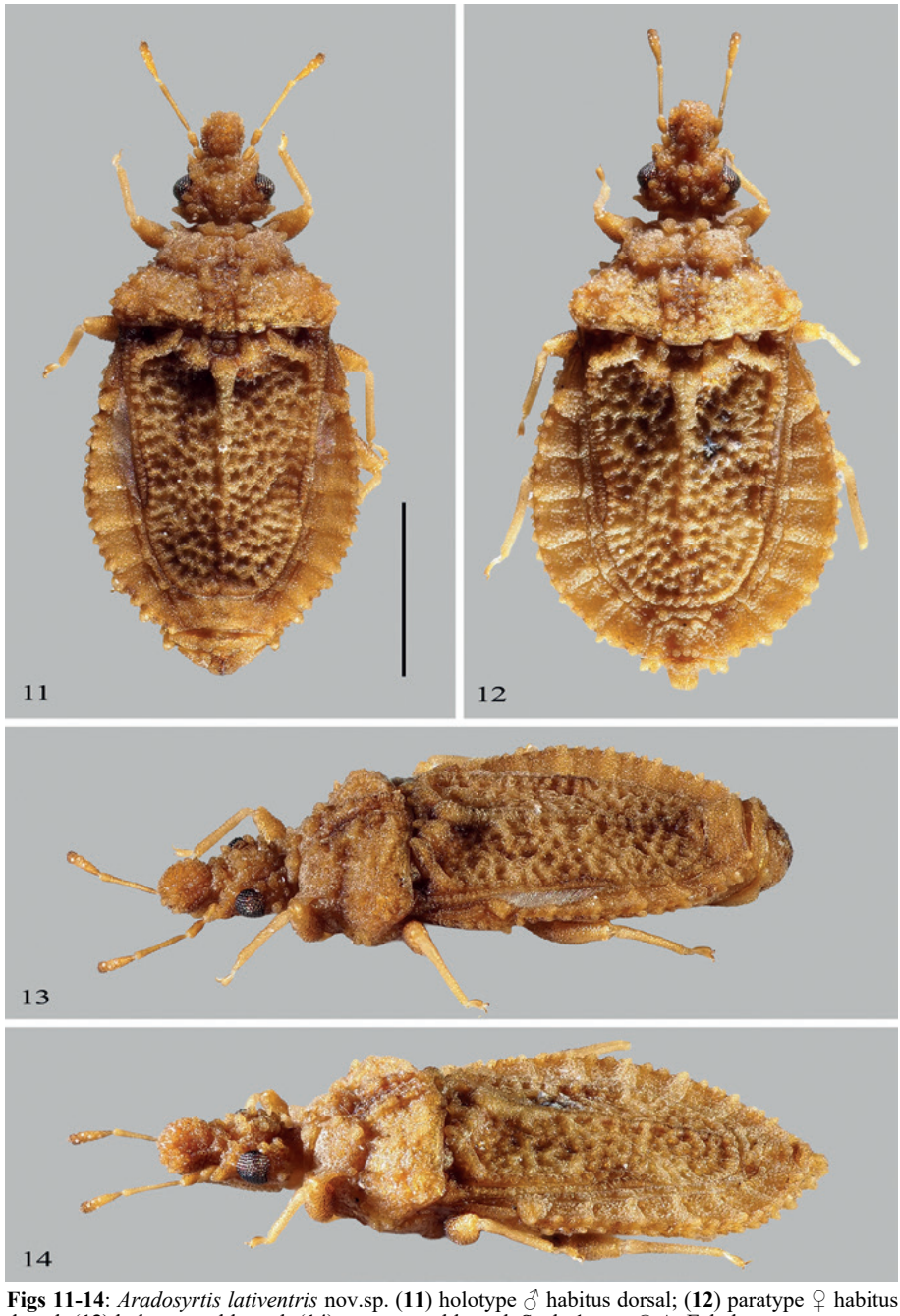
H e a d . Slightly longer than wide, clypeus elongate, rounded anteriorly, depressed laterally, reaching ¼ of antennal segment III which is longest and thinnest.

P r o n o t u m . Anterior and posterior lobes separated by a transverse depression, lateral parts of anterior lobe raised and granulate.

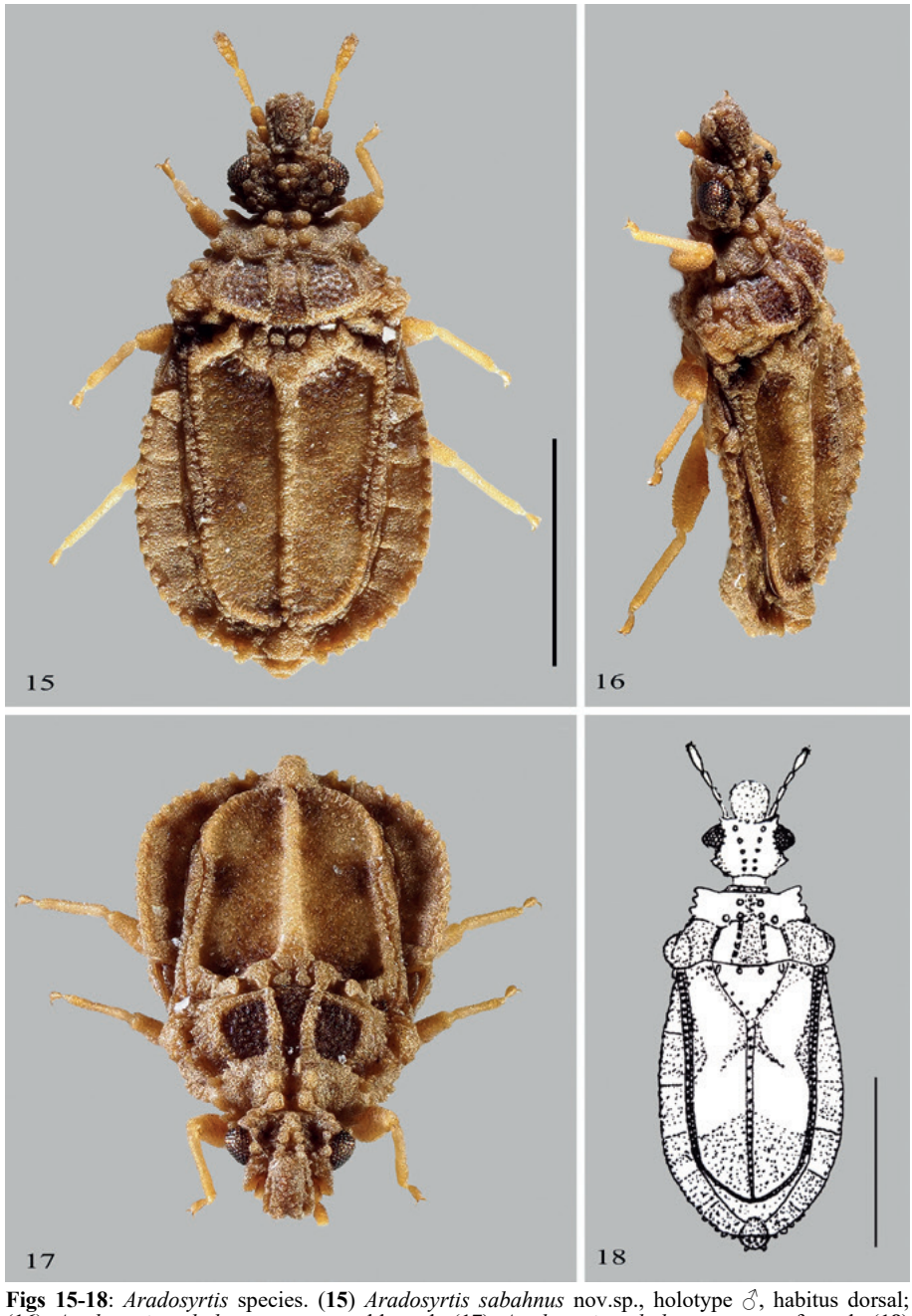
S c u t e l l u m . Lateral margins with distinct tubercles along exposed corium, then granulate; disk deeply punctured.

A b d o m e n . Surface of deltg II-VII flat, granulate, posterior margin of lighter colour; inner margin delimiting tergal disk carinate.

M e a s u r e m e n t s . Holotype: ♂. Length of body 3.25; head width/length 0.65/0.60 (ratio 1.08); pronotum width/length 1.30/0.65 (ratio 2.00); width of abdomen across tergite IV 1.60; length of antennae/width of head 1.31. Paratype: ♀. Length of body 3.55; head width/length 0.60/0.70 (ratio 1.16); pronotum w/l 1.40/0.75 (ratio 1.86); width of abdomen across tergite IV 1.90; length of antennae/width of head 1.27.



Figs 11-14: *Aradosyrtis lativentris* nov.sp. (**11**) holotype ♂ habitus dorsal; (**12**) paratype ♀ habitus dorsal; (**13**) holotype sublateral; (**14**) paratype sublateral. Scale 1 mm. © A. Eckelt.



Figs 15-18: *Aradosyrtis* species. (**15**) *Aradosyrtis sabahnus* nov.sp., holotype ♂, habitus dorsal; (**16**) *Aradosyrtis sabahnus* nov.sp., sublateral; (**17**) *Aradosyrtis sabahnus* nov.sp., frontal; (**18**) *Aradosyrtis borneensis* (KORMILEV, 1986), illustration from original description. Scale 1 mm. © A. Eckelt.

Aradosyrtis sabahnus nov.sp. (Figs 15-17)

Holotype: ♂. MALAYSIA - Sabah / Kinabalu Nat. Park / Headqu. env. / 8-10 VII 92 E.Heiss // (CEHI). Holotype is labelled accordingly.

E t y m o l o g y : Refers to Sabah province of Malaysia where it was collected.

D i a g n o s i s : Distinguished from congeners by the two loop shaped carinae on posterior lobe of pronotum.

D e s c r i p t i o n . Medium sized with 2.60 mm, body egg-shaped with rounded lateral margins; colouration brownish, yellowish are legs, antennae and carinate structures and tubercles of abdomen.

H e a d . Slightly wider than long, clypeus truncate anteriorly with a median notch, dorsally raised; antenniferous lobes small, triangular; antennae about the same length as width of head; vertex with two rows of larger tubercles.

P r o n o t u m . Anterior lobe medially with four large round tubercles, granulate laterally; posterior lobe raised posteriorly with two distinct carinate loops and deeply punctured disk.

S c u t e l l u m . Raised basal part with a cluster of larger tubercles; lateral margins, corium and median ridge densely beset with tubercles, disk with flat round punctures and ill defined yellowish-brownish colour pattern.

A b d o m e n . Tergal disk covered by scutellum, its lateral margin exposed as granulate carinae; surface of deltg II-VII flat, finely granulate, their lateral margins with a double row of tubercles.

M e a s u r e m e n t s . Holotype: ♂. Length of body 2.60; head width/length 0.55/0.50 (ratio 1.10); pronotum width/length 1.05/0.50 (ratio 2.10); width of abdomen across tergite IV 1.30.

Aradosyrtis borneensis (KORMILEV, 1986) (Fig. 18)

Calisius borneensis KORMILEV, 1986

Holotype: ♂. MALAYSIA, Borneo, Sabah, 1 km S of Kusadang, 1530 m, Aug. 24, 1983, G.F. Hevel & W.E. Steiner. Deposited at the National Museum Natural History, Washington, DC (not examined).

D i a g n o s i s : Distinguished from congeners from Borneo by "exterior border of connexiva granulate; disc bicolored: black and yellow brown" (descr.) and specific pattern of scutellum as Fig.1 of original description.

M e a s u r e m e n t s : Total length 2.80, width of pronotum 1.00, width of abdomen 1.04.

Remarks. Habitus and body structures correspond to those of *Aradosyrtis* and is therefore assigned to this genus. The detailed description by KORMILEV is not repeated here.

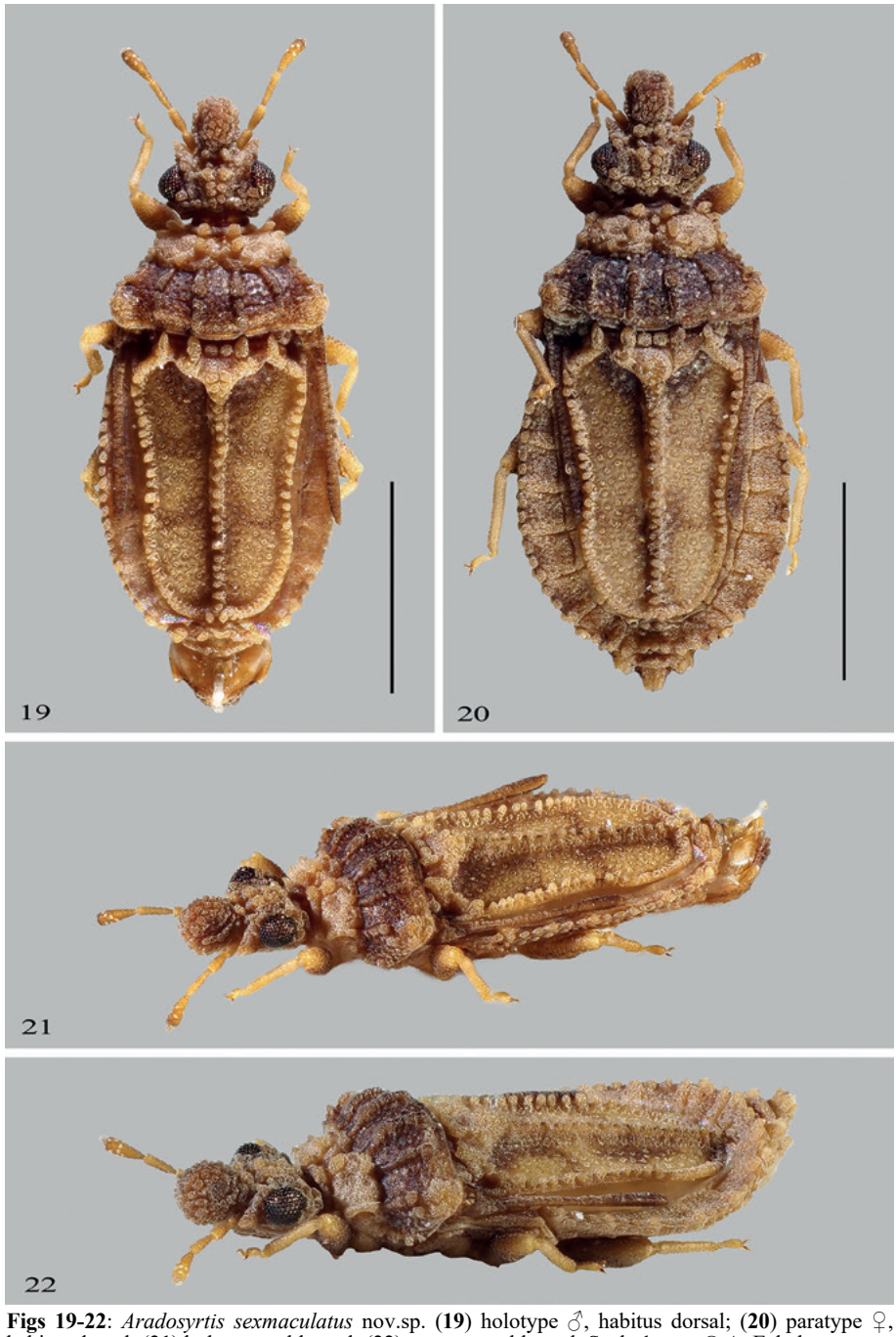
Aradosyrtis sexmaculatus nov.sp. (Figs 19-22)

Holotype: ♂. MALAYSIA - Sabah / Kinabalu Nat. Park / Headqu. env. / 8-10 VII 92 E.Heiss //. Paratypes: 2♀♀ collected with holotype (CEHI). Types are labelled accordingly.

E t y m o l o g y : Refers to its pattern of six lighter coloured spots on scutellum.

D i a g n o s i s : Recognized and distinguished by the pattern of scutellum.

D e s c r i p t i o n . Habitus elongate oval, about 2.4 times as long as wide; colouration yellowish brown with lighter parts and patches; scutellum with a pattern of six ill defined lighter oval spots.



Figs 19-22: *Aradosyrtis sexmaculatus* nov.sp. (**19**) holotype ♂, habitus dorsal; (**20**) paratype ♀, habitus dorsal; (**21**) holotype sublateral; (**22**) paratype sublateral. Scale 1 mm. © A .Eckelt.

H e a d . Slightly longer than wide, clypeus bulbous beset with tubercles; antennae longer than width of head; vertex with larger tubercles.

P r o n o t u m . Anterior lobe raised and beset with larger tubercles, separated from posterior lobe by a transverse furrow; lateral margins strongly converging anteriorly, humeri rounded; posterior lobe with four tuberculate carinae.

S c u t e l l u m . Basal elevation with 4 larger and two smaller tubercles; lateral margins, median ridge and exposed corium beset with long spaced tubercles; disk with flat round punctures.

A b d o m e n . Lateral margins of deltg II-VII with a double row of large round tubercles, disk granulate; lateral margin of tergal disk carinate.

F e m a l e . Basic structures as male, but abdomen is wider and more rounded.

M e a s u r e m e n t s . Holotype: ♂. Length of body 2.70 (2.90 with pygophore produced); head width/length 0.55/0.60 (ratio 1.09); pronotum width/length 1.05/0.50 (ratio 2.10); width of abdomen across tergite IV 1.10; length of antennae/width of head 1.16. Paratypes: 2♀♀. Length of body 3.00, 3.15; head width/length 0.57/0.60 (ratio 1.05), 0.60/0.65 (ratio 1.08); pronotum width/length 1.1/0.55 (ratio 2.00), 1.15/0.60 (ratio 1.91); width of abdomen across tergite IV 1.37, 1.40; length of antennae/width of head 1.06/1.04 (ratio 1.02).

Aradosyrtis dyak nov.sp. (Figs 23-26)

Holotype: ♂. BRUNEI - Temburong / Kuala / Belalong Field / Study Centre, 600m // Dipterocarp forest / 2-8 V 1995 E.Heiss //. Paratypes: 2♀♀ collected with holotype (CEHI). Types are labelled accordingly.

E t y m o l o g y : Refers to "Dyak", the indigenous native people of Borneo Island.

D i a g n o s i s : Distinguished from congeners by the colour pattern of scutellum and the wrinkled surface structure of pronotum, scutellum and abdomen.

D e s c r i p t i o n . Medium sized species; colouration ochraceous with distinct pattern of four brown dots on scutellum.

H e a d . Longer than wide, clypeus bulbous and raised dorsally; antennae shorter than width of head, segments I-III shorter and of subequal length, IV longer; vertex and postocular lobes beset with larger tubercles.

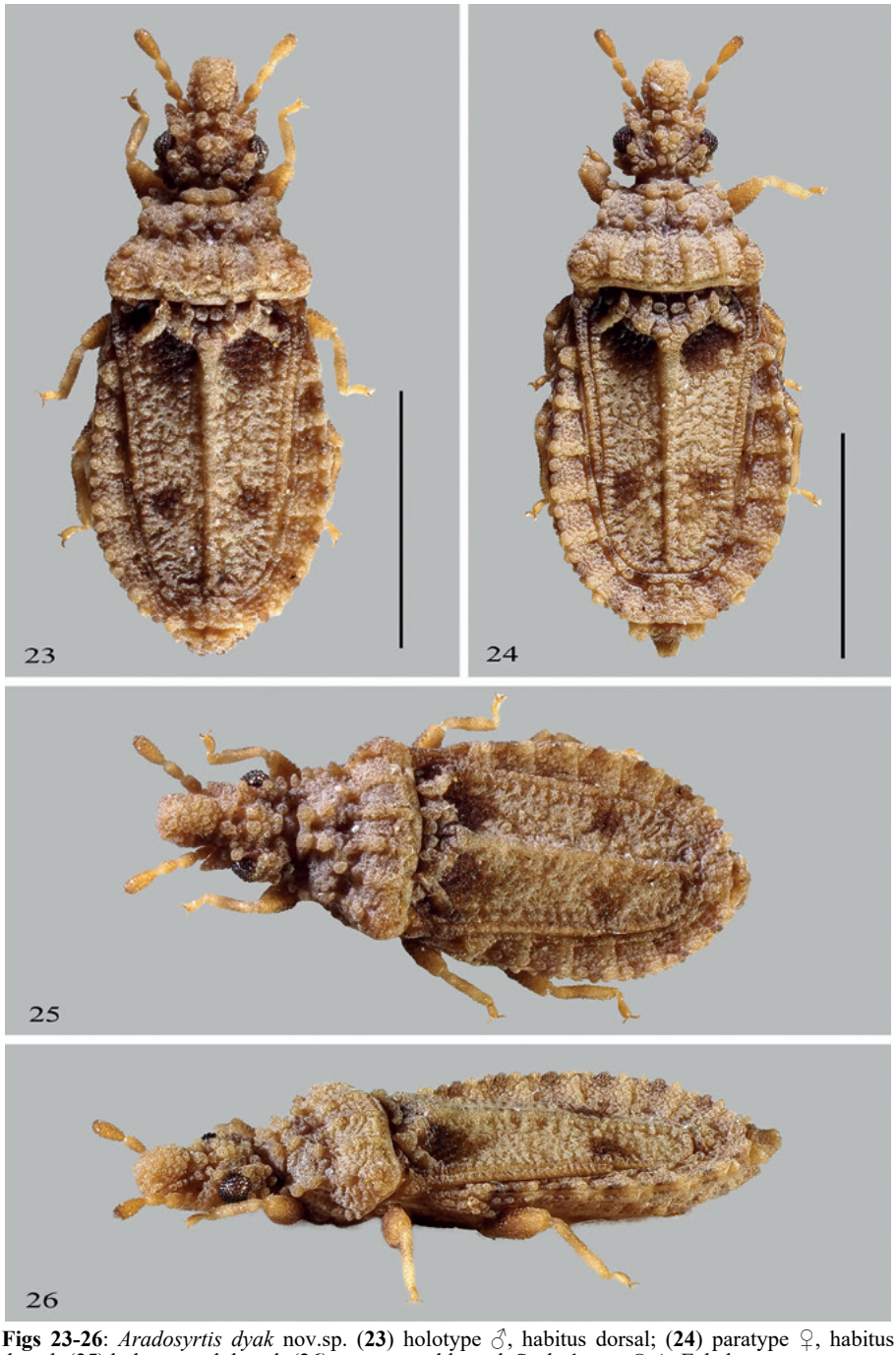
P r o n o t u m . About twice as wide as long, lateral margins sinuate; anterior lobe beset with larger round tubercles, separated from posterior lobe by a transverse furrow; posterior lobe with four distinct tuberculate carinae.

S c u t e l l u m . Basal part with six larger tubercles; lateral margins, exposed corium and median ridge densely granulate; disk with wrinkled surface structure and a specific colour pattern.

A b d o m e n . Egg-shaped, deltg II-VII flat, each with three lateral tubercles.

F e m a l e . Basic structures as male, but abdomen is wider and more rounded.

M e a s u r e m e n t s . Holotype: ♂. Length of body 2.35; head width/length 0.50/0.45 (ratio 1.11); pronotum width/length 0.80/0.45 (ratio 1.77); width of abdomen across tergite IV 0.95; length of antennae/width of head 0.96. Paratypes: 2♀♀. Length of body 2.65, 2.80; head width/length 0.55/0.47 (ratio 1.17), 0.60/0.0.47; pronotum width/length 1.35/0.45 (ratio 3.00), 1.35/0.50 (ratio 2.70); width of abdomen across tergite IV 1.10, 1.20; length of antennae/width of head 1.00/1.00 (ratio 1.00).



Figs 23-26: *Aradosyrtis dyak* nov.sp. (**23**) holotype ♂, habitus dorsal; (**24**) paratype ♀, habitus dorsal; (**25**) holotype subdorsal; (**26**) paratype sublateral. Scale 1 mm. © A. Eckelt.

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Zusammenfassung

Von der zum Staatsgebiet von Malaysien, Indonesien und Brunei Darussalam gehörenden größten Sunda-Insel Borneo sind bisher nur zwei Arten der Unterfamilie Calisiinae (Familie Aradidae, Rindenwanzen) bekannt. Nun werden zwei neue Gattungen: *Calibruneius* gen.nov. und *Stenocalisius* gen.nov. und sieben neue Arten beschrieben. *Calisius borneensis* KORMILEV, 1986 wird in die Gattung *Aradosyrtis* gestellt, für die ein Bestimmungsschlüssel der Arten von Borneo vorgelegt wird.

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