

A new species of the *Polyrhachis (Myrmhopla) flavoflagellata*-group (Hymenoptera: Formicidae: Formicinae) from Borneo

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Abstract. *Polyrhachis muara*, a new species from Borneo in the *flavoflagellata* species-group of the subgenus *Myrmhopla*, is described. A key to the workers of the group is provided and all four species are illustrated.

Keywords: Formicidae, *Polyrhachis (Myrmhopla)*, *flavoflagellata*-group, Borneo, Brunei, Malaysia, taxonomy, new species

INTRODUCTION

Although species of the *Polyrhachis flavoflagellata* group of the subgenus *Myrmhopla* are widespread, they are rather uncommon and only rarely found in collections. The name-bearing species, *P. flavoflagellata*, was described from Java in 1927 by Karavaiev, who in 1935 also described *P. (Cephalomyrma) stylifera* from Cambodia as a 'species and subgenus nov.' The subgenus *Cephalomyrma* was later considered synonymous with the subgenus *Myrmhopla* Forel (Hung, 1967), and *P. stylifera* was included by Dorow (1995) in his newly erected *P. flavoflagellata*-group. More than 70 years passed before a third species of the group, *P. storki*, was described from Sulawesi by Kohout (2008). Since its description, *P. flavoflagellata* has also been collected on Borneo (see below), while *P. storki* has also been listed from Sabah and Peninsular Malaysia (Kohout, 2008). The only known specimen of *P. stylifera* is the unique holotype. Like the other species of the group, *P. muara* described below appears to be rare and is known from only two specimens, one from Brunei and another from Johor on the Malay Peninsula.

METHODS

Photographs of specimens were taken with a digital camera attached to a stereomicroscope. Digital

images were processed using Helicon Focus (Mac OSX version) and Adobe Photoshop CS2 (Adobe Systems Inc., USA) software. Images of *P. muara* and *P. storki* are of the holotypes, those of *P. flavoflagellata* are of a syntype. As the unique holotype of *P. stylifera* could not be located, the drawing from Karavaiev's (1935) original description is used to illustrate the species.

Publication dates and the spelling of species epithets and authors' names follow Bolton (1995). Where a holotype specimen is mentioned as 'unique', this signifies it was the only specimen available for that species description and no syntypes or paratype specimens are known to exist.

Abbreviations used for specimen data: acc. = accession; B.M. = The Natural History Museum, London (as British Museum); NP = National Park; w = worker/s.

Abbreviations of institutions (with names of cooperating curators): ANIC = Australian National Insect Collection, CSIRO, Canberra, Australia (Drs S.O. Shattuck, R.W. Taylor); BMKB = Brunei Museum, Kota Batu, Brunei (Dr M. Wong); BMNH = The Natural History Museum, London, UK (B. Bolton); FIS = Forschungsinstitut Senckenberg, Frankfurt am Main, Germany (Drs J.-P. Kopelke, W.H.O. Dorow); ITBC = Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia (Prof. Datin Dr Maryati Mohamed); IZAS =

Institute of Zoology, Ukrainian Academy of Sciences, Kiev, Ukraine (Dr A.G. Radchenko); KBFSC = Kuala Belalong Field Studies Centre, Brunei (Dr Colin Maycock); MNHA = Museum of Nature and Human Activities, Hyogo, Japan (Dr Y. Hashimoto); QMBA = Queensland Museum, Brisbane, Australia (Drs C.J. Burwell, G.B. Monteith); UBDB = University Brunei Darussalam, Bandar Seri Begawan, Brunei (Dr Kamariah Abu Salim).

Measurements (in mm) and indices follow those of Kohout (2008): TL = Total length (the necessarily composite measurement of the outstretched length of the entire ant measured in profile); HL = Head length (the maximum measurable length of the head in perfect full face view, measured from the anterior-most point of the clypeal border or teeth, to the posterior-most point of the preoccipital margin); HW = Head width (width of the head in perfect full face view, measured immediately in front of the eyes); CI = Cephalic index (HW x 100/HL); SL = Scape length (excluding the condyle); SI = Scape index (SL x 100/HW); PW = Pronotal width (maximum width of the pronotal dorsum excluding the spines); MTL = Metathoracic tibial length (maximum measurable length of the tibia of the hind leg). Measurements were taken using a Zeiss SR stereomicroscope at 32x magnification with an eyepiece graticule calibrated against a stage micrometer.

SYSTEMATICS

Genus *Polyrhachis* Fr. Smith, 1857

Polyrhachis Fr. Smith, 1857: 58. Type species: *Formica bihamata* Drury, 1773: 73, pl. 38, figs 7, 8, worker; by original designation.

Subgenus *Myrmhopla* Forel, 1915

Myrmhopla Forel, 1915: 107 (as subgenus of *Polyrhachis*). Type species: *Formica armata* Le Guillou, 1842: 313, worker; by original designation.

Polyrhachis flavoflagellata species-group

The *Polyrhachis flavoflagellata* species-group was established by Dorow (1995) who divided the subgenus *Myrmhopla* into 16 species-groups: six proposed earlier by Emery (1925) and ten newly established. Only four species comprise this rather small, but relatively widespread group: *P.*

flavoflagellata Karavaiev, *P. storki* Kohout, *P. stylifera* Karavaiev and *P. muara* described below. Three of the species occur on Borneo and only one, *P. stylifera*, appears to be endemic to Cambodia.

DIAGNOSIS (modified from Dorow, 1995)

Worker. Mostly small to medium-sized ants (HL 1.15-1.85) with general characteristics of the genus. Anterior clypeal margin arcuate and entire, or medially truncate, or with a deeply emarginate median flange. Head disproportionately large compared to rest of body with eyes relatively flat, situated close to posterolateral corners. Mesosoma rather flat, laterally immarginate, humeri armed with short, triangular teeth. Propodeal spines relatively short, more-or-less horizontal, or distinctly elevated. Petiole with a pair of lateral spines that are either acute and posteriorly directed (as in e.g. *P. flavoflagellata*), or reduced to obtuse, laterally directed stumps (as in *P. stylifera*). Dorsum of petiole with a pair of short but distinct, acute intercalary spines (as in *P. flavoflagellata* and *P. muara* sp. nov.) or blunt tuberculae (as in *P. stylifera*) or smoothly rounded (as in *P. storki*). Head and body closely and finely punctate; gaster very finely shagreened. Hairs virtually absent from most of body, except a few, rather short, erect hairs on front of head and around gastral apex. Closely appressed, silvery or golden pubescence present in various densities over most dorsal surfaces. Mostly black, with only base of gaster and appendages sometimes light to dark reddish-brown.

KEY TO THE WORKERS OF THE FLAVOFLAGELLATA-GROUP

1. Lateral petiolar spines reduced to blunt, stump-like, lateral projections (Fig. 7) (Cambodia)
 - *stylifera* Karavaiev
- Lateral petiolar spines relatively long, acute, dorsoposteriorly diverging (Figs 2-6) 2
2. Anterior clypeal margin with deeply emarginate median flange; dorsum of petiole without intercalary teeth or spines (Figs 5-6)
 - *storki* Kohout
- Anterior clypeal margin entire or simply truncate with a shallow median emargination;

dorsum of petiole with a pair of distinct
intercalary spines 3

3. Propodeal spines distinctly dorsoposteriorly elevated from their bases (Fig. 2); bicoloured, body black, base of gaster and appendages mostly light reddish-brown

flavoflagellata Karavaiev

- Propodeal spines more-or-less horizontal (Fig. 4); virtually unicoloured, body black, appendages black or very dark reddish-brown
muara sp. nov.

***Polyrhachis flavoflagellata* Karavaiev, 1927**
(Figs 1, 2)

Polyrhachis (Myrmhopla) flavoflagellata Karavaiev, 1927: 35, fig. 16. Syntype workers. Type locality: INDONESIA, JAVA, Buitenzorg (V. Karavaiev #2357) (IZAS, QMBA) (examined).

ADDITIONAL MATERIAL EXAMINED

BRUNEI: Tutong District, Bukit Sulang, near Lamunin, 20.viii-10.ix.1982, fogging (N.E. Stork B.M.1982-388) (w).

REMARKS. Comparison of the specimens from Bukit Sulang with the syntypes from Java shows the former slightly smaller (HL 1.56-1.59 versus HL 1.68-1.75 in syntypes), but they are virtually identical in all other aspects and I am confident in considering them conspecific.

***Polyrhachis muara* sp. nov.**
(Figs 3, 4)

MATERIAL EXAMINED

HOLOTYPE: BRUNEI, Brunei-Muara District, Tanjung Semesta, Brunei River, 5.vii.1994, R.J. Kohout acc. 94.157 (w). PARATYPE: WEST MALAYSIA, Johor, 20 km N of Mersing, 26.ii.1987, B. Fiala #14 (w). Type distribution: Holotype in ITBC; paratype in FIS.

WORKER

Dimensions (holotype cited first): TL c. 6.05, 6.40; HL 1.50, 1.59; HW 1.28, 1.31; CI 85, 82; SL 1.75,

1.96; SI 137, 150; PW 0.94, 0.97; MTL 2.06, 2.31 (2 measured).

Mandibles with 5 teeth. Anterior clypeal margin arcuate, only very shallowly incised medially. Clypeus with rather flat median carina, and virtually straight in profile, posteriorly weakly rounding into very shallow basal margin. Frontal triangle weakly impressed. Frontal carinae sinuate, only weakly raised at mid length; central area with distinct, rather flat, median furrow. In full face view, sides of head in front of eyes weakly convex; behind eyes sides immediately rounding into very highly convex vertex. Eyes very large, situated close to posterolateral corners of head, only moderately convex, in full face view clearly breaking lateral cephalic outline. Ocelli absent. Pronotal dorsum convex in profile; humeri armed with distinct, acute teeth; promesonotal suture distinct. Mesonotum in profile flat; metanotal groove poorly marked dorsally. Propodeal dorsum flat, with lateral margins produced posteriorly into more-or-less horizontal, subparallel, medium length, acute spines; propodeal dorsum abruptly rounding into oblique declivity in medially uninterrupted line. Petiole relatively low, armed with a pair of posterolaterally directed, weakly elevated spines and a pair of acute intercalary teeth. Anterior face of first gastral segment widely rounding onto dorsum of gaster.

Head, mesosoma and petiole closely and more-or-less uniformly reticulate-punctate, somewhat more finely reticulate-punctate on sides of mesosoma. Gaster finely shagreened.

Masticatory borders of mandibles with several curved, golden hairs. Anterior clypeal margin with a single medium-length seta medially and a few short setae laterally. Pilosity absent on mesosoma and sparse on head: only a few paired, relatively short, erect hairs near anterior and basal clypeal margins and along frontal carinae. Several short, erect hairs on front coxae and ventral surfaces of femora. Gaster with several medium-length hairs along posterior margins of segments dorsally; hairs more abundant on venter of gaster. Medium-length, silvery, appressed pubescence distributed at varying density over most body surfaces; pubescence distinctly shorter on gastral dorsum.

Generally black; mandibular masticatory borders, antennae and legs (including coxae) dark to very dark reddish-brown.

Sexuals and immature stages unknown.

REMARKS. The holotype was collected from *Nypa fruticans* (Nipah Palm) foliage in mangrove forest along the Brunei River. The paratype was foraging on low vegetation.

Polyrhachis storki Kohout, 2008
(Figs 5, 6)

Polyrhachis storki Kohout, 2008: 298, figs 9C, D. Holotype and paratype workers. Type locality: SULAWESI UTARA, Dumoga-Bone NP (N.E. Stork), BMNH (examined).

ADDITIONAL MATERIAL EXAMINED

SULAWESI TENGAH: Lore Lindu NP, Toro, Watu Bohe, 860 m asl, 14.iv.2005, cacao plantation, M.M. Bos #34 (w). EAST MALAYSIA, SABAH: Kinabalu Park, Poring, 600 m asl, vii.1991 (M. Dill) (w); Forest Camp, 19 km N of Kalabakan, 60 m asl, 25.x.1962 (K.J. Kuncheria) (w). WEST MALAYSIA: Negara Sembilan, Pasoh Forest Reserve, xi.1994, fogging (M. Brendell, K. Jackson & S. Lewis) (w).

REMARKS. *Polyrhachis storki* is an apparently widespread, albeit rare species, distributed from Peninsular Malaysia to Borneo and south to Sulawesi. The single specimen from Sabah lacks the pilosity which covers the dorsal surfaces of the mesosoma, petiole and gaster of the specimens from Pasoh, but it otherwise compares well and I consider all species examined conspecific.

Polyrhachis stylifera Karavaiev, 1935
(Fig. 7)

Polyrhachis (*Cephalomyrma*) *stylifera* Karavaiev, 1935: 115, fig. 29. Holotype worker. Type locality: CAMBODIA, Kampot Province, Ream (K. Davydov, #5725), ?IZAS (location of type unknown).

REMARKS. The unique holotype of *P. stylifera* should be lodged in the Karavaiev collection (IZAS), but could not be located there nor in any other collection examined. In spite of the missing type, the characters given in the original description, together with the accompanying illustration, provide a reasonable indication about the identity of this species. *Polyrhachis stylifera* appears to be endemic to Cambodia and, like other species of the group, is evidently rare, with the holotype being the only specimen known.

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Figs 1-6. Dorsal and lateral view of *Polyrhachis (Myrmhopla) flavoflagellata*-group species: **1, 2** – *Polyrhachis flavoflagellata* Karavaiev (syntype); **3, 4** - *Polyrhachis muara* sp. nov. (holotype); **5, 6** – *P. storki* Kohout (holotype).

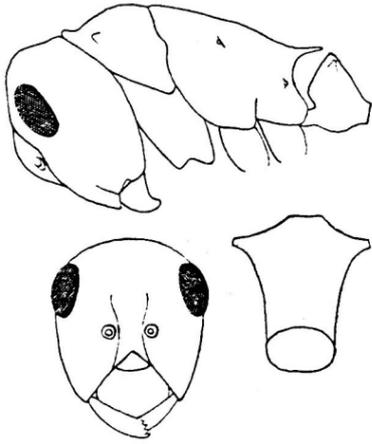


Fig. 7. *Polyrhachis stylifera* Karavaiev: Top, lateral view of head, mesosoma and petiole; Bottom left, frontal view of head; Bottom right, posterior view of petiole (From Karavaiev, 1935)

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