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A Revision of the Eubrianacinae (Coleoptera, Psephenidae)

II. *Mubrianax* gen. nov.

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Abstract *Mubrianax* gen. nov. is described from the Oriental Region. Larval and pupal characters of the genus is also described and compared with those of *Eubrianax* KIESENWETTER. *Eubrianax basipennis* PIC, 1913, *E. robustior* PIC, 1928, and *E. atripennis* PIC, 1931 are transferred to *Mubrianax*. *Eubrianax bicolor* PIC, 1955 is synonymized with *Eubrianax basipennis* PIC. A key is provided to the males of the species.

Introduction

Mubrianax is unique because its larvae are found only on woods submerged in the water. So far, only *Macroeubria* PIC (LEE *et al.*, 1997), a genus in another subfamily (Eubriinae), was reported to live in such habitats. Larva of *Mubrianax* is easily recognized from those of other genera of the eubrianacines by the oblong body form. This shape is adaptive since the larvae can tightly adhere to slender twigs. We have successfully reared larvae of *M. robustior* (PIC), comb. nov., to adults. Therefore, it is possible to define generic characteristics of larvae and pupae of *Mubrianax* by studying those of this new species.

Acronyms:

BPBM	Bernice P. Bishop Museum, Honolulu
MHNP	Muséum national d'Histoire naturelle, Paris
NHMW	Naturhistorisches Museum Wien, Vienna

NML National Natuurhistorisch Museum, Leiden
NTUC National Taiwan University, Taipei
NWU Nagoya Women's University, Nagoya

Mubrianax gen. nov.

Type species: *Eubrianax basipennis* PIC, 1913.

Description. Adult. Body form oblong, moderately depressed; surface densely pubescent in general but sparsely on pronotum; pronotum with latero-apical translucent areas not distinctly delimited.

Head completely concealed under pronotum; frons apically dilated; labrum transverse, medially emarginate. Antenna 11-segmented, segments 3–10 serrate in female, pectinate in male, rami very long, laterally flattened, starting from base on segment 3, from middle on segment 4, from apices on segments 5–10. Maxillary palpus 4-segmented, segment 1 very short, terminal segment the longest, the apex rounded or truncate; segment 2 subequal to 3, much shorter than terminal segment; labial palpus 3-segmented, terminal segment elongate and similar to that of maxillary palpus; basal segments of both maxillary and labial palpi more or less reduced. Pronotum transverse, widest usually near basal 1/3, slightly contracted towards base, more distinctly contracted towards apex; margins smooth; anterior margin rounded; posterior angles rectangular; disc medially convex. Scutellum subtriangular. Elytra parallel-sided (LE/WE=1.2–1.4); disc with stripes consisting of more impressed punctures; lateral margins smooth.

Prosternum produced anteriorly; prosternal process apically tapering, apex either short acute and not reaching mesosternum or long dilated and surpassing mesosternum; mesosternal median longitudinal cleft depressed, with device for reception of prosternal process; metasternum with median longitudinal suture, deeply impressed. Mesocoxal cavities separated from each other. Legs moderately long, apical spurs of pro-, meso- and metatibiae 2–1–1; tarsi 5-segmented, segment 1 subequal to segment 5; segment 2 similar to segment 3 in length, shorter than segment 1 or 5; segment 4 the shortest; relative lengths of segments 2–5 about 2.2 : 1.4 : 1.3 : 1 : 2.3; tarsal claws (Fig. 11) simple, slightly curved, with notches at basal 1/3 and without pulvilli.

Aedeagus:— Trilobed; fibula reduced or absent; penis basally widened, compressed near apex, baso-lateral apophyses short; parameres long and very slender, reaching apex of median lobe, apices hook-like; phallobase subequal to parameres in length, narrowed basally.

Larva. Body form oblong. Granules on dorsum not reduced at sides. Posterior plates present on all thoracic segments (including pleurites), and on abdominal segments 1–5, though reduced on main plate of abdominal segment 5 and separated from basal margins of pleurites on prothorax. Costal line well developed on abdominal segments 4–7; those on meso- and metathoraces and abdominal segments 1–3 only present on pleurites, arising and abbreviated near middle.

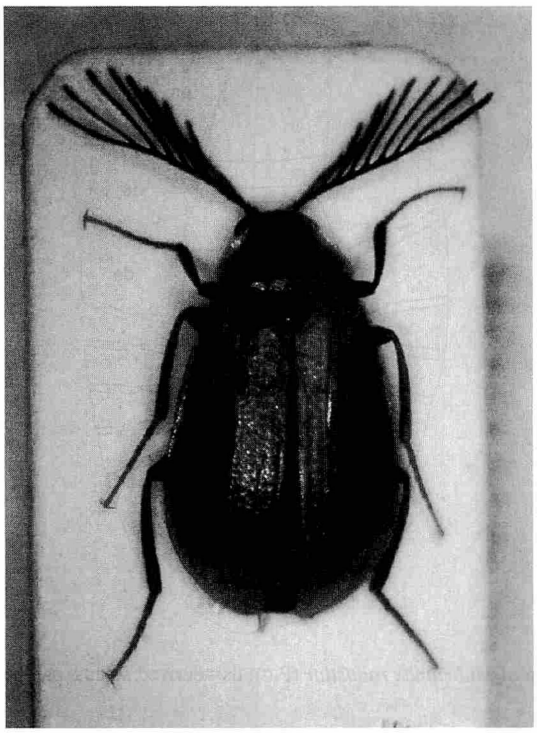


Fig. 1. Habitus of *Mubrianax basipennis* (PIC).

Periocellar sulci of prothoax conjoined with mid-dorsal line near apex; mid-dorsal pronotal plate reduced. Some derived sulci recognized on tharaces, one arising from antero-lateral angles of main plates on prothorax, and another arising from postero-lateral angles of posterior plates on prothorax and paired V-shaped one arising from middle of basal margins of pleurites on meso- and metathoraces irrespectively.

Marginal peg setae of pleurites 2-segmented (Fig. 3); basal piece with full teeth at sides; apical setae on basal pieces paired and lanceolate, apico-lateral angles lengthened. Hair-like setae on posterior margins comb-shaped. Base of coxae of all legs furnished with a row of lanceolate setae, the number of setae varying on different legs: 4–5 on prothoracic legs, 10 on mesothoracic legs, and 9 on metathoracic legs.

Pupa. Openings of spiracles gathered on 7th tergite, but absent in antero-mesal area (Fig. 5). All openings of spiracles very small, randomly scattered on tergite, though respective spiracles are much larger than in *Eubrianax*. Number of openings of each spiracle recognized as sexual dimorphism; 300 openings in the male of *M. robustior* (PIC) and 700 openings in the female. Marginal extensions of setae (Fig. 4) parallel-sided and margined by minute teeth, with the multifurcate apex. Each of them fused into a delicate, fin-like membrane and the disc provided with sparse granules and micro-spined projection.

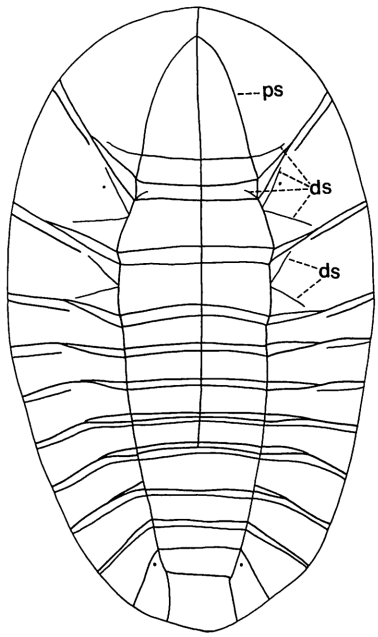
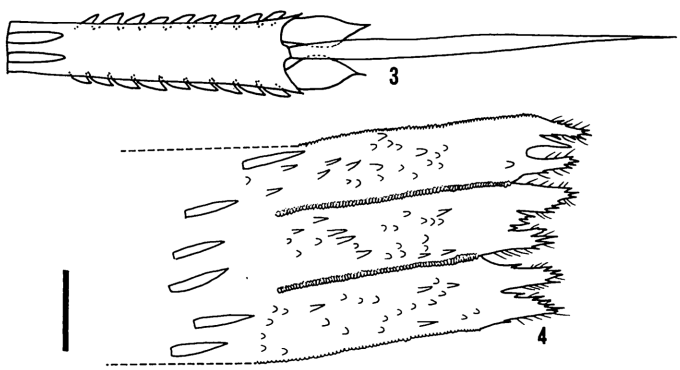


Fig. 2. Larva of *Mubrianax robustior* (PIC); ds=derived sulcus, ps=periocellar sulcus.



Figs. 3–4. *Mubriananx robustior* (PIC); 3, marginal peg seta of larva; 4, marginal seta of pupa. Scale bar=1 mm.

Diagnosis. Adult. This genus may be distinguished from others by a combination of the following characteristics: tarsal claws without pulvilli (in contrast to the presence of pulvilli in *Eubrianax* and *Hebrianax*); apical spurs of tibia 2–1–1. In addition, *Mubrianax* has one autapomorphic character — tarsal claws with a notch. It is very useful to recognize members of the genus.

Larva. The present genus is closely related to *Eubrianax*, but differs from the

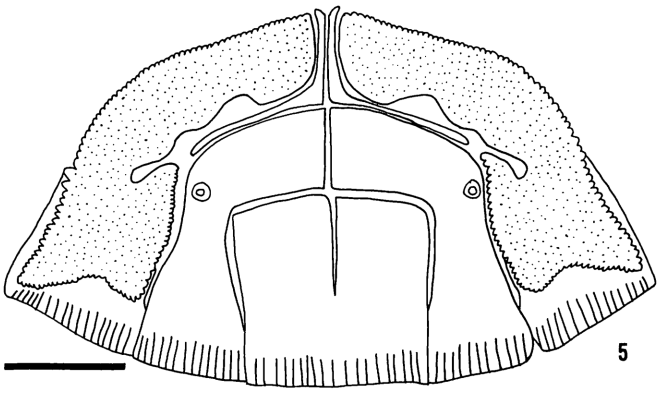


Fig. 5. *Mubrianax robustior* (PIC); abdominal terga 7–9 of pupa; dotted areas indicate spiracles. Scale bar = 1 mm.

latter in having some distinct features as described above. Besides, the lanceolate setae on the legs of *Mubrianax* is also characteristic and present on the prothorax. In *Eubrianax*, the lanceolate setae of the legs vary among different species; for example, in *E. tarokoensis* 7–10 on mesothoracic legs and 8–13 on metathoracic legs; in *E. loochooensis* 3–4 on mesothoracic legs and 5–8 on metathoracic legs; reduced on prothoracic legs.

Pupa. Differing from that of *Eubrianax* in having the characteristic spiracles on tergite and the extension setae at pleurites margins.

Etymology. Mu from wood in Chinese, indicating their preferred habitat.

Included species. *Mubrianax basipennis* (PIC), comb. nov., *M. robustior* (PIC), comb. nov., and *M. atripennis* (PIC), comb. nov.

Ecology. Larvae of *Mubrianax* prefer small unpolluted streams. They are always found on submerged woods.

Distribution. Indonesia, East Malaysia, Philippines, Central Africa (Cameroon).

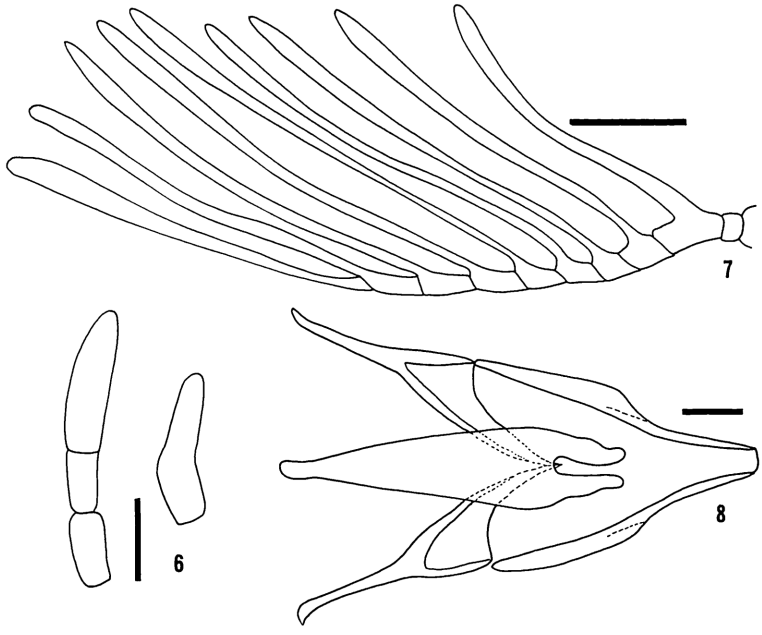
Mubrianax basipennis (PIC), comb. nov.

(Figs. 1, 6–8)

Eubrianax basipennis PIC, 1913, 173.
Eubrianax bicolor PIC, 1955, 228. *Syn. nov.*

Type material. Lectotype: ♂ (herewith designated, MHNP), Occident Sukabumi, Java, 2000', 1893, H. FRUHSTORFER leg., with "No 8 / Purteke ...undecipherable / n. sp. / Type / TYPE / *Eubrianax basipennis* Pic". Paralectotype: 1 ♂ (herewith designated, MHNP), Occident Sukabumi, Java, 4000', 1893, H. FRUHSTORFER leg.

Synonym. We have examined the lectotype of *Eubrianax bicolor* (herewith designated, MHNP), labeled: "Yumband / cotype / *Eubrianax bicolor* Pic". No doubt *E. bicolor* should be a synonym of *E. basipennis*.



Figs. 6–8. *Mubrianax basipennis* (PIC); 6, maxillary (left) and labial (right) palpi; 7, male antenna; 8, aedeagus. Scale bar: 6, 8=0.1 mm, 7=1 mm.

Additional material examined. 1♂ (NML), Djampang Tengah, 2000', Preanger, Java, X–1934, E. WALISH leg., with "Museum Leiden / *Eubrianax basipennis* Pic 1913 Det. M. SATÔ, 1986"; 1♂ (NML), Tjiheavlakte, Preanger, Java, VI–1935, F. C. DRESCHER leg., with "Museum Leiden"; 1♂ (NML), Batoerraden G., Slamet, 800 m, Java, VI–1938, F. C. DRESCHER leg., "Museum Leiden"; 1♂, G. Tangkoeban Prahoe, 4,000–5,000, Voet Preanger, Java, XI–1934, F. C. DRESCHER leg., with "Museum Leiden"; 1♂ (NML), same data as the preceding one, but "3–5 II. 1933"; 1♂ (BPBM), Del Sur Lemesahan, 600 m, Zamboanga, Mindanao, Philippines, 7–IX–1958, light trap, H. E. MILLIRON leg.; 1♂ (NWU), Sitinjaulaunt, alt. 1,000 m, 25 km east from Padang, Sumatera Barat, Indonesia, 21–VIII–1977, S. NAGAI leg., with "*Eubrianax bicolor* Pic, 1955, Det. M. SATÔ, 1986"; 1♂ (NTUC), same data as the preceding one, but "7–VIII–1977"; 1♀ (NWU), Mt. Padang, alt. 100 m, Barat, Sumatra, 7–VIII–1977, S. NAGAI leg.; 1♂ (NML), Tjibodas, Java, L. DE VOS leg., with "Museum Leiden coll J de Vos tot Nederveen Cappel".

Male. Length 5.4 mm, width 3.8 mm. Coloration yellowish brown, but antennae brown, eyes and base of each antennomere black, scutellum brown, elytra entirely or apically darkened. Antennae (Fig. 7) pectinate from segments 3 to 10; relative lengths of rami to antennomeres from segments 3 to 10 about 5.0 : 10.0 : 11.5 : 11.2 : 10.3 : 9.1 : 8.5 : 6.6. Maxillary palpus (Fig. 6) slender, with rounded apex; relative lengths of segments 2–4 about 1.2 : 1 : 2.2. Labial palpus small, about 0.5× as long as

maxillary palpus; terminal segment narrowed in apical half, with rounded apex. Prosternal process short, not reaching mesosternum; apex acute. Median longitudinal cleft on mesosternum absent. LE/WE=1.3. WP/LP=1.6. WP/WE=0.6. Aedeagus (Fig. 8) 1,500 μm long, 2.3× as long as wide. Penis 0.7× length and 0.4 width of aedeagus, basally widened, widest at basal 1/3. Parameres short, about 0.7× length of basal piece. Fibula invisible.

Variation. Some individuals have yellowish brown pronotum and elytra, and shorter antennal rami.

Female. Length 8.0 mm, width 5.3 mm. Coloration yellow, but eyes and antenna black. LE/WE=1.3. WP/LP=1.6. WP/WE=0.6.

Diagnosis. Mubrianax basipennis is easily recognized from others on the yellowish brown coloration.

Distribution. Indonesia (Java, Sumatra), Philippines (Mindanao).

Mubrianax robustior (PIC), comb. nov.

(Figs. 2–5, 9–13)

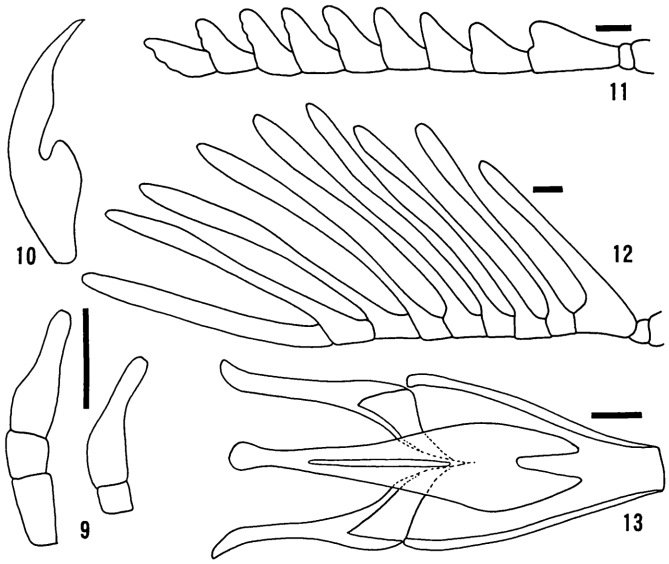
Eubrianax robustior PIC, 1928, 8.

Type material. Lectotype: ♂ (herewith designated, MHNP), Binaluan, N. Palawan, Philippines, with "Type / TYPE / *Eubrianax robustior* n. sp.". Paralectotype: 1♀ (herewith designated, MHNP), same data as the lectotype.

Additional material examined. 1♂ (NHMW), Batu Punggul, primary forest, Sabah, Malaysia, 24–VI~1–VII–1996; 1♂ (NTUC), Poring Hot Spring, Sabah, Malaysia, 10–IX–1998 (larva), 12–I–1999 (emerged), C.-F. LEE leg.; 1♀ (NHMW), same data as the preceding one, but 11–XI–1998 emerged; 1♀ (NTUC), same data as the preceding one, but 23–XI–1998 emerged; 1♂ (BPBM), Bunong Matang, 120 m, Sarawak, Borneo, 15–IX–1958, J. L. GRESSITT leg.; 1♂ (BPBM), Matang, 450–894 m, Kuchin, Sarawak, Borneo, 15–IX–1958, J. L. GRESSITT leg.

Male. Length 3.2 mm, width 2.0 mm. Coloration dark brown, except for eyes and bases of antennomeres black and antero-lateral areas of pronotum translucent. Antennae (Fig. 12) pectinate from segments 3 to 10; relative lengths of rami to antennomeres from segments 3 to 10 about 3.4 : 7.5 : 8.2 : 9.0 : 8.2 : 8.2 : 7.0 : 5.3. Maxillary palpus (Fig. 9) slender; terminal segment apically tapered, apex narrowly rounded; relative lengths of segments 2–4 about 1.6 : 1 : 3.0. Labial palpus short, about 0.7× as long as maxillary palpus; terminal segment similar to that of maxillary palpus; segment 1 very short. Prosternal process long, surpassing mesosternum; apex dilated. Median longitudinal cleft on mesosternum present only near base. LW/WE=1.3. WP/LP=1.6. WP/E=0.6. Aedeagus (Fig. 13) 890 μm long; 2.7× as long as wide. Penis 0.8× length and 0.5 width of aedeagus, basally widened, widest at basal 1/3. Parameres short, about 0.8× length of basal piece. Fibula slender.

Female. Length 6.0 mm, width 3.2 mm. Similar to male, but the antenna is strongly serrate (Fig. 11). LE/WE=1.3. WP/LP=1.7. WP/WE=0.7.



Figs. 9–13. *Mubrianax robustior* (PIC); 9, maxillary (left) and labial (right) palpi; 10, tarsal claw; 11, female antenna; 12, male antenna; 13, aedeagus. Scale bar: 9, 13=0.1 mm, 10 as same as 9; 11, 12=1 mm.

Ramarks. This new species is easily distinguished from the others by its small body size and black coloration.

Distribution. Philippines (Palawan), East Malaysia (Sarawak, Sabah).

Mubrianax atripennis (PIC), comb. nov.

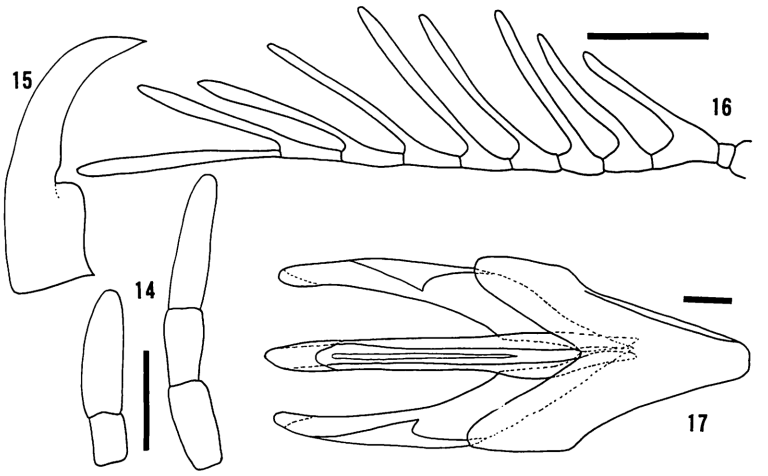
(Figs. 14–17)

Eubrianax atripennis PIC, 1931, 9.

Type material. Lectotype: ♂ (herewith designated, MHNP), Kamerun Ekoua, with "type (yellow label) / TYPE (red label) / *atripennis* n. sp."

Additional material examined. 2♂♂ (NTUC, NHMW), Nyassoso Village, Mt. Kupe, Kamerun, IV–1997, DENTON leg.

Male. Length 5.2 mm, width 3.0 mm. Coloration blackish brown, except for paler femur and antero-lateral areas on pronotum translucent. Antennae (Fig. 16) pectinate from segments 3 to 10; rami starting from base on segments 3 and 4, from middle on segments 5 and 6, from near apex on segments 7–10, relative lengths of rami to antennomeres from segments 3 to 10 about 2.0 : 3.0 : 3.5 : 3.5 : 3.5 : 3.5 : 2.9 : 2.8. Maxillary palpus (Fig. 14) slender; terminal segment apically tapered, with narrowly rounded apex; relative lengths of segments 2–4 about 1.1 : 1 : 1.9. Labial palpus short, about 0.6× as long as maxillary palpus, terminal segment similar to that of maxillary palpus; segment 1 very short. Prosternal process short, reaching base of mesosternum;



Figs. 14–17. *Mubrianax atripennis* (PIC); 14, maxillary (right) and labial (left) palpi; 15, tarsal claw; 16, male antenna; 17, aedeagus. Scale bar: 14, 17=0.1 mm; 15 same as 14; 16=1 mm.

apex acute. Median longitudinal cleft on mesosternum absent. Notches on tarsal claws (Fig. 15) very feeble. LW/WE=1.4. WP/LP=1.8. WP/E=0.6. Aedeagus (Fig. 17) 1,000 μm long, 2.6× as long as wide. Penis 0.8× length and 0.3 width of aedeagus, basally widened, widest at basal 1/3. Parameres short, about 0.7× length of basal piece. Fibula slender.

Diagnosis. This species is similar to *M. robustior*, but differs from it in the longer antennomeres, the shorter antennal rami, and the larger body size.

Distribution. Cameroon (Central Africa).

Discussion

Mubrianax shows some remarkable differences from *Eubrianax* in the pupal stage. The surface of the spiracles become larger, and the openings are very small and numerous. The marginal extensions of setae are very closely set to one another, leaving no crevices. Perhaps these imply that pupation occurs under the water. Unfortunately, we did not observe any pupae in the field. However, some observations support this assumption. *Mubrianax* prefers twigs for pupation even when provided some other substances, *e.g.*, stones and dead leaves. In addition, these twigs are seldom projected over the water in the field. Therefore, the larvae may pupate on those fully submerged twigs.

BERTRAND and LAURENTIAUX (1963) described a fossil species, *Eubrianax vandeli*, from France based on the larval form. It displays an oblong body shape as in *Mubrianax*. Unfortunately, this fossil is morphologically so inadequate that we cannot draw definite conclusion that they are phylogenetically very close. However, if the peculiar body shape is autapomorphic in *Mubrianax*, it implies that *Eubrianax vandeli*

belongs to *Mubrianax* and that both have a common ecology.

Key to the Males of the Species of *Mubrianax*

1. Coloratoin yellowish brown, or elytra apically darkened; antenna brown, bases of antennomeres black ..... *M. basipennis* (PIC).
— Coloration blackish brown ..... 2.
2. Antennomeres longer, antennal rami shorter ..... *M. atripennis* (PIC).
— Antennomeres shorter, antennal rami longer..... *M. robustior* (PIC).

Acknowledgments

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要　約

李　奇峰・佐藤正孝・楊　平世：マルヒラタドロムシ亜科の再検討．II. *Mubrianax* 属．——世界のマルヒラタドロムシ亜科についての再検討のなかで，3種からなる小さい一群を新属として認め，*Mubrianax* と命名記載した．そのうちの1種の幼虫を採集することができ，飼育にも成功したので，幼虫と蛹の形態を記載したが，これによっても属を特徴づけることができた．

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