Study on the Tribe Ochyromerini (Coleoptera, Curculionidae) from East Asia I, Descriptions of New Species of the Genera Endaeus and Endaenidius

Kojima, Hiroaki Entomological Laboratory. Faculty of Agriculture, Kyushu University

Morimoto, Katsura Entomological Laboratory. Faculty of Agriculture, Kyushu University

https://doi.org/10.5109/2582

出版情報: ESAKIA. 35, pp.63-102, 1995-01-31. Entomological Laboratory, Faculty of Agriculture,

Kyushu University バージョン:

権利関係:

Study on the Tribe Ochyromerini (Coleoptera, Curculionidae) from East Asia I, Descriptions of New Species of the Genera *Endaeus* and *Endaenidius*¹⁾

Hiroaki KOJIMA and Katsura MORIMOTO

Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, 8 12 Japan

Abstract This is the first part of our systematic study on the tribe Ochyromerini (=Endaeini) from East Asia with descriptions of 28 new species of the weevils in the genera Endaeus Schoenherr and Endaenidius Morimoto as follows: Endaeus albolineatus sp. nov. (E. Malaysia), Endaeus niger sp. nov. (E. Malaysia), Endaeus zonatus sp. nov. (E. Malaysia), Endaeus robustus sp. nov. (Thailand), Endaeus longipes sp. nov. (E. Malaysia), Endaeus formosanus sp. nov. (Taiwan), Endaeus elongatus sp. nov. (Taiwan), Endaeus sajapi sp. nov. (W. Malaysia), Endaeus selangorensis sp. nov. (W. Malaysia), Endaeus makiharai sp. nov. (Indonesia), Endaeus momosei sp. nov. (E. Malaysia), Endaeus giganteus sp. nov. (E. Malaysia), Endaeus flavoapicalis sp. nov. (E. Malaysia), Endaeus malayanus sp. nov. (W. Malaysia), Endaeus bicoloripennis sp. nov. (E. Malaysia), Endaeus nigripes sp. nov. (E. Malaysia), Endaenidius babai sp. nov. (Taiwan), Endaenidius okushimai sp. nov. (W. Malaysia), Endaenidius enicosanthi sp. nov., (E. Malaysia), Endaenidius longirostris sp. nov. (Thailand), Endaenidius macrommatus sp. nov. (E. Malaysia), Endaenidius maetoi sp. nov. (W. Malaysia), Endaenidius sarawakensis sp. nov. (E. Malaysia), Endaenidius kemae sp. nov. (E. Malaysia), Endaenidius crassipes sp. nov. (E. Malaysia), Endaenidius spinipes sp. nov. (E. Malaysia), Endaenidius polyalthiae sp. nov. (E. Malaysia) and Endaenidius brevirostris sp. nov. (E. Malaysia). Keys to species treated in this paper, the line illustrations of habitus and important features are provided.

The tribe Ochyromerini contains small-sized weevils and predominantly occurs in the tropical areas of the Oriental and Ethiopian regions. They are usually captured on the flowers and leaves by beating and sweeping, and some are often attracted to light, but most of them are rare and only a few individuals have been collected fragmentarily.

Part of the weevils treated in this study were captured during the surveys of the biodiversity in the tropical rain forests conducted by the teams of the Kyoto University and the Forestry and Forest Products Research Institute. Almost all of the weevils captured in the canopies are of the

¹⁾ Contribution from the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (Ser. No. 4, No. 79).

undescribed species and known species have been captured only on the flowers and leaves of lower trees and plants. This fact suggests the living of great many species in the canopies of the rain forests in the tropics.

Present study has been carried out for the purpose of clarifying the phylogenetic relationships of the related taxa, and descriptions of new species of the genera *Endaeus* and *Endaenidius* before us are presented here as the first part of our study. Treatment of Japanese species is now printing elsewhere in three parts.

Before going further, we wish to express our hearty thanks to the late Dr. K. Baba, Mr. 0. Furuta, Prof. S. Kimoto, Dr. K. Maetô, Mr. T. Mikage, Mr. H. Makihara, Mr. K. Matsumoto, Mr. S. Miyakawa, Dr. Y. Miyatake, Mr. K. Momose, Dr. T. Nakane, Mr. Y. Okushima, Prof. T. Saigusa, Prof. H. Sasaji and Prof. T. Shirôzu for their kindness in offering materials.

Descriptions

Genus Endaeus Schoenherr

Type species: Endaeus castus Schoenherr

See Kojima & Morimoto (in press) for synonymy, references and diagnosis.

Key to species treated in this paper

- 1(8) Front tibiae sharply pointed or angulate at the apex of inner angle.
- 2(5) Body oblong ovate, blackish. Antennal scrobes running to beneath the base of rostrum.
- 3(4) Body somewhat thinner. Prothorax about 1.4 times as wide as long, weakly rounded laterally. Elytra 1.44 times as long as wide. 2. *niger* sp. nov.
- 5(2) Body broadly ovate, yellowish brown to dark brown. Antenna1 scrobes running to the lower part of eyes.
- 6(7) Rostrum a little shorter than pronotum. Derm yellowish brown, lateral margins of pronotum, humeral angles of elytra and scutellum blackish. ... 4. *robustus* sp. nov.
- 7(6) Rostrum much longer than pronotum. Derm dark brown, with antennae and legs yellowish brown. Elytra with two transverse bands of greyish white recumbent setiform scales between golden brownish recumbent setose areas.
 - 3. *zonatus* sp. nov.
- 8(1) Front tibiae rounded at the apex of inner edge.
- 9(12) Prothorax with conspicuous depression filled with setae behind the anterior margin in female. Antenna1 scrobes running to beneath the base of rostrum.
- 10(11) Body elongate. Eyes contiguous each other. Front femora bidentate. Front tibiae with a few erect setae at the inner margin near the base.
 - 6. **elongatus** sp. nov.

- 11(10) Eyes not approximated. Prothorax evidently different in both sexes, widest at apical one-third (female) or a little behind the middle (male). Femora unidentate. 5. formosanus sp. nov. 12(9) Prothorax without depression behind the anterior margin. Front tibiae with a row of suberect setae stouter than the erect setae of femora at inner 13(22) edge. Front tibiae dilated internally near the apex. 14(21)
- Bicolorous. Antennal scrobes running to the lower part of eyes. 15(20)
- Scutellum yellowish or reddish brown. 16(19)
- 17(18) Elytra parallel-sided at basal half. Antennae blackish, excepting scape and first segment funicle. 8. sajapi sp. nov.
- Elytra widest at the middle. Antennae light reddish brown. .. 9. **selangorensis** sp. nov. 18(17)
- 19(16) Scutellum blackish.
- Concolorous, light reddish brown. Antennal scrobes running to beneath the base of 20(15) 11. **momosei**
- 21(14) Front tibiae dilated internally a little before the middle. 12. giganteus sp. nov.
- 22(13) Front tibiae without stouter setae.
- Bicolorous. Antenna1 funicle with sixth segment as long as fifth. Rostrum as long as or 23(30) a little shorter than pronotum.
- 24(25) Elytra and legs entirely blackish. Front tibiae weakly dilated internally at the apex.
 - 16. *nigripes* sp. nov.
- 25(24) Legs yellowish brown to reddish brown.
- 26(29) Elytra blackish, except for yellowish brown apical parts.
- Eyes strongly convex from temples. Antennal scrobes running to beneath the base of 27(28) rostrum. Elytra 1.45-1 .50 times as long as wide. 13. flavoapicalis sp. nov.
- 28(27) Eyes convex from temples. Antennal scrobes running to the lower part of eyes. Elytra sp. nov.
- sp.
- 30(23) Concolorous, reddish brown. Antenna1 funicle with sixth segment shorter than fifth.

1. Endaeus albolineatus sp. nov.

(Fig. 1)

Male. Derm black, apical part of rostrum, antennal scape and tarsi brownish.

Forehead between eyes narrow, 1/8 times as wide as the base of rostrum, with an indefinite median fovea. Eyes convex from temples. Rostrum shiny, a little longer than pronotum, with a carina on each side along antennal scrobe; antennal scrobes running to beneath the base of rostrum. Antennae inserted just a little before the middle of rostrum; scape reaching eyes, nearly as long as funicle; funicle with first segment just a little longer than second, third to sixth subequal in length, 2/3 times as long as second; club subelliptic, 2.9 times as long as broad, nearly as long as basal four segments of funicle combined.

Prothorax 1.3 times as wide as long, widest at the middle, rounded laterally, constricted at the

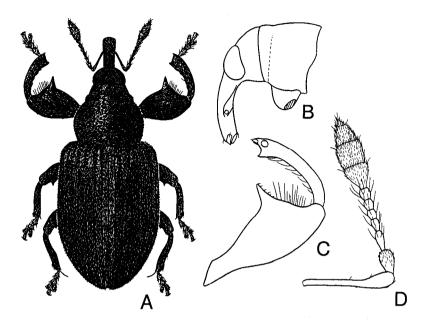


Fig. 1. Endaeus albolineatus sp. nov. - A, Male; B, head and prothorax; c, front leg; D, antenna.

apex; dorsum rugosely punctured, with greyish recumbent setae. Scutellun subtriangular, densely clothed with greyish white setiform scales. Elytra 1.36 times as long as wide, widest a little behind the middle; first interval densely clothed with greyish white setiform scales as on scutellum, and forming longitudinal stripe on elytra, other intervals each clothed with recumbent greyish setae and irregularly a little longer greyish setae. Legs clothed with recumbent greyish setae; front femora with a sharp triangular tooth; hind femora with long suberect setae along the posterior margin; front tibiae evenly curved, dilated internally at the apex and pointed at inner angle of apex; hind tibiae with a long sharped sickle like uncus at the apex.

Prosternum with coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with recumbent greyish setae.

Female. Unknown.

Length: 2.8 mm.

Holotype: male (Type No. 2964, Kyushu Univ.), Kinabalu P. H. Q., Sabah, Borneo Is., E. Malaysia, 16-18. iii. 1993, H. Kojima leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is similar to *E. nipponicus* Voss et Chûjô from Japan and *E. ater* Marshall from India, but separable from them by the following points: front tibiae sharply pointed at the apex of inner angle, hind femora with long setae along posterior margin between the base and the tooth and hind tibiae with a long sharp sickle-like uncus in the male.

Biology. No information.

2. Endaeus niger sp. nov. (Fig. 2)

Female. Derm black, apical part of tibiae and tarsi brownish.

Forehead between eyes 1/4 times as wide as the base of rostrum. Eyes convex from temples. Rostrum shiny, longer than pronotum (4:3), weakly narrowing toward the apex in lateral view, without median carina; antennal scrobes running to beneath the base of rostrum. Antennae inserted at the middle of rostrum; scape reaching eyes, a little shorter than funicle (3:3.5); funicle with first segment about 1.5 times as long as second, third 0.6 times as long as second, fourth to sixth subequal in length, each 3/4 times as long as third; club subelliptic, thrice as long as broad, as long as basal three segments of funicle combined.

Prothorax 4/5 times as wide as long, constricted at the apex, weakly rounded laterally, weakly emarginated at the middle of the anterior margin; dorsum strongly punctured excepting anterior part, clothed with recumbent greyish setae. Scutellum subtriangular, with greyish setae. Elytra 1.44 times as long as wide, widest at the middle; each interval with greyish recumbent setae. Legs clothed with recumbent greyish setae; front femora with a sharp usual triangular tooth; front tibiae curved evenly, dilated internally at the apex and pointed at inner angle of apex.

Prostemum with coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with recumbent greyish setae.

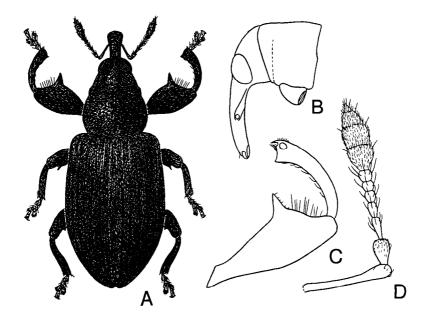


Fig. 2. *Endaeus niger* sp. nov., - A, Female; B, head and prothorax; C, front leg; D, antenna.

Male. Unknown. Length: 2.85 mm.

Holotype: female (Type No. 2965, Kyushu Univ.), 16 miles point from Keningau (Kimanis road), Sabah, Borneo, E. Malaysia, 7. iii. 1993, H. Kojima leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is very close to *E. albolineatus* sp. nov., but the prothorax and elytra are a little thinner.

Biology. No information.

3. Endaeus zonatus sp. nov.

(Fig. 3)

Male and female. Derm dark brown, often partly blackish, rostrum, antennae and legs yellowish brown.

Head clothed with recumbent yellowish grey setae. Forehead between eyes 2/3 times as wide as the base of rostrum, clothed with subrecumbent yellowish grey setae, with an indefinite median fovea. Eyes convex from temples. Rostrum longer than pronotum (10:7 in male or 11:7 in female), with a median and two rows of faint carinae on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted at apical one-fourth (male) or a little behind apical one-third (female) of rostrum; scape not reaching eyes, a little longer than funicle (3:4); funicle with first segment as long as second, third 0.6 times as

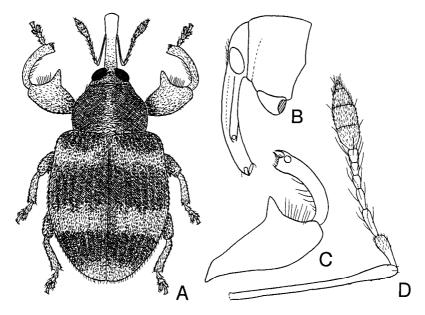


Fig. 3. *Endaeus zonatus* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

long as second, fourth to sixth subequal in length, 0.7 times as long as third; club 2.86 times as long as broad, basal two segments of funicle combined.

Prothorax 1.4-1.5 times as wide as long, widest a little behind the middle, rounded laterally, weakly constricted at the apex; dorsum finely punctured, clothed with yellowish grey recumbent setiform scales and medially greyish white setiform scales and faintly forming a longitudinal stripe. Scutellum tongue-shaped, clothed with recumbent greyish white setiform scales. Elytra broadly ovate, 1.2 times as long as wide, widest a little behind the middle, with maculation as follows: recumbent greyish white setiform scales forming two transverse bands near the base and a little behind the middle, remaining area clothed with golden brown recumbent setae; each interval with a row of subrecumbent golden brown longer and stouter setae. Legs clothed with recumbent whitish setae; front femora with a usual triangular tooth; front tibiae evenly curved, dilated internally at the apex, and weakly angulate at inner angle, with longer suberect setae along inner edge.

Prosternum with coxae located a little behind the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with yellowish grey recumbent setiform scales.

Length: 2.7-2.9 mm.

Holotype: female (Type No. 2966, Kyushu Univ.), Mamut, Sabah, E. Malaysia, 11-14. viii. 1981, K. Morimoto leg.

Paratype: 1 male, Poring, Sabah, E. Malaysia, 15-18. viii. 1981, K. Morimoto leg.

Distribution. E. Malaysia (Sabah).

Remarks. This is characteristic in the following points: rostrum slender, much longer than pronotum, antennae filiform, scape not reaching eyes, front tibiae angulate at the apex of inner angle and elytra with two transverse bands of setiform scales.

Biology. No information.

4. Endaeus robustus sp. nov.

(Fig. 4)

Female. Derm yellowish brown, lateral margins of pronotum, scutellum and humeral angles of elytra dark brown to blackish.

Forehead between eyes 2/3 times as wide as the base of rostrum, with a median fovea. Eyes slightly convex from temples. Rostrum a little shorter than pronotum, with a median and two carinae on each side of basal half; antennal scrobes running obliquely to the lower part of eyes. Antennae inserted at the middle of rostrum; scape nearly as long as funicle, reaching eyes; funicle with first segment robust, second 3/5 times as long as first, third to sixth subequal in length, transverse; club twice as long as broad, just a little longer than second to sixth segments of funicle combined.

Prothorax 1.3 times as wide as long, widest at basal one-third, constricted at the apex, rounded laterally; dorsum coriaceous, with fine recumbent greyish setae. Scutellum subtriangular, longer than wide. Elytra broadly ovate, about 1.25 times as long as wide, subparallel-sided at basal half; each interval with recumbent yellowish grey setae and medially a row of subrecumbent longer dark or yellowish grey setae irregularly. Legs clothed with recumbent

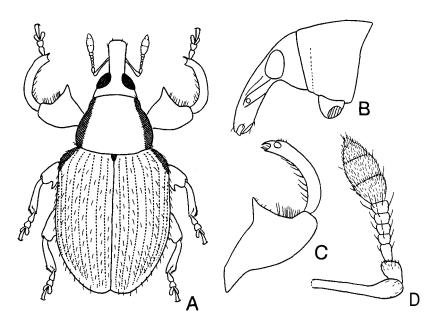


Fig. 4. *Endaeus robustus* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

greyish setae; front femora with a triangular tooth, which is about half the width of the femora at the widest point; front tibiae evenly curved, not dilated, with a little stouter suberect setae along inner edge, pointed at inner angle of apex, with sharp, sickle-shaped uncus.

Prostemum with coxae located a little behind the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with recumbent yellowish grey setae.

Length: 3.8 mm.

Holotype: female (Type No. 2967, Kyushu Univ.), Songkhla, S. Thailand, 23. vi. 1965, Y. Miyatake leg.

Distribution. Thailand.

Remarks. This is somewhat similar to *E. zonatus* sp. nov. by the robust body, but easily separable from it the characters noted in the key.

Biology. No information.

5. Endaeus formosanus sp. nov.

(Fig. 5)

Female. Derm yellowish brown to brown, antennae a little lighter.

Forehead between eyes 1/2 to 1/3 times as wide as the base of rostrum, slightly convex, with median fovea. Eyes convex from temples. Rostrum much shorter than pronotum, with a median and two carinae on each side of basal half; antenna1 scrobes running obliquely beneath the base

of rostrum. Antennae inserted a little before the middle of rostrum; scape reaching eyes, longer than funicle; funicle with first segment broadly ovate, second 2/3 times as long as first, third to sixth subequal in length, a little shorter than second; club nearly twice as long as broad, a little shorter than funicle.

Prothorax 1.25-1.35 times as wide as long, flattened, dilated, strongly rounded laterally and widest at apical one-third, with conspicuous depression behind the anterior margin, which filled with setae; dorsum finely punctured, clothed with recumbent pale setae. Scutellum subtriangular, a little longer than wide, with fine recumbent pale setae. Elytra 1.4-1.5 times as long as wide, parallel-sided at basal half, without subapical calli; each interval with fine recumbent and medially a row of a little longer subrecumbent pale setae. Pygidium often exposed at apex. Legs clothed with recumbent pale setae; front femora much thicker than the posteriors, with a triangular tooth, which is less than half the width of the femora at the widest point; front tibiae curved and dilated internally just behind the apex.

Prosternum with coxae located behind the middle, the distance between the coxa and submarginal sulcus much greater than that between this sulcus and anterior margin. Underside clothed with fine recumbent pale setae.

Male. Prothorax 1.20-1.25 times as wide as long, widest a little behind the middle. Elytra 1.5-1.6 times as long as wide. Pygidium exposed.

Length: 2.4-3.2 mm.

Holotype: female (Type No. 2968, Kyushu Univ.), Yangmingshan, Taipei Hsien, Formosa,

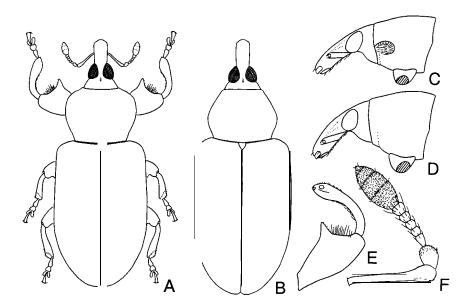


Fig. 5. *Endaeus formosanus* sp. nov. - A, Female; B, male; C, head and prothorax, female; D, ditto, male; E, front leg; F, antenna.

24. vi. 1965, S. Kimoto leg.

Paratypes: 8 males and 11 females, same data as holotype; 2 males and 3 females, 26. vi. 1965, T. Nakane leg.; 2 males, 26. vi. 1965, S. Kimoto. 1 males and 4 females, Thu Yun Shan, near Liu Kui, S-Taiwan, 20. vi. 1986, K. Baba leg. 1 male. Tun Chih, near Liu Kui, S-Taiwan, 2. vi. 1986, K. Baba leg. 4 males, Shi Nan Shan, near Liu Kui, S-Taiwan, 15. vii. 1986, K. Baba leg. 2 males, Shin Nan Shan, Kao Hsiung Hsien, S-Taiwan, 22. vi. 1986, K. Baba leg. 1 male. Mt. Lalashan, Taiwan, 5. iv. 1991, H. Kojima leg.

Distribution. Taiwan.

Remarks. The sexual differences in the prothorax is unusual, but these were captured from the same place at the same time and considered to be conspecific. This species is closely related to *E. testaceus* (Pascoe) from Sarawak and *E. rzychiommatoides* Kojima et Morimoto (in press) from Japan, but separable from them by the larger body and strongly dilated pronotum at apical half in the female.

Biology. No information.

6. Endaeus elongatus sp. nov.

(Fig. 6)

Male and female. Body elongate. Derm yellowish brown, antennae and legs a little lighter.

Forehead between eyes linear, without median fovea. Eyes large, contiguous each other, convex from temples. Rostrum stout, half the length of pronotum, with a faint median carina on basal half; antenna1 scrobes running obliquely beneath the base of rostrum. Antennae inserted a little before the middle of rostrum; scape reaching eyes, longer than funicle; funicle with first segment broadly ovate, second about half the length of first, third to sixth subequal in length, transverse; club 1.67 times as long as broad, as long as second to sixth segments of funicle combined.

Prothorax 1 .IO-1.15 times as wide as long, widest at the middle (female) or just a little behind the middle (male), weakly rounded laterally, with a conspicuous depression behind the anterior margin of each side in the female, which filled with setae; dorsum finely punctured, clothed with recumbent pale setae. Scutellum subtriangular, clothed with fine recumbent pale setae. Elytra 1.7-1 .8 times as long as wide, parallel-sided at basal half, without subapical calli; each interval clothed with recumbent pale setae. Legs clothed with pale recumbent setae; front femora much thicker than the posteriors, bidentate, inner tooth less than half the length of the femora at the widest point, outer tooth less than half the length of outer one; front tibiae evenly curved, dilated internally just a little behind the apex, with a few erect setae at basal one-third of inner margin.

Prosternum with coxae located behind the middle, the distance between the coxae and submarginal sulcus much greater (female) or greater (male) than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Length: 2.2-2.5 mm.

Holotype: male (Type No. 2969, Kyushu Univ.), Kenting, Pingtung Hsien, Taiwan, 4. iv. 1965, T. Saigusa leg.

Paratypes: 1 female, Liu Kiu, S-Taiwan, 2. iv. 1986, K. Baba leg. 1 male, Chia Lo Shui, near Keng Ting, S-Taiwan, 5. iv. 1987, K. Baba leg.

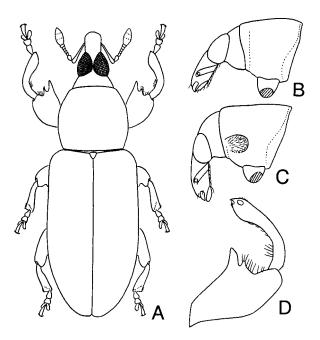


Fig. 6. Endaeus elongatus sp. nov. - A, Male; B, head and prothorax, male; C, ditto, female; D, front leg.

Distribution. Taiwan.

Remarks. This species is closely related to E. testaceus (Pascoe), E. nychiommatoides Kojima et Morimoto (in press) and E. formosanus sp. nov., but easily separable from them by the elongate body and bidentate front femora.

Biology. No information.

7. Endaeus longipes sp. nov. (Fig. 7)

Male. Derm reddish brown.

Forehead between eyes half as wide as the base of rostrum, with faint median fovea. Eyes convex from temples. Rostrum a little longer than pronotum, with a median and a carina on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted a little before apical one-third of rostrum; scape a little longer than funicle (5:4), reaching eyes; funicle with first segment nearly as long as second, third to fifth subequal in length, 0.56 times as long as second, sixth shortest, 2/3 times as long as fifth; club 1.25 times as long as broad, as long as basal two segments of funicle combined.

Prothorax 1.07 times as long as wide, widest at the middle, weakly constricted at the apex, weakly rounded laterally; dorsum shallowly punctured, with fine recumbent pale setae. Scutellum subtriangular, with fine recumbent pale setae. Elytra 1.44 times as long as widest at

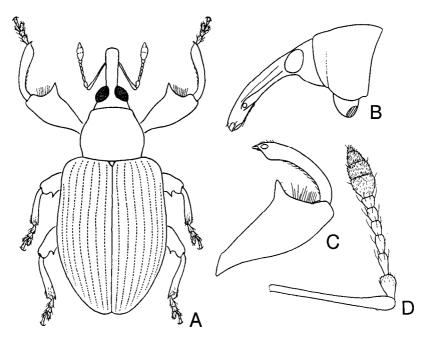


Fig. 7. *Endaeus longipes* sp. nov. - A, Male; B, head and prothorax; C, front leg; D, antenna.

the middle; each interval with densely fine recumbent and medially a row of a little longer and stouter subrecumbent pale setae. Legs clothed with fine recumbent pale setae; front femora with a usual triangular tooth; front tibiae evenly curved, dilated internally at near apex, with a row of subrecumbent setae at inner edge from base to near apex.

Prosternum with front coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside evenly clothed with fine recumbent setae.

Female. Unknown.

Length: 3.2 mm.

Holotype: male, (Type No. 2970, Kyushu Univ.), Mt. Kinabalu (nr. Head-quarters), Sabah, E. Malaysia, 18-21. vi. 1981, K. Morimoto leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is characterized by the funicle with sixth segment shortest.

Biology. No information.

8. Endaeus sajapi sp. nov. (Fig. 8)

Male and female. Antennae with second to sixth segments of funicle, club and elytra excepting apical parts blackish, remaining areas reddish brown.

Forehead between eyes half as wide as the base of rostrum, without median fovea. Eyes

slightly convex from temples. Rostrum as long as (male) or longer than (3:2, female) pronotum, with an indefinite median and two rows of carinae on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted at apical one-third (male) or the middle (female) of rostrum; scape reaching eyes, as long as funicle; funicle with first segment as long as second, third to sixth subequal in length, half as long as second; club 2.5 times as long as broad.

Prothorax 1.15-1.25 times as wide as long, widest a little behind the middle, weakly rounded laterally, weakly constricted at the apex; dorsum densely and shallowly punctured, clothed with recumbent greyish white setae. Scutellum tongue-shaped, a little longer than wide, clothed with greyish white setae. Elytra 1.35-1.40 times as long as wide, parallel-sided at basal half; each interval clothed with fine recumbent greyish white setae and medially a row of longer subrecumbent greyish white setae. Legs clothed with fine recumbent pale setae; front femora with a usual triangular tooth; front tibiae evenly curved, widened internally at the apex, with a row of stouter setae at inner edge.

Prosternum with coxae a little behind the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with fine recumbent greyish white setae. Metasternum projected just behind the mesosternal process and venter with first and second ventrites weakly convex in the middle on the suture in the middle in male.

Length: 2.80-2.95 mm.

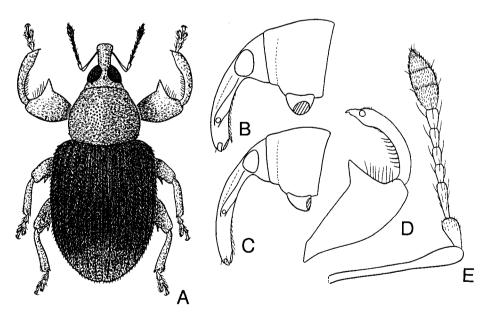


Fig. 8. *Endaeus sajapi* sp. nov. - A, Male; B, head and prothorax, male; C, ditto, female; D, front leg; E, antenna.

Holotype: male (Type No. 2971, Kyushu Univ.), Air Hitam, UPM, Selangor, Pen. Malaysia, 10. ii. 1992, A. S. Sajap leg.

Paratypes: 1 female, same locality as holotype, 4. v. 1992, A. S. Sajap leg; 1 female, 4. viii. 1994, A. S. Sajap leg.; 1 female, 11. viii. 1992, A. S. Sajap leg.

Distribution. W. Malaysia (Selangor).

Remarks. This species is characteristic among the congeners having bicolorous elytra in the following points: forehead between eyes half as wide as the base of rostrum, antennae with slender funicle, second to sixth segments of it blackish, scutellum brownish, elytra parallel-sided at basal half and front tibiae with suberect stouter setae along inner edge.

Biology. All specimens were captured by attractant traps loading on balloons.

9. Endaeus selangorensis sp. nov.

(Fig. 9)

Male and female. Elytra excepting apical parts blackish, remaining areas reddish brown.

Forehead between eyes one-third as wide as the base of rostrum, slightly convex, without median fovea. Eyes slightly convex from temples. Rostrum as long as (male) or longer than (5: 4, female) pronotum, with a median and two rows of indefinite carinae on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted a little before the middle (male) or the middle (female) of rostrum; scape reaching eyes, as long as funicle; funicle with first segment a little longer than second, third to sixth subequal in length, about half as long as second; club twice as long as broad.

Prothorax 1.25-1.35 times as wide as long, widest a little behind the middle, rounded laterally, weakly constricted at the apex; dorsum shallowly punctured, clothed with recumbent greyish setae. Scutellum tongue-shaped, a little longer than wide, with greyish recumbent setae. Elytra 1.30-1.35 times as long as wide, widest at the middle; each interval clothed with fine recumbent greyish white setae and medially a row of subrecumbent longer pale setae. Legs clothed with recumbent pale setae; front femora with a usual triangular tooth; front tibiae evenly curved, dilated internally near the apex, with a row of stouter erect setae along inner edge.

Prosternum with coxae located a little behind the middle, the distance between the coxae and submarginal sulcus is as great as that between this sulcus and anterior margin. Underside clothed with fine recumbent pale setae.

Length: 2.50-2.75 mm.

Holotype: male (Type No. 2972, Kyushu Univ.), Air Hitam, UPM, Selangor, Pen. Malaysia, 10. xi. 1992, A. S. Sajap leg.

Paratypes: 3 females, same data as holotype. 1 female, same locality as holotype, 3. xi. 1994, A. S. Sajap leg.

Non-paratypic specimens: 4 females, same data as holotype (Teneral specimens).

Distribution. W. Malaysia (Selangor).

Remarks. This species is closely related to **E. sajapi** sp. nov., but the body and antennal funicle are robuster.

Biology. This species were captured by flying balloon with attractant traps.

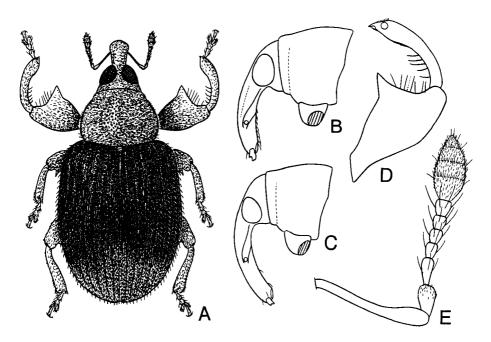


Fig. 9. *Endaeus selangorensis* sp. nov. - A, Male; B, head and prothorax, male; C, ditto, female; D, front leg; E, antenna.

10. *Endaeus makiharai* sp. nov. (Fig. 10)

Female. Scutellum, elytra excepting apical parts, apical half of front femora on dorsum, coxae, meso- and metathoraces blackish, remaining areas reddish brown.

Forehead between eyes 1/5 times as wide as the base of rostrum, weakly convex, with an indefinite median fovea. Eyes weakly convex from temples. Rostrum a little longer than pronotum (3.5:3), with a median and two rows of carinae on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted just a little before the middle; scape reaching eyes, nearly as long as funicle; funicle with first segment as long as second, third to sixth subequal in length, half as long as second; club 1.7 times as long as broad, nearly as long as basal two segments of funicle combined.

Prothorax subtrapezoidal, 1.4 times as wide as long, widest at basal one-fourth, weakly rounded laterally and narrowing to the apex, weakly constricted at the apex; dorsum finely punctured, clothed with recumbent greyish setae. Scutellum subtriangular, clothed with fine recumbent greyish setae. Elytra broadly ovate, 1.2 times as long as wide, widest at the middle; each interval evenly clothed with fine recumbent greyish setae and a few rows of subrecumbent longer greyish setae. Legs clothed with recumbent greyish setae; front femora with a usual triangular tooth; front tibiae evenly curved, dilated internally near the apex, with a row of subrect stouter setae along inner edge.

Prostemum with coxae located a little behind the middle, the distance between the coxae and

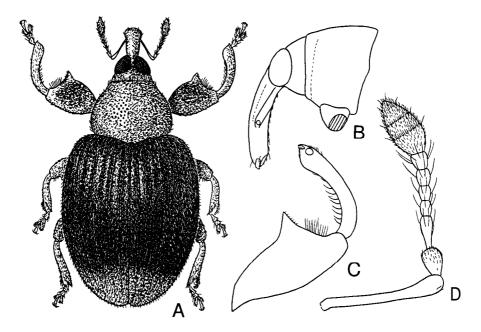


Fig. 10. Endaeus makiharai sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with greyish recumbent setae.

Male. Unknown.

Length: 3.3 mm.

Holotype: female (Type No. 2973, Kyushu Univ.), Benakat (Nursery site), South Sumatra, Indonesia, 18. iii. 1983, H. Makihara leg.

Distribution. Indonesia (S. Sumatra).

Remarks. This species is maybe close to Zeiona pulchella Pascoe from Sarawak, but the body is larger and front femora is blackish at apical half on dorsum.

Biology. No information.

11. Endaeus momosei sp. nov.

(Fig. 11)

Female. Derm light reddish brown, legs a little lighter.

Forehead between eyes narrow, 1/5 times as wide as the base of rostrum, weakly convex, without median fovea. Eyes weakly convex from temples. Rostrum a little shorter than pronotum, with a median and two rows of faint carinae on each side behind the antennal insertion; antennal scrobes obliquely running to beneath the base of rostrum. Antennae inserted a little before the middle; scape reaching eyes, shorter than funicle (6:7); funicle with first segment nearly as long as second, third to sixth subequal in length, 3/5 times as long as second;

club 1.9 times as long as broad, basal three segments of funicle combined.

Prothorax 1.25 times as wide as long, widest a little behind the middle, rounded laterally, weakly constricted at the apex; dorsum shallowly punctured, with fine recumbent pale setae. Scutellum a little longer than wide, with recumbent pale setae. Elytra broadly ovate, 1.2 times as long as wide, widest a little behind the middle; each interval evenly with recumbent pale setae. Legs clothed with fine recumbent pale setae; front femora with an usual triangular tooth; front tibiae curved at basal 2/3, dilated internally near the apex, with suberect stouter setae along inner edge of basal half.

Prostemum with coxae located a little behind the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside evenly clothed with fine recumbent pale setae.

Male. Unknown. Length: 3.0 mm.

Holotype: female (Type No. 2974, Kyushu Univ.), Lambir, Miri, Sarawak (E. Malaysia), 31. vi. 1993, K. Momose leg. captured on the flower of *Polyalthia* sp.

Distribution. E. Malaysia (Sarawak).

Remarks. This is characterized by the following points: derm concolorous, eyes weakly convex, forehead between eyes 1/5 times as wide as the base of rostrum, elytra broadly ovate and the front tibiae with stouter setae along inner edge.

Biology. See type data.

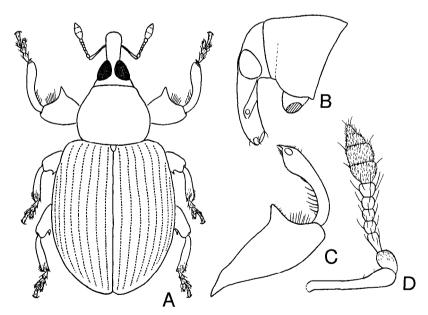


Fig. 11. *Endaeus momosei* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

12. Endaeus giganteus sp. nov.

(Fig. 12)

Male. Body broadly ovate. Derm dark brown, except for yellowish brown antennae, basal parts of femora, apical parts of elytra and underside.

Forehead between eyes half as wide as the base of rostrum, with an indefinite median fovea. Eyes weakly convex from temples. Rostrum shorter than pronotum (4:5), with an indefinite median carinae on basal half and longitudinally confluent punctures behind the antennal insertion; antennal scrobes running to beneath the base of rostrum and extending to near the apex before the antennal insertions. Antennae inserted a little before the middle; scape reaching eyes, a little longer than funicle (5:4); funicle with first segment as long as second, third to sixth subequal in length, about 1/3 times as long as second; club 1.67 times as long as broad, as long as basal two segments of funicle combined.

Prothorax 1.23 times as wide as long, widest at basal one-third, strongly rounded laterally, constricted at the apex; dorsum finely punctured, with fine recumbent pale setae. Scutellum subtriangular, densely covered with recumbent pale setae. Elytra 1.17 times as long as wide, widest at the middle; each interval with fine recumbent and few rows of stouter subrecumbent pale setae. Legs clothed with recumbent pale setae; front femora with a sharp usual triangular tooth; front tibiae curved at basal half, dilated internally a little before the middle, with suberect stouter setae along inner edge of basal half.

Prosternum with coxae located a little behind the middle; the distance between the coxae and submarginal sulcus a little greater than that between this sulcus and anterior margin. Underside

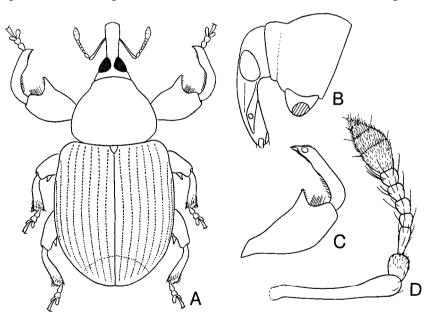


Fig. 12. *Endaeus giganteus* sp. nov. - A, Male; B, head and prothorax; C, front leg; D, antenna.

clothed with recumbent pale setae.

Female. Unknown.

Length: 4.2 mm.

Holotype: male (Type No. 2975, Kyushu Univ.), Poring, Sabah, E. Malaysia, 15-18. viii. 1981, K. Morimoto leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is characterized by the following points: antennal scrobes extending near the apex of rostrum before the antennal insertions, pronotum strongly rounded laterally, front tibiae dilated internally a little before the middle, with short stouter setae along inner edge of basal half and bicolorous elytra. This is somewhat similar to Zeiona pulchella Pascoe, but the coloration is different.

Biology. No information.

13. Endaeus flavoapicalis sp. nov.

(Fig. 13)

Male and female. Scutellum and elytra excepting apical parts blackish, metathorax and basal part of first ventrite dark brown, remaining areas reddish brown.

Forehead between eyes narrow, 1/5 times as wide as the base of rostrum, with an indefinite median fovea. Eyes strongly convex from temples. Rostrum a little longer than pronotum, a little thinner in female in lateral aspect, with an indefinite median carina on basal half; antennal scrobes indefinite near the base of rostrum, running to beneath the base of rostrum. Antennae inserted at apical one-third (male) or a little before the middle (female) of rostrum; scape reaching eyes, a little shorter than funicle (4:5); funicle with first segment as long as second, third to sixth subequal in length, 0.6 times as long as second; club 1.8 times as long as broad, nearly as long as basal three segments of funicle combined.

Prothorax 1.1-1.3 times as wide as long, widest at the middle or a little behind the middle, rounded laterally, weakly constricted at the apex; dorsum with dense and shallow punctures, clothed with fine recumbent greyish setae. Scutellum tongue-shaped, with greyish setae. Elytra 1.45-1 .50 times as long as wide, widest a little behind the middle; each interval clothed with fine recumbent and a few rows of a little longer greyish setae. Legs clothed with recumbent pale setae; front femora with a usual triangular tooth; front tibiae curved at basal 2/3, dilated internally at apical 1/4.

Prosternum with coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Length: 3.1-3.5 mm.

Holotype: male (Type No. 2976, Kyushu Univ.), Mt. Kinabalu (nr. Head-quarters), Sabah, E. Malaysia, 18-21. viii. 1981, K. Morimoto leg.

Paratypes: 6 males and 3 females, same locality as holotype, 15-18. iii. 1993, H. Kojima leg. *Distribution.* E. Malaysia (Sabah).

Remarks. This species is closely related to *E. flavidus* Kojima et Morimoto (in press) from Japan, but the coloration is different.

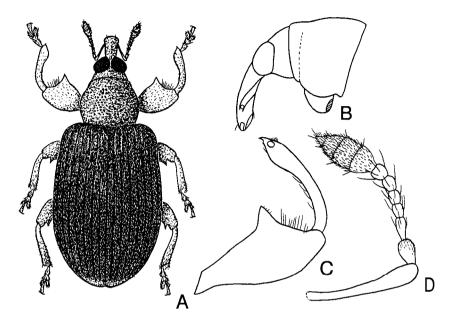


Fig. 13. *Endaeus flavoapicalis* sp. nov. - A, Male; B, head and prothorax; C, front leg; D, antenna.

Biology. The paratypes were captured on a flower by beating.

14. Endaeus **malayanus** sp. nov.

(Fig. 14)

Female. Scutellum, elytra, meso- and metathoraces blackish, remaining areas reddish brown, antennae and legs a little lighter.

Forehead between eyes one-fifth as wide as the base of rostrum, weakly convex, with an indefinite median fovea. Eyes convex from temples. Rostrum as long as pronotum, with a median and indefinitely two rows of carinae on each side of basal half; antennal scrobes running to beneath the base of rostrum. Antennae inserted a little behind the apical one-third; scape reaching eyes, shorter than funicle (3:4); funicle with first segment 4/3 times as long as second, third to sixth subequal in length, 2/3 times as long as second; club twice as long as broad.

Prothorax 1.15-1.20 times as wide as long, widest at the middle, rounded laterally, weakly constricted at the apex; dorsum shallowly punctured, clothed with greyish white setae. Scutellum subtriangular, a little longer than wide, with silvery setae. Elytra 1.4-1.5 times as long as wide, widest just a little behind the middle; each interval clothed with recumbent silvery setae and a few rows of longer recumbent silvery setae. Legs clothed with fine recumbent pale setae; front femora with a usual triangular tooth; front tibiae curved at basal 2/3, dilated internally at the apex.

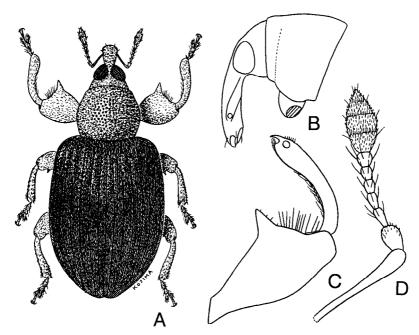


Fig. 14. *Endaeus malayanus* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

Prostrernum with coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with recumbent silvery setae.

Male. Unknown.

Length: 2.4-2.8 mm.

Holotype: female (Type No. 2977, Kyushu Univ.), Gunung Jasar, Cameon H. L., W. Malaysia, 21. ii. 1992, K. Matsumoto leg.

Paratype. 1 female, Same data as holotype.

Distribution. W. Malaysia (Selangor).

Remarks. This species is closely related to *E. flavoapicalis* sp. nov., but the elytra are entirely blackish.

Biology. No information.

15. Endaeus bicoloripennis sp. nov.

(Fig. 15)

Male and female. Elytra excepting apical parts, meso- and metathoraces and basal part of first ventrite blackish, remaining areas yellowish brown to reddish brown.

Forehead between eyes narrow, 1/4 times as wide as the base of rostrum, with an indefinite median fovea. Eyes convex from temples. Rostrum a little shorter than pronotum (6:7-8), with

a median and indefinite two rows of carinae on each side behind the antenna1 insertion; antenna1 scrobes running to the lower part of eyes. Antennae inserted at apical one-thid (male) or a little before the middle (female) of rostrum; scape reaching eyes, a little shorter than funicle (3:4); funicle with first segment just a little longer than second, about 1.2 times as long as second, third 0.7 times as long as second, fourth to sixth subequal in length, 0.86 times as long as third; club 1.88 times as long as broad, as long as basal three segments of funicle combined.

Prothorax 1.10-1 .25 times as wide as long, widest a little behind the middle or basal one-third, rounded laterally, weakly constricted at the apex; dorsum shallowly punctured, with recumbent greyish setae. Scutellum tongue-shaped, with recumbent greyish setae. Elytra ovate, 1.30-1.35 times as long as wide, widest at the middle; each interval with fine recumbent and few rows of a little longer greyish setae. Legs clothed with recumbent pale setae; front femora with a usual triangular tooth; front tibiae evenly curved, weakly dilated internally at the apex.

Prosternum with coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with greyish recumbent setae.

Length: 2.0-2.9 mm.

Holotype: female (Type No. 2978, Kyushu Univ.), Mt. Kinabalu, Sabah, E. Malaysia, 18-21. viii. 198 1, K. Morimoto leg.

Paratypes: 1 male and 1 female, Kinabalu P. H. Q., Sabah, Borneo Is., E. Malaysia, 16-18. iii. 1993, H. Kojima leg.

Distribution. E. Malaysia (Sabah).

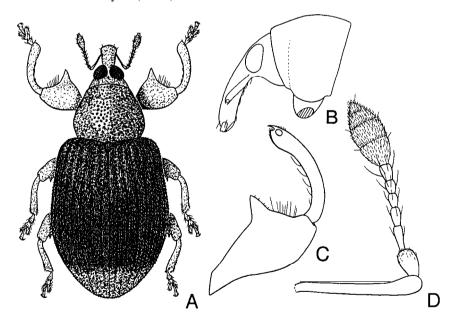


Fig. 15. *Endaeus bicoloripennis* sp. nov. - A, Male; B, head and prothorax; C, front leg; D, antenna.

Remarks. This species is closely related to **E.** flavoapicalis sp. nov., but the body is robuster. **Biology.** No information.

16. Endaeus nigripes sp. nov.

(Fig. 16)

Male. Antennal funicle and club, scutellum, elytra, legs and underside blackish, remaining areas reddish brown.

Forehead between eyes 1/3 times as wide as the base of rostrum, with a median fovea. Eyes prominent from temples. Rostrum shiny, nearly as long as pronotum, without median carina; antenna1 scrobes indefinite near the base of rostrum, running to beneath the base of rostrum. Antennae inserted a little before the middle of rostrum; scape reaching eyes, shorter than funicle (3:4); funicle with first segment about as long as second, third 0.7 times as long as second, fourth to sixth subequal in length, 0.6 times as long as third; club 2.5 times as long as broad, just a little shorter than basal four segments of funicle combined.

Prothorax 1.38 times as wide as long, widest at the middle, strongly rounded laterally, constricted near the apex; dorsum shallowly punctured, with fine recumbent pale setae. Scutellum as long as wide, with fine recumbent pale setae. Elytra 1.45 times as long as wide, widest at the middle; each interval with fine recumbent pale setae and medially a row of a little longer recumbent pale setae. Legs clothed with recumbent pale setae; front femora with a sharp

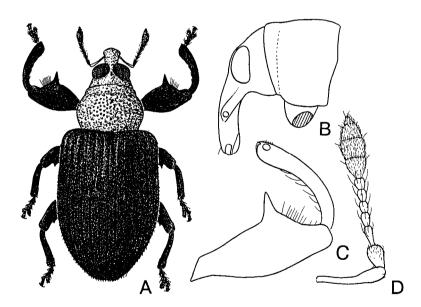


Fig. 16. *Endaeus nigripes* sp. nov. - A, Male; B, head and prothorax; C, front leg; D, antenna.

usual tooth; front tibiae evenly curved, weakly dilated internally at the apex.

Prosternum with coxae located in the middle, the distance between the coxae and submarginal sulcus as great as that between this sulcus and anterior margin. Underside clothed with fine recumbent pale setae.

Female. Unknown. Length: 2.35 mm.

Holotype: male (Type No. 2979, Kyushu Univ.), Kinabalu P. H. Q., Sabah, Borneo Is., E. Malaysia, 16-18. iii. 1993, H. Kojima leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is similar to E. flavoapicalis sp. nov., but the coloration is different.

Biology. No information.

Genus Endaenidius Morimoto

Type species: Endaenidius ikezakii Morimoto

See Kojima & Morimoto (in press) for references.

This monotypic genus has been known only from Japan up to the present and characterized by having similar front legs to the posteriors. Among 12 new species described in this paper, some species have thicker hind legs than the front pairs and armed with a little larger tooth.

Key to species

- 1(24) Rostrum much longer than broad.
- 2(19) Forehead between eyes less than half as wide as the base of rostrum.
- 3(8) Eyes approximated or contiguous each other.
- 4(5) Hind femora with a little greater tooth than the anteriors. 4. longirostris sp. nov.
- 5(4) Hind femora with a minute tooth as on the anteriors
- 6(7) Antenna1 funicle with each segment thinner, much longer than wide. Prothorax constricted at the apex and the base. 6. maetoi sp. nov.
- 7(6) Antennal funicle with third to fifth segments a little longer than wide. Prothorax weakly constricted at the apex. 5. macrommatus sp. nov.
- 8(3) Eyes distant each other.
- 9(10) Derm bicolorous, head, rostrum, pronotum and legs at least reddish brown, elytra blackish. Forehead between eyes one-third as wide as the base of rostrum.

..... 11. polyalthiae sp. nov.

- 10(9) Derm concolorous.
- 12(11) Yellowish brown to reddish brown.
- 13(14) Rostrum slender, longer than head and pronotum combined in the female.

..... 2. okushimai sp. nov.

- 14(13) Rostrum not longer than head and pronotum combined.
- 15(16) Hind femora thicker than the anteriors, hind tibiae with spatulate uncus.

	9. <i>crassipes</i> sp. nov.
16(15)	Hind femora not thicker than the anteriors.
17(16)	Middle femora and tibiae each with long setae, and hind femora with a small tuft near
, ,	the base in the male. Eyes weakly convex from temples 8. kemae sp. nov.
16(17)	Hind tibiae with spine-like uncus in the male. Eyes convex from temples.
	10. <i>spinipes</i> sp . nov.
19(2)	Forehead between eyes more than half as wide as the base of rostrum.
20(21)	Front and middle tibiae each with a very minute uncus arisen from inner angle.
	ikezakii Morimoto
21(20)	Front and middle tibiae with uncus arisen from outer angle.
22(23)	Elytra 1.45-1.50 times as long as wide. Front and middle femora each with a minute
	tooth, hind femora a little thicker than the anteriors, with a triangular tooth.
	1. <i>babai</i> sp. nov.

23(22) Elytra 1.25-1.30 times as long as wide. Each femur with a small sharp triangular tooth. 7. sarawakensis sp. nov.

24(1) Rostrum very short, as long as broad. 12. brevirostris sp. nov.

1. Endaenidius babai sp. nov.

(Fig. 17)

Derm reddish brown, antennae and legs a little lighter and meso- and metathoraces darker.

Forehead between eyes 2/3 times as wide as the base of rostrum, with a faint median fovea. Eyes slightly convex from temples. Rostrum a little shorter than (male) or as long as (female) pronotum, with two rows of carinae on each side behind the antenna1 insertion; antenna1 scrobes running to the lower part of eyes. Antennae inserted a little before the middle (male) or nearly middle (female) of rostrum; scape reaching eye, as long as funicle; funicle with first segment a little longer than second, third to sixth subequal in length, about 2/3 times as long as second; club 1.67 times as long as broad.

Prothorax 1.25-1.35 times as wide as long, widest at the middle, slightly rounded laterally, slightly constricted at the apex; dorsum shallowly punctured, with recumbent pale setae and a few subrecumbent longer setae along the anterior margin. Scutellum small, tongue-shaped, with fine recumbent pale setae. Elytra 1.45-1.50 times as long as wide, widest at the middle; each interval clothed with four or five rows of fine recumbent pale setae and medially a row of subrecumbent longer pale setae. Legs clothed with fine recumbent pale setae; front and middle femora each with a sharp minute tooth, hind femora a little greater than the anteriors, with a sharp triangular tooth; front tibiae slightly widening toward the apex, hind tibiae a little thicker than the anteriors.

Prostemum with coxae located behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Underside clothed with fine recumbent pale setae. Venter with first ventrite with a small tuft in the middle and fifth ventrite with branched tuft in the male.

Length: 1.5-2.2 mm.

Holotype: male (Type No. 2980, Kyushu Univ.), Yu Shih (Alt. 1900 m), Nan Tou Hsien, M-Taiwan, 4. vii. 1986, K. Baba leg.

Paratypes: 5 males and 3 females, Meishan-Tinchi (Alt. 800-2300 m), Kao Hsiumg Hsien, S-Taiwan, 29. vi. 1986, K. Baba leg. 6 males and 1 female, Shi Nan Shan, Kao Hsiung Hsien, S-Taiwan, 22. vi. 1986, K. Baba leg. 2 males, same data as kolotype. 1 male and 1 female, Tun Chih, near Liu Kui, S-Taiwan, 2. vi. 1986, K. Baba leg. 2 females, Shyk Shan, near Liu Kui, S-Taiwan, 28. vi. 1986, K. Baba leg. 1 female, Tsai Tie Ku, near Liu Kui, S-Taiwan, 6. x. 1986, K. Baba leg. 1 female, Shi Nan Shan, near Liu Kui, S-Taiwan, 15. vii. 1986, K. Baba leg. 1 female. Tien Chi, Alt. 2200 m, Kao Hsiung Hsien, S-Taiwan, 29. vi. 1986, K. Baba leg. 2 females, SungKang, Nantou-hsien, Taiwan, 16. vii. 1966, H. Sasaji leg.; 2 females, 9. vii. 1978, T. Mikage leg.; 1 female, 8. vii. 1978, T. Mikage leg.; 1 male. 29. vii. 1985, T. Hattori leg.; 1 female, 15. vii. 1990, T. Hattori leg. 1 male. Chuchi, Chiai Hs., Taiwan, 21. vii. 1966, H. Sasaji leg. 1 female. Tsiufeng, Nantou Hs., Taiwan, 10. vii. 1966, H. Sasaji leg. 1 male. Hori, Formosa, 27. v. 1965, T. Shirozu leg. 1 female. Hohuanchi-Sunghuankang, Nantou Hsien, Taiwan, 24. vi. 1976, H. Makihara leg. 1 male. Mt. Shitoushan, Miaoli Hsien, Taiwan, 3. vi. 1976, H. Makihara leg. 1 male. Mt. Lalashan, Taiwan, 4. iv. 1991, H. Kojima leg.

Distribution. Taiwan.

Remarks. This species is similar to Endaeus singularis Voss from Fukien, but the rostrum is not longer than head and pronotum combined and prothorax is less strongly rounded laterally. Biology. No information.

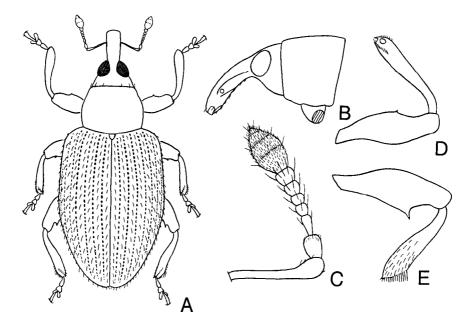


Fig. 17. *Endaenidius babai* sp. nov. - A, Male; B, head and prothorax; C, antenna; D, front leg; E, hing leg.

2. Endaenidius okushimai sp. nov.

(Fig. 18)

Female. Derm reddish brown, antennae and legs lighter.

Forehead between eyes one-fourth as wide as the base of rostrum, with a faint median fovea. Eyes convex from temples. Rostrum as long as head and pronotum combined, with a median and two rows of indefinite carinae on each side of basal half; antennal scrobes running to the lower part of eyes, extending toward the apex before the antennal insertions. Antennae inserted just a little behind the middle of rostrum; scape reaching eyes, as long as funicle; funicle with first segment 5/3 times as long as second, third to sixth subequal in length, 2/3 times as long as second; club 1.67 times as long as broad.

Prothorax 1.54 times as wide as long, widest at the middle, weakly rounded laterally, weakly constricted at the apex; dorsum finely punctured, clothed with recumbent yellowish grey setae, with a few suberect setae at anterior and lateral margins. Scutellum tongue-shaped, as long as wide, with fine recumbent pale setae. Elytra 1.34 times as long as wide, widest at the middle; each interval clothed with fine recumbent pale setae and medially irregular one or two rows of a little longer subrecumbent setae. Legs clothed with recumbent pale setae; each femur with a minute tooth; front tibiae slightly widening toward the apex.

Prosternum with the coxae located behind the middle, the diatance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Male. Unknown.

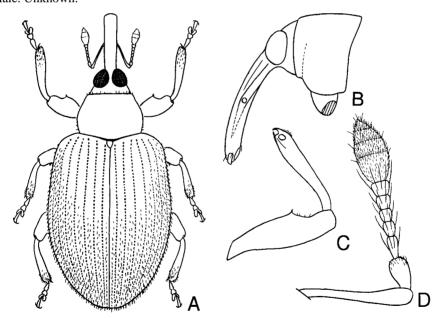


Fig. 18. *Endaenidius okushimai* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

Length: 2.7 mm.

Holotype: female (Type No. 2981, Kyushu Univ.), Gunung Jasar, Cameron H. L., W. Malaysia, 30. iii. 1989, Y. Okushima leg.

Distribution. W. Malaysia.

Remarks. This is close to *E. longirostris* sp. nov., but the eyes are convex, forehead between eyes is wider and the tooth of each femur is minute.

Biology. No information.

3. Endaenidius enicosanthi sp. nov.

(Fig. 19)

Female. Derm brown to dark brown, antenna1 scape, often funicle and legs lighter, rostrum blackish.

Forehead between eyes one-third as wide as the base of rostrum, with a median fovea. Eyes weakly convex from temples. Rostrum longer than head and pronotum combined (5:4), with a median and indefinitely two rows of carinae on each side behind the middle; antennal scrobes running to the lower part of eyes and extending near the apex before the antennal insertions. Antennae inserted a little behind the middle of rostrum; scape reaching eyes, a little longer than funicle; funicle with first segment as long as second, third to sixth subequal in length, about half as long as second; club twice as long as broad.

Prothorax 1.4 times as wide as long, widest at apical one-third, then narrowing toward the base, emarginated at the anterior margin; dorsum obscurely punctured, clothed with fine recumbent pale setae, with suberect longer yellowish brown setae along anterior and lateral margins. Scutellum subtriangular, longer than wide, with fine recumbent pale setae. Elytra 1.30-1.35 times as long as wide, widest a little behind the middle; each interval clothed with fine recumbent pale setae and medially a row of suberect longer pale setae. Pygidium exposed at the apex. Legs clothed with recumbent pale setae; front and middle femora each with a triangular tooth, hind femora with a little greater tooth than the anteriors, each tooth with three erect setae beyond it; front tibiae slightly widened internally a little before the middle.

Prosternum with coxae located behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Male. Unknown. Length: 3.3 mm.

Holotype, female (Type No. 2982, Kyushu Univ.), Lambir, Miri, Sarawak, 28. v. 1993, K. Momose leg. captured on the flower of *Enicosanthum* sp.

Paratype. 1 female, same data as holotype.

Distribution. E. Malaysia (Sarawak).

Remarks. This is close to *E. longirostris* sp. nov. and *E. okushimai* sp. nov., but the coloration is different, the prothorax is widest at apical one-third and the front tibiae dilate internally a little before the middle.

Biology. Two females were captured on the flower of Enicosanthum sp.

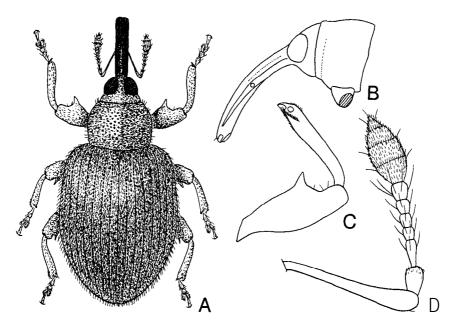


Fig. 19. *Endaenidius enicosanthi* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

4. **Endaenidius** *longirostris* sp. nov. (Fig. 20)

Female. Derm yellowish brown to reddish brown, antennae and legs lighter.

Forehead between eyes linear, weakly convex, without median fovea. Eyes slightly convex from temples, coarsely facetted. Rostrum slender, longer than head and pronotum combined (6:5), with a median and two rows of carinae on each side of basal half; antennal scrobes running to the lower part of eyes, extending near the apex before the antennal insertions. Antennae inserted at the middle; scape reaching eyes, longer than funicle; funicle with first segment a little longer than second, third to sixth subequal in length, 2/3 times as long as second, sixth as long as broad; club twice as long as broad.

Prothorax 1.4-1.5 times as wide as long, widest at the middle, rounded laterally, faintly constricted at the apex; dorsum obscurely punctured, clothed with recumbent pale setae, with a few suberect longer setae along anterior and lateral margins. Scutellum tongue-shaped, as long as wide, clothed with fine reumbent pale setae. Elytra 1.33 times as long as wide, widest at the middle; each interval clothed with fine recumbent pale setae and medially a row of longer suberect yellowish grey setae. Legs clothed with pale recumbent setae; front and middle femora each with a small triangular tooth, hind one with a little greater triangular tooth than the anteriors; front tibiae slightly widening toward the apex.

Postemum with the coxae located behind the middle, the distance between this coxae and submarginal sulcus much greater than that between this sulcus and anterior margin. Underside

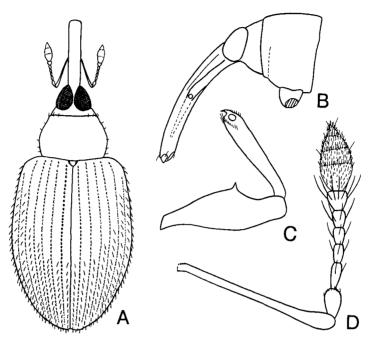


Fig. 20. *Endaenidius longirostris* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

clothed with recumbent pale setae.

Male. Unknown. Length: 2.8 mm.

Holotype: female (Type No. 2983, Kyushu Univ.), Khao Chong, S. Thailand, 26. vi. 1965,

Y. Miyatake leg.

Paratype: 1 female, same data as holotype.

Distribution. S. Thailand.

Remarks. This is close to **E. macrommatus** sp. nov., but the body is larger, the rostrum is longer and the hind femur arms with a little greater tooth than the anteriors.

Biology. No information.

5. Endaenidius macrommatus sp. nov.

(Fig. 21)

Female. Derm reddish brown, antennae and legs a little lighter.

Head without median fovea. Eyes contiguous each other, coarsely facetted, convex from temple. Rostrum longer than pronotum (4:3), with a median and a row of carinae on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted a little before the middle; scape reaching eye, a little longer than funicle; funicle with first segment about twice as long as second, third to sixth subequal in length, 2/3 times as long as second, sixth as long as broad; club oval, 1.4 times as long as broad.

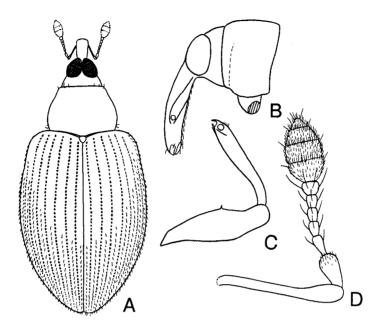


Fig. 21. *Endaenidius macrommatus* sp. nov. - A, Female; B, head and prothorax; C, front leg; D, antenna.

Prothorax 1.5 times as wide as long, widest a little behind the middle, weakly rounded laterally, weakly constricted at the apex; dorsum obscurely punctured, with fine recumbent pale setae and a few longer suberect yellowish grey setae along anterior and lateral margins. Scutellum subtriangular, with fine recumbent pale setae. Elytra 1.33 times as long as wide, widest at the middle; each interval clothed with fine recumbent pale setae and medially a row of a little longer subrecumbent setae. Legs clothed with recumbent pale setae; each femur with a minute tooth; front tibiae slightly widening toward apex.

Posternum with front coxae behind the middle, the distance between the coxae and submarginal sulcus a little greater than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Male. Unknown. Length: 1.95 mm.

Holotype: female (Type No. 2984, Kyushu Univ.), Mt. Kinabalu (nr. Head-quaters), Sabah, E. Malaysia, 18-21. viii. 1981, K. Morimoto leg.

Distribution. E. Malaysia (Sabah).

Remarks. This is characterized by having contiguous eyes and ovate club of the antennae.

Biology. No information.

6. Endaenidius maetoi sp. nov.

(Fig. 22)

Male and female. Derm yellowish brown, basal half of rostrum darker, often dark brown.

Forehead between eyes contiguous, without median fovea. Eyes convex from temples, rather coarsely facetted. Rostrum a little shorter than (male) or as long as (female) head and pronotum combined, with a median and two rows of carinae on each side behind the antennal insertion; antennal scrobes running obliquely beneath the base of rostrum. Antennae inserted at apical one-third (male) or a little before the middle (female) of rostrum; scape reaching eyes, longer than funicle (5:4); funicle with first segment as long as second, third to sixth subequal in length, each much longer than wide, 2/3 times as long as second; club twice as long as broad.

Prothorax 1.35-1.40 times as wide as long, widest at the middle, rounded laterally, constricted at the apex and the base; dorsum shallowly and separately punctured, clothed with fine recumbent pale setae, with suberect yellowish grey longer setae along anterior margin. Scutellum as long as wide, with fine recumbent pale setae. Elytra 1.45-1.55 times as long as wide, widest a little behind the middle; each interval clothed with fine recumbent pale setae and medially a row of subrecumbent longer pale setae. Legs clothed with recumbent pale setae; each femur with a minute tooth, front tibiae slightly widening toward the apex.

Prostemum with the coxae located a little behind the middle, the distance between the coxae and submarginal sulcus a little greater than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Length: 1.5-2.1 mm.

Holotype: female (Type No. 2985, Kyushu Univ.), Air Hitam, IJPM, Selangor, Pen. Malay-

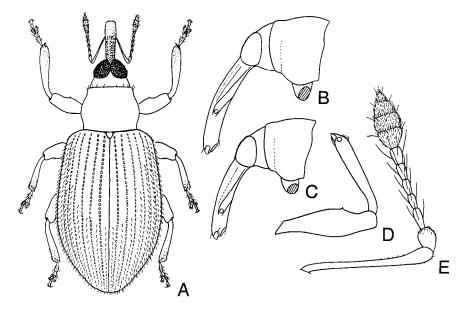


Fig. 22. *Endaenidius maetoi* sp. nov. - A, Female; B, head and prothorax, female; C, ditto, male; D, front leg; E, antenna.

sia, 11. v. 1992, A. S. Sajap leg.

Paratypes: 12 males and 18 females, same locality as holotype, 4. v. 1992, A. S. Sajap leg.; 4 males and 9 females, 11. v. 1992, A. S. Sajap leg.; 1 male and 3 females, 4. viii. 1992, A. S. Sajap leg.

Distribution. W. Malaysia (Selangor).

Remarks. This may be close to *E. macrommatus* sp. nov., *E. longirostris* sp. nov. and *E. okushimai* sp. nov., but the eyes are rather coarsely facetted and contiguous each other, the antennal funicle is slender and the prothorax is constricted at the apex and the base.

Biology. All specimens were captured by attractant traps loading on balloons.

7. Endaenidius sarawakensis sp. nov. (Fig. 23)

Male and female. Derm light reddish brown, antennae brownish, legs yellowish brown.

Forehead between eyes half as wide as the base of rostrum, without median fovea. Eyes slightly convex from temples. Rostrum shorter (5:6; in the male) or longer (4:5; in the female) than pronotum, with an indefinite median and two rows of carinae on each side behind the antennal insertion; antennal scrobes running to the lower part of eyes. Antennae inserted a little before the middle (male) or the middle (female) of rostrum; scape reaching eyes, as long as funicle: funicle with first segment a little longer than second, third to fifth subequal in length, 2/3 times as long as second, sixth a little longer than fifth; club 1.4 times as long as broad.

Prothorax 1.3-1.4 times as wide as long, widest at the middle, faintly constricted at the apex; dorsum finely and separately punctured, clothed with fine recumbent pale setae, with suberect longer yellowish brown setae along anterior and lateral margins. Scutellum tongue-shaped, as long as wide, with fine recumbent pale setae. Elytra 1.3-1.4 times as long as wide, subparallel-sided at basal half; each interval with fine recumbent pale setae and medially one, irregularly two rows of subrecumbent longer pale setae. Pygidium concealed. Legs clothed with recumbent pale setae; each femur with a small triangular tooth; front tibiae slightly widening toward the apex.

Prosternum with the coxae located behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Venter with first and second ventrites weakly depressed in the middle in male. Underside clothed with recumbent pale setae.

Length: 252.7 mm.

Holotype: male (Type No. 2986, Kyushu Univ.), Lambir, Miri, Sarawak, 10. vi. 1993, K. Momose leg., on the flower of *Fissistigma* sp.

Paratype: 1 female, Lambir, Miri, Sarawak, 31. iii. 1993, K. Momose leg., on the flower of *Desmos* sp.

Distribution. E. Malaysia (Sarawak).

Remarks. Two type specimens of different sexes were captured on the different flowers, but the difference between sexes is only observed on rostrum, and these are regarded as conspecific. This is similar to *E. kemae* sp. nov. and *E. crassipes* sp. nov., but the forehead between eyes is wider and the pygidium is concealed in the male.

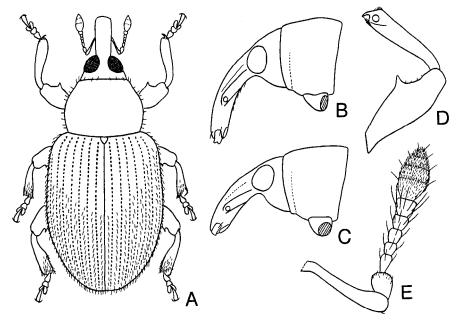


Fig. 23. *Endaenidius sarawakensis* sp. nov. - A, Male; B, head and prothorax, female; C, ditto, male; D, front leg; E, antenna.

Biology. See type data.

8. Endaenidius kemae sp. nov.

(Fig. 24)

Male. Derm yellowish brown to reddish brown.

Forehead between eyes 1/5 as wide as the base of rostrum, with a median fovea. Eyes weakly convex from temples. Rostrum a little longer than pronotum (6:5), with a median and two rows of indefinite carinae on each side behind the antenna1 insertion; antenna1 scrobes running to the lower part of eyes. Antennae inserted a little before the middle; scape reching eyes, as long as funicle, funicle with first segment 5/3 times as long as second, third to sixth subequal in length, a little shorter than second; club twice as long as broad.

Prothorax 1.45-1.55 times as wide as long, widest at the middle, weakly rounded laterally, weakly constricted at the apex; dorsum finely punctured, clothed with fine recumbent pale setae, with a few longer suberect yellowish brown setae along anterior and lateral margins. Scutellum tongue-shaped, a little longer than wide, with fine recumbent pale setae.

Elytra 1.25-1.30 times as long as wide, nearly paralell-sided at basal half; each interval with fine recumbent pale setae and medially a row of suberect longer pale setae. Pygidium exposed.

Legs clothed with recumbent pale setae; each femur with a small sharp triangular tooth, middle fomora with a row of long erect setae from base to the point of tooth, hind femora with a tuft of setae near the base; front tibiae weakly widening toward the apex, middle tibiae with a

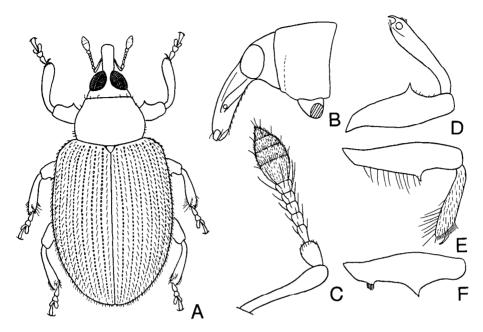


Fig. 24. Endaenidius kemae sp. nov. - A, Male; B, head and prothorax; C, antenna; D, front leg; E, middle leg; F, hind femur.

row of suberect longer setae at apical half.

Prosternum with coxae located behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Female. Unknown.

Length: 2.1-2.2 mm.

Holotype: male (Type No. 2987, Kyushu Univ.), Poring Hot spring, Sabah, Borneo Is., E. Malaysia, 20-26. iii. 1993, H. Kojima leg.

Paratypes: 3 males, Lambir, Miri, Sarawak, 30. iii. 1993, K. Momose leg. on the flower of *Kema* sp.

Distribution. E. Malaysia (Sabah, Sarawak).

Remarks. This has characteristic middle femora and tibiae with long setae and hind femora with a small tuft near the base.

Biology. As this specific name indicates, three males were captured on the flower of Kema sp. in Sarawak.

9. Endaenidius crassipes sp.nov.

(Fig. 25)

Male. Derm yellowish brown.

Forehead between eyes 1/5 as wide as the base of rostrum, with an indefinite median fovea. Eyes slightly convex from temples. Rostrum as long as pronotum, with a median and two rows of indefinite carinae on each side behind the antenna1 insertion; antenna1 scrobes running to the lower part of eyes. Antennae inserted a little before the middle of rostrum; scape reaching eyes, a little longer than funicle, funicle with first segment 5/3 times as long as second, third to sixth subequal in length, about half as long as second; club twice as long as broad.

Prothorax 1.35 times as wide as long, widest a little behind the middle; dorsum finely and separately punctured, clothed with fine recumbent pale setae, with suberect longer brown setae along anterior and lateral margins. Scutellum rounded, with fine recumbent pale setae. Elytra 1.33 times as long as wide, widest at the middle; each interval with fine recumbent pale setae and medially a row of suberect longer pale setae. Pygidium partly exposed. Legs clothed with recumbent pale setae; front and middle femora each with a minute tooth, hind femora thicker than the anteriors and each with a greater triangular tooth; front tibiae slightly widening toward apex, hind tibiae with a spatulate uncus at the apex.

Prosternum with coxae located behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Underside clothed with recumbent pale setae.

Female. Unknown. Length: 2.2 mm.

Holotype: male (Type No. 2988, Kyushu Univ.), Lambir, Miri, Sarawak, 8. ii. 1993, K. Momose leg., on the flower of *Goniotharamus* sp.

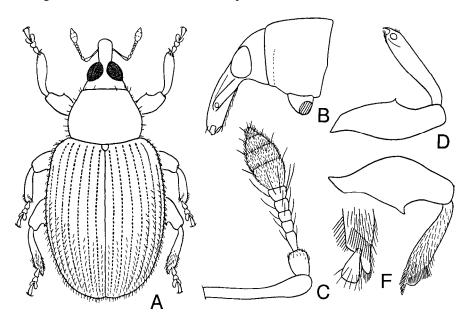


Fig. 25. Endaenidius crassipes sp. nov. - A, Male; B, head and prothorax; C, antenna; D, front leg; E, hind leg.

Distribution. E. Malaysia (Sarawak).

Remarks. This is very close to **E. kemae** sp. nov., but the hind femora are thicker and hind tibiae have spatulate uncus.

Biology. See type data.

10. Endaenidius spinipes sp. nov.

(Fig. 26)

Male. Derm light reddish brown, antennae and legs yellowish brown.

Forehead between eyes 3/10 times as wide as the base of rostrum, with a median fovea. Eyes coarsely facetted, convex from temples. Rostrum as long as pronotum, with two rows of carinae on each side before the antenna1 insertion; antenna1 scrobes running to the lower part of eyes. Antennae inserted a little before the middle; scape reaching eye, a little longer than funicle; funicle with first segment 5/3 times as long as second, third to sixth subequal in length, 2/3 times as long as second; club twice as long as broad.

Prothorax 1.4 times as wide as long, widest at basal one-third, weakly rounded laterally, slightly constricted at the apex; dorsum shallowly punctured, with recumbent pale setae and few suberect longer yellowish grey setae along anterior and lateral margins. Scutellum subtriangular, with recumbent pale setae. Elytra 1.4 times as long as wide, nearly subparallel-sided at basal half; each interval with fine recumbent pale setae and medially a row of suberect longer yellow-

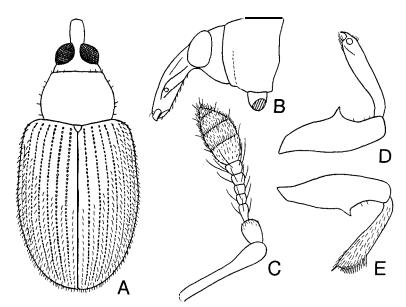


Fig. 26. *Endaenidius spinipes* sp. nov. - A, Male; B, head and prothorax; C, antenna; D, front leg; E, hind leg.

ish grey setae. Pygidium exposed at the apex. Legs clothed with recumbent pale setae; femora with small triangular tooth of the same size, with a few short erect setae beyond it; front tibiae slightly widening toward apex, hind one with long, straight spine-like uncus at the apex.

Prosternum with coxae located behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Underside clothed with fine recumbent pale setae.

Length: 2.0 mm.

Holotype: male (Type No. 2989, Kyushu Univ.), Poring, Sabah, E. Malaysia, 15-18. viii. 198 1, K. Morimoto leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is characterized by the long, spine-like uncus of hind tibiae.

Biology. No information.

11. Endaenidius polyalthiae sp. nov.

(Fig. 27)

Male and female. Head, rostrum, pronotum reddish brown, scutellum and elytra dark brown to blackish, often basal and apical part of elytra, antennae and legs lighter.

Forehead between eyes one-third as wide as the base of rostrum, with a median fovea. Eyes slightly convex from temples. Rostrum as long as (male) or longer than (4:3, female) pronotum, with an indefinite median and two rows of carinae on each side behind the antennal

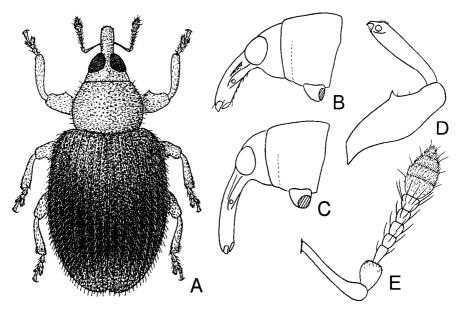


Fig. 27. *Endaenidius polyalthiae* sp. nov. - A, Male; B, head and prothorax, male; C, ditto, female; D, front leg; E, antenna.

insertion; antennal scrobes running to the lower part of eyes. Antennae inserted at the middle (male) or a little behind the middle (female) of rostrum; scape reaching eyes, a little shorter than funicle; funicle with first segment a little longer than second, third to sixth subequal in length, a little shorter than second; club 1.67 times as long as broad.

Prothorax 1.35-1.45 times as wide as long, widest a little before the middle, rounded laterally, weakly constricted at the apex; dorsum shallowly punctured, clothed with fine recumbent pale setae, with suberect yellowish grey longer setae along anterior and lateral margins. Scutellum subtriangular, a little longer than wide, with fine recumbent pale setae. Elytra 1.35-1 .40 times as long as wide, widest at the middle; each interval clothed with fine recumbent pale setae and medially a row of suberect longer pale setae. Legs clothed with fine recumbent pale setae; each femur with a small triangular tooth, with a few short erect setae beyond it; front tibiae slightly widening toward the apex.

Prostemum with coxae located behind the middle, the distance between the coxae and submarginal sulcus a little greater than that between this sulcus and anterior margin. Underside clothed with fine recumbent pale setae.

Length: 2.25-2.50 mm.

Holotype: male (Type No. 2990, Kyushu Univ.), Lambir, Miri, Sarawak, 31. i. 1993, K. Momose leg. captured on the flower of *Polyalthia* sp.

Paratype: 1 female. same data as holotype.

Distribution. E. Malaysia (Sarawak).

Remarks. This is close to E. spinipes sp. nov., but the coloration is different.

Biology. One pair was captured on the flower of Polyalthia sp.

12. Endaenidius brevirostris sp. nov.

(Fig. 28)

Female. Body somewhat flattened. Derm reddish brown, antennae and legs a little lighter.

Forehead between eyes half as wide as the base of rostrum, without median fovea. Eyes large, coarsely facetted, convex from temples. Rostrum very short, half as long as pronotum, as long as broad, without carina; antennal scrobes running toward beneath the base of rostrum. Antennae inserted just a little before the middle of rostrum; scape reaching eyes, short and robust, as long as basal fourth segments of funicle combined; funicle with first segment twice as long as second, second and third subequal in length, fourth to sixth subequal in length a little shoter than third; club 1.25 times as long as broad, nearly as long as scape.

Prothorax 1.5 times as wide as long, subparallel-sided from apical one-third to basal one-third, weakly constricted at the apex; dorsum densely and finely punctured, clothed with fine recumbent pale setae. Scutellum subtriangular. Elytra 1.54 times as long as wide, parallel-sided at basal half; each interval clothed with fine recumbent pale setae. Pygidium concealed. Legs clothed with fine recumbent pale setae; front femora with a minute tooth, middle and hind femora each with an indefinite tooth; front tibiae faintly dilated internally at the middle, thence widening toward the apex.

Prosternum with coxae located a little behind the middle, the distance between the coxae and submarginal sulcus greater than that between this sulcus and anterior margin. Metastemum de-

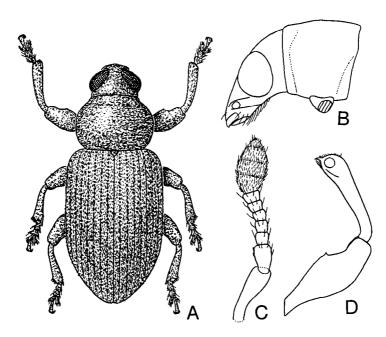


Fig. 28. *Endaenidius brevirostris sp.* nov. - A, Female; B, head and prothorax; C, antenna; D, front leg.

pressed in the middle at the base. Underside clothed with setae as on dorsum.

Male. Unknown.

Length: 1.9 mm.

Holotype: female (Type No. 3000, Kyushu Univ.), 16 miles point from Keningau, Sabah, E. Malaysia, 8. iv. 1990, 0. Furuta leg.

Distribution. E. Malaysia (Sabah).

Remarks. This species is characteristic in the short rostrum.

References

Kojima, H. and K. Morimoto, The Tribe Ochyromerini (Coleoptera, Curculionidae) of Japan I, Genera with six segments in the funicle. *Jpn. J. Ent.* (in press).

Kojima, H. and K. Morimoto, The Tribe Ochyromerini (Coleoptera, Curculionidae) of Japan II, Genus *Ochyromera. Jpn. J. Ent.* (in press).

Kojima, H. and K. Morimoto, The Tribe Ochyromerini (Coleoptera, Curculionidae) of Japan III, Genera with seven segments in the funicle and key to genera. *Jpn. J. Ent.* (in press).