

# Description of *Paeneutheia pallida* gen. et sp. nov. from Borneo, with Notes on Allied Genera of the Tribe Eutheini (Coleoptera, Scydmaenidae)

Paweł Jałoszyński

Wieniecka 30/105, 87–800 Włocławek, Poland  
e-mail: japawel@man.poznan.pl

**Abstract** *Paeneutheia pallida* gen. et sp. nov. from Kalimantan, Borneo is described. The diagnosis of the new genus is based on the following characters: enlarged, subtriangular maxillary palpomere III; very short and broad palpomere IV; eyes in lateral view with deeply emarginate posterior margin; procoxae and mesocoxae relatively narrowly separated by pro- and mesosternal process; pronotum with basal groove; each elytron with single basal fovea and truncate apex; aedeagus with elongate, bulbous median lobe, well separated, slender apical part and long parameres. Current taxonomical problems with the classification of the Eutheini are reviewed; morphological details characteristic for *Paeneutheia* gen. nov., *Eutheia* Stephens, *Veraphis* Casey, *Protoeuthia* Franz, and *Euthiconus* Reitter are illustrated and discussed. Redefinition of some genera is postulated; new diagnostic characters are proposed for *Veraphis* (fovea or grooves on vertex; and elongate, nearly tubular aedeagus without delimited basal part) and *Eutheia* (vertex without foveae and grooves; aedeagus with well separated, bulbous basal capsule). The diagnosis of *Protoeuthia* is supplemented with a detailed design of the aedeagus, which possesses a pair of parameres, overlooked in the existing literature. The genus *Euthiconus* is recognized as heterogenous and in need of comprehensive study.

**Key words:** Scydmaenidae, Eutheini, *Paeneutheia* gen. nov., taxonomy, Borneo

## Introduction

The tribe Eutheini of the subfamily Scydmaeninae comprises about fifty known species placed in five genera. The majority of species (about thirty) belongs to *Eutheia* Stephens, twelve species are known in *Veraphis* Casey, four in *Euthiconus* Reitter, two in *Protoeuthia* Franz, and one species in *Eutheimorphus* Franz et Löbl (Newton & Franz, 1998). Most Eutheini are Palearctic in distribution (majority of *Eutheia*, three species of *Veraphis*, two of *Euthiconus* and both known species of *Protoeuthia*). Relatively small number of species belonging to *Eutheia*, *Veraphis* and *Euthiconus* are known from the Nearctic; Eutheini of the Oriental Region are represented only by a few species of *Eutheia*, and *Eutheimorphus paradoxus* Franz et Löbl. Very recently, the first Neotropical member of the

tribe, *Eutheia linda* O'Keefe, has been described (O'Keefe, 1999). No Eutheini are known from Afrotropics, Lemuria, Australia, Oceania and New Zealand. However, the tribe remains relatively poorly studied, and many undescribed species are present in various collections, especially from Southeast and East Asia (Jałoszyński, unpublished data).

Tropical to subtropical Asiatic members of the Eutheini have hitherto been represented by five species only: *Eutheia klapperichi* Franz, *E. similima* Franz, and *E. taiwanensis* Franz from Taiwan; *E. siamensis* Franz, from Thailand; and *Eutheimorphus paradoxus* Franz et Löbl from Sabah, Borneo (Franz, 1975c, 1985c; Franz & Löbl, 1990). A new genus, *Paeneutheia*, is described below, based on specimens collected in Kalimantan, Borneo. The type material is preserved in the collection of the National Science

Museum, Tokyo (NSMT).

Among Eutheini, the most recently described *Eutheimorphus* is well defined at the generic level, but the diagnoses of the remaining genera are not entirely clear. *Euthiconus* may be a heterogeneous taxon, and the differences between *Eutheia* and *Veraphis* seem to be problematic (discussed in further parts of this paper). To provide unambiguous diagnosis of the newly described genus, a comparative analysis of representatives of all genera of Eutheini was undertaken, based either on specimens, or on the literature. Specimens of the following species were examined:

*Paeneutheia* gen nov.: *P. pallida* sp. nov. (type species of *Paeneutheia*), Borneo (type series).

*Protoeutheia* Franz: *Pr. mirifica* Franz (type species of *Protoeutheia*), Italy (holotype).

*Veraphis* Casey: *V. irkutensis* (Reitter), Siberia, Mongolia (type series); *V. fatiloquus* Kurbatov, Russian Far East (paratype); *V. engelmarki* Franz, Sweden; four undescribed species from Japan.

*Eutheia* Stephens: *E. scydmaenoides* Stephens (type species of *Eutheia*), Serbia, Slovakia; *E. plicata* (Gyllenhal), Romania, Serbia; *E. exortiva* Kurbatov, Russian Far East; *E. horiola* Kurbatov, Russian Far East (holotype); two undescribed species from Japan.

*Euthiconus* Reitter: *Ec. conicicollis* Fairmaire et Laboulbene (type species of *Euthiconus*), Moravia; *Ec. lustrifucus* Kurbatov, Russian Far East; *Ec. paradoxus* Sawada, Japan.

Diagnostic characters of *Eutheimorphus* are well described, and important morphological details are illustrated in the original description (Franz & Löbl, 1990). Therefore, specimens of *E. paradoxus* were not examined.

## Taxonomy

### Tribe Eutheini Casey

Eutheini Casey, 1897: 507. Type genus: *Eutheia* Stephens, 1830

Ascydmini Casey, 1897:505. Type genus: *Ascydms* Casey, 1897 (= *Euthiconus* Reitter, 1881), synonymized by O'Keefe, 1998.

The members of Eutheini possess the following set of features: body slender, usually remarkably flattened dorso-ventrally; maxillary palpomere IV small, broad and short to very short, sometimes inserted into excavated apex of palpomere III and hardly visible; neck broad; pronotum with sharp lateral edges at least in posterior half; pygidium entirely exposed, subhorizontal; lack of sclerotized spermatheca in females. Genera of Eutheini can be determined using the following key:

### Key to World Genera of the Eutheini

1. Hind coxae weakly separated, pronotum with a pair of longitudinal C-shaped grooves posteriorly connected by a transverse groove . . . . . *Eutheimorphus* Franz et Löbl
- Hind coxae broadly separated, pronotum without longitudinal grooves . . . . . 2
2. Maxillary palpomere IV very short, inserted into excavated apex of palpomere III, hardly visible . . . . . 3
- Maxillary palpomere IV small but well visible, conical . . . . . 5
3. Mesocoxae very broadly separated . . . . . *Protoeutheia* Franz
- Mesocoxae separated by narrow mesosternal process . . . . . 4
4. Body convex; mesosternal process very narrow and high; maxillary palpomere III relatively slender, twice as long as wide . . . . . *Euthiconus* Reitter
- Body flat; mesosternal process moderately narrow, low; maxillary palpomere III stout, subtriangular, only slightly longer than wide . . . . . *Paeneutheia* gen. nov.
5. Vertex with pits or grooves; aedeagus without separated basal capsule . . . . . *Veraphis* Casey
- Vertex with neither pits nor grooves; aedeagus with well separated basal capsule. . . . . *Eutheia* Stephens

### Genus *Paeneutheia* gen. nov.

*Type species.* *Paeneutheia pallida* sp. nov.

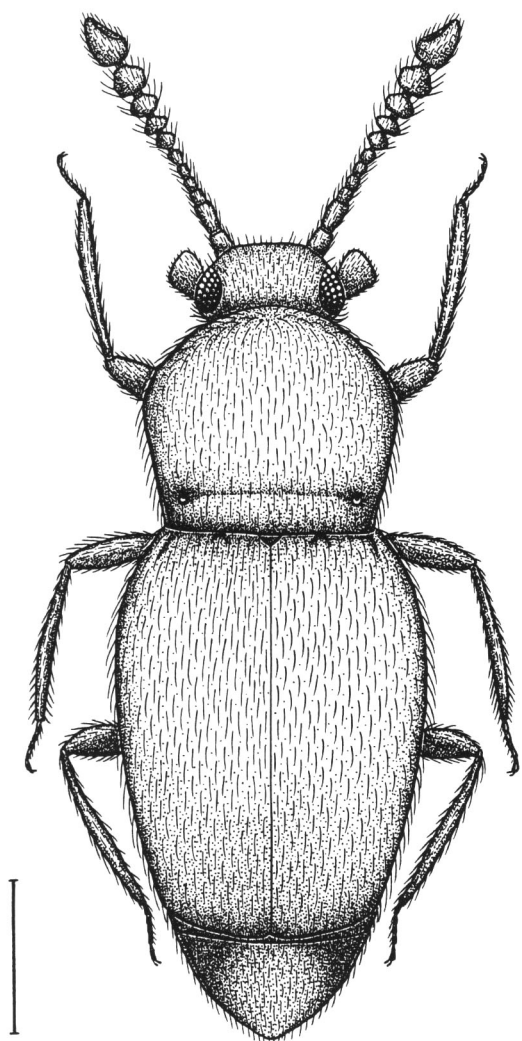


Fig. 1. *Paeneutheia pallida* sp. nov., male habitus. Scale: 0.2 mm.

*Diagnosis.* The new genus can be distinguished from all other Eutheini by the following combination of characters: maxillary palpomere III remarkably enlarged, subtriangular; palpomere IV very short and broad; eyes in lateral view with deeply emarginate posterior margin; procoxae and mesocoxae equally, relatively narrowly separated by pro- and mesosternal processes; pronotum with basal groove; each elytron with single basal fovea and truncate apex; aedeagus with elongate, bulbous median lobe with well separated, slender apical part and long parameres.

*Description.* Body slender, flattened, yellowish-brown; head wider than long; tempora short but distinct, narrowing toward broad occiput; vertex transverse, regularly convex; eyes large, convex, in lateral view with deeply emarginate posterior margin; antennal insertions located in large cavities narrowly separated in middle; antenna with enlarged scape and pedicel, gradually thickened toward apex, last antennomere large, oval; maxillary palpus with small palpomeres I and II, very large, subtriangular palpomere III and very short, broad, hardly visible palpomere IV; pronotum with sharp lateral edges not reaching anterior margin, with short lateral carinae near hind angles and two basi-lateral foveae connected by transverse groove; each elytron with single basal fovea, apex truncate; scutellum small, triangular; procoxae separated by moderately narrow prosternal process; mesocoxae separated by moderately narrow mesosternal process; metacoxae very widely separated; six abdominal sternites visible; male genitalia elongate, with large, bulbous median lobe and slender, well separated apical part, and with long, slender parameres bearing apical setae.

*Distribution.* Indonesia: Borneo (Kalimantan).

*Etymology.* The generic name is a combination of Latin “*paene*”, meaning “nearly, almost”, and *Eutheia*, the type genus of Eutheini.

*Remarks.* The description of the new genus and species is based on two individuals, male and female. Both of them possess antennomere XI with broadly excavated or collapsed internal margin. The only genus in Eutheini, whose members have distinctly asymmetrical, excavated antennomere XI, is *Veraphis*. In known species of *Veraphis* the excavation is rather circular, distinctly smaller in males than in females. However, in some undescribed species from Japan, South Korea and China the last antennomere is not excavated (Jałoszyński, unpublished observations). This suggests that the excavation of the last antennomere cannot be used as a key diagnostic character in taxonomy of the Eutheini. Moreover, a very broad and elongate concave area in

antennomere XI in *Paeneutheia* may appear to be an artifact. The author of the present paper observed broadly collapsed internal margin of antennomere XI in individuals belonging to various species of the Scydmaenidae, which have delicate antennae with relatively large, oval last antennomere (e.g., *Euthiconus*), killed by placing in

ethanol. For this reason, the excavated antennomere XI was not used as a diagnostic character for the new genus and species. A natural or artificial origin of this feature must be verified when additional material becomes available.

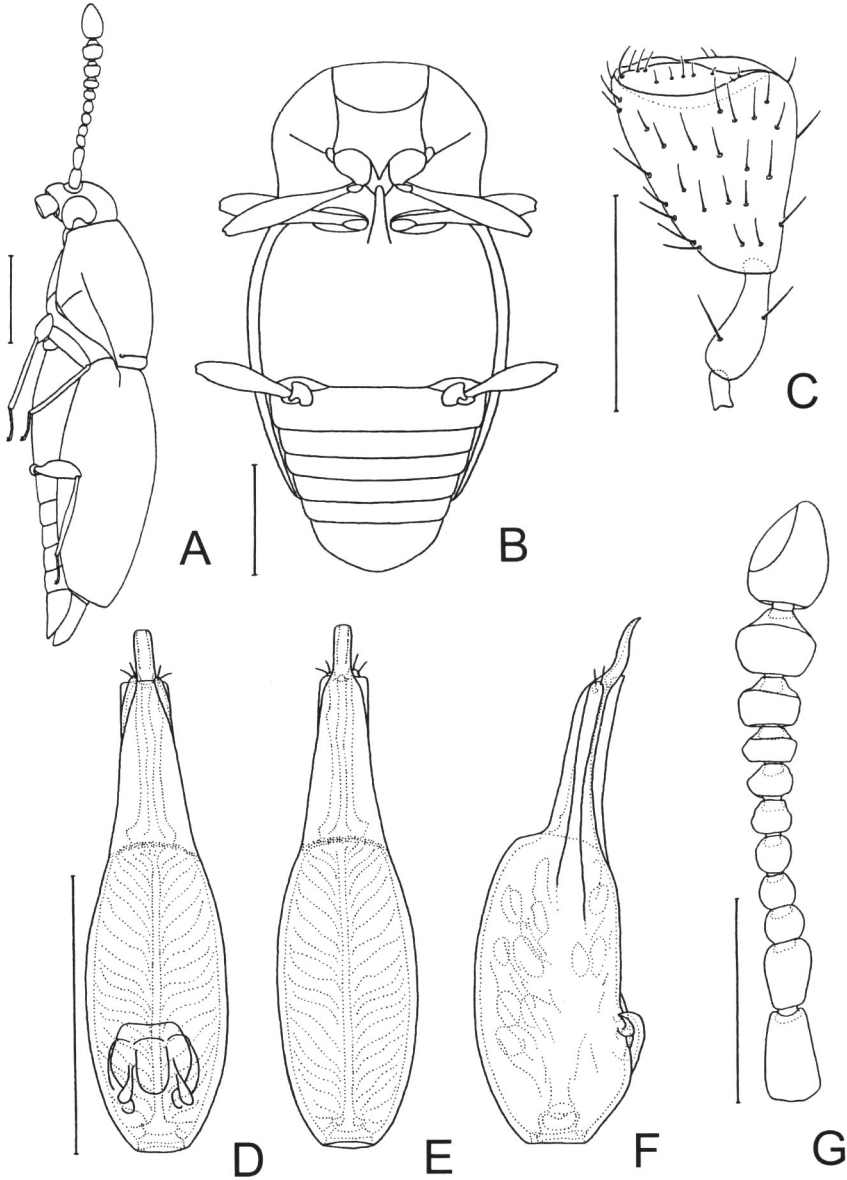


Fig. 2. *Paeneutheia pallida* sp. nov.; lateral habitus of male (A); thorax and abdomen, ventral view (B); right maxillary palpus, dorsal view (C); aedeagus in ventral (D), dorsal (E) and lateral views (F); right antenna, dorsal view (G). Scale: 0.2 mm for A, B, D–G; 0.05 mm for C.



*Paeneutheia pallida* sp. nov.

(Figs. 1; 2A–G)

*Diagnosis.* This species can be distinguished from all other Eutheini by characters given in the generic diagnosis. Examination of the male genitalia is required to confirm the species identification.

*Description.* Body slender, relatively flat, yellowish-brown, with relatively short and moderately dense suberect setation.

Male (Fig. 1, 2A). Body length (from anterior margin of clypeus to apex of pygidium): 1.05 mm. Head convex, wider than long, widest at eyes; length: 0.12 mm, width: 0.2 mm. Frons steeply lowering and narrowing toward subrectangular clypeus; antennal insertions located on anterior margin of head, inside large cavities narrowly separated in middle, between anterior margins of eyes, and below very indistinctly marked supraantennal tubercles; vertex broad, regularly convex; tempora short but distinct, rounded, strongly narrowing toward occipital constriction; neck as broad as vertex between eyes; punctation of head very sparse and fine; setation relatively sparse and erect, setae relatively short on frons, much longer on vertex. Eyes large, finely faceted, in lateral view with deeply emarginate posterior margin, covered with sparse, short, erect setae. Labrum transverse, subrectangular, with slightly emarginate anterior margin; maxillary palpus (Fig. 2C) with palpomere I very small, subcylindrical, more than twice as long as wide, without setae; palpomere II slightly curved, twice as wide as I, elongate, 3 times as long as wide at base, narrowing toward apex, with two long erect setae; palpomere III very large, subtriangular, widest at apex, longer than I and II together, slightly longer than wide at apex, with numerous moderately long, suberect setae; palpomere IV very short and broad, hardly visible, inserted into concave apex of palpomere III, with short and sparse setae. Antenna (Fig. 2G) moderately long, slender, length: 0.59 mm; scape and pedicel enlarged, elongate; antennomeres III–V subequal in size, then antenna gradually thickened toward

apex; XI large, oval, with large excavation in internal lateral margin.

Pronotum relatively flat, slightly wider than long, widest anterior to middle, length: 0.27 mm, maximum width: 0.31 mm, width at base: 0.25 mm. Anterior and lateral margins rounded, without anterior angles; sides narrowing from widest place to slightly arcuate base; hind angles well marked; lateral margins with sharp edges from hind angles to widest place of pronotum (Fig. 2A), and with short and narrow area demarcated by faint lateral carina near each hind angle; base with two small but very distinct lateral foveae connected by shallow transverse groove; punctation very fine and sparse, hardly noticeable; setation moderately long, suberect, directed posteriorly.

Elytra relatively flat, widest near anterior fourth and third, length: 0.52 mm, width: 0.29 mm, elytral index (length/combined width): 1.8. Each elytron with single basal fovea located closer to small, triangular scutellum than to distinctly marked humerus; apex of each elytron truncate, slant; adsutural angle rounded; punctation more distinct than that on pronotum, sparse and fine; setation slightly denser than that on pronotum, only slightly suberect, directed posteriorly, relatively short. Hind wings well developed, twice as long as elytra, with row of dense and very long setae along posterior margin.

Venter (Fig. 2B): Basisternal area of prosternum relatively long, posterior margin expanded in middle, fused to moderately broad and long prosternal process; mesosternum with distinct median carina forming mesosternal process, anteriorly adjacent to posterior margin of prosternal process; metasternum large and broad, regularly convex. Six abdominal sternites visible (here numbered I–VI); sternite I nearly as long as sternites II–III together; sternites II–V subequal in length, sternite VI transverse, subtriangular, longer than IV–V together, posterior margin rounded; sutures between sternites nearly straight.

Legs: Procoxae narrowly separated by prosternal process, nearly globular, moderately large;

mesocoxae separated by mesosternal process as widely as procoxae, elongate, distinctly transverse; metacoxae very broadly separated, transverse, with oval base and separated distal part. All trochanters relatively small, elongate; mesotrochanters slightly longer than pro- and metatrochanters. All femora moderately long, with slender basal third, distinctly broadening to distal third, then narrowing toward apex; tibiae as long as femora or slightly longer, slender, slightly curved; tarsomeres I–IV gradually decreasing in size; V only slightly longer than IV.

Male genitalia: Aedeagus (Fig. 2D–F) 0.37 mm in length, relatively large, with elongate, bulbous basal part, and well separated, slender apical lobe; base with circular foramen connected to longitudinal inner structure surrounded by muscle fibres; ventral opening moderately large, semicircular, surrounded by lightly sclerotized, hardly visible structures projecting ventrally in lateral view; apical lobe gradually narrowing, well delimited and rectangular at apex, recurved ventrally in lateral view; inner longitudinal duct slightly irregular in shape; ventral wall with lightly sclerotized elongate plate in distal half, rectangular at apex. Parameres long and slender, broadly constricted between middle and apical third, with two apical setae, basal half of each paramere seems to be fused with wall of aedeagus.

Female. Body length: 0.8 mm; length of head: 0.12 mm, width of head: 0.21 mm; length of pronotum: 0.28 mm, maximum width of pronotum: 0.34 mm, width of pronotum at base: 0.27 mm; length of elytra: 0.55 mm, width of elytra: 0.44 mm. Very similar to male, including proportions of antennomeres, antenna slightly shorter (0.47 mm); pronotum and elytra broader, elytral index distinctly lower: 1.25.

*Distribution.* Indonesia: Borneo (Kalimantan).

Holotype, ♂, Indonesia, Borneo, E Kalimantan, Bukit Soeharto, 6. viii. 1993, N. Ishii leg. (NSMT). Paratype, ♀, same data as holotype (NSMT).

*Etymology.* The specific epithet “*pallida*” re-

flects light body coloration, after the Latin word “*pallidus*”, meaning “pale”.

## Discussion

The current classification of the Eutheini is based on the division into five genera: *Eutheia*, *Veraphis*, *Euthiconus*, *Protoeutheia*, and *Eutheimorphus*. However, some of these genera are not well defined, or the original diagnoses are inaccurate or misleading. Therefore, the comparison of *Paeneutheia* with other genera of the tribe must be supplemented with brief notes on the current problems on the generic classification of the Eutheini.

The small, flat and slender body, light coloration, similar shape of antenna and enlarged maxillary palpi make *Paeneutheia* similar to *Protoeutheia*. The only two known species of *Protoeutheia* occur in Italy. They are unique among Eutheini by having very widely separated mesocoxae (narrowly in other genera) (Fig. 3A; also illustrated in Franz, 1970, fig. 2; and in Pace, 1977, fig. II. 3). *Paeneutheia* and *Protoeutheia* have similarly widely separated metacoxae, adjacent to lateral margins of the metasternum. The clear difference can be seen in the design of prosternum: in *Paeneutheia* the procoxae are separated by relatively narrow prosternal process (Fig. 2B), while in *Protoeutheia* the prosternal process is very short and it does not separate procoxae (Fig. 3A). Both genera share similar design of the maxillary palpus; palpomeres I and II are relatively small, while palpomere III is very large, relatively stout, and its apex bears very broad and short, hardly visible palpomere IV. However, in *Paeneutheia* the palpomere III is subtriangular and longer than wide (Fig. 2C), and in *Protoeutheia*, it is oval and wider than long (Fig. 4A). The shape of the male copulatory organ provides another unambiguous character to discriminate between the two genera. In *Protoeutheia* the aedeagus is very characteristic; the basal capsule is short and flattened, the distal part of the median lobe is curved ventrally and gradually narrowing toward asymmetrical apex in both

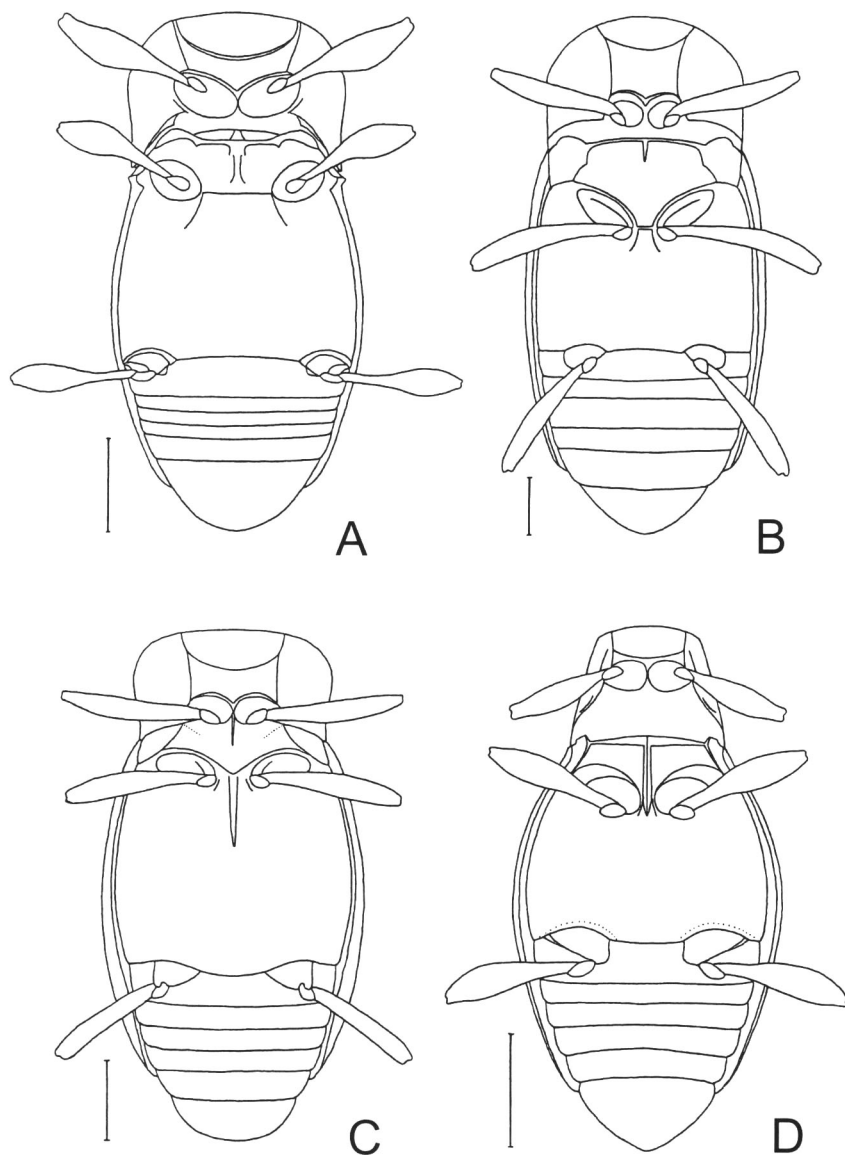


Fig. 3. Thorax and abdomen in ventral view; *Protoeutheia mirifica* Franz (A); *Eutheia plicata* (Gyllenhal) (B); *Veraphis engelmarki* Franz (C); and *Euthiconus conicicollis* Fairmaire et Laboulbene (D). Scale: 0.2 mm.

known species (Fig. 5A, B; also in Franz, 1970, fig. 3; Pace, 1977, fig. II. 1, 2). Distinct asymmetry of the apex of the aedeagus seems to be unique for this genus. However, it is noteworthy that small asymmetry can also be observed in the aedeagi of some *Eutheia* (e.g., in *E. plicata*, Fig. 5C). The examination of the holotype of *Pr. mirifica* revealed that despite the illustration given in the original diagnosis (Franz, 1970), the aede-

agus of this species possesses small and short, but distinct parameres. In *Paeneutheia*, the aedeagus is symmetrical, basal bulbous part is elongate, parameres are relatively long, and they seem to be fused with the median lobe in basal half (Fig. 2D, E, F).

*Eutheia* and *Veraphis* show significant resemblances (at least when most accurately described Palearctic, Oriental and Neotropical species are

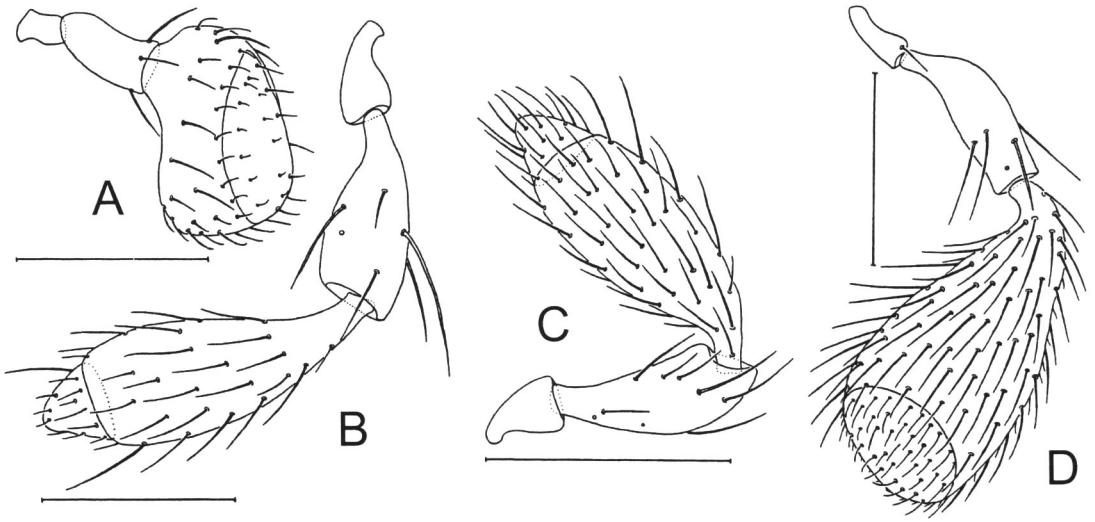


Fig. 4. Maxillary palpus; *Protoeuthia mirifica* Franz (left, ventral view) (A); *Eutheia plicata* (Gyllenhal) (left, dorsal view) (B); *Veraphis engelmarki* Franz (right, dorsal view) (C); and *Euthiconus conicicollis* Fairmaire et Laboulbène (right, ventral view) (D). Scale: 0.2 mm.

compared), and the discrimination between the two genera based on the existing literature may be problematic. Members of the two genera share the following characteristics: the relatively slender, flat body; elongate maxillary palpomere III and conical, well visible palpomere IV; contiguous procoxae; narrowly separated mesocoxae; widely separated metacoxae, distinctly separated from lateral margins of the metasternum; the mesosternum is carinate; the aedeagus has long, slender parameres; and the sexual dimorphism is often expressed in different proportions of antennomeres in males and females. So far, *Veraphis* was believed to differ from *Eutheia* by having the mesosternal carina and pits on the vertex; asymmetrical, excavated antennomere XI; and by different design of the aedeagus (Franz, 1971). In fact, all species of *Eutheia* examined for purpose of the present study possess carinate mesosternum. In *E. plicata* (Fig. 3B) and *E. scydmaenoides* the carina is confined to the anterior third of the mesosternum, but in two undescribed Japanese species the carina is entire. In *Veraphis*, the carina is variable in length; in *V. engelmarki* it is confined to the anterior half of the mesosternum (Fig. 3C), in Japanese species the carina is

entire. In both genera the difference between sexes can be noticed in proportions of antennomeres. In *V. engelmarki*, *V. irkutensis* and *V. fatiloquus*, the last antennomere in females is enlarged and bears a large circular excavation in the anterior lateral margin, whereas males possess distinctly smaller antennomere XI; also proportions of flagellomeres are different between sexes (Franz, 1971, fig. 12c, 13c; Kurbatov, 1995, fig. 1, 2). However, detailed examination of *E. scydmaenoides* revealed that the antennomere XI has a small, shallow, circular excavation in internal lateral margin. Moreover, several undescribed Japanese Eutheini have vertex with distinct, sometimes deep pits or grooves, which is typical for *Veraphis*, but the antenna is similar in males and females, representing all possible variants of the shape of the antennomere XI from non-excavated, through small, hardly visible circular pit, to distinct, large excavation (Jałoszyński & Hoshina, in preparation). These data show that also the excavation of the antennomere XI cannot be used as an unambiguous diagnostic character at the generic level. The only reliable features remain pits or grooves on the vertex, unique for *Veraphis*, and the design of the aedeagus. The typi-

cal aedeagus representative for *Eutheia* is illustrated in Fig. 5C, D; the general design in all species of *Eutheia*, whose aedeagi have been illustrated in the literature, is consistently the same (e.g.: Franz, 1971, fig. 1–11; 1974, fig. 1; 1982, fig. 1; 1985, fig. 1–3; Kurbatov, 1990, fig. ж, 3; 1991, fig. a; O'Keefe, 1999, fig. 7a–c). The only exception is *E. siamensis* Franz, known to occur in Thailand, with the aedeagus very different from that found in the type species of the genus

(Franz, 1975, fig. 1). The generic identity of this species remains to be verified. The median lobe of the male genitalia in *Eutheia* possesses voluminous basal capsule and well separated, slender apical part, usually flattened dorso-ventrally. The dorsal foramen or, more correctly, a lightly sclerotized, hymenous area, is located between the two parts, and its position is nearly transversal to the long axis of the aedeagus. This structure may play a role during copulation as a part of a pump-

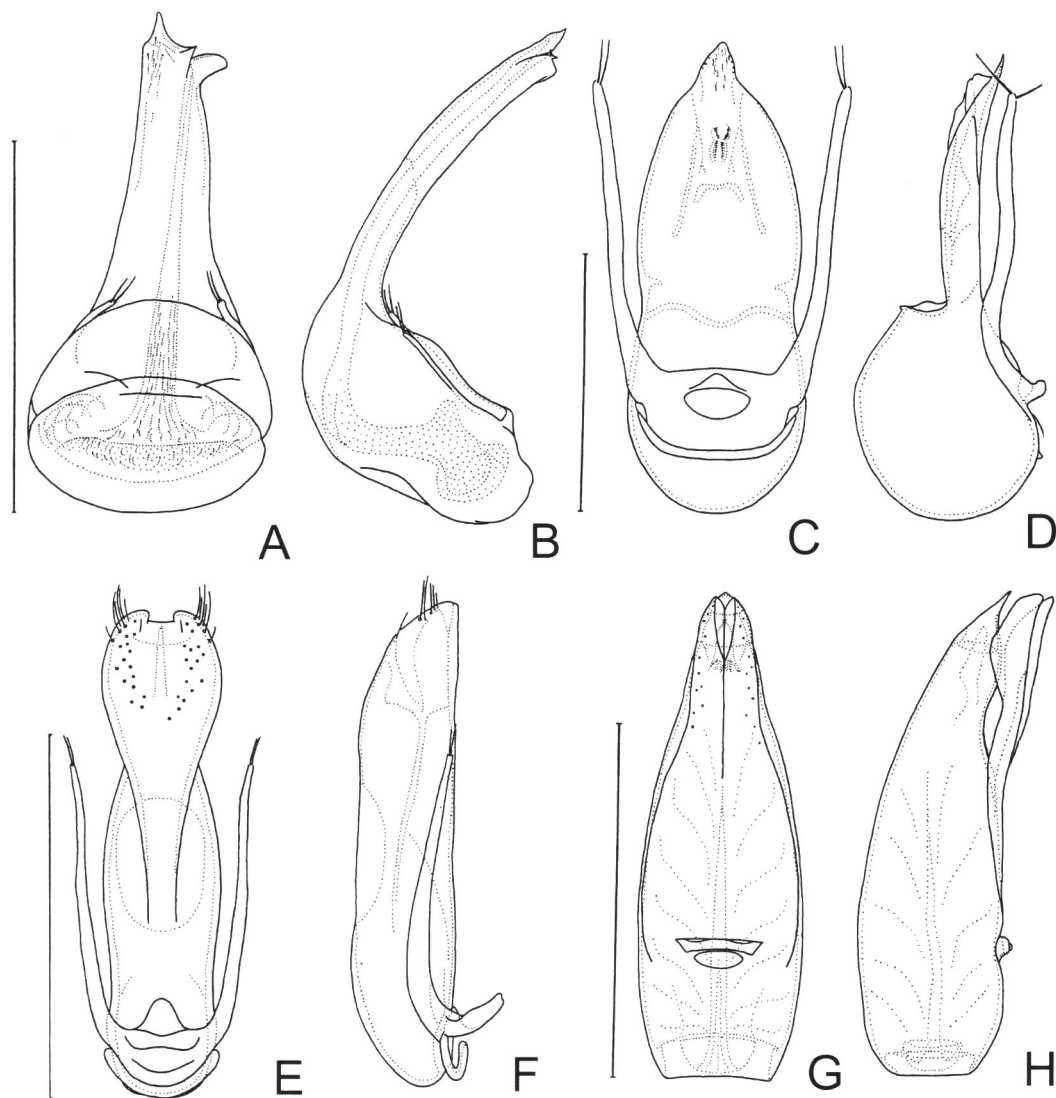


Fig. 5. Aedeagus in ventral (A, C, E, G) and lateral view (B, D, F, H); *Protoeutheia mirifica* Franz (A–B); *Eutheia plicata* (Gyllenhal) (C–D); *Veraphis engelmarki* Franz (E–F); and *Euthiconus conicicollis* Fairmaire et Laboulbène (G–H). Scale: 0.2 mm.

ing mechanism, powered by muscles located inside the median lobe and attached to the hymenous area. In *Veraphis*, the aedeagus is nearly tubular, very slender, without separated basal capsule, and the oval or circular hymenous structure is located near middle of the dorsal wall of the median lobe (Fig. 5E, F).

The new genus, *Paeneutheia*, differs significantly from both *Eutheia* and *Veraphis* by having separated procoxae, and the metacoxae not separated from lateral margins of the metasternum (Fig. 2 B). The maxillary palpomere III in *Paeneutheia* is remarkably enlarged, subtriangular, only slightly longer than wide, widest at apex, and the palpomere IV is very broad and short, hardly visible, whereas in *Eutheia* and *Veraphis* the palpomere III is elongate, nearly 3 times as long as wide, widest near middle, and the palpomere IV is conical and well visible (Fig. 4B, C). The aedeagus of *Paeneutheia* (Fig. 2D, E, F) also clearly differs from designs typical for *Eutheia* and *Veraphis*; the basal capsule is distinctly demarcated from the slender apical part, but the hymenous area is located at the base of the aedeagus. This circular region is connected to a longitudinal structure located inside the median lobe, which is a place of attachment for muscle fibres, probably supporting constriction of the median lobe during copulation.

*Eutheimorphus* is another genus of Eutheini characterized by flat and slender body (habitus illustrated in Franz & Löbl, 1990, fig. 1). The only known species, *Et. paradoxus*, is known to occur in Sabah, Borneo, and possesses a very small body length, 0.73 mm. This genus can be easily identified by a unique sculpture of the pronotum, which consists of two longitudinal, C-shaped grooves connected by transverse, basal groove, and two large basi-lateral pits. All other genera of the Eutheini have only basal pits or/and shallow basal groove on the pronotum. Another character unique for *Eutheimorphus* is a narrow separation of the metacoxae, which are widely separated in all other Eutheini, including *Paeneutheia*. The maxillary palpus of *Eutheimorphus* is of the type of *Eutheia/Veraphis*, i.e.,

palpomere III is elongate, widest slightly anterior to the middle, antennomere IV is small, conical, relatively well visible (Franz & Löbl, 1990, fig. 2). However, the antennomere IV in *Eutheia* and *Veraphis* is distinctly longer than that in *Eutheimorphus*. Also the male copulatory organ of *Eutheimorphus* is very characteristic and unique among Eutheini; the aedeagus is very stout, only twice as long as wide, widest at base, with relatively short and thick parameres, and complex internal sac (Franz & Löbl, 1990, fig. 3, 4).

*Euthiconus* is the only genus of the Eutheini, members of which have relatively convex, not flattened body. Besides, the most characteristic morphological features which allow for discriminating between *Euthiconus* and all other Eutheini, including the newly described *Paeneutheia*, are: the very short prosternum (Fig. 3D); mesocoxae separated by very narrow and high mesosternal process; the maxillary palpus with the palpomere III elongate, widest near apex, and palpomere IV very short and broad (Fig. 4D; Kurbatov, 1990, fig. 5-B); and a different design of the aedeagus. There are two distinctly different types of aedeagi found in *Euthiconus*, which show so great difference that the genus seems to be heterogeneous and in future may be split into two separate genera (the aedeagi of Nearctic species remain yet to be examined). The aedeagus of the type species of the genus, *Ec. conicicollis* (Fig. 5G, H), and also that of *Ec. lustrifucus* (Kurbatov, 1990, fig. 5-e), is elongate, relatively slender, gradually narrowing toward apex, without separated basal capsule, with simple internal sac, and without parameres. On the other hand, the aedeagus of *Ec. paradoxus* is relatively stout, with long, slender parameres with apical setae, and with a pair of hook-like sclerites protruding from the internal sac (Sawada, 1962, fig. 3, 4, confirmed by examination of Japanese specimens). Detailed examination of the aedeagus of *Ec. conicicollis* revealed that the pumping apparatus is very similar to that found in *P. pallida*, and consists of basally located circular hymenous area connected to a longitudinal structure serving as a place for attachment of muscle fibres (Fig.

3K, L). In *Ec. paradoxus*, the circular hymenous area is located near the middle of the dorsal wall of the median lobe. The ventral wall of the aedeagus of *Ec. conicicollis* has an additional hymenous plate-like structure deeply notched in middle, in natural position tightly adhering to the median lobe (in Fig. 5H this structure is slightly separated, which is an artifact of the preparation). Slightly similar structure can be seen in the aedeagus of *P. pallida* (Fig. 2F). In this case, however, the hymenous plate visible in distal half of aedeagus is not divided axially in middle. The aedeagus of *Paeneutheia* also differs clearly from that found in *Ec. paradoxus* by having elongate median lobe with well separated, elongate basal capsule, and well developed parameres.

#### Acknowledgments

Many special thanks are due to Dr. Shûhei Nomura (the National Science Museum, Tokyo), for his invaluable help during my stay in Japan and for giving me the opportunity to examine specimens from the collection of NSMT. I am also greatly indebted to Dr. Otto Merkl (Hungarian Natural History Museum, Budapest), for the loan of the type material of *Protoeuthia mirifica* and *Veraphis irkutensis*, Dr. Stig Lundberg (Luleå, Sweden), Dr. Serguei Kurbatov (Moscow, Russia), and Mr. Peter Hlaváč (Košice, Slovakia), for giving or lending me specimens of Palearctic *Eutheini* from their collections. I also express my gratitude to many Japanese entomologists who collected interesting materials, which I examined during my study. My sincere thanks also go to

Dr. Giorgio Castellini (Museo di Storia Naturale della Maremma, Grosseto, Italy) for his comments on the manuscript, and to Dr. Sean O'Keefe (Morehead State University, USA), for his continuous help in my study of the Scydmaenidae.

#### References

- Franz, H., 1970. Eine neue Scydmaeniden-Gattung aus Sudeuropa. *Koleopt. Rdsch.*, **48**: 31–33.
- Franz, H., 1974. Die Scydmaeniden des Raumes von Jumla in Westnepal und aus dem Therai (Col.). *Koleopt. Rdsch.*, **51**: 86–104.
- Franz, H., 1975. Zweiter Beitrag zur Kenntnis der Scydmaenidenfauna Sudostasiens. *S.-b. österr. Akad. Wiss., Math.-Naturw. Klasse, Abt. I.* **183**: 57–107.
- Franz, H., 1982. Beitrag zur Kenntnis der Scydmaeniden des Mediterrangebietes und des Kaukasus. *Ent. Bl.*, **78**: 151–182.
- Franz, H., 1985. Neue und ungenügend bekannte Scydmaeniden (Coleoptera) aus Taiwan, Fukien und Thailand. *Mitt. Münch. ent. Ges.*, **74**: 91–128.
- Franz, H., & I. Löbl, 1990. *Eutheimorphus paradoxus* gen. n., sp. nov. un Scydmaenidae (Coleoptera) interessant de Borneo. *Mitt. schweiz. ent. Ges.*, **63**: 169–172.
- Kurbatov, S. A., 1990. More on the tribe Eutheini (Coleoptera, Scydmaenidae) in the USSR Far East. *Zool. Zh.*, **69**: 136–140.
- Kurbatov, S. A., 1991. New data for the fauna of beetles tribe Eutheini (Coleoptera, Scydmaenidae) from the Far East of the USSR. *Zool. Zh.*, **70**: 153–155.
- O'Keefe S. T., 1999. The Scydmaenidae of Costa Rica. I. *Leptochromus* Motschulsky, *Eutheia* Stephens, and *Paracephennium* gen. n. (Coleoptera: Scydmaenidae). *Koleopt. Rdsch.*, **69**: 67–81.
- Pace, R., 1977. Nuove specie di Scydmaenidae della Toscana e della Puglia. *Redia, Firenze* **40**: 211–219.



