

A SUPPLEMENT TO THE RECENT REVIEW OF THE GENUS *ENDOMYCHUS* PANZER (COLEOPTERA: ENDOMYCHIDAE), WITH DESCRIPTIONS OF TWO NEW SPECIES

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Abstract.— The recent review of the genus *Endomychus* is supplemented. Two new species are described: *Endomychus sasajii* (Taiwan) and *E. atricornis* (Burma). Two species are redescribed, based on type material: *E. sauteri* Chûjô, 1938 and *E. nigripes* Mader, 1955. *Endomychus muelleri* (Mader, 1955) is synonymized with *Endomychus nigriceps* Chûjô, 1938, **syn. nov.** Lectotypes are designated for *Endomychus sauteri* Chûjô, 1938 and *E. nigricornis* Chûjô, 1938. Distribution, nomenclatural history, diagnoses and illustrations are provided for each species. Key to the world species of *Endomychus* is updated.



Key words.— Entomology, taxonomy, supplement to revision, Coleoptera, Cucujoidea, Endomychidae, *Endomychus*

INTRODUCTION

During preparation of the review of *Endomychus* (Tomaszewska 1997), the types of Mader species preserved in the former Frey Museum (now under care of Museum in Basel), and species of Chûjô preserved in the Taiwan Agriculture Research Institute in Taichung, were not available for study. Therefore, redescriptions of Chûjô's species: *Endomychus nigriceps*, *E. nigricornis* and *E. sauteri* were based on a few determined specimens, and on the original descriptions. *E. nigripes* Mader was treated as species *incerte sedis*, because of unavailable material and insufficient description.

At present, after detailed study of the type specimens of the species mentioned above, *E. nigripes* from Fukien, appears to be a distinct species. *E. muelleri* from Fukien and *E. nigriceps* from Taiwan, were treated as two distinct species, in spite of insignificant differences between them. After my study of the holotype of *E. nigriceps*, *E. muelleri* is synonymized with *E. nigriceps*. Moreover, after study of the type of *E. sauteri* from Taiwan, it appears that my redescription of this species, based on two determined specimens, refers to a new species (proposed here as *E. sasajii*), and the proper redescription of *E. sauteri* is provided in this paper. During my recent visit to The Natural History Museum in London, one more new species of *Endomychus* was found, and is described here. The study of the types of *E. jureceki* Mader and *E. nigricornis* Chûjô, confirms previous diagnoses of these species.

MATERIAL AND METHODS

This paper is based on the examination of types and material from the following institutions:

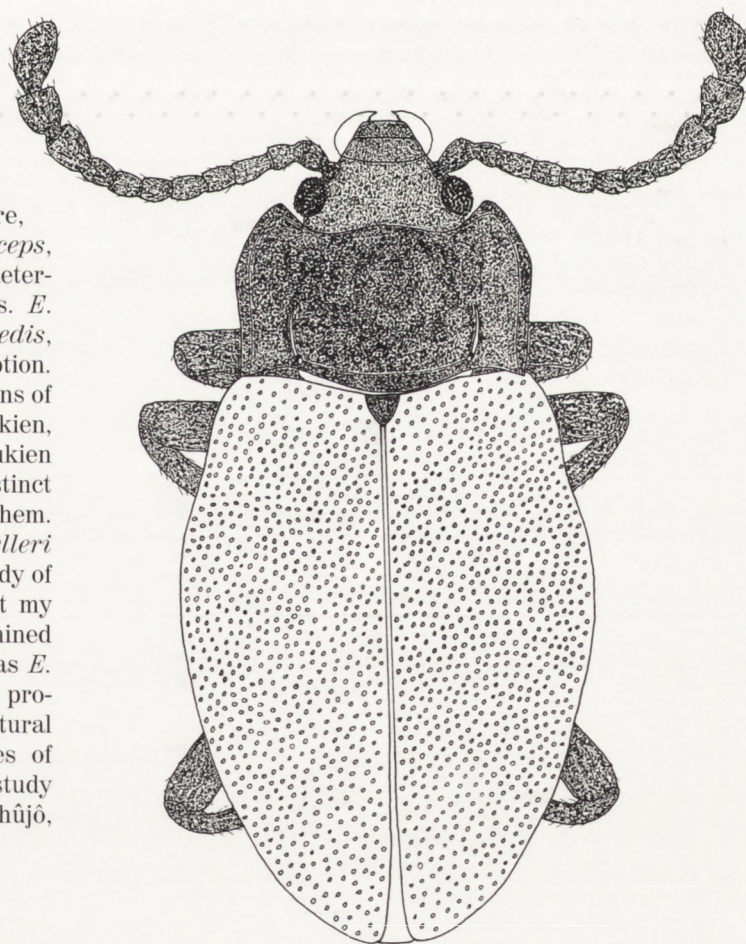


Figure 1. Habitus of *Endomychus sasajii* sp. nov.

BLFU – Biological Laboratory, Fukui University, Fukui (H. Sasaji);

BMNH – The Natural History Museum, London (M. Kerley);

MZPW – Museum Zoologicum Polonicum, Warszawa;

NHMB – Naturhistorisches Museum, Basel (D. Burckhardt);

TARI – Taiwan Agriculture Research Institute, Insect collection, Taichung (L.Y. Chou);

TMB – Termesztudományi Múzeum, Budapest (O. Merkl).

Measurements were made using a filar micrometer as follows: body length, from apical margin of clypeus to apex of elytra; width, across both elytra (maximum); pronotal length, from the middle of anterior margin to margin of basal foramen; pronotal width, across widest part; elytral length, along suture including scutellum. Outline drawings were made from dry preserved specimens using a camera lucida attached to a Olympus dissecting microscope.

SPECIES DESCRIPTIONS

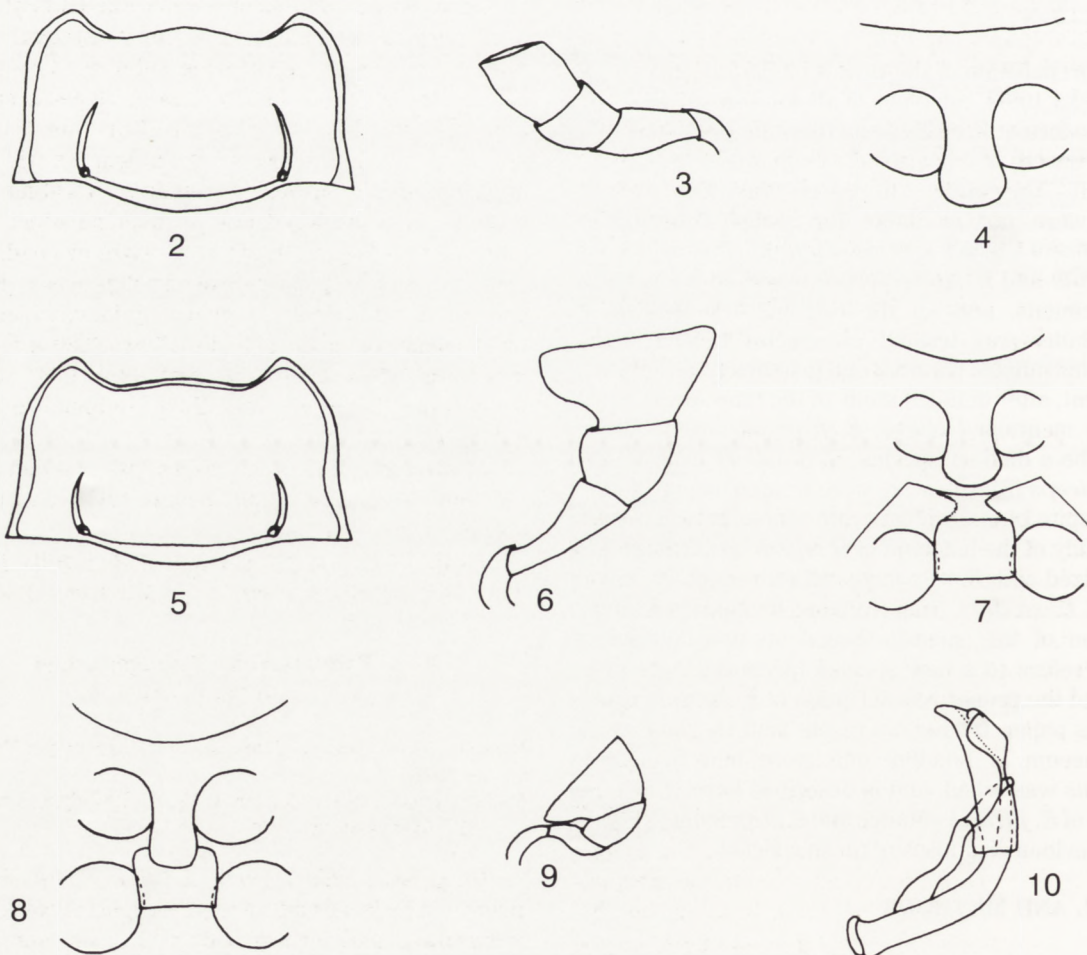
Endomychus sauteri Chûjô (Figs 2–4)

Endomychus sauteri Chûjô, 1938: 405. Lectotype, here designated: Taiwan; TARI, examined.

Diagnosis. This species is most similar to *E. divisus* and *E. chinensis*. Larger size, less transverse pronotum, whole mesosternum uniformly dark, separate it from *E. divisus*. Decidedly broader and shorter prosternal process, larger size, more elongate body and absence of any spots on the elytra distinguish *E. sauteri* from *E. chinensis*.

Description. Length 5.00 mm. Body elongate-oval; 1.72× as long as wide; light brown, with elytra, metasternum and abdomen pale yellow; scutellum and tarsi brownish. Pronotum (Fig. 2) 1.05 mm long, 1.90 mm wide; 0.55× as long as wide. Anterior angles of pronotum produced, weakly rounded, lateral margins distinctly bordered, basal sulcus distinct. Punctures on pronotum finer than those on elytra or head. Scutellum elongate, acute apically. Prosternal process (Fig. 4) comparatively broad, about 0.80× as broad as coxal diameter, moderately long, weakly widened behind front coxae, rounded apically. Elytra 3.80 mm long, 2.90 mm wide; 3.62× as long as pronotum, 1.53× as wide as pronotum. Terminal maxillary palpomere subquadrate, truncate apically (Fig. 3).

Note. The specimen designated here as the lectotype seems to be teneral, because of the body colouration. Fully pigmented specimens are probably black, with elytra,



Figures 2–10. *Endomychus* spp. 2–4. *E. sauteri*; 5–7. *E. nigripes*; 8–10. *E. sasajii*. 2, 5. Outline of pronotum. 3, 6, 9. Maxillary palp. 4. Prosternal process. 7, 8. Pro- and mesosternum. 10. Aedeagus, lateral.

metasternum and abdomen light brown; scutellum and tarsi brownish-black.

Types. Lectotype: **Taiwan** – “Chip-Chip, Formosa, II.1909, Sauter/ Cotype/ *Endomychus sauteri* Chl jô, det. M. Chl jô / 161” (TARI).

Endomychus nigripes Mader
(Figs 5–7)

Endomychus nigripes Mader, 1955: 70. Holotype: China, Fukien; NHMB, examined.

Diagnosis. This species resembles *E. atripes*, *E. nigricornis* and *E. flavus* in combination of body colouration and shape of the terminal maxillary palpomere. Larger size, more elongate body, more elongate elytra and brownish-black tarsi, separate it from *E. atripes*. Larger size, less elongate body, more transverse pronotum and broader prosternal process, separate it from *E. flavus* and *E. nigricornis*.

Description. Length 6.00 mm. Body convex, elongate-oval; 1.71× as long as wide; reddish-brown with dorsal surface of head darker, strongly shiny; legs, antennae and mouthparts brownish-black, tarsi dark brown. Pronotum (Fig. 5) 1.25 mm long, 2.40 mm wide; 0.51× as long as wide; anterior angles produced, finely rounded; lateral margins bordered, basal sulcus distinct. Punctures on pronotum weakly finer than those on head or elytra, where punctures are dense and rather coarse. Scutellum heart-shaped. Prosternal process (Fig. 7) broad (about 0.93× as wide as coxal diameter), weakly widened behind front coxae, rounded at apex. Elytra 4.70 mm long, 3.50 mm wide; 3.76× as long as pronotum, 1.46× as wide as pronotum. Terminal maxillary palpomere (Fig. 6) enlarged at apex.

Types. Holotype: **China** – “Kuatun, Fukien, China, 10.V.46 (Tschung Sen)/ Typus, *nigripes* M./ *Endomychus nigripes* Mader/ *nigripes* Mader/ Museum Frey Tutzing” (NHMB).

Endomychus sasajii sp. nov.
(Figs 1, 8–10)

Diagnosis. This species is most similar to *E. tonkineus* and *E. divisus*. Shape of the terminal maxillary palpomere (Fig. 9), smaller size and strongly shiny body, separate it from *E. divisus*. More elongate body, less transverse pronotum, longer and slender antenna, and black scutellum distinguish it from *E. tonkineus*.

Description. Length 3.70–4.50 mm. Body elongate-oval (Fig. 1); 1.74–1.82× as long as wide; head, antennae, pronotum, scutellum, legs (tarsi brownish-black), prosternum and at least sides of mesosternum black; elytra, abdomen, metasternum yellowish-brown. Pronotum (Fig. 1) 0.81–0.97 mm long, 1.44–1.84 mm wide; 0.53–0.56× as long as wide. Anterior angles of pronotum weakly rounded, lateral margins rather distinctly bordered, basal sulcus distinct. Punctures on pronotum much finer than those on elytra or head. Scutellum elongate, acute apically. Prosternal process (Fig. 8) rather broad, about 0.87× as broad as coxal

diameter, moderately long, weakly widened behind front coxae, finely rounded apically. Elytra 2.70–3.40 mm long, 2.00–2.59 mm wide; 3.32–3.52× as long as pronotum, 1.39–1.41× as wide as pronotum. Terminal maxillary palpomere enlarged apically (Fig. 9). Aedeagus as in Fig. 10.

Etymology. This species is dedicated to Professor Hiroyuki Sasaji, who sent to me rich material of Asian *Endomychus*, including the specimens of this species.

Types. Holotype: **Taiwan** – “Nanshanchi, Nantou Hsien, 2.X.1984, S. Osawa leg.” (MZPW); paratype: same data as holotype (BLFU).

Comment. The above specimens were originally determined as *E. sauteri* sensu Tomaszewska (1997: 235). With the examination of type material of *E. sauteri*, it became necessary to redescribe the above specimens under a new species name.

Endomychus atricornis sp. nov.
(Figs 11–13)

Diagnosis. This species is most similar to *E. atripes* and *E. nigricornis* in body colouration and shape of the terminal maxillary palpomere, but differs in having prosternal process distinctly wider and truncate apically.

Description. Length 4.30 mm; body oval, somewhat flattened; 1.65× as long as wide; yellowish-brown with dorsal surface of head slightly darker, clypeus, mouthparts, antennae and legs dark brown. Pronotum (Fig. 11) 0.90 mm long, 1.80 mm wide; 0.50× as long as wide. Anterior angles of pronotum weakly rounded, lateral margins moderately widely bordered, basal sulcus indistinct. Punctures on pronotum finer than those on elytra or head. Scutellum elongate, acute apically. Prosternal process (Fig. 13) as wide as coxal diameter, moderately long, widened behind front coxae, truncate apically. Elytra 3.20 mm long, 2.60 mm wide; 3.55× as long as pronotum, 1.44× as wide as pronotum. Terminal maxillary palpomere (Fig. 12) enlarged apically.

Etymology. The name *atricornis* is a combination of the names *E. atripes* and *E. nigricornis*, to which the new species is very similar.

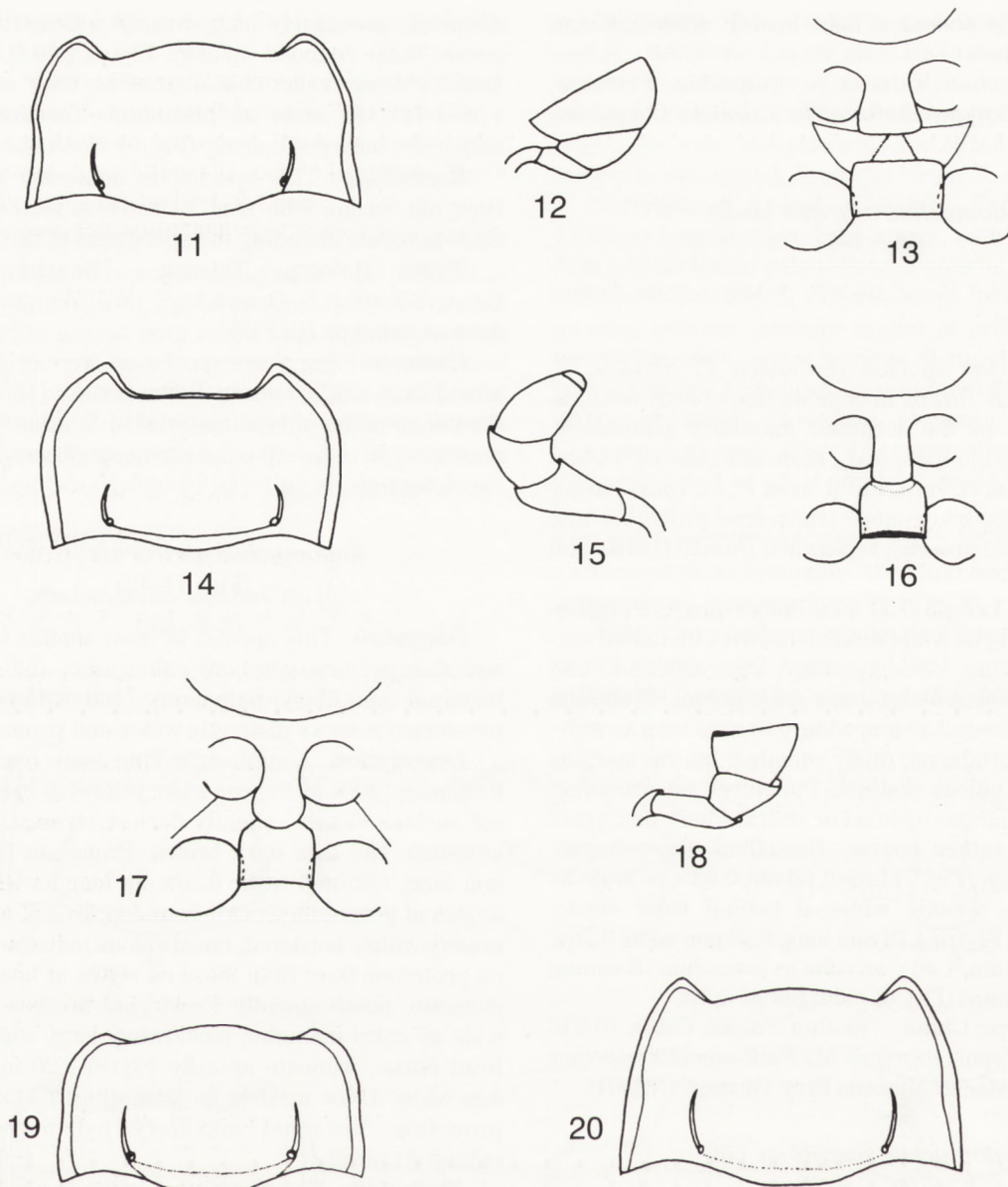
Types. Holotype ♀: “**Burma**: Mishmi Hills, Lohit River. 30.III.1935. M. Steele./Brit. Mus. 1935–312.” (BMNH).

Endomychus nigriceps Chûjô
(Figs 14–16)

Endomychus nigriceps Chûjô, 1938: 404. Holotype: Taiwan; TARI, examined.

Caenomychus mülleri Mader, 1955: 71. Lectotype: China, Fukien; TMB, examined. Syn. nov.

Diagnosis. This species of *Endomychus* is very distinctive in its large body size (the largest species) and by its colouration, dark brown body with head, antennae, legs, pro-, meso-, and often metasternum and at least basal portion of first abdominal ventrite black, or blackish-brown.



Figures 11–20. *Endomychus* spp. 11–13. *E. atricornis*; 14–16. *E. nigriceps*; 17, 19. *E. nigricornis*; 18, 20. *E. jureceki*. 11, 14, 19–20. Outline of pronotum. 12, 15, 18. Maxillary palp. 13, 16–17. Pro- and mesosternum.

Description. Length 6.1 mm. Body elongate; 1.79× as long as wide; reddish-brown with head, antennae, legs, pro- and mesosternum, often metasternum and at least basal portion of first abdominal ventrite black. Pronotum (Fig. 14) 1.35 mm long, 2.50 mm wide; 0.54× as long as wide; anterior angles acute, lateral margins bordered; basal sulcus distinct. Scutellum weakly acute apically, nearly heart-shaped. Punctations on pronotum finer than those on elytra. Prosternal process (Fig. 16) moderately broad (about 0.87× as broad as coxal diameter) and long, almost parallel-sided, weakly rounded at apex. Elytra 4.30 mm long, 3.40 mm wide; 3.19× as long as pronotum, 1.36× as wide as pronotum. Terminal maxillary palpomere (Fig. 15) elongate, cylindrical, rounded apically.

Note. The redescription above is based mostly on the holotype of *E. nigriceps*, except of body colouration, which includes the lectotype and paralectotypes of *Caenomychus mülleri*.

Types. Holotype of *E. nigriceps*: **Taiwan** – “Formosa, Musha.18.V–15.VI.1919, T. Okuni/ Type/ *Endomychus nigriceps* Chûjô, det. M. Chûjô/154” (TARI).

Lectotype of *Caenomychus mülleri* (designated by Tomaszewska 1997: 233/4), ♂: **China** – Paratypus, *Caenomychus mülleri*, Mader, 1955/ Kuantun, Fukien, China, 2.XI.46, Tschung Sen/ Paratype, *Caenomychus mülleri*, det. Mader 1955” (TMB). Paralectotypes of *C. mülleri*: “Typus, *mülleri*/ Kuantun, Fukien, China 8.VI.46 (Tschung Sen.)/ *Caenomychus mülleri* M./*mülleri* Mad.”

(NHMB); *Caenomychus mülleri* M./ Kuantun, Fukien, China 3.VI.46, (Tschung Sen.)/ Paratype" (NHMB).

Endomychus nigricornis Chûjô

(Figs 17, 19)

Endomychus nigricornis Chûjô, 1938: 405. Lectotype, here designated: Taiwan; TARI, examined.

Types. Lectotype: **Taiwan** – "Taiheizan, 25.VIII.1923, Col. T. Shiraki/ Cotype/ *Endomychus nigricornis* Chûjô, det. M. Chûjô /157."(TARI).

Comment. Although figures 17, 19 (*E. nigricornis*) and 18, 20 (*E. jureceki*) are very similar to those in Tomaszewska 1997, I have decided to include the illustrations of the same characters drawn from the types, because of their diagnostic value.

Endomychus jureceki Mader

(Figs 18, 20)

Endomychus jureceki Mader, 1936: 69. Holotype: East Siberia, Vladivostok; NHMB, examined.

Types. Holotype: "Vladivostok, Sibir, or. Ussuri, Dr. Jureček 1919/ *Jurečeki* m, Typus/ *Cyanauges Gorhami* Lew. (label crossed out)/ *Jurečeki* Mad.,/unter Rinde eines Nadelbaumstamm, (rest of label data illegible)" (NHMB). Paratype: "Vladivostok 1919, Ussuri mer. Dr. Jureček/ *Cotypus/ Jurečeki*, M."(NHMB).

KEY TO THE WORLD SPECIES OF *ENDOMYCHUS*

Note. Numbers in brackets [] refer to figures in my review of *Endomychus* (Tomaszewska 1997). All remaining numbers refer to the present paper.

1. Dorsum covered with fine pubescence; [uniformly dark brown, or only humeral angles and area around scutellum lighter, or elytra lighter with two large, black, oval spots on each elytron]; USA (California) *E. limbatus* (Horn)
- Dorsum without pubescence 2
2. Background of pronotum and elytra of the same colour 3
- Background of pronotum of different colour than background of elytra 4
3. Dorsal background yellow, yellowish-brown or brown .. 5
- Dorsal background black or blackish-brown 6
4. Elytra with contrasting markings 7
- Elytra without contrasting markings 8
5. Ventral surface uniformly coloured; [pro-, meso-, metasternum and abdomen yellow or brown as dorsal background] 9
- Ventral surface variably coloured 10
6. Terminal maxillary palpomere distinctly enlarged towards its apex [Fig. 32] 11
- Terminal maxillary palpomere not enlarged towards its apex [Fig. 69] 12
7. Each elytron with four small, oval, black spots

- *E. rogeri* Tomaszewska
- Each elytron with two oval, black spots 13
8. Terminal maxillary palpomere axe-shaped [Fig. 48] .. 14
- Terminal maxillary palpomere not axe-shaped [Fig. 118] 15
9. Terminal maxillary palpomere elongate, cylindrical, rounded apically [Fig. 143] 16
- Terminal maxillary palpomere widened apically [Fig. 21] 17
10. Each elytron with two large, black, oval spots; middle part of pronotum most often with black longitudinal stripe [Fig. 20] *E. coccineus* (Linnaeus)
- Elytra and pronotum without spots or stripes; terminal maxillary palpomere as in Fig. 15 .. *E. nigriceps* Chûjô
11. Prosternal process comparatively broad (about 0.85× as broad as coxal diameter), distinctly widened apically [Fig. 40]; elytra without spots; Russian Far-East *E. jureceki* Mader
- Prosternal process narrow (about 0.65× as broad as coxal diameter), weakly widened apically [Fig. 63]; elytra most often with yellow spots or stripes [Figs 56, 57, 58]; Japan *E. quadra* (Gorham)
12. Each elytron with elongate, yellow stripe, sometimes interrupted at middle [Figs 71, 72] ... *E. plagiatus* (Gorham)
- Elytra without markings 18
13. Posterior spot about four times as large as anterior one [Fig.115] *E. biguttatus* Say
- Posterior and anterior spots on elytra subequal [Fig. 129] 19
14. Elytra strongly convex; body black with elytra and abdomen orange, more oval (1.59–1.63× as long as wide) *E. bicolor* Gorham
- Elytra moderately convex; body black with elytra, abdomen, metasternum and middle part of mesosternum orange, more elongate (1.64–1.82× as long as wide) 20
15. Elytra and all visible ventrites orange 21
- Elytra orange with humeral angles black; ventrites 1 and 2 black, ventrites 3–6 orange ... *E. tomishimai* Nakane
16. Antennae and legs black; elytra uniformly yellowish-brown or brown 22
- Antennae and legs dark brown; each elytron with six elongate, slender, blackish rows of pigmented spots [Fig. 140] *E. agatae* Tomaszewska
17. Antennae and legs black or dark brown 23
- Antennomeres 1 and 2 (scape and pedicel) and legs yellowish-brown or red-brown, as rest of body; [each elytron with two large, black, oval spots] *E. armeniacus* Motschulsky
18. Body less than 4 mm long; terminal maxillary palpomere cylindrical, rounded apically [Figs 86, 87]; Pakistan 24
- Body more than 4 mm long; terminal maxillary palpomere subcylindrical, obliquely truncate at apex [Fig. 34]; Japan, India (Kashmir) 25
19. Body more oval, 1.48–1.60× as long as wide; each elytron with two large, oval, black spots; metasternum or at least its edges black *E. thoracicus* Charpentier

- . Body more elongate, 1.73–1.78× as long as wide; each elytron with two small, oval, black spots; metasternum yellow or orange 26
20. Body more oval, 1.64–1.73× as long as wide; pronotum more transverse, 0.50–0.52× as long as wide; scutellum dark brown; antenna comparatively short and stout; Vietnam *E. tonkineus* Pic
- . Body more elongate, 1.74–1.82× as long as wide; pronotum more elongate, 53–0.56× as long as wide; scutellum black; antenna long, slender; Taiwan *E. sasajii* sp. nov.
21. Mesosternum orange; smaller specimens (3.70 mm long) *E. yunnani* Tomaszewska
- . Mesosternum or at least its edges black; larger specimens (4.40–5.00 mm long) 27
22. Prosternal process almost as broad as coxal diameter, strongly widened behind coxae [Fig. 133]; Burma *E. slipinski* Tomaszewska
- . Prosternal process narrower than coxal diameter, almost parallel-sided [Fig. 85]; Cambodia *E. atriceps* Pic
23. Each elytron with two small, oval, black spots *E. flavus* Strohecker
- . Elytra without spots 28
24. Body broadly oval, 1.60–1.65× as long as wide; dark brown with antennae, legs, mouthparts, prosternum and edges of pronotum lighter (yellowish); Pakistan *E. micrus* Tomaszewska
- . Body more elongate, 1.74–1.80× as long as wide; whole body blackish-brown with dark greenish shade; Pakistan *E. pakistanicus* Tomaszewska
25. Body brownish-black with antennae, legs in part, mouthparts and elytra at shoulders and behind scutellum yellowish (elytra sometimes uniformly black); India (Kashmir) *E. humeralis* Pic
- . Whole body uniformly black or dark brown; only abdominal ventrites from 2 to 6 orange; Japan ... 29
26. Intercostal process of mesosternum yellow or orange; prosternal process moderately long and rather broad [Fig. 128]; pronotum more transverse (0.50–0.53× as long as wide); Vietnam *E. punctatus* Arrow
- . Intercostal process of mesosternum black; prosternal process long and narrow [Fig. 125]; pronotum more elongate (0.54–0.56× as long as wide); China (Fukien) *E. chinensis* Csiki
27. Pronotum strongly transverse (0.48–0.49× as long as wide); intercostal process of mesosternum yellow or orange; Vietnam *E. divisus* Arrow
- . Pronotum more elongate (0.54–0.56× as long as wide); intercostal process of mesosternum black; China (Fukien), Taiwan 30
28. Each elytron with two rows of black macropunctures extending along its inner edge from near scutellum to sutural angle [Fig. 59]; mouthparts brown like whole body; [Nepal] *E. mroczkowskii* Tomaszewska
- . Elytra without rows of black macropunctures; mouthparts blackish; 31
29. Prosternal process [Fig. 73] narrower, rounded apically; body more elongate (1.80–1.90× as long as wide), often with violet luster; Japan *E. gorhami* (Lewis)
- . Prosternal process [Fig. 67] broader, truncate apically; body less elongate (1.75× as long as wide), without violet luster; Japan *E. nigropiceus* (Gorham)
30. Prosternal process about 0.80× as broad as coxal diameter, widened behind front coxae; Taiwan *E. sauteri* Chûjô
- . Prosternal process about 0.54× as broad as coxal diameter, parallel-sided; China (Fukien) *E. chinensis* Csiki
31. Prosternal process as wide as coxal diameter, truncate apically (Fig. 13); basal sulcus on pronotum invisible *E. atricornis* sp. nov.
- . Prosternal process narrower than coxal diameter, rounded apically; basal sulcus on pronotum distinct 32
32. Body 5.00–6.00 mm long, rather oval (1.50–1.71× as long as wide) 33
- . Body 4.06–4.50 mm long, rather elongate (1.73–1.76× as long as wide) 34
33. Length 6.00 mm; body 1.71× longer than wide; China (Fukien) *E. nigripes* Mader
- . Length 5.00–5.55 mm; body 1.50–1.61× longer than wide; China (Tibet), Vietnam; [aedeagus as in Fig. 37] *E. atripes* Pic
34. Smaller specimens (4.06–4.38 mm long); pronotum more transverse (0.52–0.54× as long as wide); Taiwan *E. nigricornis* Chûjô
- . Larger specimens (4.5 mm long); pronotum more elongate (0.55× as long as wide); [aedeagus as in Fig. 46]; China (Sichuan) *E. flavus* Strohecker

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