Linzer biol. Beitr.	46/2	1087-1096	19.12.2014

Three new species and additional records of *Echiaster* from Asia (Coleoptera: Staphylinidae: Paederinae)

V. ASSING

A b s t r a c t : Three species of the paederine genus *Echiaster* ERICHSON, 1839 from Asia are described and illustrated: *Echiaster bivirgatus* nov.sp. (Thailand, North India), *E. paulexcisus* nov.sp. (Thailand), and *E. discrepans* nov.sp. (South India). Additional records from Thailand, Taiwan, and China are reported for *E. unicolor* BERNHAUER, 1922 and *E. maior* ASSING, 2013. The genus is now represented in Asia by five species in two lineages, one of them composed of one species (*E. discrepans*) from South India and the other of the remaining four species. A key to species is provided. The distribution of the genus in Asia is mapped.

K e y w o r d s : Coleoptera, Staphylinidae, Paederinae, *Echiaster*, Oriental region, Asia, taxonomy, new species, new records, distribution map.

Introduction

The paederine genus *Echiaster* ERICHSON, 1839 was previously represented in Asia by only two species, the widespread *E. unicolor* BERNHAUER, 1922 (China, Taiwan, Japan) and the recently described *E. maior* ASSING, 2013 from Laos (ASSING 2011, 2013).

Three additional species were discovered among material of unidentified Paederinae from several public and private collections, which also included new records of the two previously described species.

Material and methods

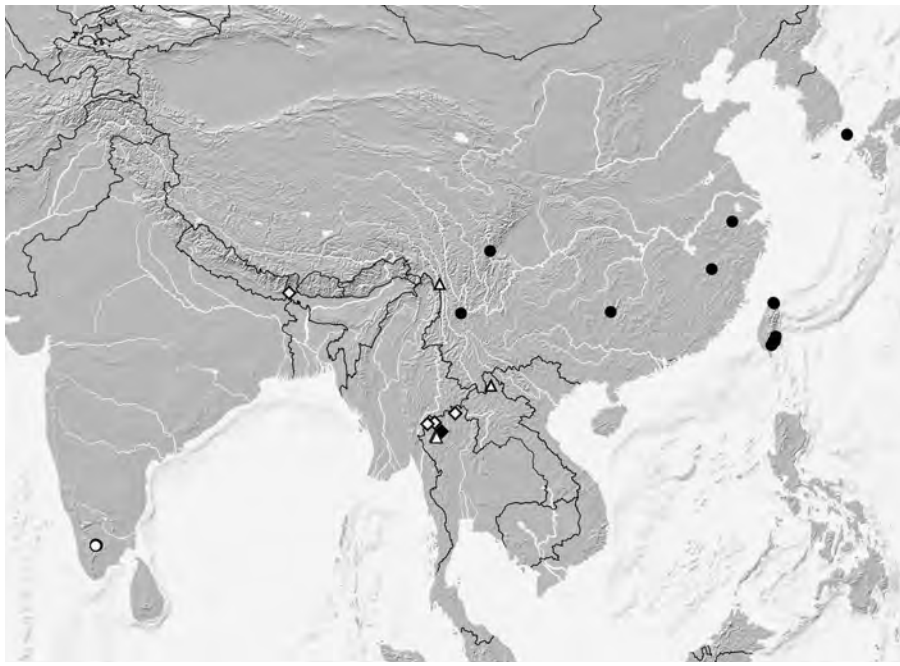
The material treated in this study is deposited in the following collections:

MHNG ..... Muséum d'Histoire Naturelle, Genève (G. Cuccodoro)
MNHUB ..... Museum für Naturkunde der Humboldt-Universität, Berlin (J. Frisch, J. Willers)
SMNS ..... Staatliches Museum für Naturkunde, Stuttgart (W. Schawaller)
cAss..... author´s private collection
cRou..... private collection Guillaume de Rougemont (Oxford)
cSme..... private collection Aleš Smetana, Ottawa

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena). A digital camera (Nikon Coolpix 995) was used for the photographs. Some images of the habitus and the fore-

body were created using a photographing device constructed by Arved Lompe (Nienburg) and CombineZ software. The map was created using MapCreator 2.0 (primap) software.

Body length was measured from the anterior margin of the mandibles (in resting position) to the abdominal apex, the length of the forebody from the anterior margin of the mandibles to the posterior margin of the elytra, head length from the anterior margin of the frons to the posterior margin of the head, elytral length at the suture from the apex of the scutellum to the posterior margin of the elytra, and the length of the aedeagus from the apex of the ventral process to the base of the aedeagal capsule. The "parameral" side (i.e., the side where the sperm duct enters) is referred to as the ventral, the opposite side as the dorsal aspect.



Map 1: Distribution of *Echiaster* species in Asia. *Echiaster discrepans* (white circles); *E. bivirgatus* (white diamonds); *E. maior* (white triangles); *E. paulexcisus* (black diamond); *E. unicolor* (black circles).

Descriptions of new species and additional records

Echiaster unicolor BERNHAUER, 1922 (Map 1)

Material examined: Taiwan: 2 exs., Taitung Hsien, Hsinkangshan, above Chengkang, 900 m, 19.IV.1995, leg. Smetana [T184] (cSme, cAss); 6 exs., Taichung, Chipen-wenchuan, 400 m, 24.-27.IV.2001, leg. Sugaya (MNHUB, cAss); 6 exs., same data, but 6.-8.XI.2000 (MNHUB, cAss). China: 2 exs., W-Sichuan, Ganzi Tibet. Aut. Pref., Luding Co., tributary of Da

He river, 29°53'N, 102°13'E, 1250 m, river bank, 21.VI.1999, leg. Wrase (cRou); 1 ex., Fujian, Wuyi Shan, Qiliqiao-Guadun road, 27.75°N, 117.64°E, 1200 m, mixed forest litter, 1.VI.2001, leg. Cooter & Hlavác (cRou); 1 ex., Guangxi, Maoer Shan, 23.VIII.1998, leg. Fellowes (cRou).

C o m m e n t : *Echiaster unicolor* is rather common in Taiwan. In China, the species was previously known from Zhejiang, Yunnan, and Hunan provinces (ASSING 2011). The currently known distribution is illustrated in Map 1.

Echiaster maior ASSING, 2013 (Map 1)

M a t e r i a l e x a m i n e d : China: 1 ex., Yunnan, Nujiang Lisu Aut. Pref., Gongshan Co., Gaoligong Shan, creek valley 17 km N Gongshan, 27°55'N, 98°40'E, 1525-1600 m, 20.VI.2005, leg. Smetana [C158] (cAss). Thailand: 1♀, Chiang Mai, Doi Inthanon, 1720 m, 7.XI.1985, leg. Burckhardt & Löbl (MHNG); 1♂, Doi Inthanon, 15.III.1982, leg. Rougemont (cRou); 1♀, Doi Inthanon, Doi Pui, 1100-1500 m, 10.XI.1995, leg. Wunderle (cAss).

C o m m e n t : The original description is based on a single male from Laos (ASSING 2013). The above material represents the first records from Thailand and China. The distribution is illustrated in Map 1.

Echiaster bivirgatus nov.sp. (Figs 1-8, Map 1)

T y p e m a t e r i a l : Holotype ♂: "NW THAILAND, W Pai, above waterfall, 800 m, 19.IV.2004, leg. W. Schawaller / Holotypus ♂ *Echiaster bivirgatus* sp.n. det. V. Assing 2013" (SMNS). Paratypes: 1♀: "THAILAND, C. Rai: Mae Yao, 13:III:1982, G. de Rougemont" (cRou); 1♀: "THAILAND Doi Inthanon, 15:III:1982, G. de Rougemont" (cAss); 2♀♀: "Thailand, Ban Maeo Microwave, Mae Hong Son Dist., 1250 m, 15.12.1990, P. Schwendinger" (MHNG, cAss); 1♂ [dissected prior to present study, aedeagus slightly damaged, sternite VIII completely destroyed], 2♀♀: "INDIA W. Bengal, Darjeeling distr., Mahanadi 1200 m 6.X.78, Besuchet-Löbl / Echiaster n. sp., G. de Rougemont 1999" (MHNG, cAss).

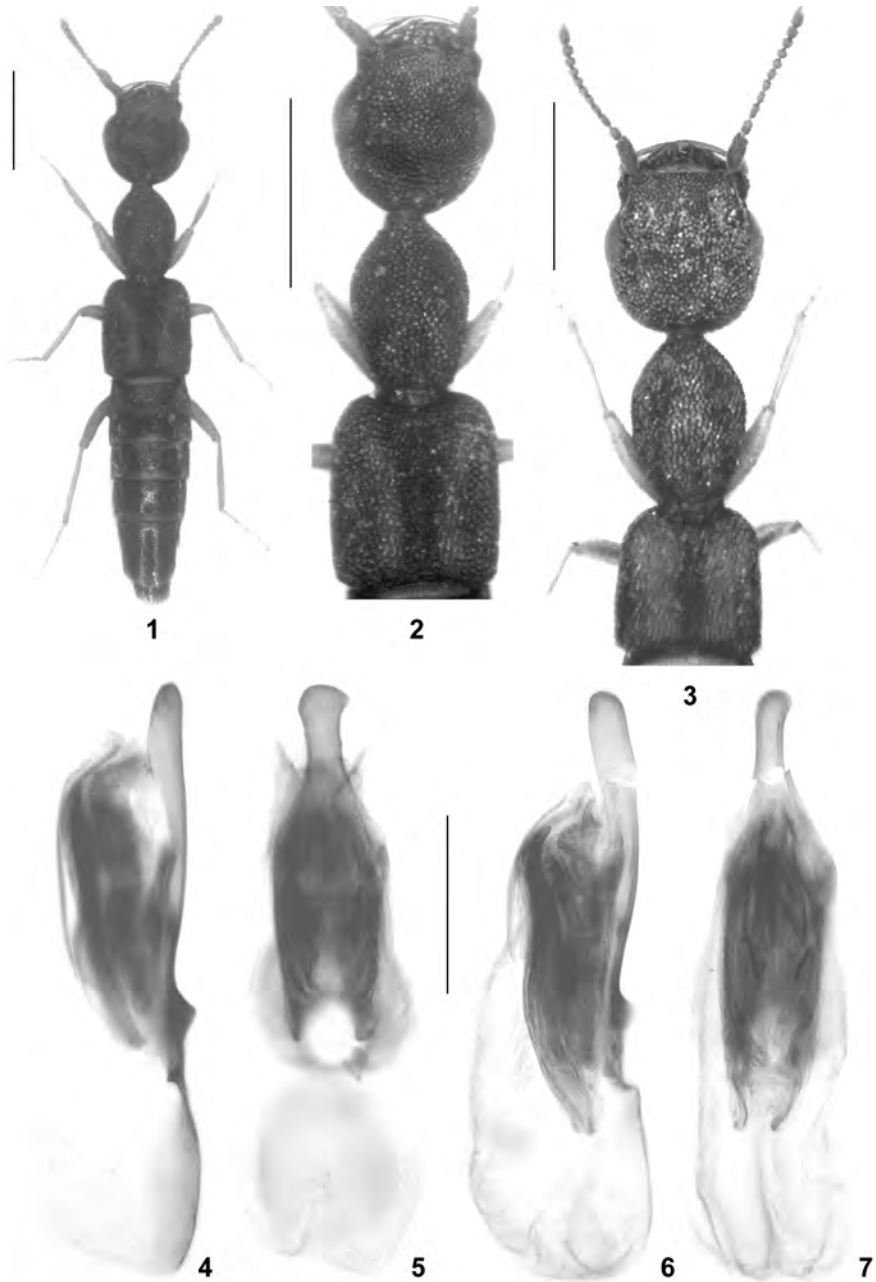
E t y m o l o g y : The specific epithet is an adjective composed of the Latin prefix bi- (two) and the Latin adjective virgatus (striped). It alludes to the pair of reddish bands on the elytra.

D e s c r i p t i o n : Body length 5.4-6.0 mm; length of forebody 2.8-3.1 mm. Species of slender habitus (Fig. 1). Coloration: forebody dark-brown to blackish-brown, elytra each with a long, often slightly curved reddish band of variable width extending from the humeral angles to the posterior margin, or nearly so; abdomen blackish; legs yellowish; antennae yellowish-red to reddish with brown antennomere I.

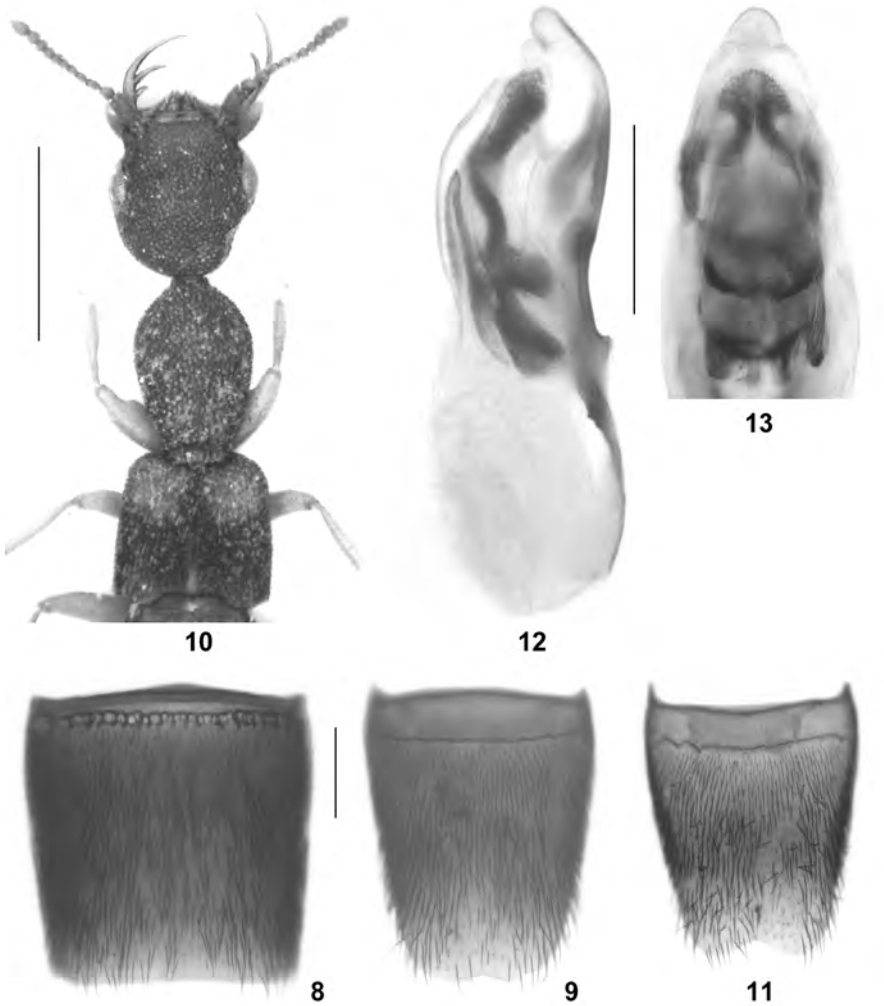
Head (Figs 2-3) approximately as broad as long, widest across eyes, behind eyes convexly narrowed towards neck in dorsal view; posterior angles obsolete; punctation coarse, areolate, and extremely dense; interstices reduced to narrow ridges; dorsal surface matt. Eyes conspicuously large, nearly as long as distance from posterior margin of eye to posterior constriction of head in dorsal view. Antenna short, 1.0-1.1 mm long.

Pronotum (Figs 2-3) slender, approximately 1.4 times as long as broad and 0.71-0.75 times as broad as head; median portion shallowly impressed in posterior two thirds, this impression with median elevation in posterior third of pronotum; punctation similar to that of head, but slightly coarser.

Elytra (Figs 2-3) dimorphic, approximately 0.85 times as long and 1.4 times as broad as pronotum in macropterous morph, approximately 0.65 times as long and 1.3 times as broad as pronotum in brachypterous morph; humeral angles pronounced in macropterous morph, less pronounced in brachypterous morph; punctation very dense and granulose.



Figs 1-7: *Echiaster bivirgatus* nov.sp. (**1-2**, **4-5**: holotype; **3**, **6-7**: paratype from North India): (**1**) habitus; (**2-3)** forebody; (**4-7**) aedeagus in lateral and in ventral view. Scale bars: 1-3: 1.0 mm; 4-7: 0.2 mm.



Figs 8-13: *Echiaster bivirgatus* nov.sp., holotype (**8-9**) and *E. paulexcisus* nov.sp. (**10-13**): (**8**) male sternite VII; (**9**, **11**) male sternite VIII; (**10)** forebody; (**12**) aedeagus in lateral view; (**13**) apical portion of aedeagus in ventral view. Scale bars: 10: 1.0 mm; 8-9, 11-13: 0.2 mm.

Abdomen little more than 0.9 times as broad as elytra (macropterous morph) or broader than elytra (brachypterous morph), broadest at base, gradually tapering posteriad (Fig. 1); tergites III-V with very coarse and dense punctation; tergites VI-VIII with dense and fine punctation; posterior margin of tergite VII strongly convex, with palisade fringe both in macropterous and in brachypterous morph; tergite VIII distinctly oblong and with strongly convex posterior margin.

♂: sternite VII (Fig. 8) slender, as long as broad and with very dense dark pubescence, posterior margin weakly concave; sternite VIII (Fig. 9) distinctly oblong, nearly 1.3 times as long as broad, posterior margin convex and in the middle weakly concave; aedeagus 0.67 mm long and shaped as in Figs 4-7.

Intraspecific variation: The specimens from North India are all brachypterous and have elytra with a broad, nearly straight longitudinal reddish band on both elytra, whereas those from Thailand are all macropterous and have elytra with a very narrow and somewhat curved longitudinal reddish band (Figs 2-3). The aedeagus (Figs 4-7), however, is very similar, so that the observed differences are attributed to intra- rather than interspecific variation. Unfortunately, the abdominal sternite VIII of the sole male from India had been completely destroyed and was thus not available for examination.

Comparative notes: The new species is easily distinguished from *E. unicolor* and *E. maior* by numerous characters, particularly the larger eyes, the longer and differently coloured elytra, the more distinctly conical abdomen, the presence of a palisade fringe at the posterior margin of the male tergite VII, the more slender male sternite VII, the much shallower posterior excision of the male sternite VIII, and by the completely different morphology of the aedeagus. For illustrations of *E. unicolor* and *E. maior* see ASSING (2013).

Distribution and natural history: The specimens were collected in four localities in Thailand and one in North India (Map 1), the holotype at an altitude of 800 m, two of the paratypes from Thailand at 1250 m, and the specimens from India at 1200 m. Additional data are not available.

***Echiaster paulexcisus* nov.sp.** (Figs 10-13, Map 1)

Type material: Holotype ♂: "THAILAND: Chiang Mai, Doi Suthep, 1600 m, 4.XI.1985, Burckhardt-Löbl / Holotypus ♂ *Echiaster paulexcisus* sp.n. det. V. Assing 2014" (MHNG). Paratypes: 1♂, 2♀♀: same data as holotype (MHNG, cAss).

Etymology: The specific epithet is an adjective composed of the Latin adverb paulum (slightly) and the adjective excisus. It refers to the posteriorly shallowly excised male sternite VIII.

Description: Body length 5.0-5.7 mm; length of forebody 2.6-2.8 mm. Coloration: head and pronotum reddish to dark-brown; elytra dark-brown to blackish, each with a large and defined reddish, subcircular humeral spot; abdomen dark-brown to blackish; legs yellowish; antennae reddish, apically dark-yellowish.

Head (Fig. 10) 1.02-1.06 times as long as broad, widest across eyes, behind eyes convexly narrowed towards neck in dorsal view; posterior angles obsolete; punctation coarse, areolate, and extremely dense; interstices reduced to narrow ridges; dorsal surface matt. Eyes approximately 0.7-0.8 times as long as distance from posterior margin of eye to posterior constriction of head in dorsal view. Antenna 0.8-0.9 mm long.

Pronotum (Fig. 10) slender, 1.35-1.40 times as long as broad and 0.75-0.80 times as broad as head; median portion shallowly impressed in posterior two thirds, this impression with median elevation in posterior third of pronotum; punctation similar to that of head.

Elytra (Fig. 10) short, 0.65-0.70 times as long as pronotum, with somewhat depressed disc; humeral angles moderately pronounced; punctation very dense and granulose. Hind wings not examined, but apparently of reduced length.

Abdomen as broad as, or slightly narrower than elytra, broadest at segment V; tergites III-V with coarse and dense punctation; tergites VI-VIII with dense and fine punctation; posterior margin of tergite VII strongly convex, with palisade fringe; tergite VIII distinctly oblong and with strongly convex posterior margin.

♂: sternite VIII (Fig. 11) distinctly oblong, posterior excision shallow and broad; aedeagus (Figs 12-13) 0.65 mm long, ventral process basally broad (ventral view), apically semitransparent and strongly bent dorsad in lateral view.

Comparative notes: Based on the male sexual characters, particularly the similar general morphology of the aedeagus, *E. paulexcisus* is closely allied to *E. unicolor*, from which it differs by the shallow posterior excision of the male sternite VIII and by the slightly larger aedeagus with a ventral process of different shape (apex basally broader in ventral view, apically membranous, and strongly bent dorsad in lateral view).

Distribution and natural history: The type locality is situated to the west of Chiang Mai, North Thailand (Map 1), at an altitude of 1600 m.

***Echiaster discrepans* nov.sp.** (Figs 14-19, Map 1)

Type material: Holotype ♂: "INDIA 22 Madras, Palni H., Kodai Kanal, 2100 m, 11-XI-72, Besuchet Löbl Mussard / Holotypus ♂ *Echiaster discrepans* sp.n. det. V. Assing 2014" (MHNG). Paratypes: 5 exs.: same data as holotype (MHNG, cAss, cRou); 2 exs.: "INDIA N. 27 Madras, Palni H., 10 km N.O. de Kodai Kanal, 2150 m, 15-XI-72, Besuchet Löbl Mussard" (MHNG, cAss); 2 exs.: "INDIA N. 23 Madras, Palni H., au-dessus de Kodai Kanal, 2200 m, 12-XI-72, Besuchet Löbl Mussard" (MHNG); 2 exs.: "INDIA N. 26 Madras, Palni H., Berijan Lake, 2150 m, 14-XI-72, Besuchet Löbl Mussard" (MHNG).

Etymology: The specific epithet is the present participle of the Latin verb discrepare (to differ) and alludes to the numerous characters distinguishing this species from other congeners recorded from Asia.

Description: Conspicuously small species; body length 2.6-3.1 mm; length of forebody 1.4-1.6 mm. Habitus as in Fig. 14. Coloration: head dark-brown to blackish-brown, with the anterior portion reddish to reddish-yellow; pronotum brown; elytra brown, with the postero-lateral portions usually more or less extensively infuscate, sometimes leaving only the humeral angles, the anterior margins, and the anterior sutural portion paler; abdomen brown to dark-brown, with the apex, as well as the posterior and lateral margins of the segments reddish; legs and antennae yellowish.

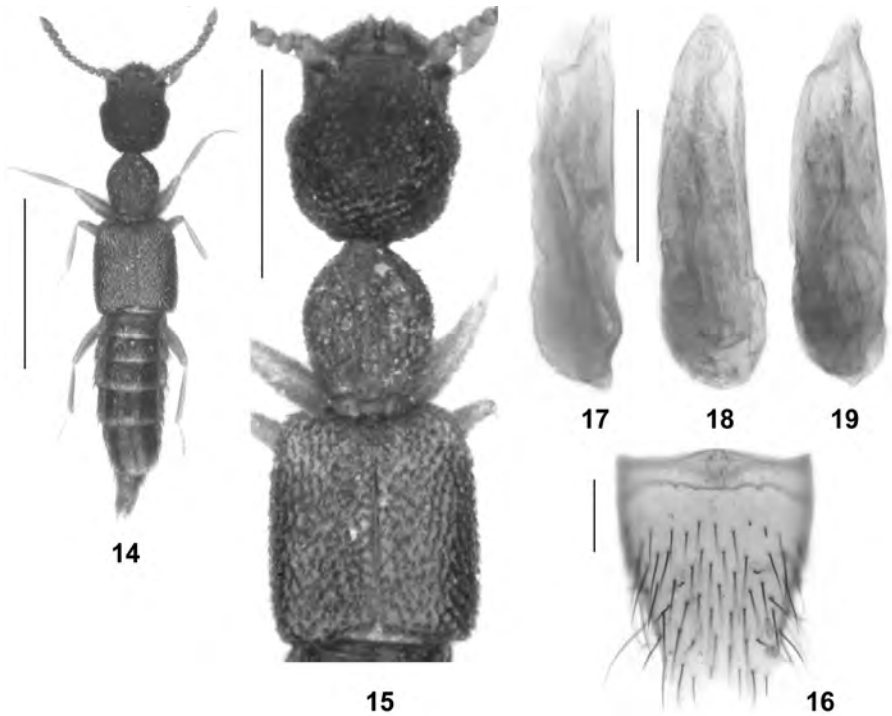
Head (Fig. 15) oblong and of subquadrangular shape, 1.05-1.10 times as long as broad and with rounded, but noticeable posterior angles; punctation coarse, very dense, and umbilicate; interstices reduced to narrow ridges, but glossy, surface not completely matt; eyes slightly more than half as long as distance between posterior margin of eye to posterior constriction of head in dorsal view. Antenna approximately 0.6 mm long.

Pronotum (Fig. 15) conspicuously small (in relation to head and elytra) and not particularly slender, approximately 1.15 times as long as broad and 0.75 times as broad as head; middle elevated or flat, not impressed; punctation similar to that of head.

Elytra (Fig. 15) relatively long and large, approximately 1.2 times as long and 1.5-1.6 times as large as pronotum; humeral angles pronounced; punctation very dense and coarse, not granulose. Hind wings fully developed.

Abdomen distinctly narrower than elytra; tergites III-V with moderately coarse and moderately dense, tergites VI-VIII with fine and moderately dense punctation; interstices glossy; posterior margin of tergite VII very weakly convex, with palisade fringe; tergite VIII distinctly oblong and with weakly convex posterior margin.

♂: sternite VIII (Fig. 16) oblong, with moderately dense pubescence composed of stout, long, and dark setae, posterior excision shallow; aedeagus (Figs 17-19) minute, approximately 0.25 mm long, weakly sclerotized, and of simple shape.



Figs 14-19: *Echiaster discrepans* nov.sp.: (**14**) habitus; (**15**) forebody; (**16**) male sternite VIII; (**17-19**) aedeagus in lateral and in ventral view. Scale bars: 14: 1.0 mm; 15: 0.5 mm; 16-19: 0.1 mm.

Comparative notes: *Echiaster discrepans* differs from other Asian representatives of the genus by numerous significant external and sexual characters, particularly much smaller body size, completely different habitus (much smaller and shorter pronotum, different head shape, much larger elytra), different punctation of the forebody and of the abdomen, posteriorly weakly convex posterior margins of the abdominal tergites VII and VIII, different chaetotaxy of the male sternite VII and VIII, and by the different general morphology of the aedeagus. The number and quality of these differences suggest that it probably belongs to a separate lineage.

Distribution and natural history: The species was collected in several localities near Kodaikanal [10°13'N, 77°29'E] in Tamil Nadu, South India (Map 1), at altitudes of 2100-2200 m.

Key to the Asian species of *Echiaster*

1 Minute species; body length < 3.2 mm; length of forebody < 1.7 mm. Forebody with dense punctation, but noticeable shine. Head oblong and of subquadrangular shape (Fig. 15). Pronotum conspicuously small in relation to head and elytra (Fig. 15). Elytra large and long (Fig 15). Abdominal tergites VI-VIII with moderately dense punctation; posterior margins of tergites VII and VIII very weakly convex. ♂: sternite VIII with long and distinctly sparser pubescence (Fig. 16); aedeagus minute, approximately 0.25 mm long, and shaped as in Figs 17-19. South India: Tamil Nadu (Map 1)..... .....*E. discrepans* nov.sp.

- Larger species; body length > 4.0 mm; length of forebody > 2.2 mm. Forebody matt. Head of oval shape (e.g., Figs 2-3, 10). Pronotum larger and much more oblong, at least approximately 1.3 times as long as broad. Elytra smaller and narrower (e.g., Figs 2-3, 10). Abdominal tergites VI-VIII with very dense punctation; posterior margins of tergites VII and VIII strongly convex. ♂: sternite VIII with short and very dense pubescence (e.g., Figs 9, 11); aedeagus distinctly larger and of different shape. Unknown from South India 2

2 Each elytron with longitudinal reddish band extending from humeral angles to posterior margin, or nearly so. Eyes large, nearly as long as distance from posterior margin of eye to posterior constriction of head (Figs 2-3). ♂: sternite VIII shaped as in Fig. 9; ventral process of aedeagus apically long and slender (Figs 4-7). Thailand, North India (Map 1) ..... *E. bivirgatus* nov.sp.

- Elytra of uniform coloration or with subcircular reddish humeral spot of variable size. Eyes smaller. ♂: sternite VIII of different shape; ventral process of aedeagus apically shorter and less slender 3

3 Larger species; body length 5.3-5.7 mm; length of forebody 3.0-3.3 mm. ♂: sternite VIII shaped as in ASSING (2013: figure 4); aedeagus larger, 0.75 mm long (ASSING 2013: figures 5-6). Laos, Thailand, China: Yunnan (Map 1) ..... *E. maior* ASSING, 2013

- Smaller species; length of forebody < 3.0 mm. ♂: aedeagus approximately 0.65 mm long at most 4

4 ♂: sternite VIII with very shallow posterior excision (Fig. 11); aedeagus larger, approximately 0.65 mm long; ventral process basally broader in ventral view and apically strongly bent dorsad in lateral view (Figs 12-13). North Thailand (Map 1) ..... *E. paulexcisus* nov.sp.

- ♂: sternite VIII with deeper posterior excision; aedeagus smaller, approximately 0.55 mm long; ventral process basally more slender in ventral view and apically weakly bent dorsad in lateral view (ASSING 2013: figures 7-8). Widespread: China, Taiwan, South Japan (Map 1) ..... *E. unicolor* BERNHAUER, 1922

Acknowledgements

I am indebted to the colleagues mentioned in the material section for the loan of the material which this study is based on. Benedikt Feldmann (Münster) proof-read the manuscript.

Zusammenfassung

Drei Arten der Gattung *Echiaster* ERICHSON, 1839 aus Asien werden beschrieben und abgebildet: *Echiaster bivirgatus* nov.sp. (Thailand, Nordindien), *E. paulexcisus* nov.sp. (Thailand) und *E. discrepans* nov.sp. (Südindien). Weitere Nachweise von *E. unicolor* BERNHAUER, 1922 und *E. maior* ASSING, 2013 werden aus Thailand, Taiwan und China gemeldet. Die Gattung ist derzeit mit fünf Arten in Asien vertreten. Diese gehören zwei phylogenetischen Linien an, davon eine mit einer Art (*E. discrepans*) aus Südindien und die andere mit den übrigen vier Arten. Eine Bestimmungstabelle wird erstellt. Die Verbreitung der Gattung in Asien wird anhand einer Verbreitungskarte illustriert.

References

ASSING V. (2011): A revision of *Sclerochiton* (Coleoptera: Staphylinidae: Paederinae). — Beiträge zur Entomologie, Keltern **61** (2): 413-453.

ASSING V. (2013): The second species of *Echiaster* from Asia (Coleoptera: Staphylinidae: Paederinae). — Linzer biologische Beiträge **45** (2): 1527-1530.

Author´s address: Dr. Volker ASSING
Gabelsbergerstr. 2
D-30163 Hannover, Germany
E-mail: vassing.hann@t-online.de