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On the *Oedichirus* fauna of China (Coleoptera: Staphylinidae: Paederinae)

V. ASSING

A b s t r a c t : Three micropterous species of *Oedichirus* ERICHSON, 1839 from Yunnan, China, are described and illustrated: *O. latexciscus* nov.sp. (environs of Dongchuan), *O. schuelkei* nov.sp. (Diancang Shan), and *O. abbreviatus* nov.sp. (environs of Tengchong). The genus is now represented in China and Taiwan by six described species, four of them micropterous. A key to the species of China and Taiwan is provided. The distributions of the micropterous species are mapped.

K e y w o r d s : Coleoptera, Staphylinidae, Paederinae, Pinophilini, *Oedichirus*, Palaearctic region, China, taxonomy, new species, key to species, distribution map

Introduction

Oedichirus ERICHSON, 1839 has a mainly circumtropical distribution and currently includes approximately 320 species (ASSING 2013; HERMAN 2013). HERMAN (2010) provided a list of species. According to SMETANA (2004), *Oedichirus* was previously represented in the Palaearctic region by fifteen species. The only key available for the species of the northern Oriental region is that by CAMERON (1931), who included eight species from India, Sri Lanka, and Burma. Two additional species were described from Northeast India by ASSING (2013). Only two species had been recorded from China, the micropterous *O. flammeus* KOCH, 1939 from Tianmu Shan in Zhejiang (known only from the type locality) and the macropterous *O. lewisius* SHARP, 1874, which was originally described from Japan and subsequently recorded also from North and South Korea, as well as from the Chinese provinces Guangxi and Shanghai (LI et al. 2010; SMETANA 2004; WANG 1990). One macropterous species, *O. kuroshio* HAYASHI, 1989, is known from Taiwan.

A study of several specimens from the collection of Michael Schülke (Berlin) and one male collected during a recent field trip to China, all of them micropterous and from Yunnan, revealed that they represent three undescribed species.

Material and methods

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

cAss..... Author's private collection

cSch..... Private collection Michael Schülke, Berlin

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena). The photographs were taken with 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.

Species descriptions

Oedichirus latexciscus nov.sp. (Figs 1-8, Map 1)

Type material: Holotype ♂: "CHINA [1a] - Yunnan, mts NW Dongchuan, 2350 m, 26°10'00"N, 103°03'32"E, trail side, 8.VIII.2014, V. Assing / Holotypus ♂ *Oedichirus latexciscus* sp.n. det. V. Assing 2014" (cAss).

Etymology: The specific epithet is an adjective composed of the Latin adjective *latus* (broad) and the past participle of the Latin verb *excidere* (to cut out). It alludes to the broad posterior excision of the male sternite VIII, one of the characters distinguishing this species from the similar *O. flammeus*.

Description: Large species; body length 11.5 mm; length of forebody 5.0 mm. Coloration: forebody reddish-brown; abdomen with segments III-VII dark-brown and segments VIII-X reddish-brown; legs, antennae, and maxillary palpi pale-yellowish.

Head (Fig. 1) approximately 1.15 times as broad as long, broadest across eyes; lateral contours behind eyes smoothly curving towards posterior constriction, posterior angles obsolete; dorsal surface with moderately sparse and irregular coarse punctures, postero-median area and frons impunctate. Eyes strongly convex, slightly longer than distance from posterior margin of eye to posterior constriction. Antenna 3.5 mm long and shaped as in Fig. 1.

Pronotum (Fig. 1) 1.22 times as long as broad and approximately 1.05 times as broad as head, widest anteriorly and distinctly tapering posteriorly; punctation similar to that of head; median portion of pronotum with two series of punctures situated in a furrow, these series separated by a distance of approximately one-fourth the width of pronotum; area between these series anteriorly with moderately dense coarse punctures and posteriorly impunctate.

Elytra (Fig. 1) short, 0.67 times as long as pronotum and depressed; humeral angles completely obsolete; punctation very coarse and dense. Hind wings completely reduced.

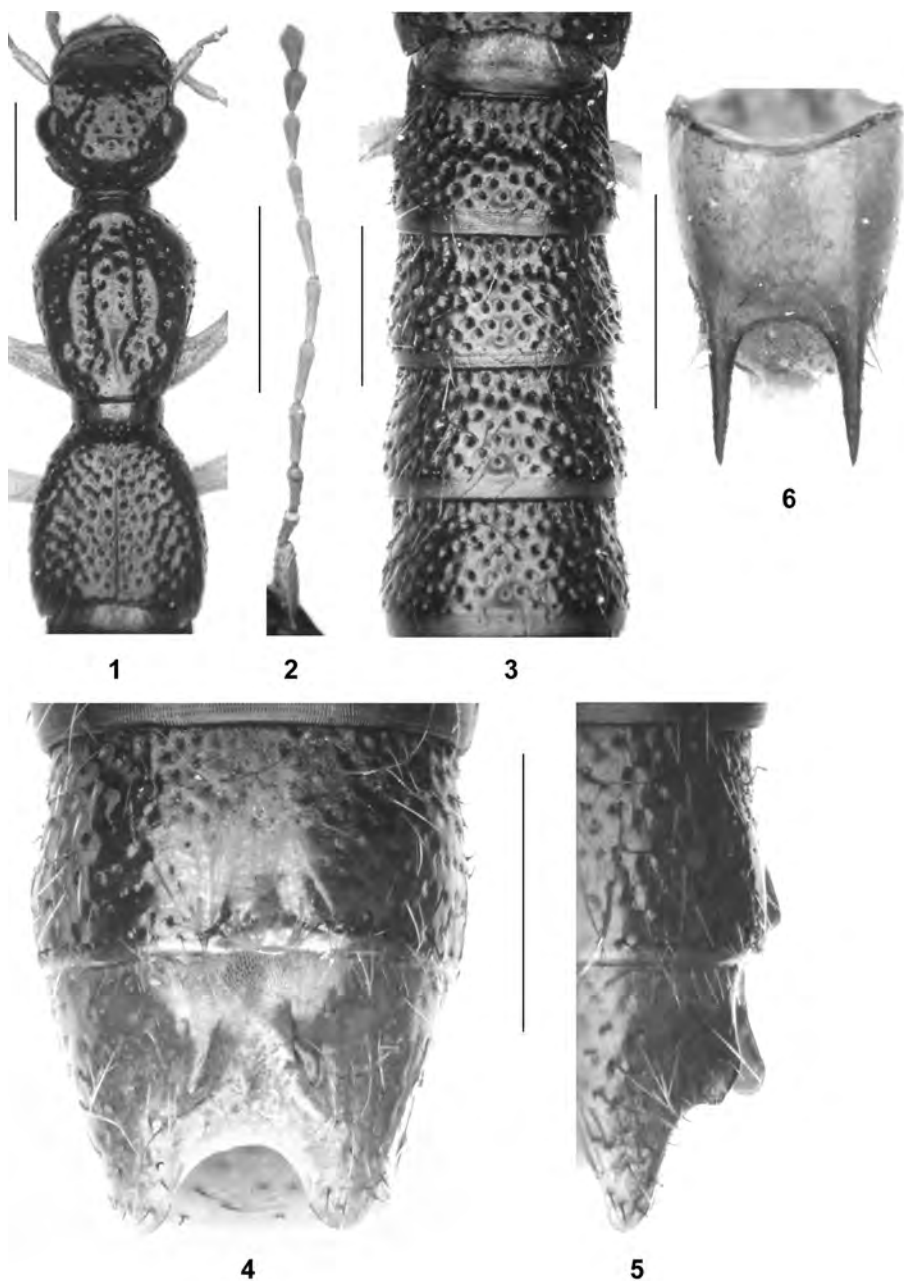
Abdomen (Fig. 3) slightly broader than elytra; punctation irregular, not arranged in transverse rows, coarse and dense on tergites III-VI, sparser and less deep on tergites VII-VIII; anterior impressions of tergites III-VI without longitudinal keels; anterior impressions of tergites III-VII with pronounced reticulate microsculpture, remainder of tergal surfaces with very shallow and fine microsculpture composed of transverse striae; microsculpture of tergite VIII composed of transverse meshes; posterior margin of tergite VII without palisade fringe.

♂: sternite VII (Figs 4-5) with an impression of subtriangular shape in postero-median portion, this impression nearly impunctate and laterally delimited by a moderately pronounced oblique fold on either side, posterior margin weakly concave in the middle; sternite VIII (Figs 4-5) strongly impressed in postero-median portion and with a pair of pronounced oblique folds in the middle, median portion without setae, posterior margin with broad, not very deep, and slightly asymmetric median excision; tergite IX (Fig. 6) with pair of rather long and acute posterior processes, these processes approximately 0.85 times as long as median portion of tergite IX; aedeagus (Figs 7-8) 1.8 mm long; ventral process apically obliquely and asymmetrically truncate in ventral view, subapically with two conspicuous processes of completely different shapes, the left process (ventral view) long, asymmetrically spear-shaped, and curved apicad, the right process much shorter and apically broadly bifid; parameres moderately long, of different lengths, right paramere (ventral view) longer than left paramere; dorsal plate not distinctly sclerotized.

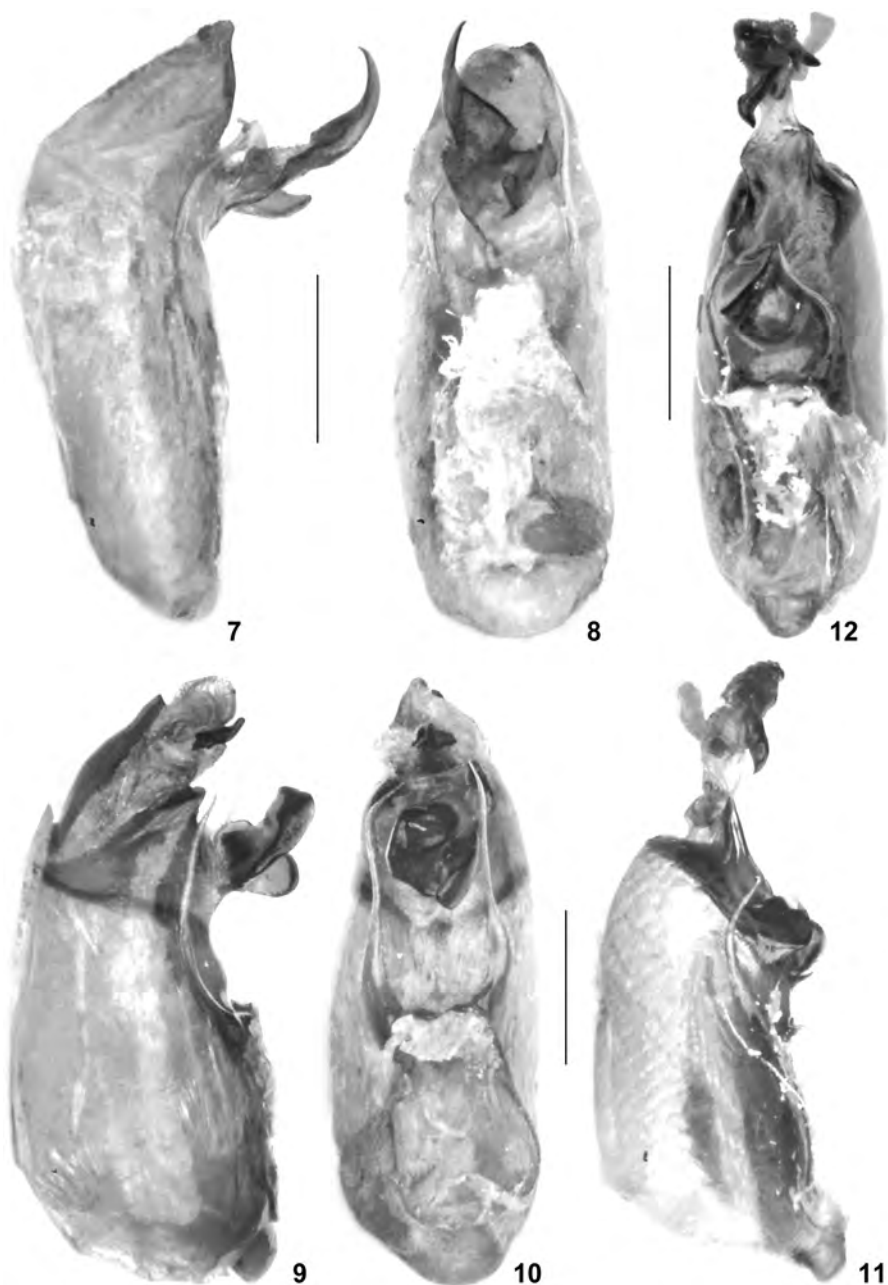
♀: unknown.

Comparative notes: The similarly modified male primary and secondary sexual characters suggest that *O. latexcisus* is closely allied to the similarly coloured *O. flammeus*, from which it differs by smaller body size (*O. flammeus*: length of forebody < 4.0 mm), the more slender, more densely punctate, and sublaterally more distinctly impressed pronotum, the longer and more slender elytra, the more pronounced impression and folds of the male sternite VII, the broader and less deep posterior excision of the male sternite VIII, and by the differently shaped subapical processes of the aedeagus. In the key by CAMERON (1931), *O. latexcisus* would key out at couplet 7 together with *O. niger* CAMERON, 1914 (South India) and *O. minor* CAMERON, 1914 (Sri Lanka). The new species is readily distinguished from both of them by the paler coloration and larger size alone, from the former additionally by shorter elytra and from the latter by a much more oblong pronotum.

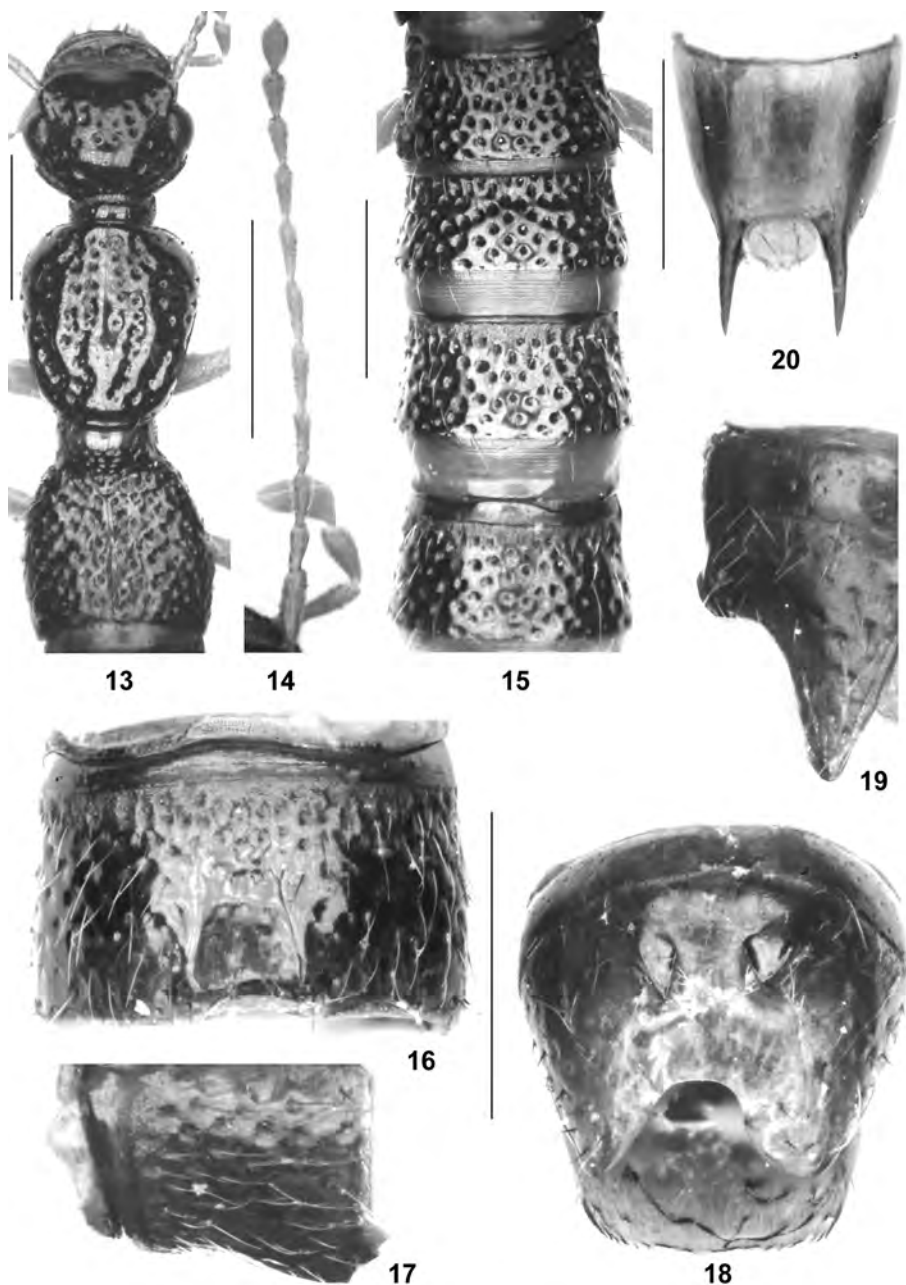
Distribution and natural history: The type locality is situated in a mountain approximately 15 km to the northwest of Dongchuan, Yunnan (Map 1), at an altitude of 2350 m. The specimen was collected by sifting litter and the roots of herbs and grass at and near the margin of a mountain trail.



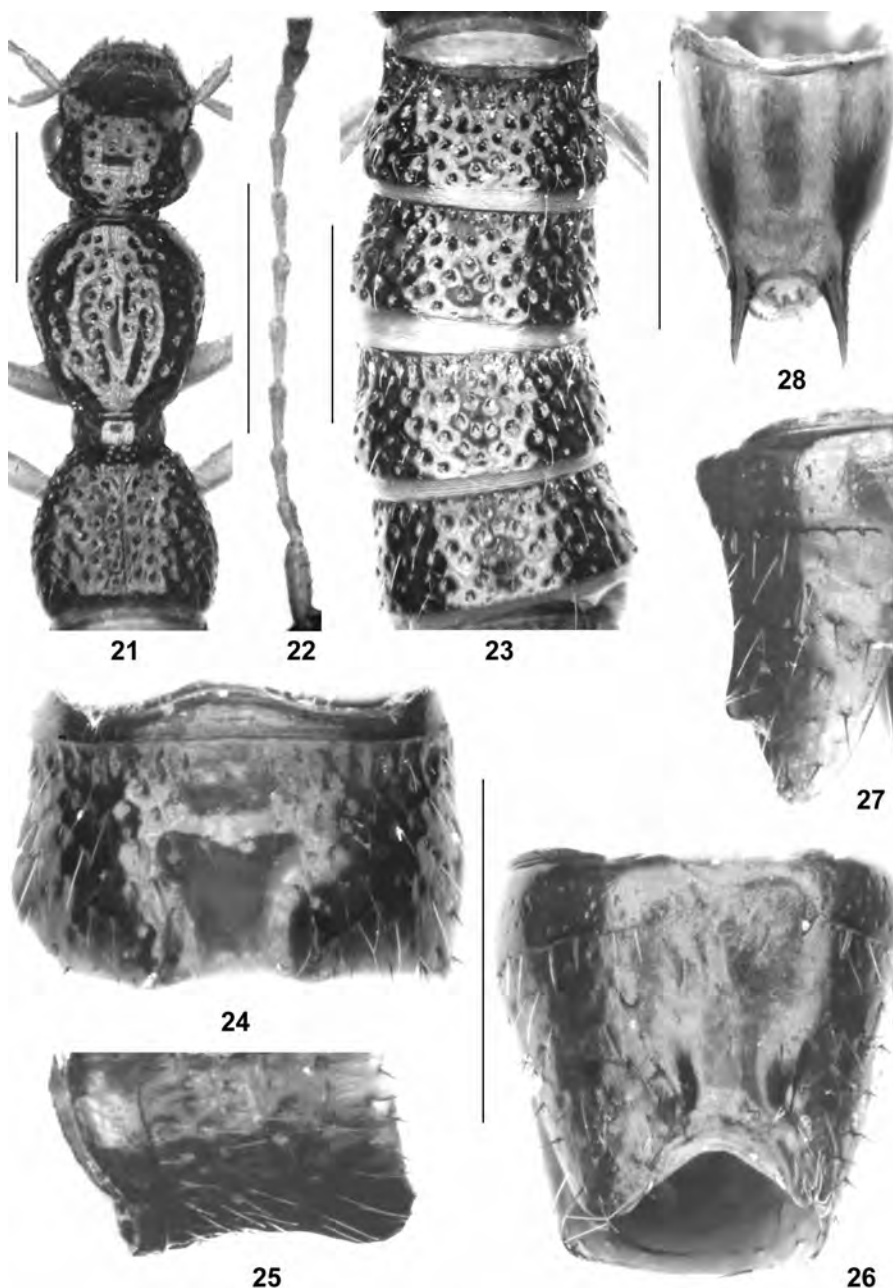
Figs 1-6: *Oedichirus latexcisus* nov.sp.: (1) forebody; (2) antenna; (3) abdominal segments III-VI in dorsal view; (4) male abdominal segments VII-VIII in ventral view; (5) male abdominal segments VII-VIII in lateral view; (6) male tergites IX-X. Scale bars: 1.0 mm.



Figs 7-12: Aedeagi of *Oedichirus* species in lateral and in ventral view: (7-8) *Oedichirus latexcisus* nov.sp.; (9-10) *O. schuelkei* nov.sp.; (11-12) *O. abbreviatus* nov.sp. Scale bars: 0.5 mm.



Figs 13-20: *Oedichirus schuelkei* nov.sp.: (13) forebody; (14) antenna; (15) abdominal segments III-VI in dorsal view; (16) male sternite VII in ventral view; (17) male sternite VII in lateral view (turned by 90°); (18) male segment VIII in ventral view; (19) male sternite VIII in lateral view; (20) male tergites IX-X. Scale bars: 1.0 mm.



Figs 21-28: *Oedichirus abbreviatus* nov.sp.: (21) forebody; (22) antenna; (23) abdominal segments III-VI in dorsal view; (24) male sternite VII in ventral view; (25) male sternite VII in lateral view (turned by 90°); (26) male segment VIII in ventral view; (27) male sternite VIII in lateral view; (28) male tergites IX-X. Scale bars: 1.0 mm.

***Oedichirus schuelkei* nov.sp.** (Figs 9-10, 13-20, Map 1)

Type material: Holotype ♂: "CHINA: N-Yunnan [C03-19A], Dali Bai Nat. Aut. Pref., Diancang Shan, 3 km W Dali old town, pine forest at "Cloud Road", right upper chairlift station, 25°41.1'N, 100°06.8'E, 2650-2750 m, / [C03-19A] pine needles, moss (dry) in ditches, 30.VIII.2003, leg. M. Schülke / Holotypus ♂ *Oedichirus schuelkei* sp.n. det. V. Assing 2014" (cAss). Paratypes: 1 ♀: same data as holotype (cSch); 1 ♀: "CHINA (N-Yunnan) Dali Bai Nat. Aut. Pref., Diancang Shan, 5 km SSW Dali old town, creek valley above cablecar, 2800 m, 25°38.7'N, 100°08.3'E (shrubs, bamboo, moss, old flood debris [sic]), 26.VIII.2003 Wrase [15]" (cSch).

E t y m o l o g y : This species is dedicated to Michael Schülke, who collected most of the type material of this and the following species.

D e s c r i p t i o n : Moderately large species; body length 9.0-10.0 mm; length of forebody 3.8-4.2 mm. Coloration: body uniformly black; legs, antennae, and maxillary palpi pale-yellowish.

Head (Fig. 13) strongly transverse, 1.25-1.35 times as broad as long, broadest across eyes; lateral contours behind eyes converging in nearly straight line, posterior angles obsolete; dorsal surface with sparse and coarse punctures, postero-median area and frons impunctate; median dorsal portion only with few punctures. Eyes strongly convex, slightly longer than distance from posterior margin of eye to posterior constriction. Antenna 2.4-2.9 mm long and shaped as in Fig. 14.

Pronotum (Fig. 13) 1.12-1.14 times as long as broad and approximately 1.05 times as broad as head, widest anteriorly and distinctly tapering posteriorly; punctuation coarse, moderately dense, irregularly distributed or partly arranged in indistinct series on either side of midline; midline and oblong lateral areas impunctate.

Elytra (Fig. 13) short, approximately 0.60 times as long as pronotum, depressed, and with distinctly convex lateral contours; humeral angles completely obsolete; punctuation coarse and moderately dense to dense. Hind wings completely reduced.

Abdomen (Fig. 15) slightly broader than elytra; punctuation not arranged in transverse rows, coarse, dense, and defined on tergites III-VI, sparser and less deep on tergites VII-VIII; anterior impressions of tergites III-VI without longitudinal keels; near anterior margins of tergites III-VII narrowly with pronounced reticulate microsculpture, remainder of tergal surfaces with very shallow and fine microsculpture composed of transverse striae; microsculpture of tergite VIII composed of distinct isodiametric meshes; posterior margin of tergite VII with narrow rudiment of a palisade fringe.

♂: sternite VII (Figs 16-17) with an approximately square-shaped impression in postero-median portion, this impression sparsely and finely punctate and laterally delimited by a pronounced fold on either side, posterior margin weakly concave in the middle; sternite VIII (Figs 18-19) strongly impressed and without setae in posterior portion, anteriorly with a pair of structures shaped like oblique scrapers, and with a rather large, slightly asymmetric posterior excision; tergite IX as in Fig. 20; aedeagus (Figs 9-10) 1.65 mm long; ventral process apically concave and with two short lateral process in ventral view, subapically with a process divided into two blades of different shapes; parameres apically curved, moderately long, of different lengths, right paramere (ventral view) longer than left paramere; dorsal plate sclerotized, flat, and apically narrowed in dorsal view.

♀: posterior margin of sternite VIII truncate.

C o m p a r a t i v e n o t e s : *Oedichirus schuelkei* is readily distinguished from other previously described congeners recorded from China by the uniformly black body alone. For characters distinguishing it from the similar *O. abbreviatus* see the compara-

tive notes in the following section. In the key by CAMERON (1931), *O. schuelkei* would key out at couplet 7 together with *O. niger* and *O. minor*. The new species is readily distinguished from the former by distinctly shorter elytra and from the latter by much larger size alone.

Distribution and natural history: The specimens were collected in two localities near Dali, West Yunnan (Map 1), by sifting litter, debris, and moss in a pine forest and in a stream valley at altitudes between 2650 and 2800 m.

***Oedichirus abbreviatus* nov.sp.** (Figs 11-12, 21-28, Map 1)

Type material: Holotype ♂: "CHINA: Yunnan, Baoshan Pref., mount. range 25 km S Tengchong, 1900 m, 24°48'21"N, 98°32'05"E, cleft with devast. primary forest, litter & mushr. sifted, 30.VIII.2009, leg. M. Schülke [C09-18] / Holotypus ♂ *Oedichirus abbreviatus* sp.n. det. V. Assing 2014" (cAss). Paratypes: 2 ♀ ♀: "CHINA: Yunnan, Baoshan Pref., 10 km SE Kambaiti pass, 45 km NW Tengchong, 1700-1800 m, 25°21'13-29"N, 98°13'29-54"E, primary forest, litter and mushrooms sifted, 29.VIII.2009, leg. M. Schülke [C09-15]" (cSch).

E t y m o l o g y : The specific epithet (Latin, adjective: shortened) alludes to the short parameres of the aedeagus, one of the characters distinguishing this species from the similar *O. schuelkei*.

D e s c r i p t i o n : Moderately large species; body length 8.0-9.2 mm; length of fore-body 3.5-4.1 mm. Coloration: body uniformly black; legs, antennae, and maxillary palpi pale-yellowish.

Head (Fig. 21) transverse, 1.20-1.25 times as broad as long, broadest across eyes; lateral contours behind eyes converging in nearly straight line, posterior angles obsolete; dorsal surface with sparse and coarse punctures, postero-median region, except for the area near posterior constriction, and frons impunctate; median dorsal portion only with few punctures. Eyes strongly convex, distinctly longer than distance from posterior margin of eye to posterior constriction. Antenna 2.3-2.7 mm long and shaped as in Fig. 22.

Pronotum (Fig. 21) 1.08-1.14 times as long as broad and approximately 1.10-1.13 times as broad as head, widest anteriorly and distinctly tapering posteriorly; punctation coarse, moderately dense, and in anterior half irregularly distributed; median portion in posterior half with a V-shaped impunctate area, this area laterally delimited by two posteriorly converging series of punctures.

Elytra (Fig. 21) short, 0.55-0.58 times as long as pronotum, depressed, and with strongly convex lateral contours; humeral angles completely obsolete; punctation coarse and dense. Hind wings completely reduced.

Abdomen (Fig. 23) slightly broader than elytra; punctation not arranged in transverse rows, coarse, dense, and defined on tergites III-VI, sparse and less deep on tergites VII-VIII; anterior impressions of tergites III-VI without longitudinal keels; anterior impression of tergite III and narrow anterior portions of tergites III-VII with pronounced reticulate microsculpture (distinctly more extensive and more pronounced on tergite III than on tergites IV-VI), remainder of tergal surfaces with very shallow and fine microsculpture composed of transverse striae, on tergite VII also of transverse meshes; microsculpture of tergite VIII composed of distinct isodiametric meshes; posterior margin of tergite VII with narrow rudiment of a palisade fringe.

♂: sternite VII (Figs 24-25) with a relatively large, but shallow impression in postero-median portion, this impression impunctate and without setae, and postero-laterally delimited by a pronounced carina, posterior margin weakly concave in the middle; ster-

nite VIII (Figs 26-27) moderately impressed in postero-median portion, in the middle extensively impunctate and without setae, the impression postero-laterally delimited by a short but distinct carina on either side, posterior margin with slightly asymmetric, broad, but not very deep posterior excision; tergite IX as in Fig. 28; aedeagus (Figs 11-12) 1.60 mm long; ventral process apically concave in ventral view, subapically with two short processes of different shapes, the left one (ventral view) shaped like a scraper, the right one a blunt projection; parameres short and bisinuate, left paramere (ventral view) slightly longer than right paramere; dorsal plate reduced.

♀: posterior margin of sternite VIII truncate to weakly convex.

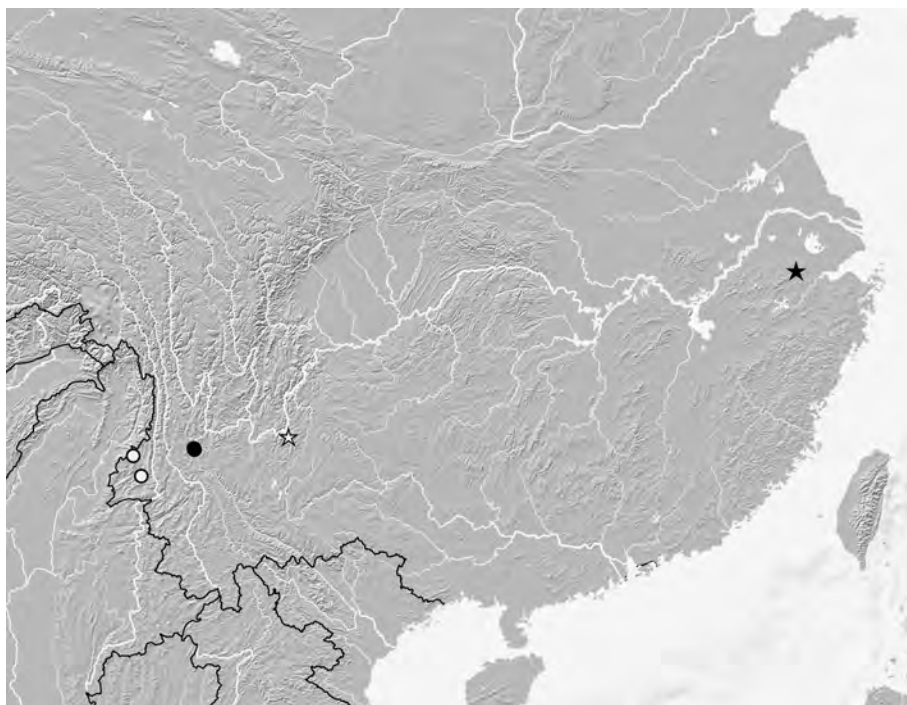
Comparative notes: *Oedichirus abbreviatus* is of similar coloration and general appearance as the geographically close *O. schuelkei*, but distinguished by slightly smaller average size, a less transverse head, larger eyes, an on average less oblong and (in relation to head) broader pronotum, the different punctuation of the head and pronotum, the slightly shorter and more transverse elytra, the less extensive and less pronounced isodiametric microsculpture at the anterior margins of the abdominal tergites IV-VII, and particularly by the different modifications of the male sternites VII and VIII, as well as by the different morphology of the aedeagus (shapes of ventral process and of subapical processes, reduced dorsal plate, much shorter parameres). In the key by CAMERON (1931), *O. abbreviatus* would key out at couplet 7 together with *O. niger* and *O. minor*. The new species is readily distinguished from the former by distinctly shorter elytra and from the latter by larger size.

Distribution and natural history: The specimens were collected in two localities near Tengchong, West Yunnan (Map 1), by sifting litter in primary forests at altitudes of 1700-1900 m.

Key to the *Oedichirus* species of China and Taiwan

- 1 Macropterous species. Elytra with pronounced humeral angles, much broader than, and at least approximately as long as pronotum. Abdomen bicoloured.2
- Micropterous species; elytra much shorter than pronotum, approximately 0.7 times as long as pronotum at most; humeral angles obsolete. Abdomen of more or less uniform coloration. Species with restricted distributions.3
- 2 Distinctly bicoloured species. Forebody with the reddish pronotum distinctly contrasting with the blackish head and the blackish elytra; abdomen with segments III-VI reddish and the apex (segments VII-X) blackish. Japan, North and South Korea; in China recorded from Shanghai and Guangxi.*O. lewisius* SHARP
- Forebody uniformly reddish-brown; abdomen with segments III-VI brown and the apex (segments VII-X) black. ♂: primary and secondary sexual characters as illustrated by HAYASHI (1989). South Japan, Taiwan.*O. kuroshio* HAYASHI
- 3 Body blackish with pale-yellowish appendages. Yunnan.4
- Body reddish to reddish-brown with pale-yellowish appendages5
- 4 Elytra slightly longer, approximately 0.6 times as long as pronotum (Fig. 13); pronotum with punctuation as in Fig. 13. ♂: sternite VII with smaller and sparsely punctate postero-median impression (Figs 16-17); sternite VIII anteriorly with a pair of obliquely scraper-shaped structures, posteriorly strongly impressed, and with deeper and less broad posterior excision (Figs 18-19); aedeagus with longer and distinctively shaped subapical processes, with distinct dorsal plate, and with longer parameres (Figs 9-10). Yunnan: Diancang Shan (Map 1).*O. schuelkei* nov.sp.

- Elytra slightly shorter, 0.55-0.57 times as long as pronotum (Fig. 21); pronotum in posterior half with two posteriorly converging series of punctures (Fig. 21). ♂: sternite VII with larger and impunctate postero-median impression (Figs 24-25); sternite VIII anteriorly without pair of elevations, with a pair of short carinae posteriorly, with a less pronounced posterior impression, and with a broader and shallower posterior excision (Figs 26-27); aedeagus with much shorter subapical processes of different shapes, with distinctly shorter parameres, and without distinct dorsal plate (Figs 11-12). Yunnan: environs of Tengchong (Map 1). *O. abbreviatus* nov.sp.
- 5 Larger species; length of forebody approximately 5.0 mm. Pronotum more oblong, approximately 1.2 times as long as broad (Fig. 1). Elytra longer, approximately 0.7 times as long as pronotum (Fig. 1). ♂: sternite VII with more pronounced postero-median impression and with pronounced pair of folds posteriorly (Figs 4-5); posterior excision of sternite VIII broader and less deep (Figs 4-5); aedeagus with subapical processes of distinctive shapes (Figs 7-8). Northeastern Yunnan (Map 1). *O. latexcisus* nov.sp.
- Smaller species; length of forebody < 4.0 mm. Pronotum less oblong, < 1.2 times as long as broad. Elytra shorter, < 0.7 times as long as pronotum. ♂: sternite VII with less pronounced postero-median impression and with less pronounced pair of folds; posterior excision of sternite VIII narrower and deeper; aedeagus with subapical processes of different shapes. Zhejiang: Tianmu Shan. *O. flammeus* KOCH



Map 1: Distributions of the micropterous *Oedichirus* species of China: *O. abbreviatus* (white circles); *O. schuelkei* (black circles); *O. latexcisus* (white star); *O. flammeus* (black star).

Acknowledgements

I am indebted to Michael Schülke, Berlin, for the loan of *Oedichirus* material from his collection and above all for the generous gift of two holotypes. Moreover, I am most grateful to Wenrong Li, Shanghai, for sharing unpublished photographs and an unpublished redescription of the holotype of *O. flammeus*, which enabled me to include the species in the key and which helped to clarify the status of *O. latexcisus*.

Zusammenfassung

Drei brachyptere Arten der Gattung *Oedichirus* ERICHSON, 1839 aus Yunnan, China, werden beschrieben und abgebildet: *O. latexcisus* nov.sp. (Umgebung von Dongchuan), *O. schuelkei* nov.sp. (Diancang Shan) und *O. abbreviatus* nov.sp. (Umgebung von Tengchong). Die Gattung ist damit in China und Taiwan mit sechs Arten vertreten, von denen vier brachypter und endemisch verbreitet sind. Eine Bestimmungstabelle der aus China und Taiwan bekannten Arten wird erstellt. Die Verbreitung der brachypteren Arten wird anhand einer Karte illustriert.

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