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A revision of *Sclerochiton*. II. Two new species and additional records, including the first records of the genus from Vietnam (Coleoptera: Staphylinidae: Paederinae)

Volker ASSING

Abstract: Two species of *Sclerochiton* KRAATZ, 1859 are described and illustrated: *Sclerochiton pectinatus* nov.sp. (Laos) and *S. peniculatus* nov.sp. (North Vietnam). Additional records of ten species are reported. The genus is recorded from Vietnam for the first time (two species). The distribution of the genus in the southern East Palearctic and Oriental regions and the individual distributions of all the species treated are mapped. *Sclerochiton* now includes a total of 23 described species, 17 of which are distributed in the southern East Palearctic and Oriental regions.

Key words: Coleoptera, Staphylinidae, Paederinae, *Sclerochiton*, Palearctic region, Oriental region, Vietnam, Laos, taxonomy, new species, new records, distribution maps.

Introduction

According to a recent revision, the distribution of the genus *Sclerochiton* KRAATZ, 1859 is discontinuous and includes both the Afrotropical (six species), as well as the Oriental and the adjacent southern East Palearctic regions (15 described species). In the latter regions, the distribution ranges from the western Himalaya (North Pakistan) to South India, China, Thailand, Laos, Malaysia, and Indonesia (Sumatra) (ASSING 2011).

In the meantime, additional material has been examined, including two new species from Laos and Vietnam, from where the genus is recorded for the first time.

Material and methods

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

MHNG Museum d'Histoire Naturelle, Genève (G. Cuccodoro)

MNHUB..... Museum für Naturkunde der Humboldt-Universität Berlin (J. Frisch)

NHMW Naturhistorisches Museum Wien (H. Schillhammer)

NME Naturkundemuseum Erfurt (M. Hartmann)

SNSD Senckenberg Naturhistorische Sammlungen Dresden (O. Jäger)

ZMUC..... Natural History Museum Denmark/ University of Copenhagen Zoological Museum (A. Solodovnikov)

cAss..... author's private collection

cSch..... private collection Michael Schülke, Berlin

cSha..... private collection Alexey Shavrin, Daugavpils

cWun..... private collection Paul Wunderle, Mönchengladbach

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena). The image of the forebody of *Sclerochiton peniculatus* was created using a photographing device constructed by Arved Lompe (Nienburg) and CombineZ software, the remaining photographs were taken with a digital camera (Nikon Coolpix 995). The maps were created using Map-Creator 2.0 (primap) software.

Body length was measured from the anterior margin of the labrum to the abdominal apex, the length of the forebody from the anterior margin of the labrum 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.

Results

Including the new taxa, *Sclerochiton* now includes 23 species, 17 of which are distributed in the southern East Palaearctic and Oriental regions, from the West Himalaya (Pakistan) in the northwest to South India, Indonesia (Sumatra), Malaysia, Vietnam, and China in the south and southeast (Map 1).

Sclerochiton indicus (MOTSCHULSKY, 1858) (Map 2)

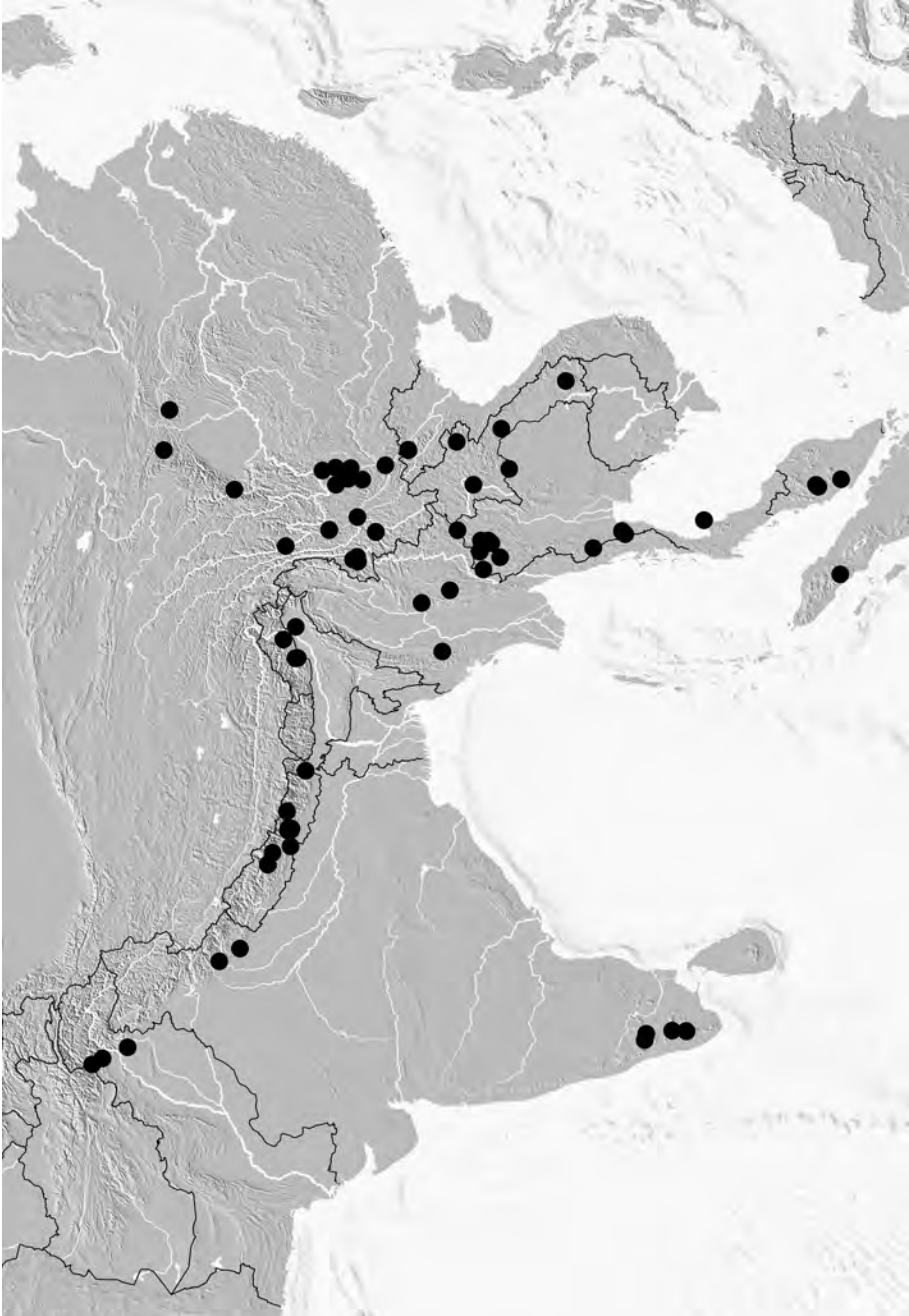
Material examined: India: 1♀, Uttarakhand, valley of Kosi river, 5 km N Ramnagar, 29°26'N, 79°08'E, 23.-26.IV.2012, leg. Shavrin (cSha).

Comment: *Sclerochiton indicus* is the most widespread species of the genus, its distribution ranging from North India and Nepal across Burma to South China and Thailand (Map 2).

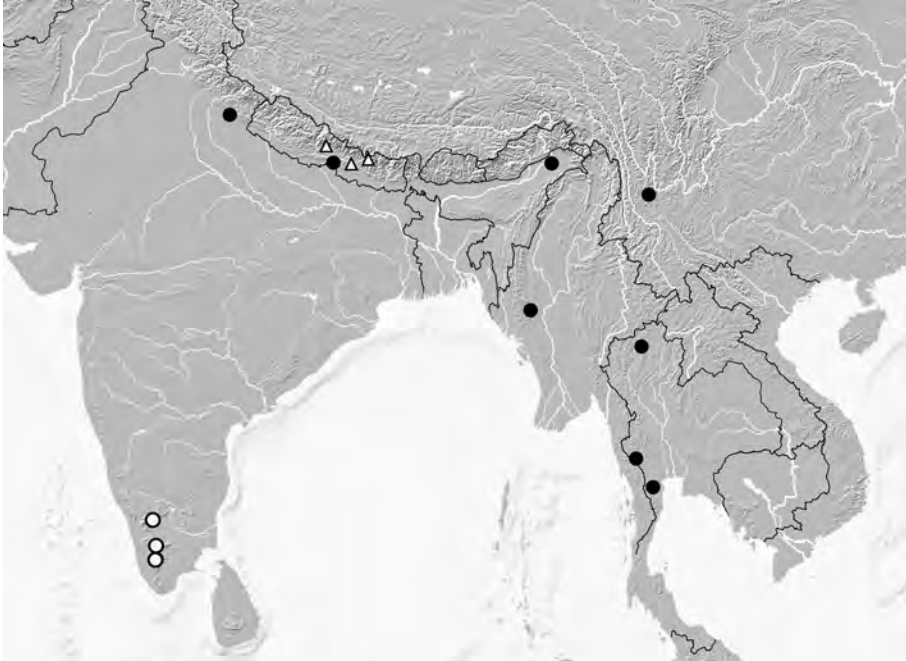
Sclerochiton bistipulatus ASSING, 2011 (Map 2)

Material examined: India: 1♂, Tamil Nadu, Nilgiri Hills, 15 km SE Kotagiri, Kunchappanai, 11°22'N, 76°56'E, 900 m, 15.XI.1993, leg. Boukal & Kejval (NHMW).

Comment: The known distribution of this species is confined to South India (Map 2).



Map 1: Distribution of *Sclerochiton* in the southern East Palearctic and Oriental regions (all records pooled).



Map 2: Distributions of *Sclerochiton indicus* (black circles), *S. penicillatus* (white triangles), and *S. bistipulatus* (white circles).

***Sclerochiton unicolor* COIFFAIT, 1975 (Map 3)**

Material examined: Nepal: 2 ♀♀, southeastern Dhaulagiri Himal, Rahughat Khola valley, river bank S Dwari, 28°31'N, 83°31'E, 1850 m, 10.V.2002, leg. Jäger (SNSD, cAss).

Comment: This Himalayan species is currently known from Nepal and North India (Map 3).

***Sclerochiton penicillatus* ASSING, 2011 (Map 2)**

Material examined: Nepal: 1 ♀, Annapurna, Madi Khola valley, below Siklis, 1500 m, 10.V.1996, leg. Schmidt & Jäger (SNSD); 1 ♂, 1 ♀, Gandaki province, Sikles range, water power station, 1450 m, 10.V.1996, leg. Schmidt (NME, cAss); 2 ♀♀, Bagmati province, 15 km S Kathmandu, Phulchoki, 27°35'N, 85°23'E, 1600-1800 m, deciduous forest, 18.VII.2001, leg. Weigel (NME).

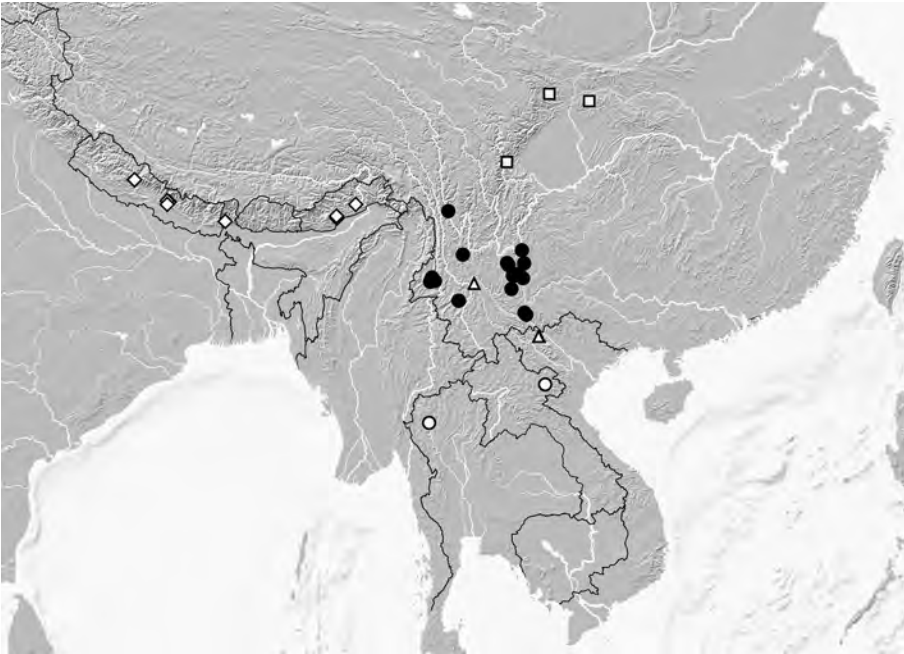
Comment: *Sclerochiton penicillatus* has been recorded only from Nepal (Map 2).

***Sclerochiton schuelkei* ASSING, 2011 (Map 3)**

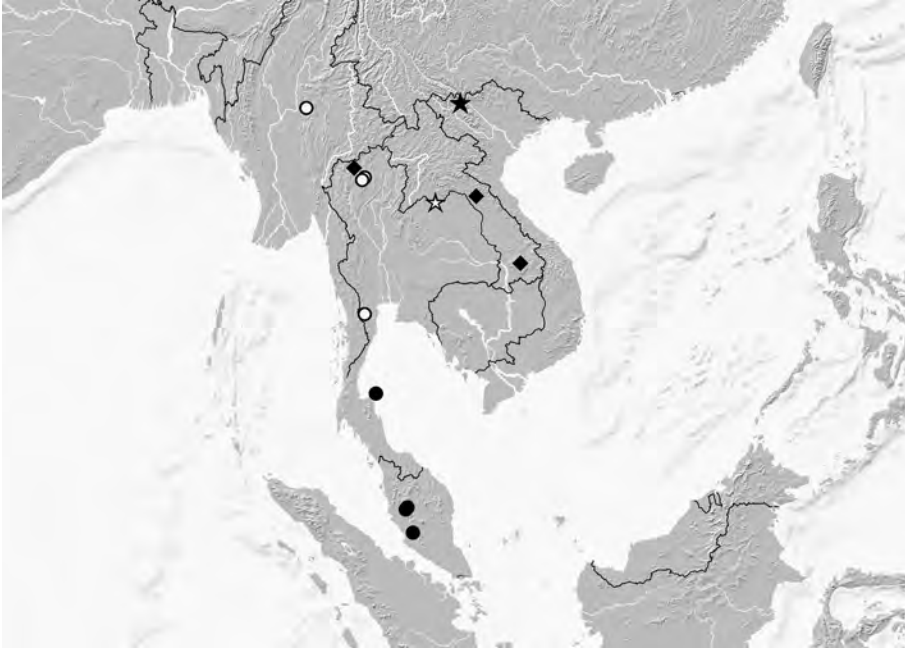
Material examined: China: Yunnan: 3 ♀♀, 100 km W Kunming, Diaolin Nat. Res., 22.V.-2.VI.1993, leg. Jendek & Sausa (NHMW, cAss); 2 ♂♂, 1 ex., mountains NW Dongchuan, 26°10'N, 103°04'E, 2350 m, trail margin, litter and soil between herbs sifted, 8.VIII.2014, leg. Assing & Schülke (cAss, cSch); 1 ♀, 1 ex., E Kunming, Xiaobailong Forest Park, 24°56'N, 103°05'E, 2110 m, secondary pine forest, pine litter and litter at trail margin sifted,

10.VIII.2014, leg. Assing & Schülke (cAss, cSch); 12♂♂, 7♀♀, 49 exs., NE Kunming, 25°09'N, 102°54'E, 2280 m, secondary pine forest, with scattered old alder, litter sifted, 11.VIII.2014, leg. Assing & Schülke (cAss, cSch, MNHUB); 1♀, mountain W Xundian, 25°35'N, 103°09'E, 2200 m, mixed forest with alder and pine, bark of rotting pine trunk with termites sifted, 15.VIII.2014, leg. Assing (cAss); 10♂♂, 9♀♀, 3 exs., mountain W Xundian, 25°35'N, 103°09'E, 2300 m, mixed forest with alder, pine, shrub undergrowth, litter, twigs, and roots of herbs sifted, 15.VIII.2014, leg. Assing & Schülke (cAss, cSch, MNHUB); 1♀, 1 ex., mountain W Xundian, 25°35'N, 103°09'E, 2300 m, mixed forest with alder, pine, shrub undergrowth, litter, twigs, and roots of herbs sifted, 16.VIII.2014, leg. Assing & Schülke (cAss, cSch); 1 ex., Wuding, Lion Mountain Scenic Area, 25°32'N, 102°23'E, 2200 m, stream valley with deciduous forest, moist litter sifted, 17.VIII.2014, leg. Schülke (cSch); 1♀, 1 ex., mountain NW Wuding, 25°37'N, 102°19'E, 2190 m, degraded mixed forest with alder, oak, and pine, litter, mushrooms, and dead wood sifted, 17.VIII.2014, leg. Assing & Schülke (cAss, cSch); 1 ex., mountain SE Gejiu, 23°18'N, 103°12'E, 2400 m, graveyard with pine, pine litter and herb roots sifted, 20.VIII.2014, leg. Schülke (cSch); 19♂♂, 7♀♀, 12 exs., mountain W Gejiu, 23°24'N, 103°07'E, 1990 m, mixed forest, litter and various debris sifted, 23.VIII.2014, leg. Assing & Schülke (cAss, cSch, MNHUB); 1♂, 1♀, 19 exs., same data, but 24.VIII.2014 (cAss, cSch, MNHUB); 2♂♂, 3♀♀, 2 exs., same data, but 25.VIII.2014 (cAss, cSch, MNHUB); 1♀, 1 ex., mountain W Yuxi, 24°27'N, 102°30'E, 2250 m, secondary mixed forest, litter, roots, and moss sifted, 31.VIII.2014, leg. Assing & Schülke (cAss, cSch).

C o m m e n t : *Sclerochiton schuelkei* has been reported from Yunnan, with female-based records also from Thailand and Laos (Map 3). The new records suggest that this species is common at least in East Yunnan.



Map 3: Distributions of *Sclerochiton unicolor* (white diamonds), *S. schuelkei* (black circles: male-based records; white circles: female-based records), *S. barbatus* (white triangles), and *S. acutissimus* (white squares).



Map 4: Distributions of *Sclerochiton sinuatus* (white circles), *S. excisus* (black circles), *S. rougemonti* (black diamonds), *S. peniculatus* (black stars), and *S. pectinatus* (white star).

***Sclerochiton acutissimus* ASSING, 2011 (Map 3)**

Material examined: China: 2♂♂, 1♀, 11 exs., S-Gansu, S Longnan, Min Shan, 33°05'N, 104°45'E, 1500 m, N-slope, macchia, litter and moss sifted, 6.VIII.2012, leg. Assing & Schülke (cAss, cSch); 1 ex., N-Sichuan, Micang Shan, 42 km S Hanzhong, 32°41'N, 106°49'E, 1090 m, NW-slope, mixed forest margin with rocks, litter, grass, and moss sifted, 14.VIII.2012, leg. Wrase (cSch); 5♂♂, 4♀♀, 2 exs. [partly teneral], N-Sichuan, Micang Shan, 42 km S Hanzhong, 32°41'N, 106°49'E, 1090 m, stream valley, shady S-slope, secondary mixed forest, litter, grass, and herbs along path sifted, 17.VIII.2012, leg. Assing & Schülke (cAss, cSch).

Comment: This species was previously known only from the environs of Labahe in West Sichuan (Map 3).

***Sclerochiton rougemonti* ASSING, 2011 (Map 4)**

Material examined: Laos: 6 exs., Champasak province, Bolaven plateau, Muang Paxong, Ban Thongvay, 15°14'N, 106°32'E, 1000-1200 m, disturbed primary rainforest, 7.-16.VI.2008, leg. Solodovnikov & Pedersen (ZMUC, cAss); 1♀, Khammouane province, Ban Khounkham (Nahin), 18°13'N, 104°31'E, 300 m, disturbed primary rainforest, 17.-18.VI.2008, leg. Solodovnikov & Pedersen (ZMUC).

Comment: The original description is based on a single male from northern Thailand. The above specimens represent the first records from Laos (Map 4).

***Sclerochiton sinuatus* ASSING, 2011 (Map 4)**

Material examined: Thailand: 2♂♂, Phetchaburi, Kraeng Krachan National Park, 300-400 m, 17.XI.1985, leg. Burckhardt & Löbl (MHNG, cAss).

Comment: This species was previously known from three localities in Burma and Thailand (Map 4).

***Sclerochiton excisus* ASSING, 2011 (Map 4)**

Material examined: Thailand: 1♂, Surat Thani prov., Ko Samui, Nam Tok, Na Muang Forest Park, 30 m, 5.I.1992, leg. Schwendinger (MHNG).

Comment: The above male represents the first record from Thailand. *Sclerochiton excisus* was previously known only from Malaysia (Map 4).

***Sclerochiton barbatus* ASSING, 2011 (Map 3)**

Material examined: Vietnam: 2♀♀, 7 km NW Sa Pa, 22°22'N, 103°47'E, 1840 m, steep moist stream valley with bushes and trees, litter and roots of herbs sifted, 30.VII.2013, leg. Assing & Wunderle (cAss, cWun); 1♂, pass 8 km WNW Sa Pa, 22°21'N, 103°46'E, 2010 m, secondary deciduous forest with bamboo and forest margin with bushes, litter, moss, and roots sifted, 12.VIII. 2013, leg. Assing (cAss); 1♂, 2♀♀, pass 8 km NW Sa Pa, 22°21'N, 103°46'E, 2030 m, margin of secondary deciduous forest with bushes, bamboo, and herbs, litter, roots, and moss sifted, 9.VIII. 2013, leg. Assing (cAss); 4♀♀, same data, but 10.VIII. 2013 (cAss); 1♀, 6 km NW Sa Pa, 22°22'N, 103°47'E, 1810 m, margin of pasture with bushes and small trees, litter and roots sifted, 7.VIII.2013, leg. Wunderle (cWun).

Comment: Only the holotype from the Ailao Shan in southern Yunnan was known previously (ASSING 2011). The above material was collected together with *S. peniculatus* nov.sp. The new material of *S. barbatus* and the type material of *S. peniculatus* represent the first records of the genus from Vietnam (Map 3).

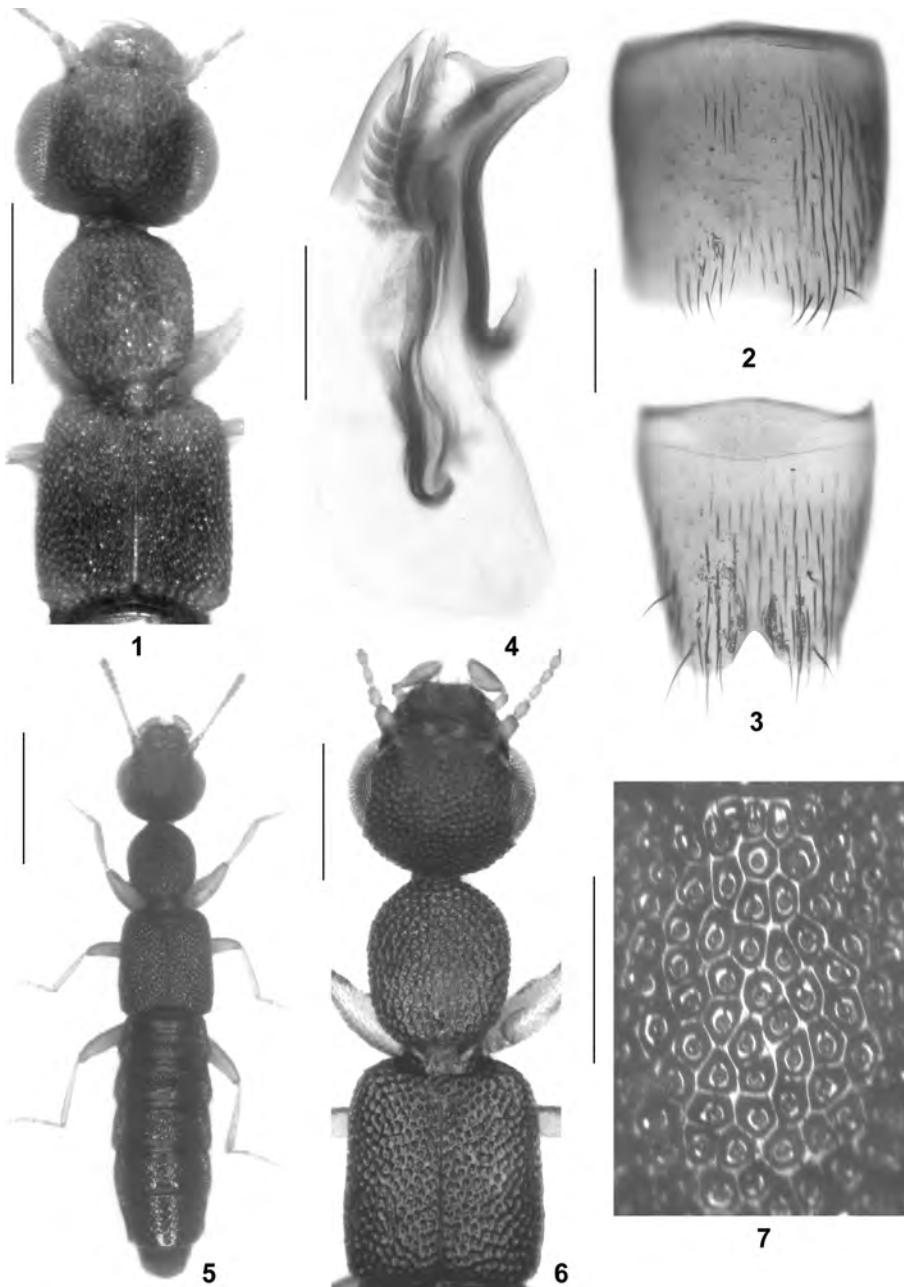
***Sclerochiton pectinatus* nov.sp. (Figs 1-4, Map 4)**

Type material: Holotype ♂: "Laos: Vientiane prov.: Vientiane, 22.vi.2008; 160 m, 17°57.597'N 102°36.518'E / A. Solodovnikov & J. Pedersen leg., Bank of river Mekong; in decaying debris; ZMUC collection / Holotypus ♂ *Sclerochiton pectinatus* sp. n., det. V. Assing 2012" (ZMUC). Paratypes: 2♀♀: same data as holotype (ZMUC, cAss).

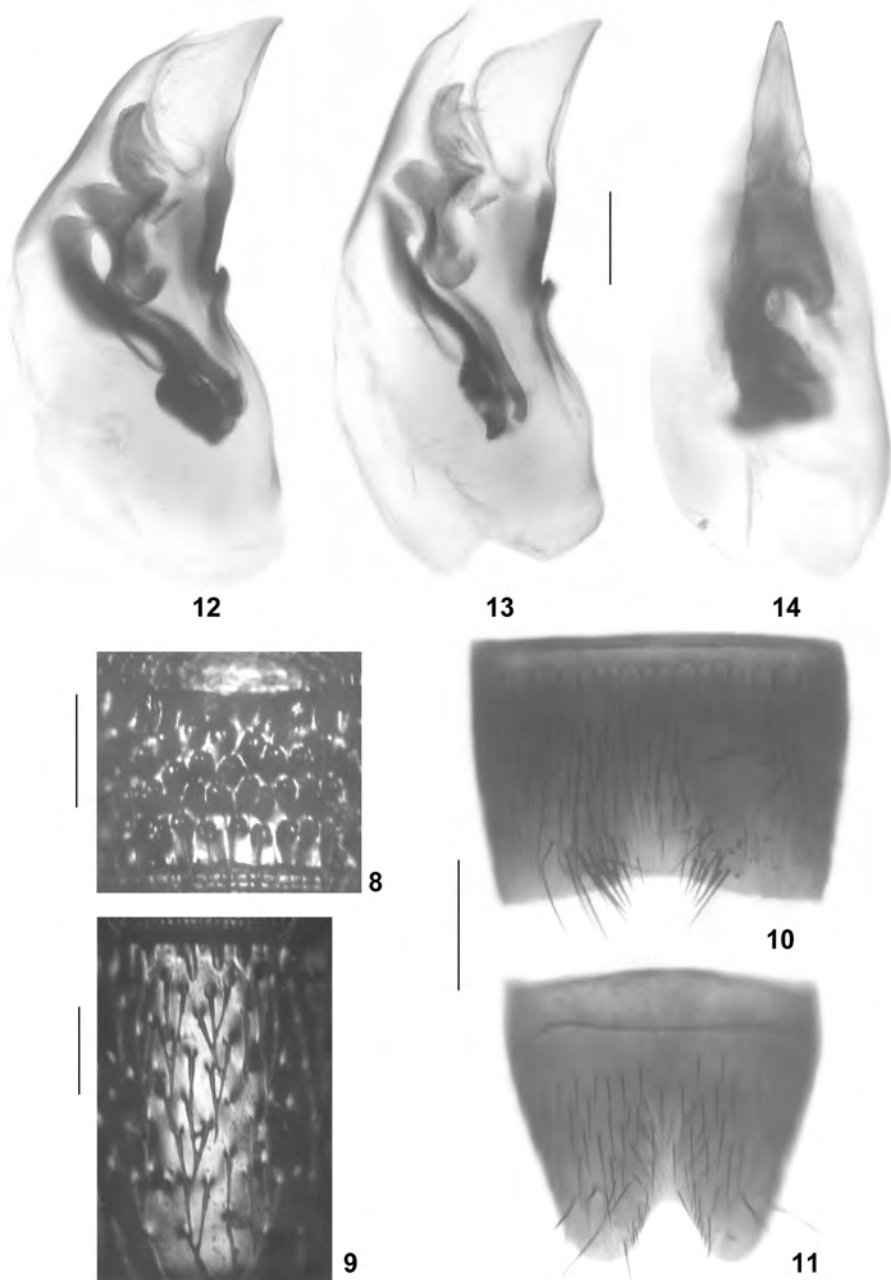
Etymology: The specific epithet (Latin, adjective: with a comb) alludes to the arrangement of the internal spines of the aedeagus.

Description: Body length 2.9-3.3 mm; length of forebody 1.6-1.7 mm. Coloration variable: body uniformly reddish or elytra with indistinct and weakly delimited, slightly darker area posteriorly; legs yellowish; antennae yellowish, gradually darkened apically. (Note that the holotype is distinctly darker, with the body blackish-brown, the pronotum dark-brown, the elytra brown, and the appendages dark-brown, apparently a result of post-mortem darkening.)

Head (Fig. 1) strongly transverse, approximately 1.35-1.40 times as wide as long; neck slender, approximately 0.25 times as wide as head across eyes; posterior margin straight; punctuation coarse, areolate, and extremely dense, interstices reduced to narrow ridges; dorsal surface matt. Eyes large, practically reaching posterior margin, with short pubescence. Antennae approximately 0.55 mm long. Anterior margin of labrum feebly concave in the middle.



Figs 1-7: *Sclerochiton pectinatus* nov.sp. (1-4) and *S. peniculatus* nov.sp. (5-7): (1, 6) forebody; (2) male sternite VII; (3) male sternite VIII; (4) aedeagus in lateral view; (5) habitus; (7) antero-medial portion of head. Scale bars: 5: 1.0 mm; 1, 6: 0.5 mm; 2-3: 0.2 mm; 4, 7: 0.1 mm.



Figs 8-14: *Sclerochiton peniculatus* nov.sp.: (8) median portion of tergite IV; (9) median portion of tergite VII; (10) male sternite VII; (11) male sternite VIII; (12-14) aedeagus in lateral and in ventral view. Scale bars: 10-11: 0.2 mm; 8-9, 12-14: 0.1 mm.

Pronotum (Fig. 1) approximately as long as broad or weakly oblong and approximately 0.75 times as wide as head; punctuation slightly coarser and more defined than that of head; pubescence extremely short, short, and barely noticeable.

Elytra (Fig. 1) approximately as long as pronotum; humeral angles marked; punctuation similar to that of head, partly confluent; pubescence fine, short, depressed, and indistinct. Hind wings present. Metatarsomere I elongate, approximately as long as the combined length of II and III.

Abdomen distinctly narrower than elytra; punctuation rather coarse and very dense on tergites III-V, distinctly sparser on tergites VI-VIII; tergites III-V matt, tergites VI-VIII glossy; posterior margin of tergite VII with palisade fringe.

♂: sternite VII (Fig. 2) with long pubescence, posteriorly weakly concave in the middle; posterior excision of sternite VIII of moderate depth and V-shaped (Fig. 3); aedeagus (Fig. 4) 0.37 mm long and of distinctive shape, with comb-like series of internal spines.

Comparative notes: Using the key in ASSING (2011), *S. pectinatus* would key out at couplet 4, together with *S. rougemonti*. It is distinguished from this species by paler coloration and by the male sexual characters, particularly the shape and chaetotaxy of the male sternite VII and the morphology of the aedeagus (shape of the ventral process and the comb-like arrangement of internal spines).

Distribution and natural history: The type locality is situated near Vientiane, Laos, very close to the border with Thailand (Map 4). The specimens were collected from debris at the bank of Mekong river at an altitude of 160 m.

***Sclerochiton peniculatus* nov.sp. (Figs 5-14, Map 4)**

Type material: Holotype ♂: "N-Vietnam - 6 km NW Sa Pa, 22°21'39"N, 103°47'19"E, 1810 m, pasture margin, 7.VIII.2013, V. Assing [8+2] / Holotypus ♂ *Sclerochiton peniculatus* sp. n., det. V. Assing 2015" (cAss). Paratypes: 3♂♂, 1♀: same data as holotype (cAss, MNHUB); 9♂♂, 10♀♀: same data as holotype, but leg Wunderle (cWun, cAss); 1♂, 1♀: "N-Vietnam - 7 km NW Sa Pa, 22°21'49"N, 103°46'49"E, 1840 m, stream valley, 30.VII.2013, V. Assing [3+2]" (cAss, MNHUB); 3♀♀: same data, but leg. Wunderle (cWun); 4♂♂, 3♀♀: "N-Vietnam - 7 km NW Sa Pa, 22°21'49"N, 103°46'49"E, 1850 m, stream valley, 1.VIII.2013, V. Assing [3a+2]" (cAss, MNHUB); 1♂: "N-Vietnam - pass 8 km NW Sa Pa, 22°21'13"N, 103°46'01"E, 2030 m, forest margin, 9.VIII.2013, V. Assing [10+2]" (cAss).

Etymology: The specific epithet is an adjective derived from the Latin noun peniculus (brush) and alludes to the pair of clusters of long setae at the posterior margin of the male sternite VII.

Description: Body length 3.5-4.2 mm; length of forebody 2.0-2.2 mm. Habitus as in Fig. 5. Coloration: body blackish; elytra with or without very indistinct reddish spot; legs yellowish; antenna yellowish with the apical 2-5 antennomeres often slightly darker.

Head (Fig. 6) approximately 1.25 times as wide as long; neck approximately 0.25 times as wide as head across eyes; posterior outline of head smoothly convex, nearly semi-circular in dorsal view; punctuation coarse, areolate, and extremely dense, interstices reduced to narrow ridges (Fig. 7); dorsal surface matt. Eyes large, nearly twice as long as distance from posterior margin of eye to posterior constriction in dorsal view, with short pubescence. Antennae 0.75-0.80 mm long. Anterior margin of labrum with distinct and narrow median incision.

Pronotum (Fig. 6) small and slender, 1.12-1.18 times as long as broad and approximately 0.75 times as wide as head; punctation slightly coarser and more defined than that of head; pubescence extremely short, stout, and barely noticeable.

Elytra (Fig. 1) approximately as long as, or slightly longer than, pronotum; humeral angles marked; punctation coarse, very dense, defined, not confluent; pubescence fine, short, depressed, and indistinct. Hind wings fully developed. Metatarsomere I elongate, approximately as long as the combined length of II and III.

Abdomen slightly narrower than elytra; punctation very coarse and very dense on tergites III-V (Fig. 8), distinctly sparser and less coarse on tergites VI-VIII (Fig. 9); microsculpture absent; posterior margin of tergite VII with palisade fringe.

♂: sternite VII (Fig. 10) strongly transverse, with a rather extensive and distinct impression in postero-median portion, posterior margin broadly and shallowly, but distinctly concave in the middle, on either side of this concavity with a conspicuous dense cluster of long black setae; sternite VIII (Fig. 11) weakly transverse, posterior excision moderately deep and anteriorly convex (not V-shaped), near margins of this excision with a row of very short setae on either side; aedeagus (Figs 12-14) approximately 0.6 mm long and of distinctive shape.

Comparative notes: *Sclerochiton peniculatus* is readily distinguished from all its congeners particularly by the distinctive shape and internal structures of the aedeagus, as well as by the shape and chaetotaxy of the male sternite VII. Based on the modifications of the male sternites VII and VIII, as well as on the general morphology of the aedeagus, the new species is most closely allied to *S. schuelkei* and *S. barbatus*. It is additionally distinguished from these species as follows:

from *S. schuelkei* only by the more slender and more oblong pronotum (*S. schuelkei*: pronotum 1.05-1.10 times as long as broad);

from *S. barbatus* by smaller body size, a more slender habitus, the more slender and oblong pronotum, and the very indistinct or obsolete reddish spot on the elytra (always distinct in *S. barbatus*).

For illustrations of the external and male sexual characters of other *Sclerochiton* species see ASSING (2011).

Distribution and natural history: The type specimens were collected in several close localities near a pass about 8 km to the northwest of Sa Pa, North Vietnam (Map 4), by sifting leaf litter, roots of herbs, and various debris at the margin of a pasture, near bushes and small trees in steep stream valley, and at the margin of a secondary deciduous forest at altitudes of 1810-2030 m. In all the localities, the species was found together with *S. barbatus*.

Acknowledgements

I am indebted to the colleagues indicated in the material section for making their material available for study.

Zusammenfassung

Zwei Arten der Gattung *Sclerochiton* KRAATZ, 1859 werden beschrieben und abgebildet: *Sclerochiton pectinatus* nov.sp. (Laos) und *S. peniculatus* nov.sp. (Nord-Vietnam). Weitere Nachweise von zehn Arten werden gemeldet. Die Gattung wird erstmals mit zwei Arten aus Vietnam nachgewiesen. Die Gesamtverbreitung der Gattung in der südlichen Ostpaläarktis und der Orientalis sowie die bekannten Verbreitungsgebiete der behandelten Arten werden anhand von Karten illustriert. *Sclerochiton* enthält derzeit insgesamt 23 beschriebene Arten, von denen 17 in der südlichen Ostpaläarktis und der Orientalis vorkommen.

Reference

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

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