Cavernicolous Stenosini (Coleoptera: Tenebrionidae) from Cambodia and Vietnam, with descriptions of two new species of Pseudochillus Fouquè and general remarks on cave Tenebrionidae

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RESEARCH ARTICLE

Cavernicolous Stenosini (Coleoptera: Tenebrionidae) from Cambodia and Vietnam, with descriptions of two new species of *Pseudochillus* Fouquè and general remarks on cave Tenebrionidae

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Abstract

Two species of Stenosini Schaum, 1859 (Tenebrionidae: Pimeliinae) from northwestern Cambodia (Battambang Province) are presented: *Pseudochillus steineri* **sp. n.** and *Gebieniella stenosides* (Pascoe, 1862). Both were exclusively collected in different caves from guano (except one specimen of *Gebieniella stenosides*). *Pseudochillus honchongensis* **sp. n.** is described from a cave in South Vietnam. General remarks on cave Tenebrionidae worldwide are presented.

Keywords: cavernicolous life, darkling beetles, Oriental Region, Pimeliinae, taxonomy.

Zusammenfassung

Zwei Arten der Stenosini Schaum, 1859 (Tenebrionidae: Pimeliinae) aus Nordwest-Kambodscha (Battambang Provinz) werden vorgestellt: *Pseudochillus steineri* **sp. n.** und *Gebieniella stenosides* (Pascoe, 1862). Beide Arten wurden ausschließlich in verschiedenen Höhlen an Guano gesammelt (außer 1 Exemplar von *Gebieniella stenosides*). Zudem wird *Pseudochillus honchongensis* sp. n. aus einer Höhle in Süd-Vietnam beschrieben. Beigefügt werden einige generelle Bemerkungen zu Höhlen-Tenebrioniden weltweit.

Introduction

Cavernicolous beetles are known in various Coleoptera families, including—although less numerous—in Tenebrionidae. Cave-inhabiting Tenebrionidae are assigned to different tribes in the Old and New World (see general remarks below), and are particularly speciose in the tribe Stenosini Schaum, 1859 (subfamily Pimeliinae Latreille, 1802).

Here, we present two species of cavernicolous Stenosini from northwestern Cambodia (Battambang Prov.): *Pseudochillus steineri* **sp. n.** and *Gebieniella stenosides* (Pascoe, 1862). *Pseudochillus honchongensis* **sp. n.** from a cave in Southern Vietnam is also described.

The first contributions on Oriental Stenosini were presented by Koch (1940) and Kaszab (1980, 1981). Subsequently, Medvedev (1991, 1994a, 1994b, 2009) published valuable comprehensive taxonomic studies including identification keys to special regions and genera. Fouquè (2008, 2013, 2015) carefully revised certain genera. Arndt & Ferrer (1996), Ferrer (2004) and Ferrer & Lemaire (2019) described three species. Ren & Shi (2006) and Ba & Ren (2013) added small supplements to the Chinese fauna. Yoshitomi (2015) published a new record for Thailand. Aalbu et al. (2017b) contributed with the description of a new genus from South America and with a detailed identification key to the World genera of Stenosini. Recently, Schawaller & Bigalk (2021) described two new genera and six new species from Myanmar (Burma).

Independently, the authors Medvedev and Fouquè proposed subgenera in some genera of Stenosini based on certain species, but not on complete revisions of the corresponding genera. As stated already in Schawaller & Bigalk (2021), these subgenera are not considered herein.

All specimens of Stenosini from Cambodia (except one of *G. stenosides*) studied here were collected from guano inside caves. Some of the visited caves had been completely cleared out by guano miners, but these were very poor in wildlife. In undisturbed guano patches, beetles were quite abundant (Helmut Steiner, pers. comm.).

Material and methods

The treated specimens are deposited in the Staatliches Museum für Naturkunde in Stuttgart, Germany (SMNS). The locality data are not given verbatim but are modified to a stand-

[1] Contribution to Tenebrionidae n. 171; for n. 170, see Zootaxa **5200** (2022)

ard format, partly completed by additional geographical information for a better localisation and translated into English when given in other languages on the labels. The designated holotypes and paratypes have been provided with red, printed labels. The aedeagi were mounted using water soluble glue on cards pinned together with the corresponding specimens. The photographs were taken with a Visionary Digital photography system (LK Imaging System) equipped with a Canon EOS 5DSR, and subsequently processed with the Helicon Focus Pro, Adobe Lightroom and Adobe Photoshop CS6 software.

The species

Pseudochillus steineri **sp. n.**
(Figs. 1–4)

Type material

Holotype (♂): Cambodia, Battambang Prov., Sampov Lun, cave La Ang Som Nak Poa, N13°21′43.0″ E102°21′56.1″, 24.I.2018, leg. H. Steiner (182/18), SMNS.

Paratypes: Same data as for the holotype, 13 exx., SMNS. – Cambodia, Battambang Prov., Sampov Lun, cave Roung Barang Kleah 1, N13°21′42.6″ E102°21′40.1″, 25.I.2018, leg. H. Steiner (150/18), 1 ex. dry mounted (SMNS), 1 ex. stored in ethanol (SMNS-M379).

Description

Body length 3.8–4.1 mm. Body and appendages dull red-brown. Head as long as wide, widest across anterior margin of eyes. Tempora widest across posterior margin of eyes, parallel, sharply narrowed to cervix. Genae arched from posterior margin of eyes to widest part of genae, genae there arched and directly narrowed to clypeus, margins behind clypeus finely dentate. Clypeus concave, medially with small tooth pointing slightly to the right. Suborbital keel flat, indistinct. Frons and vertex without distinct impressions. Eyes completely divided by genae. Dorsal punctures large, on frons slightly confluent, diminishing towards clypeus, with fine, short, forward-oriented yellow setae. Antennae with golden setae oriented forwards, shape of antennomeres as in Fig. 1, antennomere three 1.5x as long as antennomere two. Pronotum cordiform, only slightly longer than wide, widest across anterior third, lateral margins parallel in anterior half, without distinct crenulation; anterior angles rounded, not protruding; posterior angles rectangular; anterior and posterior margins straight. Disc medially with a feeble longitudinal impression, somewhat deeper before base. Punctures dense, as large as those on head but not confluent, without distinct setae. Elytra oval, widest across middle, 1.8x as long as wide, with ten rows of punctures, size of punctures as on pronotum but more separate, punctures without setae. Alternate intervals 3, 5, 7 and 9 with distinct crenulated keels, interval 7 flattened in anterior quarter; keels with a row of distinct yellow setae pointing backwards. Humeral calli absent. Epipleura with one row of punctures over whole length. Legs covered with fine, light adherent hairs. Posterior tibiae in males slightly curved, all tibiae at inner apical third with distinct dentation (Fig. 3). Ventrites with equisized small punctures and fine setae. Aedeagus as in Fig. 4a, basale broader and about 1.5x as long as apicale, apicale broad with rounded apex. Sternite VIII as in Fig. 4b.

Diagnosis

Fouquè (2015) established the genus *Pseudochillus*, included seven species and presented an identification key. In that key, *P. steineri* **sp. n.** runs to *P. thailandicus* Fouquè, 2015. However, that species has vertex with a longitudinal impression, frons next to the eyes with an impression, thicker and longer setae on the head, antennomere three only slightly longer than antennomere two, anterior and posterior margins of pronotum slightly rounded, lateral margins of pronotum finely crenulated, pronotum with distinct setae, posterior tibia in males not curved, all tibiae without dentation in the inner apical third, and a completely different aedeagus [compared with figures in Fouquè (2015)].

Etymology

Named in honour of Helmut Steiner (Hanau, Germany), collector of the type series.

Remarks

The type locality of *P. thailandicus* lies in northwestern Thailand (Doi Suthep, Monthathan, 650 m), far away from Cambodia.

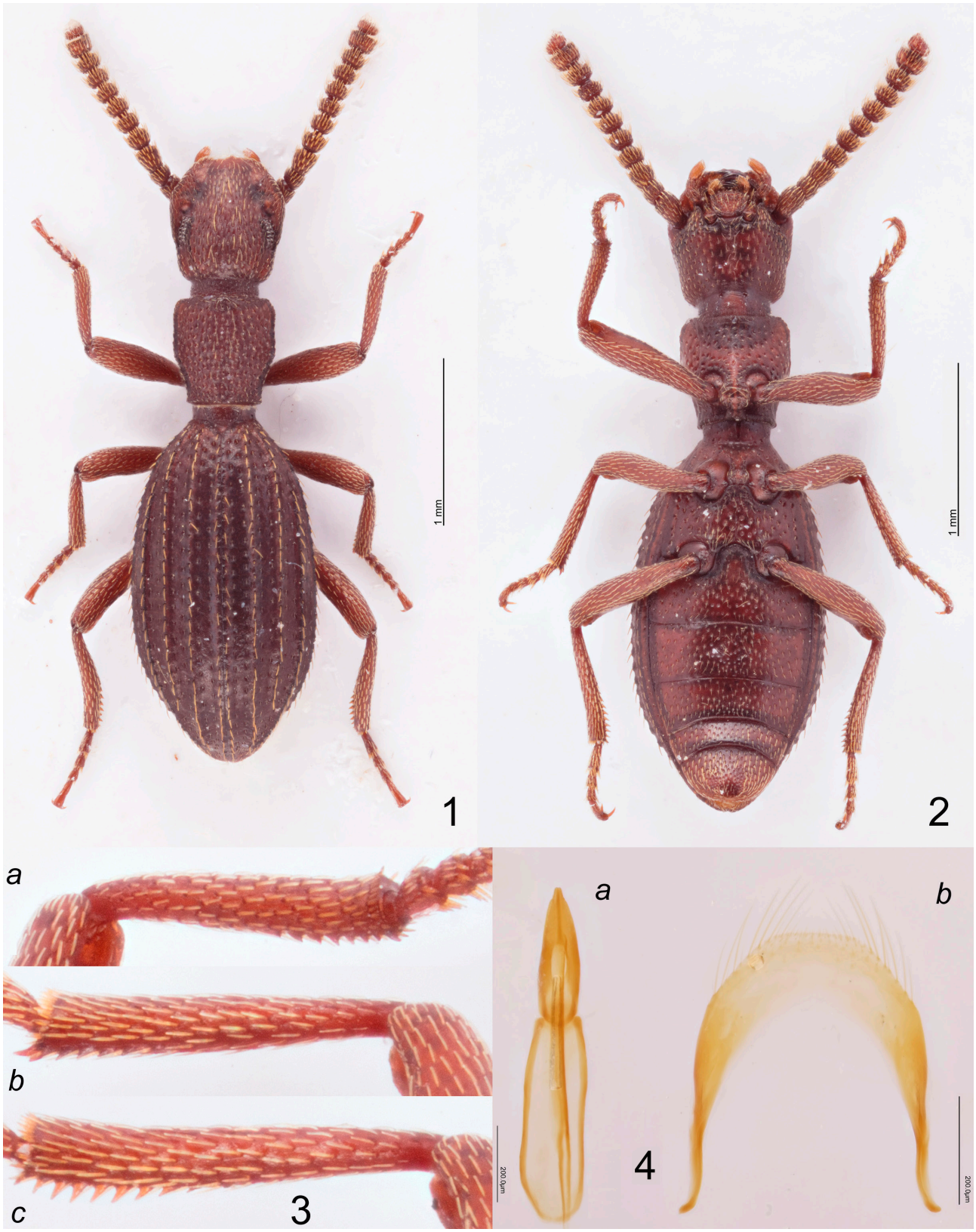
Pseudochillus honchongensis **sp. n.**
(Figs. 5–7)

Type material

Holotype (♂): Vietnam: Kien Luong: Hon Chong: Nui Bai Voi: grotte-hôpital de Mo So, 19/12/1994, cave, guano, by hand & pitfall trap, Louis Deharveng, Dung & Le Cong Kiet leg. (sample n° VIET-045, 10.228138N, 104.616506E, alt. 4 m), SMNS (DNA extraction code SMNS-M440).

Description

Body length 4.2 mm. Body and appendages dull red-brown. Head as long as wide, widest across anterior margin of eyes. Tempora widest across posterior margin of eyes, parallel, sharply narrowed to cervix. Genae arched from posterior margin of eyes to widest part of genae, genae there arched and directly narrowed to clypeus, margins behind clypeus finely dentate. Clypeus concave, medially with a small tooth pointing slightly to the right. Suborbital keel prominent. Frons without, vertex with a feeble longitudinal impression. Eyes completely divided by genae. Dorsal punctures large, slightly confluent on frons, diminishing towards clypeus, with fine, short, forward-oriented yellow setae. Antennae with golden setae oriented for-



Figs. 1–4. *Pseudochillus steineri* **sp. n. 1**. Dorsal view, holotype. **2**. Ventral view, paratype. **3**. Protibia (a), mesotibia (b), metatibia (c), paratype. **4**. Aedeagus (a), sternite VIII (b), paratype.

Fig. 5–7. *Pseudochillus honchongensis* **sp. n. 5**. Dorsal view, holotype. **6**. Aedeagus, holotype. **7**. Sternite VIII (a), spiculum gastrale (b), holotype.

wards, shape of antennomeres as in Fig. 5, antennomere three 1.5x as long as antennomere two. Pronotum cordiform, 1.15 longer than wide, widest across the middle, lateral margins constricted in anterior half, without distinct crenulation; anterior angles rectangular, not protruding; posterior angles rectangular; anterior margin finely convex, posterior margin straight. Disc medially with a feeble longitudinal impression, somewhat deeper anterior to base. Punctures dense, of same size as those on head, partly confluent, without distinct setae. Elytra oval, widest across middle, 2.0x as long as wide, with ten rows of punctures, size of punctures as those on pronotum but more separate, punctures without setae. Alternate intervals 3, 5, 7 and 9 with distinct crenulated keels, interval 7 flattened in anterior quarter; keels with a row of short yellow setae pointing backwards. Humeral calli absent. Epipleura with one row of punctures on whole length. Legs covered with fine, light adherent hairs. Posterior tibiae curved in males, without distinct dentation on inner surface. Ventrites with equisized small punctures and fine setae. Aedeagus as in Fig. 6, basale narrow and only slightly longer than apicale, apicale narrow, parallel, finger-like, with rounded apex. Sternite VIII and spiculum gastrale as in Fig. 7.

Diagnosis

Pseudochillus honchongensis **sp. n.** is very similar to the only other known species from Vietnam, *P. indochinensis* Fouquè, 2015. However, in the latter the pronotum is slightly shorter, the anterior angles of the pronotum are rounded and the aedeagus is different in having the apicale not parallel-sided but distinctly broader across the middle and with an acute apex [compared with figures in Fouquè (2015)].

Etymology

Named after the Hon Chong Karst in Vietnam, where the holotype was collected.

Remarks

The Hon Chong limestone hills are known to host a remarkable subterranean biodiversity (Deharveng & Bedos 1996). The type locality is already the only known collection locality of other cave invertebrates, such as the

ground beetle *Eustra honchongensis* Deuve or the pseudoscorpion *Lagynochthonius fragilis* Judson (Deuve 1996; Judson 2007). Regarding Tenebrionidae only, the area hosts remarkable monospecific genera, such as *Harvengia* Ferrer, 2004, the only representative of the tribe Harvengiini, of uncertain affinities, or *Microblattelus* Ferrer, 2006, one of the three monospecific genera of the tribe Falsocossyphini Ferrer, 2006 [see Bremer (2014) for a discussion regarding this tribe].

The new species had already been reported from the cave under the name "*Dichillus* sp.", in a previous work dealing with the diversity of the Hon Chong area (Deharveng et al. 2009). The area is under threat due to destruction of the hills for cement exploitation (Deharveng et al. 2009).

Pseudochillus sp.

Remarks

A further species of *Pseudochillus* was collected in a cave in Thailand. This species, according to unpublished photographs (Yunchun Li, pers. comm.), differs distinctly from *P. steineri* **sp. n.** and *P. thailandicus* Fouquè, 2015.

Gebieniella stenosides (Pascoe, 1862) (Figs. 8–10)

New material

Cambodia, Battambang Prov., Sampov Lun, cave Roung Nou 2, N13°20′55.8″ E102°30′13.5″, 3.II.2018, leg. H. Steiner (039/18), 1 ex., SMNS. – Cambodia, Battambang Prov., Sampov Lun, cave La Ang Touch, N13°22′09.9″ E102°22′18.4″, 27.I.2018, leg. H. Steiner (090/18), 7 exx., SMNS (1 ex. with DNA extraction code SMNS-M374). – Cambodia, Battambang Prov., Sampov Lun, cave Roung Nou 1, N13°20′57.6″ E102°30′15.7″, 3.II.2018, leg. H. Steiner (101/18), 1 ex. dry mounted, SMNS, 1 ex. stored in ethanol, SMNS-M380. – Cambodia, Battambang Prov., Sampov Lun, cave Roung Barang Kleah 1, N13°21′42.6″ E102°21′40.1″, 25.I.2018, leg. H. Steiner (149/18), 2 exx. dry mounted, SMNS, 1 ex. stored in ethanol, SMNS-M382. – Cambodia, Battambang Prov., Sampov Lun, cave La Ang Barang Kleah 2, N13°20′41.1″ E102°21′36.4″, 8.II.2018, leg. H. Steiner (164/18), 4 exx., SMNS, 1 ex. with DNA extraction code SMNS-M375. – Cambodia, Battambang Prov., Sampov Lun, cave La Ang Som Nak Poa, N13°21′43.0″ E102°21′56.1″, 24.I.2018, leg.

Figs. 8–10. *Gebieniella stenosides.* **8**. Dorsal view, non-type. **9**. Ventral view, non-type. **10**. Aedeagus, non-type.

H. Steiner (181/18), 7 exx. dry mounted, SMNS, 1 ex. stored in ethanol, SMNS-M381. – Cambodia, Battambang Prov., Sampov Lun, cave Roung Heyndan 1, N13°21′57.4″ E102°27′44.6″, 31.I.2018, leg. H. Steiner (195/18), 1 ex. SMNS. – Cambodia, Angkor Wat West, under stone outside cave, N13°24′43″ E103°51′47″, 27.III.2015, leg. J. Schönfeld, 1 ex., SMNS. – [All specimens from Thailand listed hereafter were identified by R. Grimm.] N Thailand, Chang Mai, NNE Chang Mai, Mae Ngad Dam, 20.VIII.1995, leg. R. Grimm, 4 exx., SMNS. – Thailand, Old Sukhothai, 26.V.1999, leg. R. Grimm, 7 exx., SMNS. – N Thailand, NE San Kamphaeng Roong, Aroon Hot Springs, 28.V.1999, leg. R. Grimm, 3 exx., SMNS. – N Thailand, NE Mae Malai Mae Ngad Dam, 14.V.1999, leg. R. Grimm, 2 exx., SMNS. – N Thailand, N Chiang Mai, 8 km NE Mae Malai, W Cho Lae, 14.V.1999, leg. R. Grimm, 8 exx., SMNS. – NW Thailand, Mae Hong Son Pai, Thapai Hot Springs, 6.V.2004, leg. R. Grimm, 3 exx., SMNS.

Remarks

Ferrer & Lemaire (2019) described *Gebieniella fouquei* on the basis of a single female from Angkor Wat in Cambodia, illustrated the differences in external characters to *G. stenosides* and added an identification key to the species of the genus. Unfortunately, the aedeagi were not studied. The above-listed specimen from Angkor Wat fully coincides with *G. stenosides*.

Distribution

Widespread in Indochina, in and outside caves: Burma, Thailand, Cambodia (new country record), Vietnam.

General remarks on cave Tenebrionidae

Tenebrionidae from various subfamilies and tribes have been collected in caves worldwide:

Kuhitangiinae: Foranotini

Foranotum Nabozhenko & Sadeghi, 2017: Iran (Nabozhenko & Sadeghi 2017).

Lagriinae: Eschatoporiini

Eschatoporis Blaisdell, 1906: USA: California (Aalbu et al. 2017a).

Lagriinae: Lupropini

Terametus Motschulsky, 1869: South Africa (Schawaller 2007).

Pimeliinae: Stenosini

Dichillus Jaquelin du Val, 1861: Thailand (Kaszab 1980).
Discopleurus Lacordaire: Brazil (Aloquio et al. 2019).
Gebienella Koch, 1940: Cambodia (present work).
Harvengia Ferrer, 2004: Vietnam (Ferrer 2004).
Pseudochillus Fouquè, 2015: Cambodia, Vietnam (present work).
Typhlosechus Linell, 1897: North America (Aalbu & Andrews 1985).

Pimeliinae: Leptodini

Leptodes Dejean, 1834: Iran, Afghanistan (Tahami et al. 2016; Kaszab 1959).

Pimeliinae: Trimytini

Trimytantron Ardoin, 1977: Cuba (Garrido & Gutiérrez 1997; Peck et al. 1998).

Tenebrioninae: Opatrini

Coeloecetes Blair, 1929: W Malaysia (Blair 1929).

Tenebrioninae: Alphitobiini

Guanobius Grimm, 2008: Malaysia, Sabah (Grimm 2008).

Tenebrioninae: Ulomini

Phayllus Champion, 1886: Venezuela (Peck & Kukalova-Peck 1989).

Tenebrioninae: Amphidorini

Eleodes (*Caverneleodes* Triplehorn, 1975): Mexico; USA: New Mexico, Arizona, Utah, California (Triplehorn 1975; Aalbu et al. 2012).
Spelaebiosis Bousquet & Bouchard, 2018 (= *Ardoinia* Özdikmen, 2004): Cuba (Ardoin 1977; Peck et al. 1998).

Tenebrioninae: Cyphaleini

Brises Pascoe, 1869: Australia (Matthews 1986)

Either all species or at least one species of each of the listed genera seem to have a cavernicolous mode of life. The subfamilies Diaperinae and Alleculinae are missing completely from this list, whereas the tribe Stenosini is the most diverse in caves. Although some adults are known exclusively from caves, it has not been observed whether they really live and feed in caves, including in their immature stages, or if they shelter in caves only during certain periods due to the more stable humidity conditions and, less probably, temperature conditions there. Cave tenebrionids are morphologically not highly adapted to that environment, although sometimes the eyes are reduced or completely missing. However, this condition is not found uniquely in cave-adapted species but also in species from other habitats.

Besides the listed genera, many species of the genera *Megagenius* Solier, 1835, *Akis* Herbst, 1799 and *Scaurus* Fabricius, 1775 have been mentioned as frequent in caves in Spain and Morocco, with some species being only known from caves (Kocher 1965; Español 1972; Labrique 1995; Decu et al. 1998). Many species have been recorded from guano in tropical caves in Cuba (see Peck et al. 1998), the genera *Zophobas* Dejean, 1834, *Blapstinus* Sturm, 1826 and *Alphitobius* Stephens, 1829 have been recorded in caves in Jamaica, Puerto Rico, Mexico, Australia and Venezuela (Decu et al. 1998). All these taxa are regarded as first-level troglophiles sensu Peck et al. (1998), i.e., species living also outside of caves.

The following species mentioned in Decu et al. (1998) are occasional visitors of caves, and can be found also outside caves, have their life cycle outside of caves and should not be considered troglophilic or troglobitic:

Mesostenopa cavatica Andres, 1926 (= *Mesostenopa longicornis cavatica* Andres, 1926) from Egypt.

Troglogeneion zapoteca Aalbu, 1985 from Mexico.
Menimopsis (= *Caecomenimopsis*) *leleupi* Kaszab, 1970 from the Galapagos Is. (Ecuador), in cave and soil.
Pterohelaeus Brême, 1842 from Australia (Johannsen's cave).
Timosmithus basilewskyi Ardoin, 1974 from Botswana (Drotsky cave).
Perdicus anthrophilus Fairmaire, 1899 from a cave in Madagascar.
Palorus cerylonoides Pascoe, 1863 [syn. *P. exilis* (Marseul, 1876)] from Assam (Siju cave).
Diaclina rufocincta Fairmaire, 1893 from Assam (Siju cave).
Eurychora Thunberg, 1889 from a guano cave in Angola (Furina Grande).
Praogena splendens Mäklin, 1864 and *Peristeptus marginalis* Gebien, 1910 from lava tubes on Mt. Suswa, Kenya.
Tenebrio guineensis Imhoff, 1843 from caves in Ivory Coast and Congo.

Cave habitats are mainly characterised by stable ecological conditions throughout the year and by extremely poor food resources. A food resource that might be suitable for tenebrionids are the fungi growing on bat guano and on washed-in rotten wood. But only the subfamily Diaperinae, which contains mainly arboreal fungus-feeding taxa, is so far unknown from caves.

It is striking that tenebrionids have only been found in caves in regions with higher average temperatures. In more temperate regions (e.g., Europe, Japan) other Coleoptera families, such as the particularly abundant and highly adapted Carabidae and Cholevidae, occur in caves.

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References

Aalbu, R. L. & Andrews, F. G. (1985): New species, relationships, and notes on the biology of the endogean Tentyriine genus *Typhlosechus* (Tenebrionidae: Stenosini). – Occasional Papers in Entomology **30**: 1–26.

Aalbu, R. L., Kanda, K. & Smith, A. D. (2017a): Reinstatement of Eschatoporiini Blaisdell, 1906, a unique tribe of blind cavernicolous Tenebrionidae from California, with a new species from Napa County (Coleoptera, Tenebrionidae, Lagriinae). – ZooKeys **688**: 131–149. https://doi.org/10.3897/zookeys.688.13575

Aalbu, R. L., Smith, A. D., Kanda, K. & Bouchard, P. (2017b): *Renefouqueosis peruviensis*, a new genus and species of Stenosini (Coleoptera: Tenebrionidae) from Peru with a key to the Stenosini of the world and notes on the genera *Anchomma* and *Fitzsimonsium*. – Acta Entomologica Musei Nationalis Pragae **57**: 313–330. https://doi.org/10.1515/aemnp-2017-0078

Aalbu, R. L., Smith, A. D. & Triplehorn, C. A. (2012): A revision of the *Eleodes* (subgenus *Caverneleodes*) with new species and notes on cave breeding *Eleodes* (Tenebrionidae: Amphidorini). – Annales Zoologici **62**: 199–216. https://doi.org/10.3161/000345412X652729

Aloquio, S., Flores, G. E. & Lopes-Andrade, C. (2019): A new species of *Discopleurus* Lacordaire: the first Stenosini (Coleoptera: Tenebrionidae: Pimeliinae) from Brazil. – Annales Zoologici **69**: 99–103. https://doi.org/10.3161/00034541ANZ2019.69.1.005

Ardoin, P. (1977): Tenebrionidae (Coleoptera) récoltés par la deuxième expédition biospéologique cubano-roumaine (1973). – In: Résultats des expéditions biospéologiques Cubano-roumaines à Cuba, Editura Academiei Republicii Socialiste România (Bucarest) **2**: 387–392.

Arndt, E. & Ferrer, J. (1996): Die Gattung *Stenosis* Herbst in Thailand (Coleoptera: Tenebrionidae). – Koleopterologische Rundschau **66**: 215–218.

Ba, Y.-B. & Ren, G.-D. (2013): Two new species and one new combination of Stenosini (Coleoptera: Tenebrionidae) from Xizang, China. – Acta Entomologica Musei Nationalis Pragae **53**: 697–702.

Blair, K. G. (1929): III. Fauna of the Batu Caves, Selangor. XVII. Coleoptera. – Journal of the Federated Malay States Museums **14**: 381–387.

Bremer, H. J. (2014): Revision of *Azarelius* Fairmaire, *Ziaelas* Fairmaire and related Oriental termitophilous genera, with descriptions of two new genera and remarks on tribal placement (Coleoptera: Tenebrionidae: Amarygmini). – Stuttgarter Beiträge zur Naturkunde A (Neue Serie) **7**: 163–182.

Decu, V., Juberthie, C. & Nitzu, E. (1998): Coleoptera (varia). – In: Juberthie, C. & Decu, V. (eds.): Encyclopaedia Biospeologica II, pp. 1163–1173; Moulis/Bucarest (Société de Biospéologie).

Deharveng, L. & Bedos, A. (1996): *Rambutsinella*, a new genus of Entomobryidae (Insecta: Collembola) from southeast Asia. – Raffles Bulletin of Zoology **44**: 279–285.

Deharveng, L., Le Cong Kiet, Le Cong Man & Bedos, A. (2009): Hot issues in karst conservation: the biodiversity of Hon Chong Hills (southern Vietnam), with emphasis on invertebrate endemism. – In: Batelaan, O., Dusar, M., Masschelein, J., Vu Than Tam, Tran Tan Van & Nguyen Xuan Khien (eds.): Trans-KARST-2004. Proceedings of the International Transdisciplinary Conference on Development and Conservation of Karst Regions, p. 40; Hanoi, Vietnam, 13–18 Sept. 2004.

Deuve, T. (1996): Description d'un coléoptère troglobie du genre *Eustra*, découvert dans un karst du Vietnam méridional (Paussidae). – Revue Française d'Entomologie (N. S.) **18**: 23–26.

Español, F. (1972): Los coléoptèros cavernícolas de Marruecos. – In: Comunicaciones del I Congreso Nacional de Espeleología, pp. 115–121; Barcelona, 1970.

Ferrer, J. (2004): Description d'un nouveau genre de Stenosini du Vietnam (Coleoptera, Tenebrionidae). – Nouvelle Revue d'Entomologie (N. S.) **20** (2003): 367–371.

Ferrer, J. & Lemaire, J. M. (2019): Une nouvelle espèce du genre *Gebieniella* Koch, 1940 du Cambodge (Coleoptera, Tenebrionidae, Stenosini). – Le Coleopteriste **22**: 28–32.

Fouquè, R. (2008): Revision of the genus *Pseudethas* Fairmaire, with descriptions of four new species from Nepal and Thai-

land (Coleoptera: Tenebrionidae: Stenosini). – Stuttgarter Beiträge zur Naturkunde A (Neue Serie) **1**: 357–369.

Fouquè, R. (2013): Revision of the genus *Herbertfranziella* Kaszab and description of the new genus *Nepalofranziella* of Himalayan Dichillina (Coleoptera: Tenebrionidae: Stenosini). – Stuttgarter Beiträge zur Naturkunde A (Neue Serie) **6**: 183–197.

Fouquè, R. (2015): A review of the genera *Indostola*, *Tagenostola*, *Indochillus*, *Pseudethas*, and *Pseudochillus* gen. nov. in South East Asia (Coleoptera: Tenebrionidae: Stenosini). – Acta Entomologica Musei Nationalis Pragae **55**: 217–242.

Garrido, O. H. & Gutiérrez, E. (1997): Revisión del género endémico cubano *Trimytantron* (Coleoptera: Tenebrionidae: Trimytini), con la descripción de ocho nuevas especies. – Insecta Mundi **11**: 29–41.

Grimm, R. (2008): *Guanobius borneensis* n. gen., n. sp. from Borneo (Coleoptera: Tenebrionidae: Alphitobiini). – Stuttgarter Beiträge zur Naturkunde A (Neue Serie) **1**: 375–379.

Judson, M. L. I. (2007): A new and endangered species of the pseudoscorpion genus *Lagynochthonius* from a cave in Vietnam, with notes on chelal morphology and the composition of the Tyrannochthoniini (Arachnida, Chelonethi, Chthoniidae). – Zootaxa **1627** (1): 53–68.
https://doi.org/10.11646/zootaxa.1627.1.4

Kaszab, Z. (1959): Neue *Leptodes*-Arten aus Asien, nebst einer Revision der Leptodini (Coleoptera, Tenebrionidae). – *Acta Zoologica* Academiae Scientiarum Hungaricae **4**: 349–368.

Kaszab, Z. (1980): Eine neue höhlenbewohnende *Dichillus*-Art aus Thailand (Coleoptera: Tenebrionidae). – Annalen des Naturhistorischen Museums in Wien **83** (1979): 585–588.

Kaszab, Z. (1981): Neue orientalische Stenosini (Coleoptera: Tenebrionidae). – Acta Zoologica Academiae Scientiarum Hungaricae **27**: 273–313.

Koch, C. (1940): Phylogenetische, biogeographische und systematische Studien über ungeflügelte Tenebrioniden. II. – Mitteilungen der Münchner Entomologischen Gesellschaft **30**: 683–750, pls. 18–20.

Kocher, L. (1965): *Scaurus* cavernicoles de la collection Antoine (Col. Ténébr.). – Bulletin de la Société des Sciences Naturelles et Physiques du Maroc **44**: 33–36.

Labrique, H. (1995): Les *Scaurus* du groupe *tingitanus* Peyerimhoff (Coleoptera, Tenebrionidae). – Bulletin de la Société Entomologique de France **100**: 119–126.
https://doi.org/10.3406/bsef.1995.17133

Matthews, G. E. (1986): A revision of the troglophilic genus *Brises* Pascoe, with a discussion of the Cyphaleini (Coleoptera, Tenebrionidae). – Records of the South Australian Museum **19**: 77–90.

Medvedev, G. S. (1991): New darkling beetles of tribes Stenosini and Cnemeplatiini (Coleoptera, Tenebrionidae) of the world. – Entomologicheskoe Obozrenie **79**: 557–570. [In Russian; English translation in Entomological Review **71**: 133–147.]

Medvedev, G. S. (1994a): Tenebrionid beetles of the tribe Stenosini from China (Coleoptera: Tenebrionidae). – Zoosystematica Rossica **2**: 307–309.

Medvedev, G. S. (1994b): New data on systematics of darkling beetles of the tribe Stenosini. – Entomologicheskoe Obozrenie **73**: 844–867. [In Russian; English translation in Entomological Review **75**: 101–124.]

Medvedev, G. S. (2009): New species of tenebrionid beetles of the tribe Stenosini (Coleoptera: Tenebrionidae) from Thailand. – Caucasian Entomological Bulletin **5**: 75–79. [In Russian.]

Nabozhenko, M. & Sadeghi, S. (2017): *Foranotum perforatum* gen. et sp. nov.—a new troglobitic darkling beetle (Coleoptera: Tenebrionidae: Kuhitangiinae: Foranotini trib. nov.) from a cave in Southern Zagros, Iran. – Zootaxa **4338** (1): 163–172.
https://doi.org/10.11646/zootaxa.4338.1.9

Peck, S. B. & Kukalova-Peck, J. (1989): Beetles (Coleoptera) of an oil-bird cave: Cueva del Guácharo, Venezuela. – The Coleopterists Bulletin **43**: 151–156.

Peck, S. B., Ruiz-Baliú, A. E. & Garcés González, G. F. (1998): The cave-inhabiting beetles of Cuba (Insecta: Coleoptera): diversity, distribution and ecology. – Journal of Cave and Karst Studies **60**: 156–166.

Ren, G.-D. & Shi, A. M. (2006): Two new record genera of Stenosini (Coleoptera, Tenebrionidae) from China, with descriptions of two new species. – Acta Zootaxonomica Sinica **31**: 180–184.

Schawaller, W. (2007): Redescription of the monotypic genus *Terametus* Motschulsky, 1869 from South Africa and establishment of its taxonomic position (Coleoptera: Tenebrionidae: Lagriinae: Lupropini). – African Entomology **15**: 369–372.
https://doi.org/10.4001/1021-3589-15.2.369

Schawaller, W. & Bigalk, S. (2021): Two new genera and six new species of Stenosini (Coleoptera: Tenebrionidae: Pimeliinae) from Myanmar (Burma), collected by René Fouquè. – Zootaxa **5068** (1): 133–141.
https://doi.org/10.11646/zootaxa.5068.1.7

Tahami, M. S., Merkl, O. & Sadeghi, S. (2016): *Leptodes* of Iran, with description of six new cavernicolous species (Coleoptera: Tenebrionidae: Pimeliinae: Leptodini). – Annales Zoologici **66** (4): 589–606.
https://doi.org/10.3161/00034541ANZ2016.66.4.012

Triplehorn, C. A. (1975): A new subgenus of *Eleodes*, with three new cave-inhabiting species (Coleoptera: Tenebrionidae). – The Coleopterists Bulletin **29**: 39–43.

Yoshitomi, H. (2015): New record of *Pseudochillus* (*Micropseudocillus*) *indochinensis* Fouquè, 2015 (Coleoptera: Tenebrionidae: Stenosini) from Thailand. – Japanese Journal of Systematic Entomology **21**: 230.

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