

# Contribution to the weevil fauna of Montenegro with the description of a new *Echinodera* WOLLASTON, 1863 species, and lectotype designations in the genus *Sciaphobus* K. DANIEL, 1904 (Coleoptera, Curculionoidea)

With 12 figures and 5 Appendices

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## Abstract

We provide first records for 108 weevils species sensu lato (Curculionoidea) to the fauna of Montenegro. During a field trip 203 weevil species were recorded and are listed here. The records of *Archarius anatoliensis* Voss, 1962 are the first ones from the Balkans and document a further spreading of this species towards Northwest. *Echinodera bryneri* spec. nov. is described and compared with the sympatrically occurring, morphologically similar species *E. romanboroveci* STÜBEN, 1998. The lectotypes of *Sciaphobus paliuri* APFELBECK, 1908, and *S. polydrosinus* APFELBECK, 1922 conserved in the Georg Frey collection are designated, and illustrated comments on their differentiation are provided. For *Leiosoma komovicum* PEDRONI, 2018 habitat, images of both sexes, a description of the female genitalia, and the presumable host plants are presented.

## Taxonomic acts

*Echinodera bryneri* spec. nov. – urn:lsid:zoobank.org:pub:DDC7D844-A853-40D2-B217-333C65648144

## Key words

Curculionoidea, Montenegro, species list, faunistics, taxonomy, new species, new records, lectotype designations, DNA barcoding, CO1, COI, COX1, integrative taxonomy

## Zusammenfassung

Erstfunde von 108 Arten der Rüsselkäfer im weiteren Sinn (Curculionoidea) werden für Montenegro aufgeführt. Mit nur einer Exkursion konnten 203 Arten gefunden und bestimmt werden. Die Funde von *Archarius anatoliensis* Voss, 1962 sind die ersten auf dem Balkan und zeigen eine weitere Ausbreitung in Richtung Nordwest auf. *Echinodera bryneri* spec. nov. wird beschrieben. Die Lectotypen von *Sciaphobus paliuri* APFELBECK, 1908, und *S. polydrosinus* APFELBECK, 1922 werden festgelegt, und die relevanten Unterscheidungsmerkmale werden illus-

triert und kommentiert. Habitat, mutmaßliche Wirtspflanzen und Abbildungen beider Geschlechter von *Liosoma komovicum* PEDRONI, 2018 werden vorgestellt, wobei die weiblichen Genitalstrukturen erstmals beschrieben werden.

## Introduction

One important goal of the excursion reported here was to contribute to the extraordinarily poorly explored weevil fauna of Montenegro. Only little was published on Curculionoidea after several expeditions by the ancient specialists: Victor Apfelbeck to Czerna Gora (APFELBECK 1895, 1906, 1907, 1908, 1915, 1918, 1919a, 1919b, 1919c, 1920, 1922, 1927, 1928) who described several endemic weevil species and subspecies in the subfamily Entiminae, and very recently Pedroni described *Liosoma komovicum* PEDRONI, 2018 based on specimens from Montenegro (PEDRONI 2018). But apart from these few examples, faunistic data from Montenegro are scarce (PEŠIĆ 2006) or largely lacking in recent catalogues (LÖBL & SMETANA 2011, 2013, ALONSO-ZARAZAGA et al. 2017). And even when primary literature is searched, only exceptionally data specifically from Montenegro can be found (e.g. CALDARA 1990 for *Tychius* GERMAR, 1817, MEREGALLI 1985 for *Plinthus* GERMAR, 1817, or more often STÜBEN 2018, 2019 for Cryptorhynchinae), and more recent records from the Balkans by SZÉNÁSI (2017). Hence the weevil fauna of Montenegro still awaits being discovered. In the following we give a first insight in the rich fauna, and provide data for 204 Curculionoidea species from the families Apionidae (18 species), Attelabidae (2 species), Curculionidae (122 species), Eriirhinidae (2 species), Rhynchitidae (3 species) and Nanophyidae (8 species). The recent study of *Echinodera* from Western Balkans, including already a small part of the material from Montenegro based on an integrative taxonomical approach (GERMANN & SCHÜTTE 2021) allowed to discover another new species of this genus, which is compared, described and discussed in this paper. Within the attempt to determine the collected species of the genus *Sciaphobus*, we found a series of type material in the Georg Frey collection at the NMB, which helped decisively in understanding the descriptions within that genus by APFELBECK (1908, 1922), therefore a current insight into this genus is given here.

## Material and methods

### Localities

The following 28 localities were visited from 21st April to 1st May 2018 (see Fig. 1):

- 1 Bar Mun., Sotonići, 27km SW Podgorica, N 42.2365, E 19.0446, 200 m, 21.4.2018
- 2 Bar Mun., S Bar, Maslina, N 42.0117 E 19.1524, 20 m, 21.4.2018
- 3 Bar Mun., S Sutorman, N 42.1449 E 19.0988, 770 m, *Carpinus*-Wald, 22.4.2018
- 4 Bar Mun., N Sutorman, N 42.1646 E 19.0999, 630 m, 22.4.2018
- 5 Cetinje Mun., 2 km SE Kotor, Lovćen, N 42.4091 E 18.7888, 920 m, 23.4.2018
- 6 Cetinje Mun., 4.5 km SE Kotor, Lovćen, N 42.3947 E 18.8046, 1320 m, 23.4.2018
- 7 Cetinje Mun., 5.5 km SE Kotor, Lovćen, N 42.3967 E 18.8259, 1410 m, 23.4.2018
- 8 Cetinje Mun., Vidikovac, Lovćen, N 42.3993, E 18.8390, 1620 m, 23.4.2018
- 9 Podgorica Mun., 10 km N Podgorica, N 42.5031 E 19.3272, 84 m, 24.4.2018
- 10 Podgorica Mun., 12 km N Podgorica, N 42.5189 E 19.3285, 208 m, 24.4.2018
- 11 Podgorica Mun., 12 km N Podgorica, N 42.5270 E 19.3224, 252 m, 24.4.2018
- 12 Podgorica Mun., 15 km SW Podgorica, N 42.3051 E 19.1735, 15 m, 24.4.2018
- 13 Bar Mun., 7 km E Petrovac, N 42.2245 E 19.0234, 490 m, 24.4.2018
- 14 Bar Mun., 4 km E Dubrava, N 42.0182 E 19.1869, 170 m, 25.4.2018, ruderal area
- 15 Bar Mun., 1 km W Martići, N 42.0883 E 19.2919, 210 m, 25.4.2018, *Castanea*
- 16 Ulcinj Mun., N 41.9806 E 19.3389, Feuchtgebiet, Seeufer, 13 m, 25.4.2018
- 17 Bar Mun., 3 km E Dubrava, N 42.0264 E 19.1818, 200 m, 25.4.2018
- 18 Kolašin Mun., 2 km E Ljevišta, N 42.8746 E 19.3146, 950 m, 26.4.2018
- 19 Šavnik Mun., 4.5 km NW Ljevišta, N 42.9057 E 19.2610, 1580 m, 26.4.2018
- 20 Ulcinj Mun., 7 km E Ulcinj, N 41.9416 E 19.3019, 0 m, 27.4.2018
- 21 Ulcinj Mun., 4.5 km E Ulcinj, N 41.9193, E 19.2691, 0m, Meeresufer, Saline, 27.4.2018
- 22 Ulcinj Mun., 6 km NE Ulcinj, N 41.9711 E 19.2604, 25 m, Bachtal, 28.4.2018
- 23 Ulcinj Mun., 7 km N Ulcinj, N 41.9937 E 19.2235, 250 m, 28.4.2018
- 24 Bar Mun., 6 km E Dubrava, N 42.0403 E 19.2208, 270 m, Bachufer, 29.4.2018
- 25 Ulcinj Mun., 7.5 km Dubrava, N 42.0533 E 19.2317, 700 m, 29.4.2018
- 26 Bar Mun., 4 km E Dubrava, N 42.0228 E 19.1894, 220 m, 29.4.2018
- 27 Cetinje Mun., 10 km N Virpazar, N 42.3236 E 19.0667, 90 m, 30.4.2018

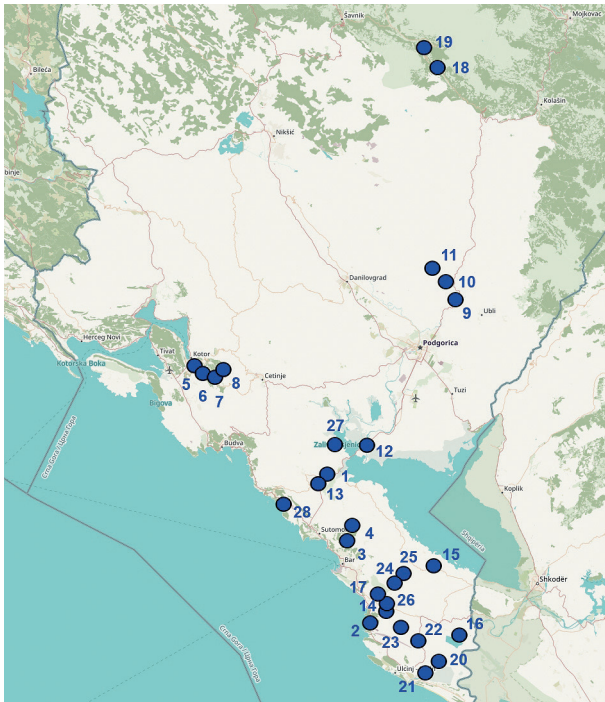


Fig. 1: Map with all 28 sampled localities in Montenegro (base layer by OpenStreetMap).

28 Budva Mun., 3.5 km SE Petrovac, N 42.1811  
E 18.9695, 30 m, 1.5.2018, Flussdelta, Küstenmacchia

The collected weevils are deposited in the Naturhistorisches Museum Basel (NMB), except for selected specimens which are conserved in the author's collections. Label data are given as written, different labels are separated by a double slash (/). Additional remarks are given in square brackets ([ ]). The following holotype of *E. romanboroveci* was used for comparison: male Yugoslavia – Crna Gora Sutomore – env. 25.6.1989 R. Borovec lgt. // Holotypus // Holotypus *Echinodera romanboroveci* P.E. Stüben 1998 // 110.2 // DEI Müncheberg Col – 11466 (SDEI). Furthermore 13 specimens of *E. romanboroveci* collected during the present excursion were used for comparison.

### Molecular analyses

For the molecular part of this study, a new COI barcoding sequence was generated and combined with 37 already published ones. All sequences originate from the Curculio Institute's joint projects, either with the Research Museum Alexander Koenig (ZFMK) or the SDEI/NMB. Due to the profound determination work by recognized specialists before the molecular processing of the specimens, a highly reliable dataset can be guaranteed. In many cases, additional specimens or remaining tissue samples from the same finding spot are available in frozen Ethanol. In most cases, the extracted specimens were recovered after the lysis step and stored in pinned dry collections at ZFMK or NMB.

This additional laboratory step facilitates the possibility of verifying the previous determination.

For all sequences, two Cryptorhynchinae adopted primer sets with degenerated nucleotides are used in ZFMK and SDEI laboratory routines. For LCO1490-JJ / HCO2198-JJ see ASTRIN & STÜBEN 2008 and for LCO1490-JJ2 / HCO2198-JJ2 see ASTRIN et al. 2016. Both target the same binding sites as the well-known primer set from FOLMER et al. 1994 does, delivering 658 nucleotides in weevils. Thus, the derived COI barcodes are compatible with Folmer primer generated ones and meet the requirement of BOLD (RATNASINGHAM & HEBERT 2007, www.barcodinglife.org).

A nucleotide alignment with 37 sequences is created with Muscle-Plugin in Geneious 6.1.8 (KEARSE et al. 2012). All sequences comprise 658 nucleotides (full-length barcode). From the nucleotide alignment, a Jukes-Cantor (JUKE & CANTOR 1969) corrected Neighbor-Joining (NJ) tree is built with Genious, *Acalles camelus* is designated as outgroup species.

The finding spots associated with the sequences are plotted on an ArcGIS map base layer with GPS Visualizer (www.gpsvisualizer.com). The p-distance values are provided in the map with connection lines between the new species *Echinodera bryneri* spec. nov. and its four closest congeners.

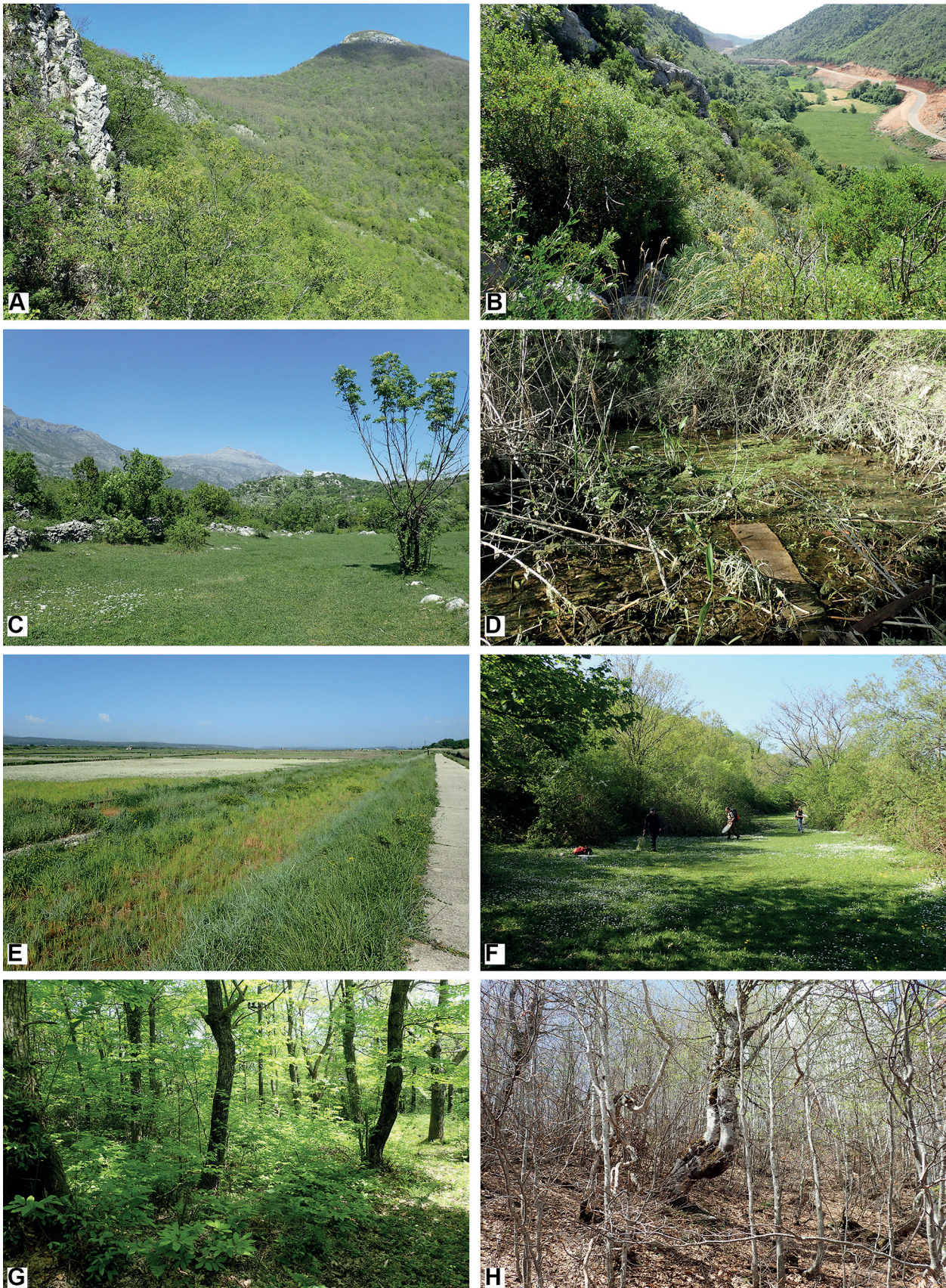
## Results

### General comments

As specific faunistic contributions to Montenegro are largely missing, especially even more so in recent times, it is not a big surprise that out of 203 recorded species, 108 – more than half of them – are new to the fauna of Montenegro. Most of these new records concern species which are generally widespread, but some of them are worth being discussed more in detail, as they were rarely found, narrowly distributed (endemic) or unexpected and thus surprising.

### Sampled habitats and excerpt of typical weevil species

Montenegro has a broad variety of interesting landscapes (Figs 2A–H). We mainly focused on the coastal region with limestone hills and low growing summergreen deciduous forests (*Carpinus*-*Fraxinus*-*Quercus* forests (Fig. 2A) [localities 1, 3–4, 25, 26] with *Aparopion costatum*, *Echinodera major*, *E. romanboroveci*, *Otiorhynchus perdis*, *Phyllobius argentatus*, *Polydrusus brevipes*, *Trichopteration holosericeum*. Evergreen typical mediterranean *Quercus ilex*-forests (Fig. 2B) [localities 2, 22, 28]



**Fig. 2A:** Limestone hills and low growing summergreen deciduous forests (locality 3). **Fig. 2B:** Evergreen typical mediterranean *Quercus ilex*-forests (locality 22). **Fig. 2C:** Extensively grazed and open meadows (11). **Fig. 2D:** Swamps, a river-delta, ponds and lake shores around Skadar lake (locality 16). **Fig. 2E:** Salty areas (locality 21). **Fig. 2F:** Humid creek valleys (locality 4). **Fig. 2G:** Tall chestnut trees (*Castanea sativa*; locality 15). **Fig. 2H:** Old grown beech forests (*Fagus sylvatica*) at 900–1600 m, locality 19 (Photos: C. Germann).

with *Dodecastichus heydenii*, *Otiiorhynchus longipennis*, *Polydrusus cervinus*, *P. picus*. Extensively grazed and open meadows (Fig. 2C) [localities 9–11] with *Eutrichapion punctiger*, *E. viciae*, *Holotrichapion pisi*, *Ischnopterapion loti*, *Ceutorhynchus contractus*, *C. fulvitaris*, *C. leprieuri*, *Oprohynchus suturalis*, *Trichosirocalus horridus*, *Gymnetron aper*, *Mecinus pyraster*, *Sibinia pellucens*, *S. pyrrhodactyla*, *S. viscaria*, *Tychius aureolus*, *T. pusillus*, *T. rufipennis*, *T. tibialis*, *Argoptochus bisignatus*, *Phyllobius betulinus*, *Limobius borealis*, *Lixus punctiventris*, *Rhinocyllus conicus*. Swamps, a river-delta, ponds and lake shores around Skadar lake (Fig. 2D) [localities 16, 20, 28] with *Bagous bagdatensis*, *B. lutulentus*, *B. perparvulus*, *B. puncticollis*, *B. rufimanus*, *B. subcarinatus*, *Mononychus punctumalbum*, *Hypera conmaculata*, *Sphenophorus meridionalis*, *S. parumpunctatus*, *Tanysphyrus lemnae*, *Thryogenes festucae*, *Dieckmanniellus chevrieri*, *D. nitidulus*, *Nanomimus circumscriptus*, *Nanophyes brevis*, *N. marmoratus*. Salty areas (Fig. 2E) [locality 21] with *Polydrusus tibialis*, *Coniatus tamarisci*, *Allomalina quadrivirgata*, *Corimalia pallida*. Humid creek valleys (Fig. 2F) [localities 4, 22, 24] with *Melanapion minimum*, *Perapion violaceum*, *Echinodera bryneri* spec. nov., *Acalyptus carpini*, *Anthonomus pedicularius*, *Bradybatus seriesetosus*, *Miarus stoeckleini*, *Rhinusa moroderi*, *Brachysomus hirtus*, *Limatogaster tumidipes*. Tall chestnut trees towards the Albanian border (Fig. 2G) [locality 15] with *Eutrichapion ervi*, *Ceutorhynchus pectoralis*, *Phyllobius maculicornis*, *Magdalis fuscicornis*. Old grown beech forests (*Fagus sylvatica*) at higher elevated localities (Fig. 2H) [localities 5–8, 18–19] with *Apoderus coryli*, *Mogulones diecki*, *Cotaster cuneipennis*, *Acalles camelus* A. fallax, *A. papei*, *Acallocrates fasciatus*, *Echinodera graeca*, *E. hypocrita*, *Orchestes fagi*, *Polydrusus mollis*, *Stomodesops schaufussii*.

## New species

### Description

*Echinodera bryneri* spec. nov.

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Figs 3, 4A–B; 5A–G

**Material:** Holotype: male «312\_18.25 Montenegro, Ulcinj Mun., 7.5 km Dubrava, N 42.0533° E 19.2317°, 700 m, 29.4.2018, leg. C. Germann» // [red label] HOLOTYPE *Echinodera bryneri* spec. nov. des. Germann & Braunert, 2022 (NMB).

Paratypes: 1 male, 2 females same locality as holotype (NMB, cCG). – 2 males «312\_18.22 Montenegro, Ulcinj Mun., 6 km NE Ulcinj, N 41.9711° E 19.2604°, 25 m, Bachtal, 28.4.2018, leg. C. Germann» (NMB, cCG). – 3 males, 1 female «29.04.2018 Crna Gora Ulcinj Municipality 7.5 km Dubrava, N 42.0533° E 19.2317°, 700 m, 2018-24, 312-18-25 leg. C. Braunert» (cCB). – 1 male «22.04.2018 Crna Gora Bar Municipality S Sutorman

N 42.1449° E 19.0988°, 770 m, Carpinus Quercus Forest, 2018-4, 312-18-3 leg. C. Braunert» (cCG). All with additional red labels: PARATYPE *Echinodera bryneri* spec. nov. des. Germann & Braunert, 2022.

**DNAtype:** The barcode sequence (COI) was extracted with a none-invasive method from one paratype female (nr. 3275-GER, locality 25, the same as holotype). GenBank accession no: OM991939.

**Size** (without rostrum): 2.3–3.2 mm. Body colour dark brown to blackish (Figs 4A–B).

**Head:** eyes flattened, large and oval, upper margin above rostral groove, visible from above. Rostrum deeply punctuate-striate; densely covered with small oval scales and hairs from middle on towards rostral apex. Antennae reddish brown, antennal scape: 5 times longer than wide, segments of antennal funiculus: 1st thicker than the following, 1st and 2nd: 2 x longer than wide, 3rd to 5th: as long as wide, 6th and 7th transverse, club oval, 2.5 x thicker than last segments of funiculus.

**Pronotum:** transverse (length/width: 0.7); maximal width before base in the first third, slightly rounded towards base; strongly narrowed, cone shaped towards front margin (Fig. 4A). Coarsely punctured, larger punctures towards hind margin. Integument and vestiture: colour patterns varying with darker and lighter brown scales; spotty placed light brownish to whitish scales. The integument consists of loosely standing, appressed, almost circular scales. Longer (2 x longer than wide), broadly oval, clubbed and nearly vertically raised bristles arise from punctures.

**Elytra:** globular (length/width: 1.0–1.1); widest in middle; without shoulders; base straight, elytral decline in lateral view rounded, vertical towards apex.

**Integument and vestiture:** colour patterns varying with darker and lighter brown scales; spotty placed light brown or whitish scales forming irregular transversal bandings. Consisting of almost circular appressed scales not entirely covering the intervals.

**Striae** narrow, about half the span of intervals, visible through integument; punctures with adjacent thin, scale-like bristles. On intervals long (3.5 to 4 x longer than wide), scale-like, clubbed, vertically raised bristles.

**Legs:** brown, strong, densely covered with elongated brown and light brown scales. Spine at tip of hind tibia regularly bowed inwards in males.

**Penis:** tip of medianlobus broadly pointed, in lateral view bent, S-shaped waved (Figs 5A–D).

**Female genitalia** (Figs 5E–G). Spermatheca with cornu c-shaped, ramus and nodulus not visible (Fig. 5E). Spiculum ventrale with shovel-shaped plate, basal edges of plate inclined in an angle of 40°, and apodeme more than twice as long, tip of apodeme thickened (Fig. 5F). Gonocoxite consisting of two sclerotized segments, stylus cylindrical (Fig. 5G).

**Variability:** The width of the erect bristles on the elytra varies to a certain extent, as well as the body size.

**Etymology:** The new species *Echinodera bryneri* spec. nov. (Fig. 3) is named after our dear friend and renowned expert in Microlepidoptera (especially Adelidae) Ruedi Bryner (Biel), who is furthermore a gifted breeder of various insects including occasionally weevils as unintended guests together with his target organisms.

**Differential diagnosis:** *Echinodera bryneri* spec. nov. is morphologically similar to *E. romanboroveci* STÜBEN, 1998, which was also found at five more northwestern localities within the sampled area (Fig. 1). *E. bryneri* spec. nov. was found at three localities in the southeast and one locality (3) harboured both species.

*Echinodera bryneri* spec. nov. has longer raised setae on elytra and scales on pronotum, the shape of the elytra is more rounded, the whole body is more robust and broader. The penis is broader, its tip wider with apex not rather regularly attenuated and pointed as in *E. romanboroveci*, but more abruptly and more obtuse-angled pointed. The tip of the penis in lateral view with s-shaped wave ventrally less bowed than in *E. romanboroveci*. The female genitalia differ in the shape of the spermatheca (Fig. 5E, L), the shape of the plate of the spiculum ventrale, where the basal edges are rectangular in *E. romanboroveci* instead of inclined as in

*E. bryneri* spec. nov. (Fig. 5F, M), and the shape of the gonocoxite (Fig. 5G, N). With its long and raised setae *E. bryneri* spec. nov. is furthermore superficially similar to *E. capiomonti* (BRISOUT DE BARNEVILLE, 1865) occurring in Italy, Croatia and Bosnia and Herzegovina, but the distinctly shorter setae (8-10 times longer than wide in *E. capiomonti*) and the more oval elytra of *E. bryneri* spec. nov. already allow a reliable differentiation. *E. bryneri* spec. nov. is also similar to *E. brisouti* (REITTER, 1885) from Greece, but differs by the more erect bristles on elytra, and the different shape of the penis, which is attenuated before the tip in *E. brisouti*, and broadly rounded in *E. bryneri* spec. nov.

Taxonomical comments on the genus *Sciaphobus* K. DANIEL, 1904 based on specimens from VICTOR APFELBECK in the Georg Frey collection

Part of the genus *Sciaphobus* was revised by BOROVEC & SKUHROVEC (2015). They redefined the subgenera *Sciaphobus* s. str. K. DANIEL, 1904 and *Neosciaphobus* APFELBECK, 1922, and mentioned difficulties that remain concerning those species where at that time no type material was available. As a small part of the Apfelbeck collection (especially Curculionidae) was included in the Georg Frey collection in 1935 (conserved in

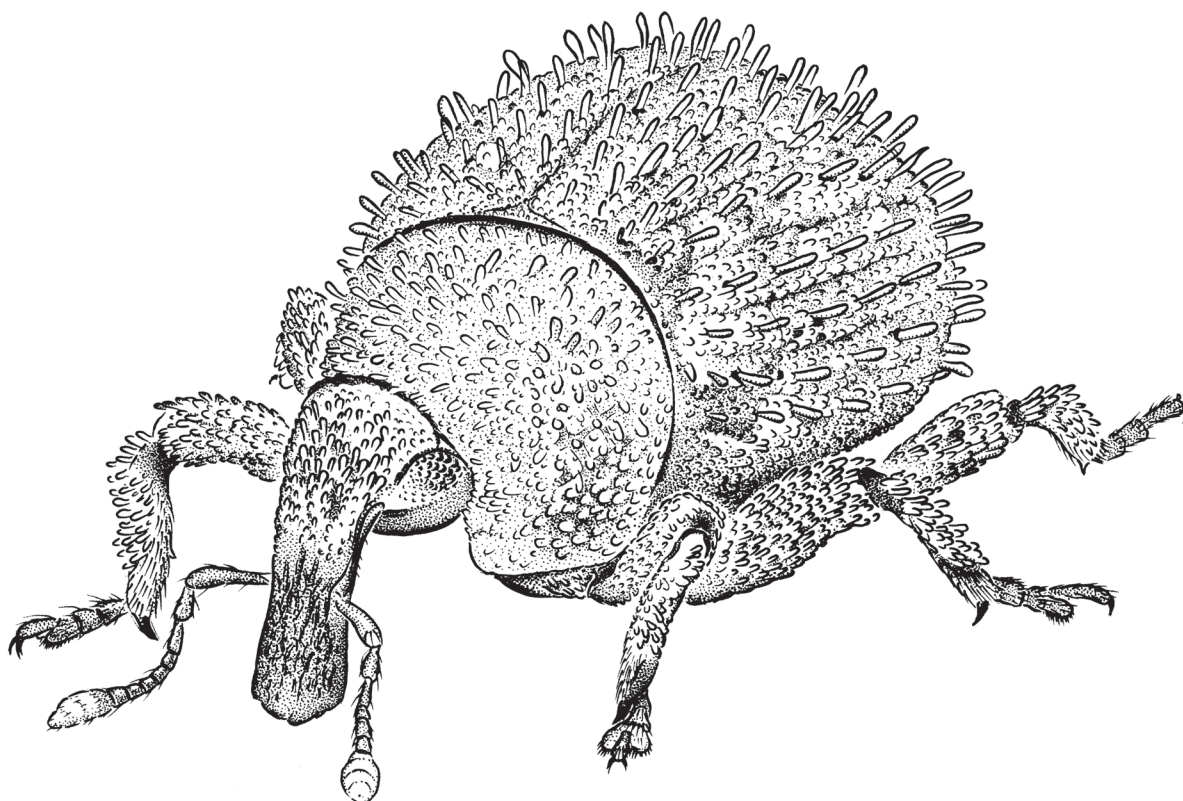
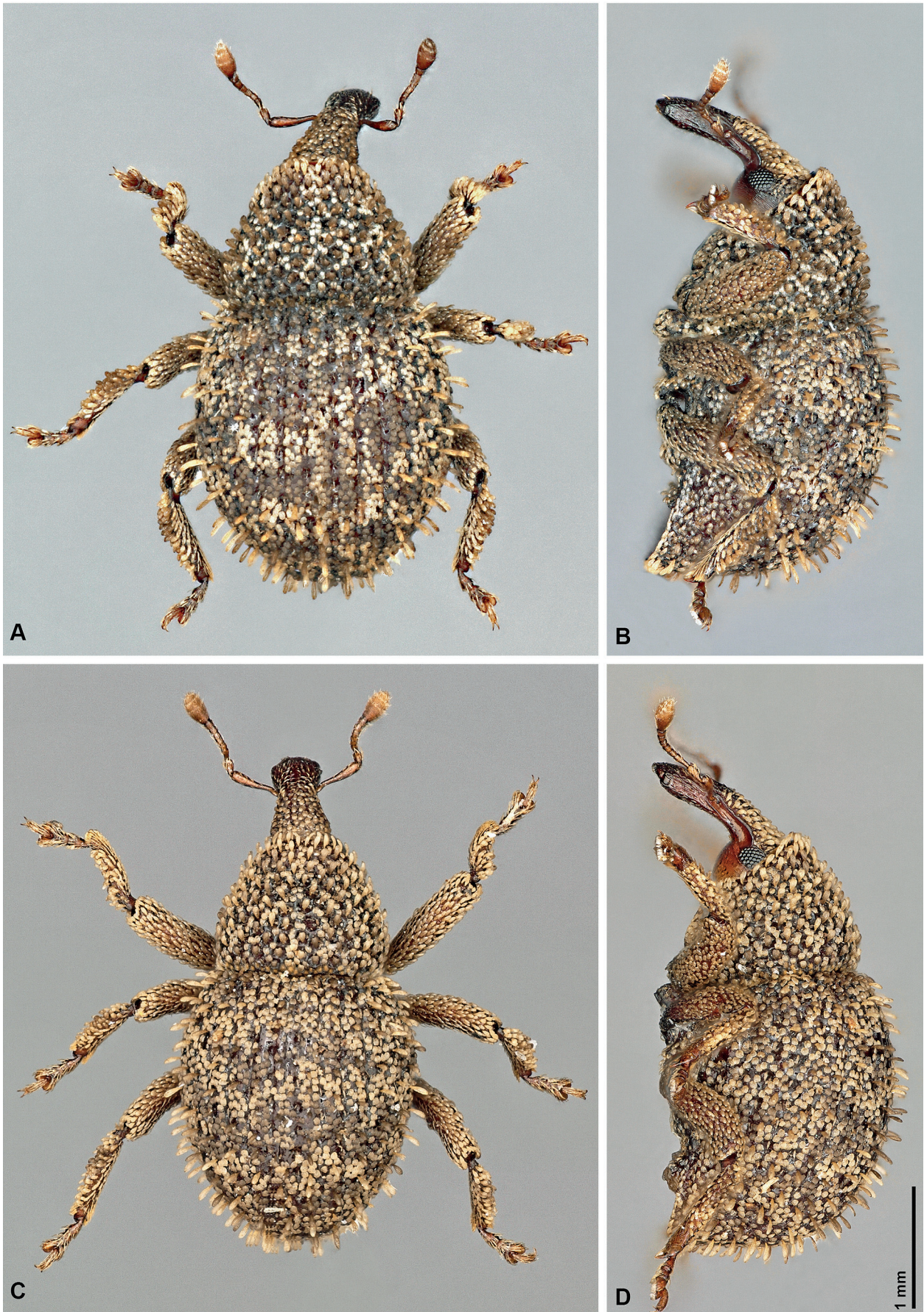


Fig. 3: Fronto-lateral view of *Echinodera bryneri* spec. nov., drawing by Christian Roesti.

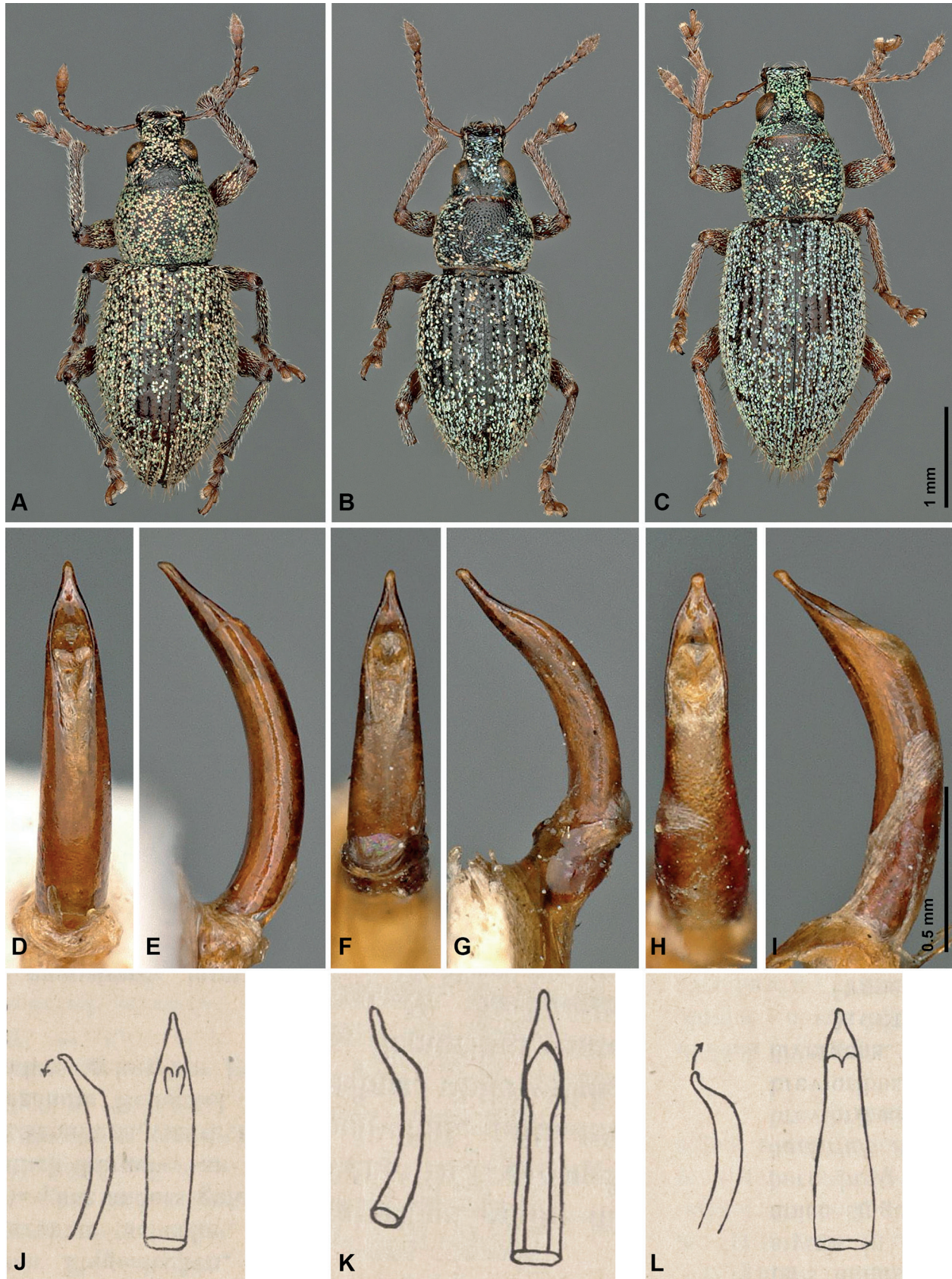


Figs 4A–B: Habitus dorsal/lateral of *Echinodera bryneri* spec. nov., and 4C–D: *E. romanboroveci* (males).



Figs 5A–D: Penis of *Echinodera bryneri* spec. nov., ventral and lateral views. 5F–G: Female genitalia of *E. bryneri* spec. nov., 5E: Spermatheca. 5F: Spiculum ventrale 5G: Gonocoxite. Figs 5H–K: Penis of *E. romanboroveci*, ventral and lateral views. 5L–N: Ditto female genitalia. 5L: Spermatheca. 5M: Spiculum ventrale. 5N: Gonocoxite (Photos: C. Germann).





Figs 6A–C: Habitus of males of 6A: *Sciaphobus paliuri* lectotype. 6B: *S. curvimanus* holotype. 6C: *S. polydrosinus* lectotype. Figs 6D–I: Penes dorsal and lateral of 6D–E: *S. paliuri*. 6F–G: *S. curvimanus*. 6H–I: *S. polydrosinus* (Photos: C. Germann). 6J–L: Ditto taken from APFELBECK (1922).

the Naturhistorisches Museum Basel), including type specimens collected by Kurt Hermann Gustav Otto Noesske (1873–1946) as written by APFELBECK (1922) in his first descriptions, the opportunity was given to revise these specimens when a series of an undetermined *Sciaphobus* was collected during the present excursion.

The examination of the available specimens showed, that specimens from all three somewhat enigmatic taxa were present. According to article 74.7.3 of the Code of Zoological Nomenclature (ICZN 1999), the lectotypes and paralectotypes of *Sciaphobus paliuri* and *S. polydrosinus* are selected based on the specimens and characters indicated and shown below.

The syntypes of *S. paliuri* APFELBECK, 1908 (page 532 with the only finding locality indicated «Virpazar»). 1 ♂ «*Sciaphobus paliuri* [handwritten] // Apflb. Virpazar [sic!] // red label Lectotype *Sciaphobus paliuri* APFELBECK, 1908 sel. C. Germann 2019» with last two ventrites, spiculum gastrale and penis mounted on a different label. Paralectotypes: 1 ex. «Apflb. Virpazar [sic!] // paliuri Apf [handwritten] // Sammlung Stöcklein // red label Paralectotype *Sciaphobus paliuri* Apfelbeck, 1908 sel. C. Germann 2019». 3 ex. „Apflb. Virpazar“ // ex Orig. Samlg. J. Breit Wien // red labels Paralectotype *Sciaphobus paliuri* Apfelbeck, 1908 sel. C. Germann 2019“. 1 ex. „Apflb. Virpazar // paliuri typ. ♀ Apf [handwritten] // Sammlung Stöcklein // red label Paralectotype *Sciaphobus paliuri* Apfelbeck, 1908 sel. C. Germann 2019“. 1 ex. „Apflb. Virpazar // ex Orig. Samlg. J. Breit Wien // *Sciaphobus paliuri* Apfb. // red label Paralectotype *Sciaphobus paliuri* Apfelbeck, 1908 sel. C. Germann 2019“. 1 ex. „Apflb. Virpazar // ex Orig. Samlg. J. Breit Wien // *Sciaphobus paliurii* [sic!] Apfb. Co-type // red label Paralectotype *Sciaphobus paliuri* Apfelbeck, 1908 sel. C. Germann 2019“. And the following additional non-type material in the G. Frey collection was examined: 8 ex. «Apflb. Pristan». 2 ex. «Rjeka Monteneg.». 2 ex. «Mustajbeg Rjeka». 2 ex. «Rjeka».

The holotype of *Sciaphobus curvimanus* Apfelbeck, 1922: 1 ♂ with penis, last 3 ventrites and spiculum gastrale mounted on a separate label «Küste» [handwritten] // *Sciaphobus curvimanus* n. sp. Typ. Apf. [all handwritten] // Sammlung Apfelbeck // Holotype *Sciaphobus curvimanus* Apfelbeck, 1922 ett. C. Germann 2019“ This data fit perfectly with the given ones on page 68 from Montenegro „...in einem einzigen Exemplare, wahrscheinlich im Küstengebiet, gesammelt...“ [collected in one single specimen, likely from the coastal area].

The syntypes of *Sciaphobus polydrosinus* Apfelbeck, 1922 (page 69 with the localities Cetinje and Rjeka), where the lectotype: 1 ♂ with penis and 5 ventrites mounted

on a separate label „Apflb. Cetinje // polydrosinus n. sp. det. Apflb. [partly handwritten] // red label Lectotype *Sciaphobus polydrosinus* Apfelbeck, 1922 sel. C. Germann 2019“, and the following paralectotypes are selected: 3 ex. „Apflb. Cetinje // Sammlung Apfelbeck // red labels Paralectotype *Sciaphobus polydrosinus* Apfelbeck, 1922 sel. C. Germann 2019“. 1 ex. Ditto with additional label «*Sciaphobus polydrosinus* Cotype Apf.». 1 ex. «Rjeka // Sammlung Apfelbeck // polydrosinus m. [= mihi] [handwritten] // red label Paralectotype *Sciaphobus polydrosinus* Apfelbeck, 1922 sel. C. Germann 2019».

Studying all specimens of the three species allowed to confirm the value of the given characters by Apfelbeck (1922), namely: i) the absence of any femoral teeth in the case of *Sciaphobus paliuri*; ii) all femora are conspicuously teathed in *S. curvimanus*; iii) tiny tooth on profemora and mostly stronger teeth on meso- and metafemora in *S. polydrosinus*, furthermore in that latter species the more elongate antennomeres and the more protruding eyes are reliable characters. The dorsal and lateral shapes of the penes, and the shape of their tips, are furthermore suitable for discrimination. There the provided Figs 6A–L illustrate these differences partly already drawn by Apfelbeck (1922), and again included here (Figs 6J–L). In *S. paliuri* the medianlobus is parallel sided in dorsal view, weakly bowed in lateral view and the tip more regularly attenuated with a hook-like tip. In *S. curvimanus* the medianlobus is more triangularly shaped, stronger bowed with a more abruptly attenuated, rounded tip. In *S. polydrosinus* the medianlobus is constricted in its middle, and broadly rounded before the tip, in lateral view thick with an almost pointed tip. On the other side, some characters used for species discrimination did not prove to be suitable for a reliable differentiation, namely i) the rather variable shape of pronotum and body, these vary within the sexes, but even more between them; more than between the three species investigated; ii) the same with the scales which show the whole spectre from greenish to pearl-like lustre, these furthermore are varying in shape from narrow setiform to broader and almost circular.

## Records of remarkable species

### Curculionidae, Molytinae

#### *Plinthus squalidus gerlii* BOHEMAN, 1842

At present recorded from Croatia and Bosnia-Herzegovina (KIPPENBERG 1981, 1982, MEREGALLI 1985). The characteristic vestiture of broad scales on elytra, pronotum and sternites can be used for a reliable determination (KIPPENBERG 1981). Based on the appressed broad scale-like hairs on the sternites, the other subspecies *P. squalidus purkynei* KIPPENBERG, 1981 with narrow and detached hairs, which is known from the Durmitor

massif in Montenegro, can be excluded. The single specimen (Fig. 7A) was found under a stone at the margin of a *Fagus* forest on Lovćen (locality nr 6). As the Lovćen massif is a continuation of the narrow mountain chain close to the coast reaching from Croatia to Montenegro, and *P. squalidus gerlii* seems to follow this chain, this present discovery fits well in the hitherto known distribution and enlarges it towards the Southeast.

*Leiosoma komovicum* PEDRONI, 2018

This species was recently described based on one couple from the Komovi mountains in the Durmitor massif in Montenegro (PEDRONI 2018). The species derives in its habitus strongly from all other species of the *Leiosoma cribrum*-group, which was also mentioned by the author. We collected three specimens of *L. komovicum*, in a *Fagus* forest. The exact finding place (FO 19) was in close vicinity of old *Fagus sylvatica* trees and consisted

of leaf litter between flowering *Anemone nemorosa* and *A. apennina* (Figs 8A–B) which might be both suitable candidates of host plants, as mostly Ranunculaceae are mentioned as host plants, and are the only ones where larvae were observed up to now (*Ranunculus* spp., *Anemone nemorosa* in the case of *L. deflexum*, SCHERF 1964). As the female is not yet described in detail, we provide as a supplement to the description good photos of both sexes (Figs 9A–H), additional photos of the penis (Figs 9C–E) and give here a description of the sclerotized female genitalia. The spiculum ventrale (or sternite VIII) (Fig. 9F) shows a biforked plate, the apodeme is 1.5 times longer than the plate, with its base broadened. The spermatheca (Fig. 9G) has a long, almost straight cornu, the corpus is bell-shaped with both, nodulus and ramus reduced. The gonocoxite is weakly sclerotized, simply bow-shaped with rather robust, somewhat flattened stylus at apex (Fig. 9H).



Fig. 7A: Habitus of *Plinthus squalidus gerlii*, female from Lovćen. 7B: *Stomodesops schaufussi* male from Lovćen (Photos: C. Germann).



Figs 8A: Habitat in general and 8B: detail with *Anemone* spp., where *Leiosoma komovicum* was sifted at locality 19 near Ljevišta (Photos: C. Germann).

Curculionidae, Bagoinae

*Bagous* spp.

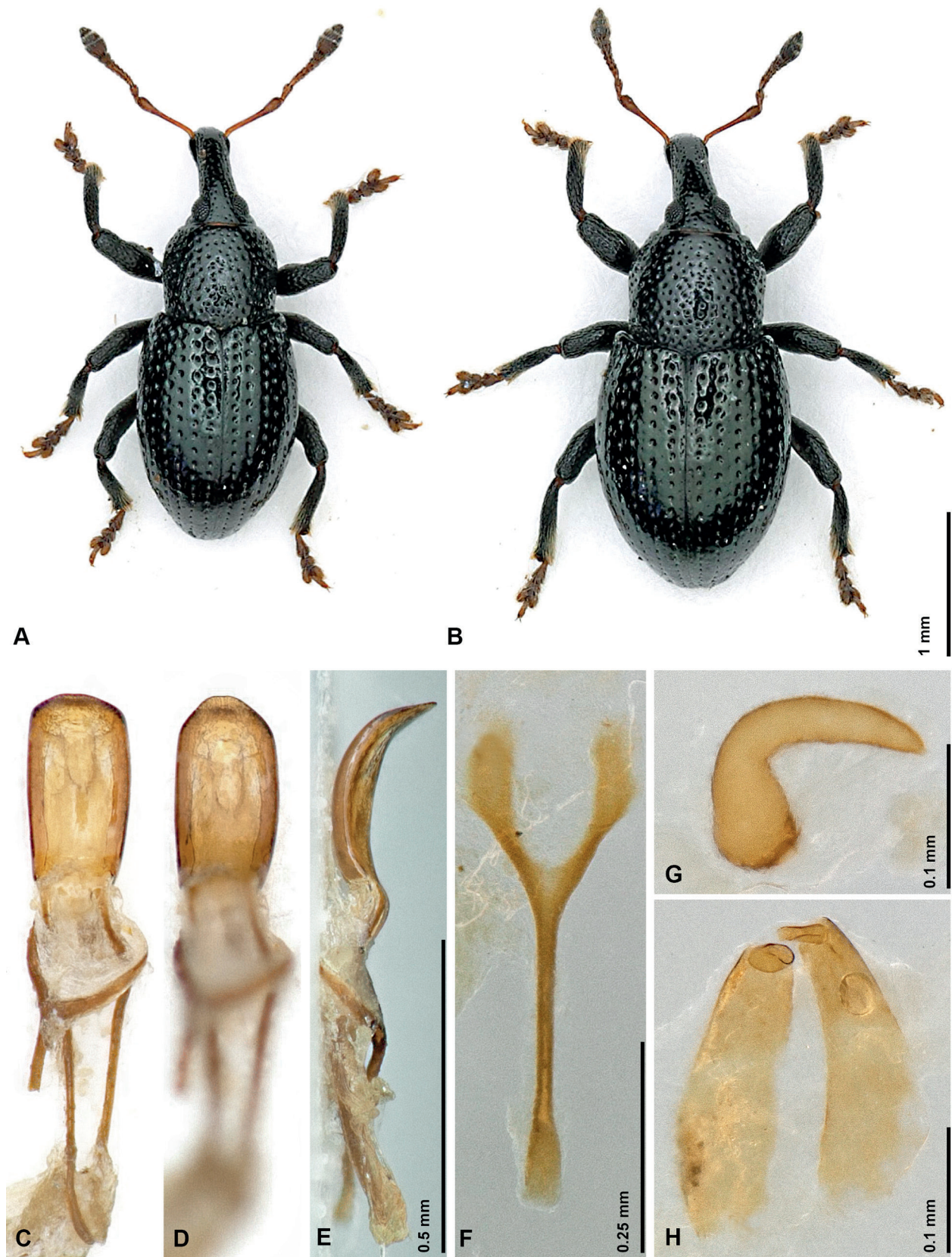
A remarkable number of six species of these mostly underwater living species could be collected along the rather unspectacular shore of a pond at locality 16 (Fig. 2D), namely *Bagous bagdatensis* (PIC, 1904), *B. lutulentus* GYLLENHAL, 1813, *B. perparvulus* ROSENHAUER, 1856, *B. puncticollis* BOHEMAN, 1845, *B. rufimanus* PÉRICART, 1989, and *B. subcarinatus* (GYLLENHAL, 1836). The quickly dropping water level of this small lake allowed to beat against mud and drying water plants, which kept hanging on shrubs and branches towards the shore.

Curculionidae, Curculioninae

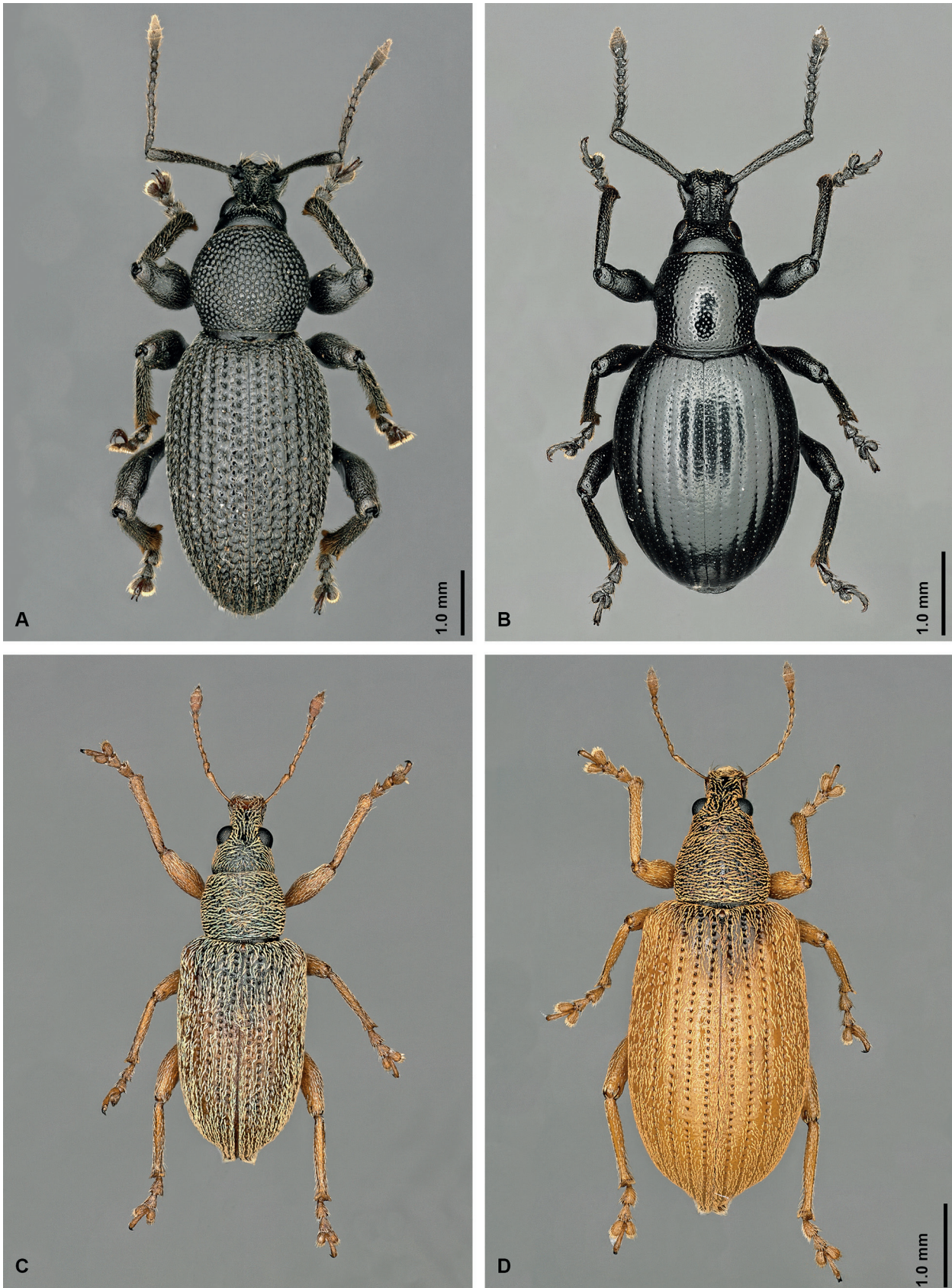
*Archarius anatoliensis* Voss, 1962

First record in Europe in 2016 from the Greek island Lesbos (GERMANN & BRAUNERT 2016). Now from Montenegro in 14 specimens from 6 localities (11, 25, 27, 10, 18, 28), which is 700 km distant from Lesbos. This definitely shows an up-to-date north-western spreading of the species.

As some of the hereby reported species were hardly ever pictured and are rarely found or mentioned in literature, we furthermore provide a picture gallery of the following species: *Stomodesops schaufussi* (MILLER, 1863) (Fig. 7B), *Otiorhynchus longipennis* STIERLIN, 1861 (Fig. 10A), *Otiorhynchus praecellens pentheri* REITTER, 1913 (Fig. 10B), and both, rather dimorphic, sexes of *Polydrusus brevipes* (KIESENWETTER, 1864) (Figs 10C–D).



Figs 9A–B: Habitus of *Leiosoma komovicum*. 9A: male. 9B: female. 9C–H: Genitalia. 9C–E: Penis 9C: ventral view. 9D: tip in ventral view. 9E: lateral view. 9F: Spiculum ventrale. 9G: Spermatheca. 9H: Gonocoxites. (Photos: C. Germann).



Figs 10A–C: Rarely depicted Curculionidae from Montenegro: 10A: *Otiorhynchus longipennis*. 10B: *Otiorhynchus praecellens pentheri* 10C–D: *Polydrusus brevipes* male, ditto female (Photos: C. Germann).

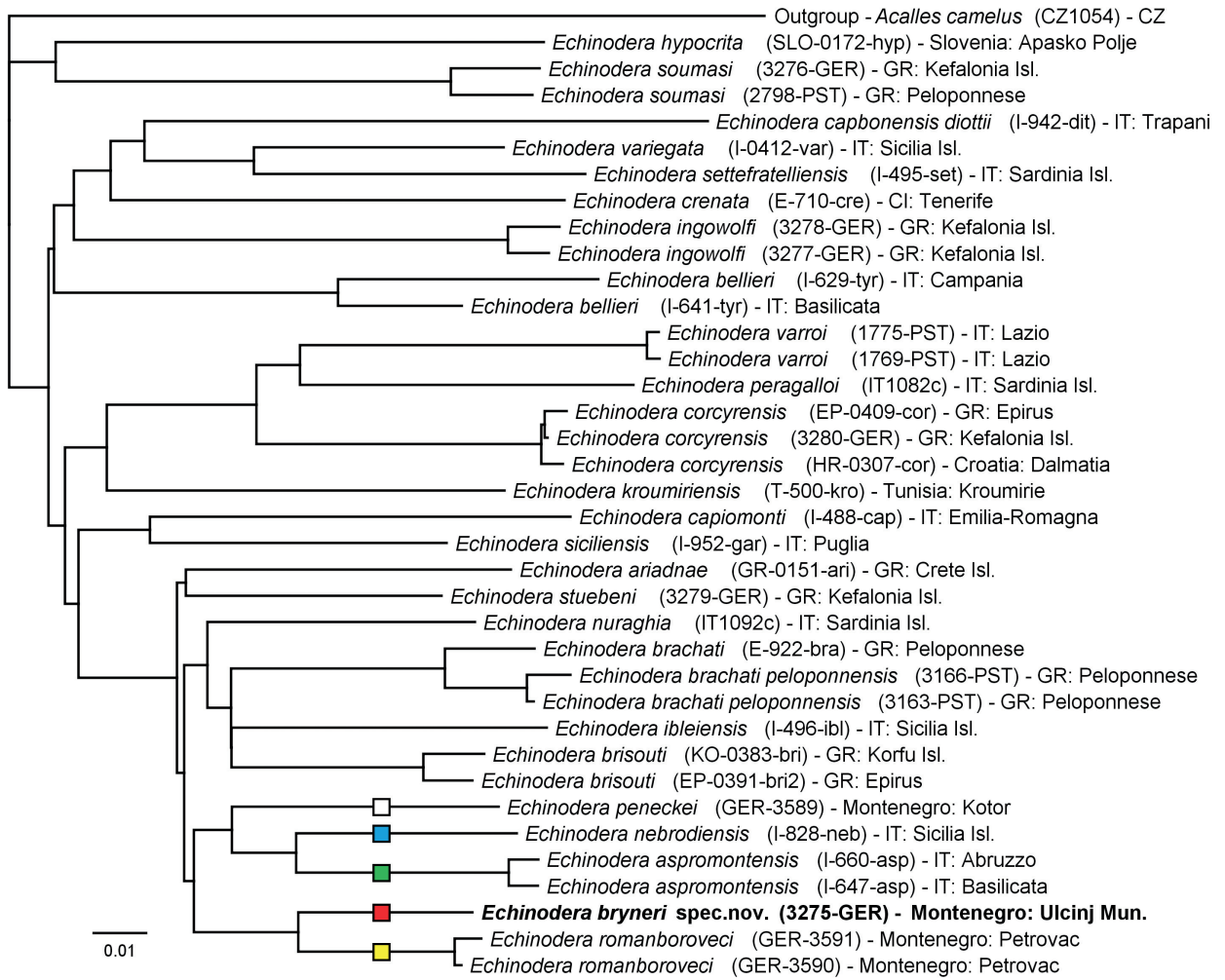


Fig. 11: Jukes-Cantor corrected Neighbor-Joining tree of west Balkans *Echinodera* including *Echinodera bryneri* spec. nov. The five coloured squares match with the colours of the geographic distribution map (Fig. 12).

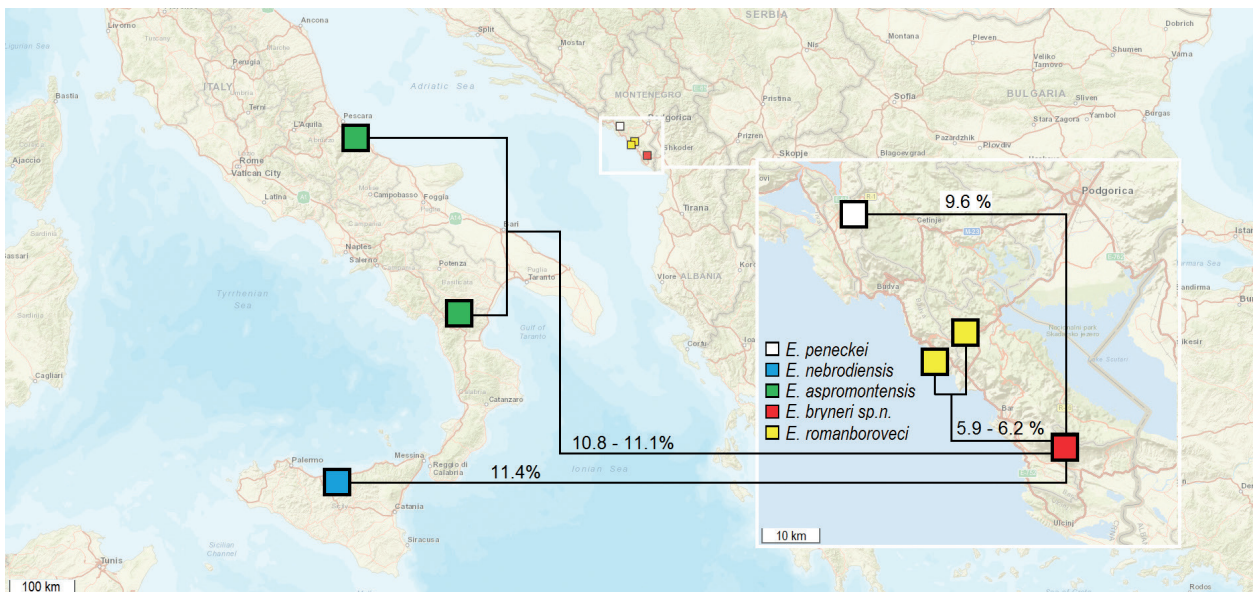


Fig. 12: Geographical map of Western Balkans and Italy with genetic distances (pdistance, uncorrected) between *Echinodera bryneri* spec. nov. and its sister species *E. romanboroveci* and other congeners. The finding spot of the new species in Montenegro is shown 10 x enlarged (right square).

## Molecular analyses

The molecular analysis clearly confirms the species status of *Echinodera bryneri* spec. nov. from the molecular perspective. The Neighbor-Joining (NJ) tree is provided in Fig. 11. The distribution map with *E. bryneri* and its congeners in focus is provided in Fig. 12, the genetic distances listed were taken from the distance matrix (Appendix 5), uncorrected p-distance values are listed.

The molecular closest congeners available in the dataset and their uncorrected p-distance values to *E. bryneri* are: *E. romanboroveci* STÜBEN, 1998 (5.9 to 6.2 % from Montenegro), *E. aspromontensis* STÜBEN, 2008 (10.8 to 11.1 % from Italy), *E. nebrodiensis* STÜBEN, 2003 (11.4 % from Sicily island, Italy), *E. penecke* STÜBEN, 1998 (9.6 % from Montenegro).

These findings regarding the interspecific genetic distances are in concordance with the MWI dataset: The average p-distance value for continental endemic *Echinodera* species is ~11 % (SCHÜTTE et al. 2022, in preparation). The smallest currently known interspecific p-distance value for continental endemic *Echinodera* species is 5.8 % for *E. cognita* from Spain (e-490-cog/ GU213684) vs. *E. incognita* from Spain (e-594-inc/ GU213709), both not included in the NJ tree. With 5.9–6.2 % genetic distance between *E. bryneri* and *E. romanboroveci* is clearly on the lower end of the scale, but the morphological characters leave no doubt about its species status as well. For all currently known closely related species COI sequence data is available and was used in the molecular analyses.

## Discussion

Our present contribution adds the remarkable number of 108 further species to the fauna of Montenegro, among them one species new to science (*Echinodera bryneri* spec. nov.). This discovery is not unusual. Despite of the thorough dedication by STÜBEN (2018) to this group, the same author and some of us just recently went on finding new species in Greece (STÜBEN & KRAMP 2019, GERMANN & SCHÜTTE 2021), therefore future investigations will certainly lead to more such discoveries. This present effort in continuing the exploration of the remarkably rich biodiversity in the Balkans follows recent additions by PEŠIĆ (2006) and SZÉNÁSI (2017). The determination of several species collected during the present excursion was difficult, and in the case of *Sciaphobus* only the direct comparison with specimen from the museum collection was successful, which led furthermore to the designation of lectotypes, and the re-evaluation of the morphological characters used for species discrimination. For future studies, the species

presented here in the photo galleries might be helpful, as in general only old keys with scarce illustrations are available.

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## Appendix 1 - species list

Species list of all 203 species of Curculionoidea recorded from Montenegro. Locality no. = refers to the numbered localities given; ME = the exclamation mark (!) indicates a new record for the fauna of Montenegro.

Sub-Family/genus/species	locality no.	ME
<b>Anthribidae</b>		
<i>Pseudeuparius centromaculatus</i> (Gyllenhal, 1833)	2	!
<b>Apionidae</b>		
<i>Catapion seniculus</i> (Kirby, 1808)	15	!
<i>Cyanapion gyllenhalii</i> (Kirby, 1808)	26	!
<i>Eutrichapion ervi</i> (Kirby, 1808)	15	!
<i>Eutrichapion punctiger</i> (Paykull, 1792)	9, 10, 11, 14, 22, 26, 28	!
<i>Eutrichapion viciae</i> (Paykull, 1800)	10, 14, 26	!
<i>Hemitrichapion pavidum</i> (Germar, 1817)	3	!
<i>Holotrichapion gracilicolle</i> (Gyllenhal, 1839)	14, 22, 26	!
<i>Holotrichapion ononis</i> (Kirby, 1808)	25	!
<i>Holotrichapion pisi</i> (Fabricius, 1801)	2, 11, 14, 25	!
<i>Ischnopterapion fallens</i> (Marseul, 1888)	20	!
<i>Ischnopterapion loti</i> (Kirby, 1808)	11, 20, 24, 25, 26	!
<i>Kalcapion semivittatum</i> (Gyllenhal, 1833)	2, 12	
<i>Melanapion minimum</i> (Herbst, 1797)	4	!
<i>Oxystoma pomonae</i> (Fabricius, 1798)	11	!
<i>Perapion violaceum</i> (Kirby, 1808)	4, 12, 14	
<i>Protapion nigritarse</i> (Kirby, 1808)	20, 23	
<i>Protapion fulvipes</i> (Geoffroy, 1785)	4	
<i>Protapion laevicolle</i> (Kirby, 1811)	26	!
<i>Taeniapion rufescens</i> (Gyllenhal, 1833)	2	!
<i>Protapion trifolii</i> (Linnaeus, 1768)	26, 28	!
<i>Protapion varipes</i> (Germar, 1817)	20	!
<i>Protapion woerzi</i> (Wagner, 1904)	20	
<i>Rhopalapion longirostre</i> (Olivier, 1807)	2	
<i>Squamapion atomarium</i> (Kirby, 1808)	26	
<i>Trichopterapion holosericeum</i> (Gyllenhal, 1833)	3, 11, 15, 18, 24, 25, 27, 28	!
<b>Attelabidae</b>		
<i>Apoderus coryli</i> (Linné, 1758)	5	!
<i>Attelabus nitens</i> (Scopoli, 1763)	11, 25	
<b>Curculionidae</b>		
<b>Bagoinae</b>		
<i>Bagous bagdatensis</i> (Pic, 1904)	16	
<i>Bagous lutulentus</i> Gyllenhal, 1813	16	
<i>Bagous perparvulus</i> Rosenhauer, 1856	16	!
<i>Bagous puncticollis</i> Boheman, 1845	16	!
<i>Bagous rufimanus</i> Péricart, 1989	16	
<i>Bagous subcarinatus</i> (Gyllenhal, 1836)	16	!

Sub-Family/genus/species	locality no.	ME
<b>Baridinae</b>		
<i>Aulacobaris lepidii</i> (Germar, 1823)	7	!
<b>Ceutorhynchinae</b>		
<i>Calosirus apicalis</i> (Gyllenhal, 1827)	26	!
<i>Ceutorhynchus cochleariae</i> (Gyllenhal, 1813)	12	!
<i>Ceutorhynchus contractus</i> (Marsham, 1802)	11, 15, 22, 24	!
<i>Ceutorhynchus erysimi</i> (Fabricius, 1787)	11	!
<i>Ceutorhynchus fulvitaris</i> Gougelet & Brisout de Barneville, 1860	11, 12	!
<i>Ceutorhynchus leprieuri</i> C. N. F. Brisout de Barneville, 1881	11	!
<i>Ceutorhynchus pectoralis</i> Weise, 1895	9, 10, 15	!
<i>Ceutorhynchus sulcicollis</i> (Paykull, 1800)	12, 14	!
<i>Ceutorhynchus unguicularis</i> C. G. Thomson, 1871	3, 25	!
<i>Datonychus arquata</i> (Herbst, 1795)	16	!
<i>Datonychus melanostictus</i> (Marsham, 1802)	3	!
<i>Glocianus distinctus</i> (C. N. F. Brisout de Barneville, 1870)	26	!
<i>Glocianus pilosellus</i> (Gyllenhal, 1837)	14	!
<i>Hadroplontus trimaculatus</i> (Fabricius, 1775)	2	!
<i>Mogulones diecki</i> (C. N. F. Brisout de Barneville, 1870)	5, 7	!
<i>Mononychus punctumalbum</i> (Herbst, 1784)	20, 21, 28	!
<i>Nedys quadrimaculatus</i> (Linné, 1758)	19	
<i>Oprohinus consputus</i> (Germar, 1823)	14, 26	!
<i>Oprohinus suturalis</i> (Fabricius, 1775)	10, 22, 26	!
<i>Rhinoncus perpendicularis</i> (Reich, 1797)	12, 16	!
<i>Tapeinotus sellatus</i> (Fabricius, 1794)	16	!
<i>Trichosirocalus horridus</i> (Panzer, 1801)	11, 22	!
<i>Trichosirocalus troglodytes</i> (Fabricius, 1787)	11	!
<i>Zacladus exiguus</i> (Olivier, 1807)	20	!
<b>Cossoninae</b>		
<i>Cotaster cuneipennis</i> (Aubé, 1850)	19	
<b>Cryptorhynchinae</b>		
<i>Acalles camelus</i> (Fabricius, 1792)	19	
<i>Acalles fallax</i> Boheman, 1844	19	
<i>Acalles papei</i> (A. Solari & F. Solari, 1905)	6	
<i>Acallocrates fasciatus</i> Colonnelli 1980	6, 7	
<i>Echinodera graeca</i> Caldara, 1973	7	
<i>Echinodera hypocrita</i> (Boheman, 1837)	19	
<i>Echinodera major</i> (A. Solari & F. Solari, 1907)	4, 5	
<i>Echinodera peneckeii</i> Stüben, 1998	5	
<i>Echinodera romanboroveci</i> Stüben, 1998	3, 4, 6, 13, 28	
<i>Echinodera bryneri</i> spec. nov.	3, 22, 25	!

Sub-Family/genus/species	locality no.	ME
<b>Curculioninae</b>		
<i>Acalyptus carpini</i> (Fabricius, 1792)	4	!
<i>Anthonomus chevrolati</i> s. str. Desbrochers des Loges, 1868	3	
<i>Antonomus kirschi</i> (Desbrochers des Loges, 1868)	3	
<i>Anthonomus pedicularius</i> (Linnaeus, 1758)	3, 4	!
<i>Anthonomus pomorum</i> (Linnaeus, 1758)	3, 14	
<i>Anthonomus rubi</i> (Herbst, 1795)	18	
<i>Archarius anatoliensis</i> Voss, 1962	10, 11, 18, 25, 27, 28	!
<i>Bradybatus fallax</i> (Gerstaecker, 1860)	3	
<i>Bradybatus seriesetosus</i> Petri, 1912	4, 22	!
<i>Cionellus gibbifrons</i> (Kiesenwetter, 1852)	9	!
<i>Cionus balianii</i> (F. Solari, 1932)	3	!
<i>Cleopomiarus distinctus</i> (Boheman, 1845)	14, 27	!
<i>Cleopomiarus medius</i> (Desbrochers des Loges, 1893)	25	
<i>Cleopomiarus meridionalis</i> H. Brisout de Barneville, 1863	25	
<i>Cleopus solani</i> (Fabricius, 1792)	21	
<i>Curculio pellitus</i> (Boheman, 1843)	18	
<i>Gymnetron aper</i> Desbrochers des Loges, 1892	11	!
<i>Gymnetron stimulosum</i> (Germar, 1821)	25, 26	
<i>Mecinus pyraster</i> (Herbst, 1795)	10, 11, 12, 26	!
<i>Miarus stoeckleini</i> Franz, 1947	2, 14, 22, 25	!
<i>Orchestes fagi</i> (Linné, 1758)	19	
<i>Orchestes pilosus</i> (Fabricius 1781)	28	!
<i>Pachytychius sparsutus</i> Olivier, 1807)	3	!
<i>Rhinusa asellus</i> (Gravenhorst, 1807)	16, 22	!
<i>Rhinusa bipustulata</i> (Rossi, 1792)	15, 25	
<i>Rhinusa moroderi</i> (Reitter, 1906)	22	!
<i>Rhinusa tetra</i> (Fabricius, 1792)	2, 25, 26	
<i>Sibinia pellucens</i> (Scopoli, 1772)	11	
<i>Sibinia pyrrhodactyla</i> (Marsham, 1802)	11, 27, 28	!
<i>Sibinia viscaria</i> (Linnaeus, 1760)	11	
<i>Smicronyx alboquamosus</i> Wollaston, 1854	3	!
<i>Smicronyx jungermanniae</i> (Reich, 1797)	3	!
<i>Smicronyx reichii</i> (Gyllenhal, 1835)	12	!
<i>Smicronyx syriacus</i> Faust, 1887	14, 20, 26	!
<i>Tychius aureolus</i> Kiesenwetter, 1852	11	
<i>Tychius balcanicus</i> (Caldara 1990)	9	!
<i>Tychius bicolor</i> (C.N.F. Brisout de Barneville, 1863)	21	!
<i>Tychius caldarai</i> Dieckmann, 1986	26	
<i>Tychius cuprifer</i> (Panzer, 1799)	20, 28	
<i>Tychius kulzeri</i> Penecke, 1934	3, 25	

Sub-Family/genus/species	locality no.	ME
<i>Tychius picirostris</i> (Fabricius, 1787)	12, 26	
<i>Tychius pusillus</i> Germar, 1842	11, 23, 25, 26	
<i>Tychius rufipennis</i> C. N. F. Brisout de Barneville, 1863	10	!
<i>Tychius schneideri</i> (Herbst, 1795)	25	!
<i>Tychius squamulatus</i> Gyllenhal, 1835	3, 25, 26	
<i>Tychius stephensi</i> Schoenherr, 1835	19, 20	
<i>Tychius thoracicus</i> (Boheman, 1843)	10, 11	!
<i>Tychius tibialis</i> Boheman, 1843	10, 11, 15, 20	
<b>Entiminae</b>		
<i>Argoptochus bisignatus</i> (Germar, 1823)	11, 14	
<i>Brachysomus hirtus</i> (Boheman, 1845)	10, 19, 24, 25	!
<i>Coelositona limosus</i> (Rossi, 1792)	1	!
<i>Dodecastichus dalmatinus</i> (Gyllenhal, 1834)	2, 5, 17	
<i>Dodecastichus heydenii</i> (Stierlin, 1861)	2, 3, 4, 5, 13, 17, 18, 25, 28	
<i>Limatogaster rugicollis</i> (Germar, 1817)	5, 6	
<i>Limatogaster</i> sp.	17	
<i>Limatogaster tumidipes</i> (Stierlin, 1861)	3, 4, 19, 22	
<i>Otiorhynchus aurifer</i> Boheman, 1842	2, 17	
<i>Otiorhynchus corruptor</i> s. str. (Host, 1790)	2, 4, 17, 28	
<i>Otiorhynchus cribricollis</i> (Gyllenhal, 1834)	2	!
<i>Otiorhynchus longipennis</i> Stierlin, 1861	2, 3, 17, 22, 26, 28	
<i>Otiorhynchus maxillosus</i> Gyllenhal, 1834	3, 4, 5	
<i>Otiorhynchus perdix</i> (Olivier, 1807)	2, 3, 4, 5, 9, 10, 17, 18, 22, 25	
<i>Otiorhynchus praecellens pentheri</i> Reitter, 1913	3, 4	
<i>Otiorhynchus rhacusensis</i> s. str. Germar, 1822	2, 4, 16, 27	
<i>Otiorhynchus truncatus</i> Stierlin, 1861	6	
<i>Phyllobius argentatus</i> s. str. (Linnaeus, 1758)	3, 4, 13, 15, 16, 20, 25	
<i>Phyllobius betulinus</i> s. str. (Bechstein & Scharfenberg, 1805)	10, 11, 14	
<i>Phyllobius dispar</i> L. Redtenbacher, 1847	4, 10, 15, 25	
<i>Phyllobius maculicornis</i> Germar, 1823	15	
<i>Phyllobius montanus</i> Miller, 1862	2, 4, 27, 28	
<i>Phyllobius oblongus</i> (Linné, 1758)	4, 11, 15, 18, 22, 24	
<i>Phyllobius pallidus</i> (Fabricius, 1792)	3, 4	
<i>Polydrusus cervinus</i> (Linné, 1758)	24, 25, 27, 28	
<i>Polydrusus mollis</i> (Strøm, 1768)	1, 2, 6, 8, 19	
<i>Polydrusus picus</i> (Fabricius, 1792)	1, 2, 6, 9, 11, 13, 15, 27, 28	
<i>Polydrusus pterygomalis</i> Boheman, 1840	10, 11, 26	
<i>Polydrusus tibialis</i> (Gyllenhal, 1834)	12, 20, 21	
<i>Polydrusus brevipipes</i> (Kiesenwetter, 1864)	1, 2, 3, 4, 10, 11, 14, 15, 18, 20, 24, 25, 27, 28	
<i>Polydrusus viridicinctus</i> Gyllenhal, 1834	28	
<i>Sciaphobus paliuri</i> Apfelbeck, 1908	14, 26, 28	
<i>Sciaphobus curvimanus</i> Apfelbeck, 1922	20	
<i>Sitona cylindricollis</i> Fåhraeus, 1840	28	

Sub-Family/genus/species	locality no.	ME
<i>Sitona humeralis</i> (Stephens, 1831)	9, 22	
<i>Sitona lineatus</i> (Linnaeus, 1758)	9	
<i>Sitona ophtalmicus</i> Desbrochers, 1869	11, 26	!
<i>Sitona striatellus</i> Gyllenhal, 1834	5	!
<i>Sitona verecundus</i> (Rossi, 1790)	20, 22	
<i>Sitona waterhousei</i> Walton, 1846	26	
<i>Stomodesops schaufussii</i> (Miller, 1863)	7	!
<b>Hyperinae</b>		
<i>Brachypera audax</i> (Faust, 1887)	23	!
<i>Coniatus tamarisci</i> (Fabricius, 1787)	21	!
<i>Hypera conmaculata</i> (Herbst, 1795)	12, 16, 17, 22, 28	
<i>Hypera contaminata</i> (Herbst, 1795)	17	
<i>Hypera melancholica</i> (Fabricius, 1792)	14	
<i>Hypera postica</i> (Gyllenhal, 1813)	8	
<i>Hypera rumicis</i> (Linnaeus, 1758)	20	
<i>Limobius borealis</i> s. str. (Paykull, 1792)	9, 10, 11, 27	!
<b>Lixinae</b>		
<i>Cleonis pigra</i> (Scopoli, 1763)	6	
<i>Lixus angustus</i> (Herbst, 1795)	2, 22	!
<i>Lixus filiformis</i> (Fabricius, 1781)	10	
<i>Lixus linearis</i> Olivier, 1807	12	!
<i>Lixus ochraceus</i> (Boheman, 1842)	28	!
<i>Lixus punctiventris</i> (Boheman, 1835)	10	
<i>Lixus vilis</i> (Rossi, 1790)	1	!
<i>Lixus brevipes</i> Brisout de Barneville, 1866	26	
<i>Pseudocleonus grammicus</i> (Panzer, 1789)	8	!
<i>Rhinocyllus conicus</i> (Froelich, 1792)	10	
<b>Mesoptilinae</b>		
<i>Magdalis armigera</i> (Geoffroy, 1785)	12, 20, 22	!
<i>Magdalis fuscicornis</i> (Desbrochers des Loges, 1870)	15	!
<b>Molytinae</b>		
<i>Aparopion costatum</i> (Fähræus, 1843)	3, 4, 7, 25	!
<i>Leiosoma komovicum</i> Pedroni, 2018	19	
<i>Plinthus squalidus gerlii</i> Boheman, 1842	6	!
<b>Scolytinae</b>		
<i>Phloetribus hercegovinensis</i> (Seitner, 1920)	3	!
<i>Scolytus pygmaeus</i> (Fabricius, 1787)	20	!
<i>Scolytus rugulosus</i> (P.W.J. Müller, 1818)	25	
<i>Xylocleptes bispinus</i> (Duftschmid, 1825)	4	
<b>Dryophthoridae</b>		
<i>Sphenophorus meridionalis</i> (Gyllenhal, 1838)	20	!
<i>Sphenophorus parumpunctatus</i> (Gyllenhal, 1838)	16	!

Sub-Family/genus/species	locality no.	ME
<b>Erirhinidae</b>		
<i>Tanysphyrus lemnae</i> (Paykull, 1792)	16	!
<i>Thryogenes festucae</i> (Herbst, 1795)	16	!
<b>Nanophyidae</b>		
<i>Allomalialia quadrivirgata</i> (A. Costa, 1863)	21	!
<i>Corimalia pallida</i> (Olivier, 1807)	21	!
<i>Dieckmanniellus chevrieri</i> (Boheman, 1845)	3, 12, 20, 28	!
<i>Dieckmanniellus nitidulus</i> (Gyllenhal, 1838)	20	!
<i>Nanodiscus transversus</i> (Aubé, 1850)	28	!
<i>Nanomimus circumscriptus</i> (Aubé, 1864)	12, 20	!
<i>Nanophyes brevis</i> Boheman, 1845	28	!
<i>Nanophyes marmoratus</i> (Goeze, 1777)	12, 28	!
<b>Rhynchitidae</b>		
<i>Neocoenorrhinus germanicus</i> (Herbst, 1797)	16	!
<i>Neocoenorrhinus interpunctatus</i> (Stephens, 1831)	20	!
<i>Neocoenorrhinus minutus</i> (Herbst, 1797)	3, 18, 22, 25	
<i>Rhodocyrtus cribripennis</i> Desbrochers des Loges, 1869	2	!
<i>Rhynchites auratus</i> (Scopoli, 1763)	4	!
<i>Tatianaerhynchites aequatus</i> (Linnaeus, 1767)	3, 4, 18, 25	

## Appendix 2 - collecting data and voucher numbers

Collecting data and voucher numbers for the material used in the molecular analysis is provided below, alphabetically sorted by species name. DNA extracts are stored either at the ZFMK Biobank in Bonn or at the SDEI in Müncheberg. Often remaining or additional tissue samples of the sequenced specimens are available as well. Sample ID is called «Collector's No» within CURCI. Dry collection of ZFMK/CURCI processed samples are located at the ZFMK Bonn, Germany. Dry collection of SDEI/CURCI processed samples are located at Natural History Museum in Basel (NMB).

### *Acalles camelus* (Fabricius, 1792)

Location: Czech Republic, SE Moravia (UH), Lopenik, Bilé Karpaty Mts., collected on: *Fagus*, 15-May-2009, 727 m, 48°56'00» 17°46'00», leg. Kresl, P., det. Kresl, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: CZ1054 / 9637; Tissue No / DNA No: ZFMK-TIS-cCZ1054 / ZFMK-DNA-0112704615; COI GenBank Accession No: KF680229

### *Echinodera ariadnae* Bahr & Bayer, 2005

Location: Greece, Crete Isl. West, Levka Ori, Imbros, above the Imbros Gorge, collected on: *Quercus*, 02-Oct-2006, 900m, N35°14'51» E24°10'30», leg. Bahr, F. & Bayer, C., det. Bahr, F. & Bayer, C., dry collection: CURCI at ZFMK; Sample ID / Biobank No: GR-0151-ari / 8786; Tissue No / DNA No: ZFMK-TIS-cGR0151 / ZFMK-DNA-0100400173; COI GenBank Accession No: EU286479

### *Echinodera aspromontensis* Stüben, 2008

Location: Italy, Basilicata, Monte Pollino, 17 km N of Rotonda, N of Episcopia, collected on: *Quercus*, *Castanea*, 8-Jul-2008, 894 m, N40°05'55» E16°07'13», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-647-aspm / 9248; Tissue No / DNA No: ZFMK-TIS-cI647 / ZFMK-DNA-0100404242; COI GenBank Accession No: GU987985



***Echinodera aspromontensis*** Stüben, 2008

Location: Italy, Abruzzo, 28 km SE of Pescara, S. Vito, collected on: *Quercus*, 17-Jul-2008, 79 m, N42°17'30» E14°27'35», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-660-asp / 9261; Tissue No / DNA No: ZFMK-TIS-cl660 / ZFMK-DNA-0100404886; COI GenBank Accession No: GU987992

***Echinodera bellieri*** (Reiche, 1860)

Location: Italy, Campania, Cilento, 14 km SW of Vallo d. Lucania, Marina di Ascea, collected on: *Quercus ilex*, 30-JUN-2008, 13 m, N40°07'42» E15°10'53», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-629-tyr / 9230; Tissue No / DNA No: ZFMK-TIS-cl629 / ZFMK-DNA-0100404311; COI GenBank Accession No: GU213711

***Echinodera bellieri*** (Reiche, 1860)

Location: Italy, Basilicata, Monte Pollino, 4 km SE of Rotonda, Zarafa, collected on: *Quercus ilex*, 07-JUL-2008, 677 m, N39°56'33» E16°04'28», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-641-tyr / 9242; Tissue No / DNA No: ZFMK-TIS-cl641 / ZFMK-DNA-0100404902; COI GenBank Accession No: GU987981

***Echinodera brachati*** Stüben, 2002

Location: Greece, Peloponnese, Mt. Taygetos W, Saidona E, collected on: *Quercus*, *Onosma*, *Cistus*, *Salvia fruticosa*, broom, 25-Apr-2009, 800 m, N36°52'59» E22°17'25», leg. Bahr, F., Bayer, C., Brunner, J. & Bueche, B. det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: E-922-bra / 9539; Tissue No / DNA No: ZFMK-TIS-cE922 / ZFMK-DNA-0100405279; COI GenBank Accession No: GU213764

***Echinodera brachati peloponnensis*** Stüben, 2019

Location: Greece, Peloponnese, Arkadia: Kosmas, collected on: *Astragalus*, 9-Aug-2018, 1151 m, N37°05'45» E22°44'28», leg. Stüben, P., det. Stüben, P., dry collection: CURCI/SDEI at NMB; Sample ID: 3163-PST; DNA No: SDEI-DNA-3163-PST; COI GenBank Accession No: MK347695

***Echinodera brachati peloponnensis*** Stüben, 2019

Location: Greece, Peloponnese, Arkadia, N Kosmas: near Moni Elonis, collected on: *Quercus*, 11-Aug-2018, 427 m, N37°08'42» E22°45'03», leg. Stüben, P., det. Stüben, P., dry collection: CURCI/SDEI at NMB; Sample ID: 3166-PST; DNA No: SDEI-DNA-3166-PST; COI GenBank Accession No: MK347697

***Echinodera brisouti*** (Reitter, 1885)

Location: Greece, Korfu Isl., 8 km S of Kerkyra, Mt. Pantokratoras NW of Makrata, collected on: *Quercus*, *Arbutus*, 27-Sep-2007, 482m, N39°32'52» E19°52'59», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: KO-0383-bri / 8897; Tissue No / DNA No: ZFMK-TIS-cKO0383 / ZFMK-DNA-0100400347; COI GenBank Accession No: GU213655

***Echinodera brisouti*** (Reitter, 1885)

Location: Greece, Epirus, 9 km SW of Metsovo, Mikro Peristeri, collected on: *Quercus ilex*, 30-Sep-2007, 693 m, N39°45'03» E21°05'09», leg. Stüben, P., det. Stüben, P., Dry collection: CURCI at ZFMK; Sample ID / Biobank No: EP-0391-bri2 / 8898; Tissue No / DNA No: ZFMK-TIS-cEP0391 / ZFMK-DNA-0100400348; COI GenBank Accession No: GU213656

***Echinodera bryneri spec. nov.*** Germann & Braunert, 2022

Location: Montenegro, Ulcinj Mun., 7.5 km Dubrava (type locality), collected via sifting, 29-APR-2018, 700 m, N42°03'12» E19°13'54», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3275-GER; DNA No: SDEI-DNA-3275-GER, COI GenBank Accession No: OM991939 (sequence obtained from paratype 3275-GER)

***Echinodera capbonensis diottii*** (Stüben, 2010)

Taxonomic note: formerly *E. diottii*

Location: Italy, Trapani, Is. Pantelleria, Montagna Grande, 01-APR-2009, 1280 m, N37°53'00» E14°04'00», leg. Monzini, S., det. Monzini, S., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-942-dit / 9550; Tissue No / DNA No: ZFMK-TIS-cl942 / ZFMK-DNA-0100405269; COI GenBank Accession No: GU213767

***Echinodera capiomonti*** (H. Brisout de Barneville, 1864)

Location: Italy, Emilia-Romagna, San Giovanni in Marignano, 10 km W of Pésaro (RN), collected on: *Quercus*, 15-Oct-2001, 100 m, N43°56'06» E12°43'00», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-488-cap / 9045; Tissue No / DNA No: ZFMK-TIS-cI488 / ZFMK-DNA-0100400974; COI GenBank Accession No: GU213682

***Echinodera corcyrensis*** Stüben, 2008

Location: Croatia, Dalmatia, 24 km W of Split, 1 km E of Marina, Poljica, collected on: *Quercus*, 1-Jul-2007, 20 m, N43°31'11» E16°08'31», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: HR-0307-cor / 8888; Tissue No / DNA No: ZFMK-TIS-CHR0307 / ZFMK-DNA-0100400080; COI GenBank Accession No: GU213650

***Echinodera corcyrensis*** Stüben, 2008

Location: Greece, Epirus, 19 km E of Igoumenitsa, Petrovitsa, collected on: *Quercus ilex*, 01-Oct-2007, 355 m, N39°33'30» E20°28'12», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: EP-0409-cor / 8900; Tissue No / DNA No: ZFMK-TIS-cEP0409 / ZFMK-DNA-0100400350; COI GenBank Accession No: GU213658

***Echinodera corcyrensis*** Stüben, 2008

Location: Greece, Kefalonia Isl., S Poros, 30-Apr-2017, 170 m, N38°07'59» E20°47'01», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3280-GER; DNA No: SDEI-DNA-3280-GER; COI GenBank Accession No: MW750620

***Echinodera crenata*** Wollaston, 1863

Location: Spain, Canary Islands, Tenerife, S of Orotava, Orotava valley, Mirador de la Rosa, collected on: *Greenovia* sp., *Aeonium spathulatum*, 04-Oct-2008, 1503 m, N28°20'25» W16°31'29», leg. Astrin, J. & Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: E-710-cre / 9299; Tissue No / DNA No: ZFMK-TIS-cE710 / ZFMK-DNA-0100404845; COI GenBank Accession No: GU213719

***Echinodera hypocrita*** (Boheman, 1837)

Location: Slovenia, Apasko Polje, Podgorje env., 30 km NE of Maribor, collected on: *Quercus*, *Carpinus*, 05-AUG-2006, 214 m, N46°42' E15°55', leg. Stejskal, R., det. Stejskal, R., dry collection: CURCI at ZFMK; Sample ID / Biobank No: SLO-0172-hyp / 8750; Tissue No / DNA No: ZFMK-TIS-cSLO0172 / ZFMK-DNA-0100400680; COI GenBank Accession No: GU987788

***Echinodera ibleiensis*** Stüben, 2003

Location: Italy, Sicilia Isl. (SR), 1.5 km S of Ferla, Valle dell'Anapo, Monti Iblei, collected on: *Castanea*, *Quercus*, *Cerastonia siliqua*, 24-Oct-2002, 450 m, N37°06'14» E14°56'07», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-496-ibl / 9053; Tissue No / DNA No: ZFMK-TIS-cI496 / ZFMK-DNA-0100400675; COI GenBank Accession No: GU213687

***Echinodera ingowolffi*** Stüben, 1998

Location: Greece, Kefalonia Isl., E Koulourata, 29-Apr-2017, 320 m, N38°12'02» E20°40'57», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3277-GER; DNA No: SDEI-DNA-3277-GER; COI GenBank Accession No: MW750617

***Echinodera ingowolffi*** Stüben, 1998

Location: Greece, Kefalonia Isl., Mt. Enos, collected on: *Abies cephalonica*, 29-Apr-2017, 1100 m, N38°09'46» E20°37'19», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3278-GER; DNA No: SDEI-DNA-3278-GER; COI GenBank Accession No: MW750618

***Echinodera kroumiriensis*** Stüben, 2004

Location: Tunisia, Kroumirie, 2 km E of Ain Draham, Jebel Bir, collected on: *Quercus suber*, *Quercus* sp., 20-Oct-2003, 770 m, N36°46'20» E08°42'40», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: T-500-kro / 9057; Tissue No / DNA No: ZFMK-TIS-cT500 / ZFMK-DNA-0100400671; COI GenBank Accession No: GU213691

***Echinodera nebrodiensis*** Stüben, 2002

Location: Italy, Sicilia Isl., Madonie Castelbuono, Rifugio Crispi Agrifol., Piano Pomo, collected on: *Fagus*, 7-Feb-2008, 1400 m, N37°53'46» E14°04'01», leg. Kapp, det. Kapp, dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-828-neb / 9448; Tissue No / DNA No: ZFMK-TIS-cI828 / ZFMK-DNA-0100405551; COI GenBank Accession No: GU213743

***Echinodera nuraghia*** Stüben, 2009

Location: Italy, Sardinia Isl. West, E of Macomer, above Lei, collected on: *Quercus*, *Acer monspessulanum*, 04-Oct-2010, 1020 m, N40°19'54» E08°53'49», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: IT1092c / 9675; Tissue No / DNA No: ZFMK-TIS-cIT1092c / ZFMK-DNA-0112704586; COI GenBank Accession No: MG322670

***Echinodera pennecki*** Stüben, 1998 (formerly: *Echinodera brisouti pennecki*)

Location: Montenegro, Cetinje Mun., 2 km SE Kotor, Lovćen, collected: 23-APR-2018, 920 m, N42°24'33» E18°47'20», leg. Braunert, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3589-GER; DNA No: SDEI-DNA-3289-GER; COI GenBank Accession No: MW822684

***Echinodera peragalloi*** (Chevrolat, 1863)

Location: Italy, Sardinia Isl., S of Aritzo, Gadoni, R. Tistigliosi x F. Flumendosa, collected on: *Quercus ilex*, 30-Sep-2010, 490 m, N39°53'57» E09°11'02», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: IT1082c / 9665; Tissue No / DNA No: ZFMK-TIS-cIT1082c / ZFMK-DNA-0112702487; COI GenBank Accession No: MG322664

***Echinodera romanboroveci*** Stüben, 1998

Location: Montenegro, Budva Mun., 3.5 km SE Petrovac, collected: 01-MAY-2018, 30 m, N42°10'52» E18°58'11», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3590-GER; DNA No: SDEI-DNA-3590-GER; COI GenBank Accession No: MW822685

***Echinodera romanboroveci*** Stüben, 1998

Location: Montenegro, Bar Mun., 7 km E Petrovac, collected: 24-APR-2018, 490 m, N42°13'28" E19°01'24», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3591-GER; DNA No: SDEI-DNA-3591-GER; COI GenBank Accession No: MW822686

***Echinodera settefratelliensis*** Stüben, 2005 (paratype)

Location: Italy, Sardinia Isl. South, 33 km NE of Cagliari, Sarrabus (Mts.), Rio di Cannas, collected on: *Quercus ilex*, *Arbutus*, *Salix*, *Pistacia lentiscus*, 2004-10-25, 110 m, N39°20'52» E09°27'18», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-495-set / 9052; Tissue No / DNA No: ZFMK-TIS-cI495 / ZFMK-DNA-0100400676; COI GenBank Accession No: GU213686

***Echinodera siciliensis*** Stüben, 2003

Location: Italy, Puglia, Gargano, Casa D'Arguma, 26-APR-2008, 584 m, N41°45'35» E15°48'27», leg. Krátky, J., det. Krátky, J., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-952-gar / 9582; Tissue No / DNA No: ZFMK-TIS-cI952 / ZFMK-DNA-0112704670; COI GenBank Accession No: MG322642

***Echinodera soumasi*** Germann, Wolf & Schütte, 2015

Location: Greece, Peloponnese, NE of Pilos, S of Kazama, Polilimnos, 26-Sep-2014, 300 m, N36°59'00» E21°51'16», leg. Germann, C., det. Germann, C., dry collection: CURCI at ZFMK; Sample ID / Biobank No: 2798-PST / 17163; Tissue No / DNA No: ZFMK-TIS-26152 / ZFMK-DNA-0169166944; COI GenBank Accession No: KT289402

***Echinodera soumasi*** Germann, Wolf & Schütte, 2015

Location: Greece, Kefalonia Isl., E Koulourata, 29-Apr-2017, 320 m, N38°12'02" E20°40'57", leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3276-GER; DNA No: SDEI-DNA-3276-GER; COI GenBank Accession No: MW750616

***Echinodera stuebeni*** Germann & Schütte, 2021

Location: Greece, Kefalonia Isl., W Vari, collected on: *Quercus*, 3-May-2017, 430 m, N38°23'04» E20°34'41», leg. Germann, C., det. Germann, C., dry collection: CURCI/SDEI at NMB; Sample ID: 3279-GER; DNA No: SDEI-DNA-3279-GER; COI GenBank Accession No: MW750619

***Echinodera variegata*** (Boheman, 1837)

Location: Italy, Sicilia Isl. (PA), 8 km S of Carini, W of M. Gibilmesì, collected on: *Quercus*, 10-Oct-2006, 539 m, N38°04'03» E13°11'37», leg. Stüben, P., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: I-0412-var / 8902; Tissue No / DNA No: ZFMK-TIS-cI0412 / ZFMK-DNA-0100400007; COI GenBank Accession No: GU213660

***Echinodera varroi*** Stüben, 2018

Location: Italy, Lazio, above S. Donato Val Di Comino, collected on: *Carpinus*, 05-MAY-2014, 756 m, N41°42'37» E13°48'39», leg. Stüben, P. & Schütte, A., det. Stüben, P., dry collection: CURCI at ZFMK; Sample ID / Biobank No: 1769-PST / 13855; Tissue No / DNA No: ZFMK-TIS-24093 / ZFMK-DNA-0171624095; COI GenBank Accession No: MF464649

***Echinodera varroi*** Stüben, 2018

Location: Italy, Lazio, Cassino, Terme Varroniane, 06-MAY-2014, 47 m, N41°28'59» E13°49'52», leg. Stüben, P. & Schütte, A., det. Stüben, P., dry collection: CURCI at ZFMK; Collector's No / Biobank No: 1775-PST / 13861; Tissue No / DNA No: ZFMK-TIS-24099 / ZFMK-DNA-0171624089; COI GenBank Accession No: MF464650

### Appendix 3 - laboratory references

References to the different laboratory routines for sequences used in this study are provided in this table. References to the different laboratory routines for sequences used in this study are provided in this table.

Organism	Collector's no / GenBank acc no	laboratory routine ref.
<i>Acalles camelus</i>	CZ1054 / KF680229	Schütte et al. 2013
<i>Echinodera ariadnae</i>	GR-0151-ari / EU286479	Astrin et al. 2012
<i>Echinodera aspromontensis</i>	I-647-asp / GU987985	Astrin et al. 2012
<i>Echinodera aspromontensis</i>	I-660-asp / GU987992	Astrin et al. 2012
<i>Echinodera bellieri</i>	I-629-tyr / GU213711	Astrin et al. 2012
<i>Echinodera bellieri</i>	I-641-tyr / GU987981	Astrin et al. 2012
<i>Echinodera brachati</i>	E-922-bra / GU213764	Astrin et al. 2012
<i>Echinodera brachati peloponnensis</i>	3163-PST / MK347695	Schütte et al. 2013
<i>Echinodera brachati peloponnensis</i>	3166-PST / MK347697	Schütte et al. 2013
<i>Echinodera brisouti</i>	EP-0391-bri2 / GU213656	Astrin et al. 2012
<i>Echinodera brisouti</i>	KO-0383-bri / GU213655	Astrin et al. 2012
<b><i>Echinodera bryneri spec. nov.</i></b>	<b>3275-GER / OM991939 (new)</b>	<b>Stüben &amp; Kramp 2019</b>
<i>Echinodera capbonensis diottii</i>	I-942-dit / GU213767	Astrin et al. 2012
<i>Echinodera capiomonti</i>	I-488-cap / GU213682	Astrin et al. 2012
<i>Echinodera corcyrensis</i>	3280-GER / MW750620	Stüben & Kramp 2019
<i>Echinodera corcyrensis</i>	EP-0409-cor / GU213658	Astrin et al. 2012
<i>Echinodera corcyrensis</i>	HR-0307-cor / GU213650	Astrin et al. 2012
<i>Echinodera crenata</i>	E-710-cre / GU213719	Astrin et al. 2012
<i>Echinodera hypocrita</i>	SLO-0172-hyp / GU987788	Astrin et al. 2012
<i>Echinodera ibleiensis</i>	I-496-ibl / GU213687	Astrin et al. 2012
<i>Echinodera ingowolffi</i>	3277-GER / MW750617	Stüben & Kramp 2019

Organism	Collector's no / GenBank acc no	laboratory routine ref.
<i>Echinodera ingowolffi</i>	3278-GER / MW750618	Stüben & Kramp 2019
<i>Echinodera kroumiriensis</i>	T-500-kro / GU213691	Astrin et al. 2012
<i>Echinodera nebrodiensis</i>	I-828-neb / GU213743	Astrin et al. 2012
<i>Echinodera nuraghia</i>	IT1092c / MG322670	Schütte et al. 2013
<i>Echinodera penneckei</i>	GER-3589 / MW822684	Stüben & Kramp 2019
<i>Echinodera peragalloi</i>	IT1082c / MG322664	Schütte et al. 2013
<i>Echinodera romanboroveci</i>	GER-3590 / MW822685	Stüben & Kramp 2019
<i>Echinodera romanboroveci</i>	GER-3591 / MW822686	Stüben & Kramp 2019
<i>Echinodera settefratelliensis</i>	I-495-set / GU213686	Astrin et al. 2012
<i>Echinodera siciliensis</i>	I-952-gar / MG322642	Astrin et al. 2012
<i>Echinodera soumasi</i>	2798-PST / KT289402	Schütte et al. 2013
<i>Echinodera soumasi</i>	3276-GER / MW750616	Stüben & Kramp 2019
<i>Echinodera stuebeni</i>	3279-GER / MW750619	Stüben & Kramp 2019
<i>Echinodera variegata</i>	I-0412-var / GU213660	Astrin et al. 2012
<i>Echinodera varroi</i>	1769-PST / MF464649	Schütte et al. 2013
<i>Echinodera varroi</i>	1775-PST / MF464650	Schütte et al. 2013

## Appendix 4 - COI sequences

We are convinced that molecular sequences should also be part of the initial description in the source in which they were first published, if possible. The fact that they are additionally stored separately in public databases like NIH's GenBank is undoubtedly a further safeguard for the long-term availability of species-specific DNA barcodes. Here we provide previously unreleased sequences in easy to use fasta format. The content can be copied and pasted into any fasta or text file and easily imported into any bioinformatics application. The provided sequences represent the full length of 658 nucleotides of COI barcodes of the Folmer barcode region (FOLMER et al. 1994). The first number in the taxa name is sample ID (internal naming «collector's number»), and the second one is GenBank accession number. More details to the finding spots are provided in Appendix 2.

```
>Echinodera bryneri spec. nov.-3275-GER.OM991939-Montenegro_Ulcinj_Mun.-type_locality
AACTTTATATTTTCATTTTTGGTTCATGATCCGGAATAGTGGGAACTTCATTAAGAATACTAATCCGAA-
CAGAACTTGGAACCCCGGAACCTTAATTTGGTAATGACCAAATCTATAACACAATTGTAAGTCTCAT-
GCTTTCATTATAATCTTTTTCATAGTCATACCAATCATAATTGGAGGCTTTGGAAATTGGTTAATTC-
CATTAAACTTTGGAGCTCCAGATATAGCTTTCCCGCGCCTTAATAATATAAGATTTTGGCTTCTACCAC-
CATCTCTTACCCTCCTACTAATAAGAAGAATTATGACAAAGGAGCCGGGACTGGTTGAACAGTTTATC-
CTCCTTTATCCTCAAATATTGCTCATGAAGGAGCTTCTATCGACTTAGCCATTTTTAGTCTCCACAT-
AGCAGGAATCTCGTCAATTCTAGGAGCTATAAACTTTATCTCCACAGTAATAAATATACGCCAACAGG-
TATAAACTAGACCGAATACCTCTATTTATCTGAGCCGTAATAAATACCGCCATTTCTCCTTCTGTTATCAT-
TACCTGTCCTTGCAGGTGCTATCACTATACTTTAACAGACCGAAATATTAATACATCATTTTTTGACCC-
CGCAGGAGGAGGAGACCCAATCCTCTACCAACATCTATTT
```

The sister species of *Echinodera bryneri* spec. nov. is *Echinodera romanboroveci*. Both COI sequences have been published previously (GERMANN & SCHÜTTE 2021) and are already available in GenBank (MW822685, MW822686), being provided here for informational purpose a second time.

>*Echinodera\_romanboroveci*-GER-3590. MW822685-Montenegro\_Petrovac

AAC TTTATACTTCAT TTTTGGCTCATGATCAGGAATAGTGGGAACATCACTAAGAATACTAATCCGAA-  
CAGAACTCGGAAACCCTGGAACCTTAATCGGTAATGACCAAATCTATAACACAATTGTAAGTCTCAT-  
GCTTTCATTATAATCTTTTTCATAGTCATACCTATCATAATTGGAGGCTTTGGAAATTGATTAATTC-  
CATTAAACTTGGAGCTCCAGATATAGCTTTCCCACGCCTAAATAATATAAGATTTTGACTTCTACCTC-  
CCTCTCTTACCCTCCTACTAATAAGAAGAATTATTGATAAAGGAGCTGGTACTGGCTGAACAGTATAC-  
CCCCCTTTATCCTCAAATATTGCTCATGAAGGAGCCTCTATCGACTTAGCCATTTTGTAGTCTCCAT-  
ATAGCAGGAATTTTCATCAATTCTAGGAGCTATAAACTTTATCTCTACAGTAATCAACATACGTCCAACAG-  
GTATAAAACTAGACCAAATACCTCTATTTATCTGAGCCGTAAAAATTACTGCCATTCTTCTTCTACTATCAT-  
TACCCGTCCTTGCAGGAGCTATCACCATACTTTTAACAGACCGAAATATTAATACATCATTTTTTGACCC-  
CGCGGGAGGAGGAGACCCAATCCTCTACCAACATCTATTT

>*Echinodera\_romanboroveci*-GER-3591. MW822686-Montenegro\_Petrovac

AAC TTTATACTTCAT TTTTGGCTCATGATCAGGAATAGTGGGAACATCACTAAGAATACTAATCCGAA-  
CAGAACTCGGAAACCCTGGAACCTTAATCGGTAATGACCAAATCTATAACACAATTGTAAGTCTCAT-  
GCTTTCATTATAATCTTTTTCATAGTCATACCTATCATAATTGGAGGCTTTGGAAATTGACTAATTC-  
CATTAAACTTGGAGCTCCAGATATAGCTTTCCCACGCCTAAATAATATAAGATTTTGACTTCTACCTC-  
CCTCTCTTACCCTCCTACTAATAAGAAGAATTATTGATAAAGGAGCTGGTACTGGCTGAACAGTATAC-  
CCCCCTTTATCCTCAAATATTGCTCATGAAGGAGCCTCTATCGACTTAGCCATTTTGTAGTCTCCAT-  
ATAGCAGGAATTTTCGTCAATTCTAGGAGCTATAAACTTTATCTCTACAGTAATCAACATACGTCCGACAG-  
GTATAAAACTAGACCAAATACCTCTATTTATTTGAGCCGTAAAAATTACTGCCATTCTTCTTCTACTATCAT-  
TACCCGTCCTTGCAGGAGCTATCACCATACTTTTAACAGACCGAAATATTAATACATCATTTTTTGACCC-  
CGCGGGAGGAGGAGACCCAATCCTCTACCAACATCTATTT

## Appendix 5 - p-distance matrix

<b>E. = Echinodera</b>  <b>country abbreviation</b> GR - Greece, IT - Italy, ME - Montenegro  <b>number</b> provided number is the sample ID (MWI internal "Collector's number") please refer to Appendix 2 or 3 for GenBank accession number	E. capbonensis diottii   I-942-dit   IT	E. hypocrita   SLO-0172-hyp   Slovenia	E. soumasi   2798-PST   GR: Peloponnese	E. soumasi   3276-GER   GR: Kefalonia	E. ingowolfi   3277-GER   GR: Kefalonia	E. ingowolfi   3278-GER   GR: Kefalonia	E. crenata   E-710-cre   CI: Tenerife	E. varroi   1769-PST   IT: Lazio	E. varroi   1775-PST   IT: Lazio	E. peragalloi   IT1082c   IT: Sardinia	E. corcyrensis   EP-0409-cor   GR: Epirus	E. corcyrensis   HR-0307-cor   Croatia
E. capbonensis diottii   I-942-dit   IT		19	18.1	19.6	16.9	16.7	17	17.8	17.6	18.8	16.3	16.4
E. hypocrita   SLO-0172-hyp   Slovenia	19		15.3	16.1	16.7	17.3	17.3	19.0	19.1	17.6	17.3	17.3
E. soumasi   2798-PST   GR: Peloponnese	18.1	15.3		3	17.9	18.4	17.2	18.5	18.5	17.9	17.6	17.2
E. soumasi   3276-GER   GR: Kefalonia	19.6	16.1	3		17.8	17.9	17.3	18.8	18.8	18.2	17.9	17.8
E. ingowolfi   3277-GER   GR: Kefalonia	16.9	16.7	17.9	17.8		1.7	16.3	17.9	17.9	16.9	17.5	17.2
E. ingowolfi   3278-GER   GR: Kefalonia	16.7	17.3	18.4	17.9	1.7		16.3	17.2	17	16.6	17.3	17.2
E. crenata   E-710-cre   CI: Tenerife	17	17.3	17.2	17.3	16.3	16.3		16.6	16.4	17.5	15.7	15.8
E. varroi   1769-PST   IT: Lazio	17.8	19	18.5	18.8	17.9	17.2	16.6		0.5	11.6	11.9	11.6
E. varroi   1775-PST   IT: Lazio	17.6	19.1	18.5	18.8	17.9	17	16.4	0.5		11.7	11.7	11.7
E. peragalloi   IT1082c   IT: Sardinia	18.8	17.6	17.9	18.2	16.9	16.6	17.5	11.6	11.7		11.9	11.6
E. corcyrensis   EP-0409-cor   GR: Epirus	16.3	17.3	17.6	17.9	17.5	17.3	15.7	11.9	11.7	11.9		0.9
E. corcyrensis   HR-0307-cor   Croatia	16.4	17.3	17.2	17.8	17.2	17.2	15.8	11.6	11.7	11.6	0.9	
E. corcyrensis   3280-GER   GR: Kefalonia	16.3	17	17.2	17.8	17	16.9	15.3	11.7	11.6	11.6	0.5	0.5
E. settefratelliensis   I-495-set   IT: Sardinia	15.8	17.2	17.9	18.2	15.3	15.8	15.2	17.3	17.2	17.2	15.8	16.0
E. variegata   I-0412-var   IT: Sicily	15.5	17	16.9	17.6	15.2	15.8	13.7	17.2	17	16.1	15	15.0
E. kroumiriensis   T-500-kro   Tunisia	18.2	16.3	17.5	18.2	15.3	15.7	16	15.8	16	15	14	13.8
E. bellieri   I-629-tyr   IT: Campania	18.5	17.8	17.8	17.3	16.3	17	16	20.2	20.7	19	16.9	16.9
E. bellieri   I-641-tyr   IT: Basilicata	19.1	16.4	14.7	14.9	14.3	14.9	16	18.2	18.1	17.6	16.1	16.1
E. capiomonti   I-488-cap   IT	19	20.1	16.6	16.4	17.5	17.5	16.0	16	16.3	17.8	14.6	14.3
E. siciliensis   I-952-gar   IT: Puglia	18.2	16	15.8	15.2	14.3	14.4	14.6	15.2	15	14.7	13.8	13.5
E. ariadnae   GR-0151-ari   GR: Crete	16.9	15.2	14.6	15.7	16.3	16.3	17	16.4	16.3	16	15.2	15.3
E. nuraghia   IT1092c   IT: Sardinia	18.5	16.6	16.7	16.4	14	14.3	16	16.9	17	16.6	16.3	16.3
E. peneckeii   GER-3589   ME	17.9	16.1	17.5	17.6	14.6	15.2	16.1	16.4	16.6	16	15.7	15.7
E. nebrodiensis   I-828-neb   IT: Sicily	18.4	16.7	17	16.6	15	15.7	16.4	17.8	17.9	18.1	16.4	16.1
E. aspromontensis   I-647-asp   IT: Basil.	19.5	17.8	18.5	17.9	15.8	15.8	16.7	18.2	18.4	17.5	16.1	16.1
E. aspromontensis   I-660-asp   IT: Abruzzo	19.1	17.5	18.1	17.8	15.7	16	17	18.2	18.4	17.8	16.1	16.1
E. brachati   E-922-bra   GR: Peloponnese	17.9	16.8	16	15.6	16	15.9	15.7	15.9	15.7	15.9	16	16
E. brachati peloponnensis   3163-PST   GR	18.5	16.7	15.8	15.8	16	16.4	16.4	17.2	17	16.4	16.6	16.6
E. brachati peloponnensis   3166-PST   GR	18.1	17	16.4	16.4	16.6	17	16.6	18.1	17.9	17.3	17.2	17.2
E. ibleiensis   I-496-ibl   IT: Sicily	17.8	16.3	16.7	16.7	15.7	16.1	15.3	16.9	16.7	16	16.1	15.8
<b>E. bryneri spec. nov.   3275-GER   ME</b>	18.1	16.3	16.7	16.7	15.8	15.8	15	16.6	16.7	15.7	13.7	13.7
E. romanboroveci   GER-3590   ME	17.6	16	17.2	17	15	14.9	15	16	16.1	16.1	14.3	14.3
E. romanboroveci   GER-3591   ME	18.2	16.4	17.2	17	15.2	15	15.2	16.1	16.3	16.1	14.4	14.4
E. stuebeni   3279-GER   GR: Kefalonia	17.6	15.7	16	15.7	15.5	16	14.1	16.6	16.1	14.9	14.9	14.9
E. brisouti   EP-0391-bri2   GR: Epirus	17.6	16	16.3	16.3	15.2	15	14.6	16.4	16.3	15.5	15.5	15.5
E. brisouti   KO-0383-bri   GR: Korfu	16.9	16.1	16	16.3	15.3	15.2	14.7	16.6	16.4	15.7	15.2	15.2

<b>E. = <i>Echinodera</i></b>  <b>country abbreviation</b> GR - Greece, IT - Italy, ME - Montenegro  <b>number</b> provided number is the sample ID (MWI internal "Collector's number") please refer to Appendix 2 or 3 for GenBank accession number	E. corcyrensis   3280-GER   GR: Kefalonia	E. settefratelliensis   I-495-set   IT: Sardinia	E. variegata   I-0412-var   IT: Sicily	E. kroumiriensis   T-500-kro   Tunisia	E. bellieri   I-629-tyr   IT: Campania	E. bellieri   I-641-tyr   IT: Basilicata	E. capiomonti   I-488-cap   IT	E. siciliensis   I-952-gar   IT: Puglia	E. ariadnae   GR-0151-ari   GR: Crete	E. nuraghia   IT1092c   IT: Sardinia	E. peneckeii   GER-3589   ME	E. nebrodiensis   I-828-neb   IT: Sicily
E. capbonensis diottii   I-942-dit   IT	16.3	15.8	15.5	18.2	18.5	19.1	19	18.2	16.9	18.5	17.9	18.4
E. hypocrita   SLO-0172-hyp   Slovenia	17	17.2	17	16.3	17.8	16.4	20.1	16	15.2	16.6	16.1	16.7
E. soumasi   2798-PST   GR: Peloponnese	17.2	17.9	16.9	17.5	17.8	14.7	16.6	15.8	14.6	16.7	17.5	17
E. soumasi   3276-GER   GR: Kefalonia	17.8	18.2	17.6	18.2	17.3	14.9	16.4	15.2	15.7	16.4	17.6	16.6
E. ingowolphi   3277-GER   GR: Kefalonia	17	15.3	15.2	15.3	16.3	14.3	17.5	14.3	16.3	14	14.6	15
E. ingowolphi   3278-GER   GR: Kefalonia	16.9	15.8	15.8	15.7	17	14.9	17.5	14.4	16.3	14.3	15.2	15.7
E. crenata   E-710-cre   CI: Tenerife	15.3	15.2	13.7	16	16	16	16	14.6	17	16	16.1	16.4
E. varroi   1769-PST   IT: Lazio	11.7	17.3	17.2	15.8	20.2	18.2	16	15.2	16.4	16.9	16.4	17.8
E. varroi   1775-PST   IT: Lazio	11.6	17.2	17	16	20.7	18.1	16.3	15	16.3	17	16.6	17.9
E. peragalloi   IT1082c   IT: Sardinia	11.6	17.2	16.1	15	19	17.6	17.8	14.7	16	16.6	16.0	18.1
E. corcyrensis   EP-0409-cor   GR: Epirus	0.5	15.8	15	14	16.9	16.1	14.6	13.8	15.2	16.3	15.7	16.4
E. corcyrensis   HR-0307-cor   Croatia	0.5	16	15	13.8	16.9	16.1	14.3	13.5	15.3	16.3	15.7	16.1
E. corcyrensis   3280-GER   GR: Kefalonia		15.7	14.7	13.7	16.9	15.8	14.1	13.5	15	16	15.3	16.1
E. settefratelliensis   I-495-set   IT: Sardinia	15.7		9.9	15.5	17	14.7	17	16	16	15.3	17.2	17.9
E. variegata   I-0412-var   IT: Sicily	14.7	9.9		15.8	16.4	14.9	16.1	14.3	15.2	14.7	14.9	16.3
E. kroumiriensis   T-500-kro   Tunisia	13.7	15.5	15.8		16.4	15	15.3	14.7	14.6	13.4	13.7	14.6
E. bellieri   I-629-tyr   IT: Campania	16.9	17	16.4	16.4		6.7	17.8	16.3	16.6	15.8	17	15.7
E. bellieri   I-641-tyr   IT: Basilicata	15.8	14.7	14.9	15	6.7		14.9	13.7	13.5	12.6	14.7	14.7
E. capiomonti   I-488-cap   IT	14.1	17	16.1	15.3	17.8	14.9		12	15.5	15.2	14.6	14.6
E. siciliensis   I-952-gar   IT: Puglia	13.5	16	14.3	14.7	16.3	13.7	12		13.1	13.1	13.1	13.2
E. ariadnae   GR-0151-ari   GR: Crete	15	16	15.2	14.6	16.6	13.5	15.5	13.1		10.5	11.9	10.9
E. nuraghia   IT1092c   IT: Sardinia	16	15.3	14.7	13.4	15.8	12.6	15.2	13.1	10.5		10	10
E. peneckeii   GER-3589   ME	15.3	17.2	14.9	13.7	17	14.7	14.6	13.1	11.9	10		9.9
E. nebrodiensis   I-828-neb   IT: Sicily	16.1	17.9	16.3	14.6	15.7	14.7	14.6	13.2	10.9	10	9.9	
E. aspromontensis   I-647-asp   IT: Basil.	15.8	18.2	15.5	15.3	16.3	15	14.7	14.1	12.3	10.3	9.4	8.2
E. aspromontensis   I-660-asp   IT: Abruzzo	15.8	18.4	15.5	15.2	16.1	15	14.6	14.6	12.3	10.6	9.1	7.8
E. brachati   E-922-bra   GR: Peloponnese	15.7	16.9	15.3	14.7	15.7	13.8	15.7	13.8	11.8	10	10.9	11.8
E. brachati peloponnensis   3163-PST   GR	16.3	16.4	15	14.1	15.7	13.2	15.3	13.2	10.9	9.6	10.6	11.9
E. brachati peloponnensis   3166-PST   GR	16.9	16.9	15.7	14.7	15.8	13.7	15.7	14	11.7	10.2	11.2	12.3
E. ibleiensis   I-496-ibl   IT: Sicily	15.8	16.7	12.9	15.3	16.9	15.7	14.7	12.5	11.9	10.3	11.9	12.2
<b>E. bryneri spec. nov.   3275-GER   ME</b>	<b>13.4</b>	<b>16.7</b>	<b>15.7</b>	<b>13.8</b>	<b>15.8</b>	<b>14.1</b>	<b>14</b>	<b>12.6</b>	<b>10.5</b>	<b>10.2</b>	<b>9.6</b>	<b>11.4</b>
E. romanboroveci   GER-3590   ME	14	16.3	16	14	16.3	13.5	14.1	11.9	10.5	9.6	9.4	10.2
E. romanboroveci   GER-3591   ME	14.1	16.4	16.4	14.4	16.9	13.8	14.4	12	10.8	9.6	9.7	10.8
E. stuebeni   3279-GER   GR: Kefalonia	14.6	15.2	13.2	12.9	15	12.3	14.6	12.2	9.9	9.7	9.7	10
E. brisouti   EP-0391-bri2   GR: Epirus	15.2	15.5	13.2	13.8	16.9	14	15.8	12.6	10.9	9.6	9.7	10.5
E. brisouti   KO-0383-bri   GR: Korfu	14.9	15.2	13.1	14.1	16.1	13.8	16.3	13.4	10.8	10.2	10.5	10.6



<b>E. = Echinodera</b>	<b>E. aspromontensis</b>   I-647-asp   IT: Basil.	<b>E. aspromontensis</b>   I-660-asp   IT: Abruzzo	<b>E. brachati</b>   E-922-bra   GR: Peloponnese	<b>E. brachati peloponnensis</b>   3163-PST   GR	<b>E. brachati peloponnensis</b>   3166-PST   GR	<b>E. ibleiensis</b>   I-496-ibl   IT: Sicily	<b>E. bryneri spec. nov.</b>   3275-GER   ME	<b>E. romanboroveci</b>   GER-3590   ME	<b>E. romanboroveci</b>   GER-3591   ME	<b>E. stuebeni</b>   3279-GER   GR: Kefalonia	<b>E. brisouti</b>   EP-0391-bri2   GR: Epirus	<b>E. brisouti</b>   KO-0383-bri   GR: Korfu
<b>country abbreviation</b> GR - Greece, IT - Italy, ME - Montenegro												
<b>number</b> provided number is the sample ID (MWI internal "Collector's number") please refer to Appendix 2 or 3 for GenBank accession number												
<i>E. capbonensis diottii</i>   I-942-dit   IT	19.5	19.1	17.9	18.5	18.1	17.8	18.1	17.6	18.2	17.6	17.6	16.9
<i>E. hypocrita</i>   SLO-0172-hyp   Slovenia	17.8	17.5	16.8	16.7	17	16.3	16.3	16	16.4	15.7	16	16.1
<i>E. soumasi</i>   2798-PST   GR: Peloponnese	18.5	18.1	16	15.8	16.4	16.7	16.7	17.2	17.2	16	16.3	16.0
<i>E. soumasi</i>   3276-GER   GR: Kefalonia	17.9	17.8	15.6	15.8	16.4	16.7	16.7	17	17	15.7	16.3	16.3
<i>E. ingowolfi</i>   3277-GER   GR: Kefalonia	15.8	15.7	16	16	16.6	15.7	15.8	15.0	15.2	15.5	15.2	15.3
<i>E. ingowolfi</i>   3278-GER   GR: Kefalonia	15.8	16	15.9	16.4	17	16.1	15.8	14.9	15	16	15	15.2
<i>E. crenata</i>   E-710-cre   CI: Tenerife	16.7	17	15.7	16.4	16.6	15.3	15	15	15.2	14.1	14.6	14.7
<i>E. varroi</i>   1769-PST   IT: Lazio	18.2	18.2	15.9	17.2	18.1	16.9	16.6	16	16.1	16.6	16.4	16.6
<i>E. varroi</i>   1775-PST   IT: Lazio	18.4	18.4	15.7	17	17.9	16.7	16.7	16.1	16.3	16.1	16.3	16.4
<i>E. peragalloi</i>   IT1082c   IT: Sardinia	17.5	17.8	15.9	16.4	17.3	16	15.7	16.1	16.1	14.9	15.5	15.7
<i>E. corcyrensis</i>   EP-0409-cor   GR: Epirus	16.1	16.1	16	16.6	17.2	16.1	13.7	14.3	14.4	14.9	15.5	15.2
<i>E. corcyrensis</i>   HR-0307-cor   Croatia	16.1	16.1	16	16.6	17.2	15.8	13.7	14.3	14.4	14.9	15.5	15.2
<i>E. corcyrensis</i>   3280-GER   GR: Kefalonia	15.8	15.8	15.7	16.3	16.9	15.8	13.4	14	14.1	14.6	15.2	14.9
<i>E. settefratelliensis</i>   I-495-set   IT: Sardinia	18.2	18.4	16.9	16.4	16.9	16.7	16.7	16.3	16.4	15.2	15.5	15.2
<i>E. variegata</i>   I-0412-var   IT: Sicily	15.5	15.5	15.3	15	15.7	12.9	15.7	16	16.4	13.2	13.2	13.1
<i>E. kroumiriensis</i>   T-500-kro   Tunisia	15.3	15.2	14.7	14.1	14.7	15.3	13.8	14	14.4	12.9	13.8	14.1
<i>E. bellieri</i>   I-629-tyr   IT: Campania	16.3	16.1	15.7	15.7	15.8	16.9	15.8	16.3	16.9	15	16.9	16.1
<i>E. bellieri</i>   I-641-tyr   IT: Basilicata	15	15	13.8	13.2	13.7	15.7	14.1	13.5	13.8	12.3	14	13.8
<i>E. capiomonti</i>   I-488-cap   IT	14.7	14.6	15.7	15.3	15.7	14.7	14	14.1	14.4	14.6	15.8	16.3
<i>E. siciliensis</i>   I-952-gar   IT: Puglia	14.1	14.6	13.8	13.2	14.0	12.5	12.6	11.9	12	12.2	12.6	13.4
<i>E. ariadnae</i>   GR-0151-ari   GR: Crete	12.3	12.3	11.8	10.9	11.7	11.9	10.5	10.5	10.8	9.9	10.9	10.8
<i>E. nuraghia</i>   IT1092c   IT: Sardinia	10.3	10.6	10	9.6	10.2	10.3	10.2	9.6	9.6	9.7	9.6	10.2
<i>E. peneckeii</i>   GER-3589   ME	9.4	9.1	10.9	10.6	11.2	11.9	9.6	9.4	9.7	9.7	9.7	10.5
<i>E. nebrodiensis</i>   I-828-neb   IT: Sicily	8.2	7.8	11.8	11.9	12.3	12.2	11.4	10.2	10.8	10	10.5	10.6
<i>E. aspromontensis</i>   I-647-asp   IT: Basil.		1.1	11.8	10.9	11.7	11.9	11.1	9.7	9.4	10.5	10.2	10.9
<i>E. aspromontensis</i>   I-660-asp   IT: Abruzzo	1.1		11.8	10.9	11.7	12.2	10.8	10	10.3	10	10.2	10.9
<i>E. brachati</i>   E-922-bra   GR: Peloponnese	11.8	11.8		3.1	4	10.4	11.9	11.8	12.1	11	9.3	9.5
<i>E. brachati peloponnensis</i>   3163-PST   GR	10.9	10.9	3.1		0.9	10.5	11.2	11.6	11.9	10.3	9.4	9.6
<i>E. brachati peloponnensis</i>   3166-PST   GR	11.7	11.7	4	0.9		11.2	12	12.3	12.6	10.9	9.9	10.2
<i>E. ibleiensis</i>   I-496-ibl   IT: Sicily	11.9	12.2	10.4	10.5	11.2		10.2	11.2	11.6	11.1	9.1	10
<b><i>E. bryneri spec. nov.</i>   3275-GER   ME</b>	11.1	10.8	11.9	11.2	12	10.2		5.9	6.2	9.4	9.9	10.2
<i>E. romanboroveci</i>   GER-3590   ME	9.7	10	11.8	11.6	12.3	11.2	5.9		0.6	9.4	8.8	9.7
<i>E. romanboroveci</i>   GER-3591   ME	9.4	10.3	12.1	11.9	12.6	11.6	6.2	0.6		10	9.4	10.3
<i>E. stuebeni</i>   3279-GER   GR: Kefalonia	10.5	10	11	10.3	10.9	11.1	9.4	9.4	10		8.7	8.7
<i>E. brisouti</i>   EP-0391-bri2   GR: Epirus	10.2	10.2	9.3	9.4	9.9	9.1	9.9	8.8	9.4	8.7		2
<i>E. brisouti</i>   KO-0383-bri   GR: Korfu	10.9	10.9	9.5	9.6	10.2	10	10.2	9.7	10.3	8.7	2	