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PENSOFT

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Annotated checklist of the Hydrophiloidea of Switzerland (Coleoptera)

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Abstract

Access to large, high-quality databases is one of the major needs in biodiversity studies. Faunistical data are essential but are often scarce and have to be compiled from various sources. On the basis of more than 30,000 occurrences obtained from specimens held in museum and private collections, as well as from literature data, we present the first updated checklist of the Swiss species of Hydrophiloidea (Georissidae, Helophoridae, Hydrochidae, Hydrophilidae, and Spercheidae) since 1900. In total, 105 species are retained as part of the Swiss fauna, while 16 species, which were recorded from Switzerland in the past, are excluded from this list, either due to insufficient documentation or because their records were based on misidentified material. *Cercyon alpinus*, *Cercyon castaneipennis*, *Cercyon tatricus*, *Helophorus montenegrinus*, *Megasternum immaculatum*, *Pachysternum capense*, and *Paracymus scutellaris* are recorded for the first time in Switzerland. This work is a further step towards the comprehension of the whole Swiss beetle fauna.

Key Words

distribution, faunistics, Insecta, new country records, species list, water scavenger beetles

Introduction

Worldwide, the super-family Hydrophiloidea currently includes the following families: Epimetopidae, Georissidae, Helophoridae, Hydrochidae, Hydrophilidae, Spercheidae, and Syntelidae (Bouchard et al. 2011), while Histeridae and Sphaeritidae were recently removed and placed in the super-family Histeroidea (Zhou et al. 2020). The super-family Hydrophiloidea comprises more than 3,300 species (Hansen 1999; Short and Fikáček 2011), most of which belong to Hydrophilidae (2,800 species). Modern molecular methods have shown that the small and moderately diverse families (Epimetopidae, Georissidae, Helophoridae, Hydrochidae, and Spercheidae), around 500 species in total, represent basal lineage of the Hydrophiloidea (Short and Fikáček 2013).

Hydrophiloidea are mostly associated with freshwater environments (Jäch and Balke 2008), but exceptions are found in each family, except for Hydrochidae, which are all strictly aquatic (Jäch 1998) and Georissidae, which are all typical shore beetles (Jäch and Balke 2008). Adults of Helophoridae are mostly aquatic with a few strictly terrestrial species (Jäch 1998), feeding on roots and decaying plant material (Hansen 1987). The larvae of Helophoridae are not aquatic but live in soil or vegetation (Angus 1992). Over the course of their evolutionary history, the Hydrophilidae have undergone numerous transitions from aquatic to semi-aquatic and to terrestrial environments (Bloom et al. 2014). Today, they exhibit a wide ecological range, with species specialized in a variety of particular aquatic environments such as waterfalls or subterranean streams (Short and Fikáček 2013) but also terrestrial environments with many coprophagous species, and even myrmecophilous and flower visiting species (Broun 1886; Hudson 1934; Spangler 1962). Many are generalists, feeding on decaying plant material and feces. Adults and larvae live in the same habitats, but the former are detritivorous or feed on algae, while the latter are mostly recorded as predaceous. The ecological diversity of Hydrophiloidea is also apparent in their wide range of size, from ca. 1 to over 50 mm.

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All the Hydrophiloidea families are present in Switzerland, with the exception of Epimetopidae. The Swiss Hydrophiloidea fauna has not been the subject of a synthetic work since Stierlin (1900). The actual study aims to present an updated and annotated checklist of the species present in Switzerland. It is based on a review of the Swiss museum and private collections, as well as the literature and data gathered by naturalists. Resident species are thus distinguished from species mistakenly mentioned for Switzerland or insufficiently documented.

Material and methods

In order to present a complete list of the Swiss fauna, based on all existing information, we performed an exhaustive examination of the relevant material present in Swiss museum collections, as was recently done for other beetle groups (e.g., Chittaro et al. 2021; Sanchez and Chittaro 2022). The collections in the following museums were studied (the contact person is reported in parentheses after each institution):

AGRO Agroscope-Changins, Nyon (Stève Breitenmoser);
BNM Bündner Natur-Museum, Chur (Stephan Liersch);
ETH Eidgenössische-Technische Hochschule, Zürich (Michael Greeff);
HGSB Musée de l'Hospice du Grand-Saint-Bernard (Jean-Pierre Voutaz);
KMLI Archäologie und Museum Baselland, Liestal (Marc Limat);
LEBA Laboratoire d'écologie et de biologie aquatique, Université de Genève (Emmanuel Castella);
MHNF Musée d'histoire naturelle de Fribourg (Sophie Giriens);
MHNG Muséum d'histoire naturelle, Genève (Giulio Cuccodoro);
MHNN Musée d'histoire naturelle de Neuchâtel (Jessica Litman);
MHNS Musée de la nature du Valais, Sion (Sonja Gerber);
MSNL Museo cantonale di storia naturale, Lugano (Bärbel Koch);
MZL Musée cantonal de zoologie, Lausanne (Anne Freitag);
MZA Museum zu Allerheiligen, Schaffhausen (Urs Weibel);
NMAA Naturama, Aarau (Christian Sprecher);
NMB Naturhistorisches Museum Basel (Matthias Borer);
NMBE Naturhistorisches Museum Bern (Hannes Baur);
NMLU Natur-Museum Luzern (Marco Bernasconi);
NMO Naturmuseum Olten (Pia Geiger);
NMSG Naturmuseum St. Gallen (Karin Urfer);
NMSO Naturmuseum Solothurn (Marc Neumann);
NMTG Naturmuseum Thurgau, Frauenfeld (Barbara Richner);
NMWI Naturmuseum Winterthur (Sabrina Schnurrenberger).

We also cited data gathered from three museums outside Switzerland:

MAMU Manchester Museum, Great Britain;
MCB Museo civico di Bolzano, Italy;
SMNS Staatlichen Museum für Naturkunde Stuttgart, Germany.

Moreover, we included data from the private collections of the authors, as well as those of the following individuals. They are classified in alphabetical order. The municipality and the abbreviated canton of residence are indicated in parentheses: Marc Bastardot (Colombier VD), Emil Birnstiel (Zurich ZH), Hansjörg Brägger (Bischofszell TG), Stève Breitenmoser (Givrins VD), Berndt Eismann (Kreuzlingen TG), Michael Gilgen (Bangerten bei Dieterswil BE), Roman Graf (Horw LU), René Hoess (Bern BE), Barbara Huber (Thusis GR), Lea Kamber (Bienne BE), Christian Monnerat (Neuchâtel NE), Alexander Szallies (Wädenswil ZH), Arnaud Vallat (La Chaux-de-Fonds NE) and André Wagner (Le Sentier VD).

All available data from the literature relevant for Switzerland were also considered. The references from these publications are included in the bibliography if they are specifically cited in the text. Publications consulted but not cited in the text are not mentioned.

The nomenclature and systematics followed were those of the "Catalogue of Palaearctic Coleoptera" (Fikáček 2015; Fikáček and Przewoźny 2015; Fikáček et al. 2015a), with the following exceptions:

- Once considered a synonym of *Megasternum concinnum* (Marsham, 1802), *Megasternum immaculatum* (Stephens, 1829) (Fig. 1E) was resurrected by Forster et al. (2014), based on unpublished notes by Hammond P. M., although this case requires taxonomic revision (Fikáček et al. 2015b). *Megasternum immaculatum* has been recorded in Great Britain (Forster et al. 2014), Russia (Ryndevich 2017), France (Salamé 2023), Sweden (Fägerström 2019), Bulgaria (Greń and Lubecki 2017), Poland and Germany (Lillig 2022; Mainda 2022). In Switzerland, both species are present in every biogeographical region (OFEV 2022). We have not dissected all Swiss specimens and most of the occurrences refer to *M. concinnum*, although *M. immaculatum* appears to be more common. A revision of all Swiss specimens of *Megasternum* spp. is necessary but should be performed once the taxonomy of this group is clarified.
- *Hydrobius rottenbergii* Gerhardt, 1872 and *Hydrobius subrotundus* Stephens, 1829 were considered morphological variations of *Hydrobius fuscipes* (Linnaeus, 1758) until Fossen et al. (2016) considered them as valid species. In the present study, we chose to treat all specimens of this group as "*H. fuscipes*", because the morphological differentiation of the three species is ambiguous outside Scandinavia and because many undescribed cryptic species of *Hydrobius* could occur in Europe (Fossen et al. 2016).

The specimens were identified using the following publications (in alphabetical order): Angus (1992), Fikáček (2006), Forster et al. (2014), Freude (2011), Gentili (1975), Hansen (1987), Pirisinu (1981), Queney and Prévost (2021) and Vorst (2009).

When not otherwise specified, general information on species' distributions is taken from the "Catalogue of Palaearctic Coleoptera" (Fikáček 2015; Fikáček and Przewoźny 2015; Fikáček et al. 2015a).

We have also used the relevant literature concerning the countries and regions adjacent to Switzerland, such as Bameul and Queney (2014) for France and regionally Callot (2001, 2018) for Alsace; Köhler and Klausnitzer (1998) for Germany; Pirisinu (1981) and Rocchi (2002) for Italy as well as the regional treatment of Brandstetter and Kapp (1998) for Vorarlberg (Austria) and Liechtenstein; and Kahlen and Hellrigl (1996) for South Tyrol / Alto Adige.

The list of the main synonyms of each taxon is provided in the "Catalogue of Palaearctic Coleoptera" (Löbl and Löbl 2015) and is, therefore, not reported here.

Once an exhaustive list of species was compiled, we followed the procedure proposed by Monnerat et al. (2015) in order to assess which of these species should be considered as belonging to the Swiss fauna. We only retained species whose relative data were deemed sufficient (unambiguous labeling, reliable collections, etc.) for inclusion on the national checklist.

Those species whose presence in Switzerland is substantiated by less than 30 valid observations are subject to an additional comment. In these cases, species names in the table are followed by a letter and a number in bold ("**C1**" for example) and all the examined specimens and published observations are mentioned in order to document and justify the presence of these species in the checklist. When not otherwise specified, all examined material was identified or reviewed by the first author.

There are various genera and species groups in Hydrophiloidea (e.g., *Laccobius* spp. and *Chaetarthria* spp.) for which the most reliable character is the male genitalia. For those species, only dissected males are counted as "verified" records, while records based exclusively upon female specimens were omitted as unverifiable.

The specimens and literature-based records presented here are listed in chronological order of discovery (or publication date) and then in alphabetical order by locality, depending on available information. All occurrences are cited according to the following scheme: number of specimens, locality (pre-2000 data) or municipality and abbreviated canton (post-2000 data), date, collector, determinator (in the case that the determinator was not one of the authors), collection and official acronym of the institution where the specimen is deposited.

Information about localities and dates are reported as found on the labels. Interpretations of alphabetical abbreviations are placed within square brackets ("[ ]"). In old collections, the collector (leg.) is not always explicitly labelled. In such cases, we favored the « coll. » tag. In some cases, the original collection holder was not labelled but we were nonetheless able to identify the source of the collection based on type labels and/or handwriting.

The Charles Maerky collection, held by the MHNG, has long been considered problematic (Monnerat et al. 2015). In addition to specimens coming from his personal collection ("coll. Maerky C."), it also contains insects from other sources (labelled, for instance, as "ex coll. Melly A.") but lacking any original labels. In such cases, we maintained the "coll. Maerky C." mention for his whole collection to ensure the association of these samples with the Maerky C. collection.

For literature-based data, detailed under "Published data", we retained the locality as it appeared in the original citation. We consider the "source" of the records to be the author of the publication, for example: "Ormontsthal by Venetz I. (Stierlin and Gautard 1867)". If the same records have been published more than once, then only the oldest publication is retained, given that localities in later publications are often altered and sometimes truncated.

Among the data cited in this paper under "Examined material" or "Published data", we inserted a superscript number code before those entries we considered insufficiently documented to be retained, using the following code to describe error type (following Monnerat et al. 2015). Thus if one of the following eight criteria is fulfilled, a record is considered as doubtful:

1. data source cannot be verified;
2. incorrect identification;
3. specimen from problematic collection;
4. specimen of unknown origin but attributed to a Swiss locality;
5. double labeling, original locality misinterpreted or incorrectly copied;
6. confusion between localities: original finding, breeding or hatching place and collection storage site;
7. non-Swiss localities or potentially Swiss localities that share their names with foreign place names (and thus of dubious Swiss origin);
8. chorological or ecological inconsistencies.

Abbreviations used: coll. = collection, det. = determinator, ex. = specimen, leg. = collector. Abbreviated Swiss cantons (only cantons cited in the text): AG = Aargau, BE = Bern, BL = Basel-Landschaft, FR = Fribourg, GE = Geneva, GR = Grisons, JU = Jura, LU = Lucerne, NE = Neuchâtel, NW = Nidwalden, SG = St. Gallen, SH = Schaffhausen, SZ = Schwyz, TI = Ticino, TG = Thurgau, UR = Uri, VD = Vaud, VS = Valais, ZH = Zurich.

Results

Swiss fauna Hydrophiloidea list

We considered that the 105 species listed in bold and without square brackets "[ ]" either currently do or formerly did form populations in Switzerland, even if only scant information is available for many of them. We also con-

sidered here several allochthonous species, originating from other regions of the world (sometimes introduced), which maintain (or have maintained) continuous populations in Switzerland during several years.

On the other hand, the 16 species listed in square brackets "[ ]" should not be considered as belonging to the Swiss fauna, until new data can show otherwise. In this category, we placed species whose individuals come from problematic collections, such as Charles Maerky's or Max Täschler's (Monnerat et al. 2015), those that were erroneously mentioned for Switzerland due to incorrect identifications and those cited in old publications, like Stierlin and Gautard (1867), without reference to specific individuals and consequently considered to be doubtful. Other species may eventually be found in the Swiss territory, but currently available data are not sufficient to confirm their establishment in Switzerland.

To facilitate the species' search in this document, taxa appear in alphabetical order for families, subfamilies, tribes, genera, subgenera, species, and subspecies.

All collected information represents 30,434 occurrences within the concerned families.

Updated distribution maps of these species are available on the info fauna cartographic server (https://lepus.infofauna.ch/carto/). All the valid data are also available on http://www.GBIF.org (https://doi.org/10.15468/dl.bw5mfe).

Checklist of the Swiss species

GEORISSIDAE

***Georissus* (*Georissus*) *crenulatus* (P. Rossi, 1794)**
***Georissus* (*Georissus*) *substriatus* Heer, 1841; C1**
[*Georissus* (*Neogeorissus*) *costatus* Laporte, 1840]; **C2**
***Georissus* (*Neogeorissus*) *laesicollis* Germar, 1832**

HELOPHORIDAE

***Helophorus* (*Empleurus*) *nubilus* Fabricius, 1777**
[*Helophorus* (*Empleurus*) *rufipes* (Bosc, 1791)]; **C3**
***Helophorus* (*Empleurus*) *schmidti* A. Villa & G.B. Villa, 1838**
***Helophorus* (*Helophorus*) *aequalis* Thomson, 1868; C4**
***Helophorus* (*Helophorus*) *aquaticus* (Linnaeus, 1758); C4**
***Helophorus* (*Helophorus*) *grandis* Illiger, 1798**
***Helophorus* (*Kyphohelophorus*) *tuberculatus* Gyllenhal, 1808; C5**
***Helophorus* (*Rhopalohelophorus*) *arvernicus* Mulsant, 1846**
***Helophorus* (*Rhopalohelophorus*) *asperatus* Rey, 1885; C6**
***Helophorus* (*Rhopalohelophorus*) *brevipalpis* Bedel, 1881**
[*Helophorus* (*Rhopalohelophorus*) *croaticus* Kuwert, 1886]; **C7**
***Helophorus* (*Rhopalohelophorus*) *dorsalis* (Marsham, 1802); C8**
***Helophorus* (*Rhopalohelophorus*) *fauveli* Ganglbauer, 1901; C9**
***Helophorus* (*Rhopalohelophorus*) *flavipes* Fabricius, 1792**
***Helophorus* (*Rhopalohelophorus*) *glacialis* A. Villa & G.B. Villa, 1833**
***Helophorus* (*Rhopalohelophorus*) *granularis* (Linnaeus, 1760)**
***Helophorus* (*Rhopalohelophorus*) *griseus* Herbst, 1793**
[*Helophorus* (*Rhopalohelophorus*) *longitarsis* Wollaston, 1864]; **C10**
***Helophorus* (*Rhopalohelophorus*) *minutus* Fabricius, 1775; C11**
***Helophorus* (*Rhopalohelophorus*) *montenegrinus* Kuwert, 1885; C12**
[*Helophorus* (*Rhopalohelophorus*) *nanus* Sturm, 1836]; **C13**
***Helophorus* (*Rhopalohelophorus*) *nivalis* Giraud, 1852**
***Helophorus* (*Rhopalohelophorus*) *obscurus* Mulsant, 1844**
***Helophorus* (*Rhopalohelophorus*) *pumilio* Erichson, 1837**
***Helophorus* (*Rhopalohelophorus*) *strigifrons* Thomson, 1868; C14**

HYDROCHIDAE

***Hydrochus angustatus angustatus* Germar, 1824; C15**
[*Hydrochus brevis* (Herbst, 1793)]; **C16**
***Hydrochus crenatus* (Fabricius, 1792)**
***Hydrochus elongatus* (Schaller, 1783)**
***Hydrochus ignicollis* Motschulsky, 1860**

HYDROPHILIDAE
Acidocerinae Zaitzev, 1908

***Helochares* (*Helochares*) *lividus* (Forster, 1771)**
***Helochares* (*Helochares*) *obscurus* (O.F. Müller, 1776)**
***Helochares* (*Helochares*) *punctatus* Sharp, 1869**

Chaetarthriinae Bedel, 1881
Anacaenini M. Hansen, 1991

***Anacaena bipustulata* (Marsham, 1802); C17**
***Anacaena globulus* (Paykull, 1798)**
***Anacaena limbata* (Fabricius, 1792)**
***Anacaena lohsei* Berge Henegouwen & Hebauer, 1989**
***Anacaena lutescens* (Stephens, 1829)**
***Crenitis* (*Crenitis*) *punctatostriata* (Letzner, 1840)**

Chaetarthriini Bedel, 1881

***Chaetarthria seminulum* (Herbst, 1797)**
***Chaetarthria similis* Wollaston, 1864**
***Chaetarthria simillima* Vorst & Cuppen, 2003**

Enochrinae Short & Fikáček, 2013

***Cymbiodyta marginella* (Fabricius, 1792); C18**

***Enochrus* (*Enochrus*) *melanocephalus* (Olivier, 1793)**
***Enochrus* (*Lumetus*) *fuscipennis* (Thomson, 1884)**
***Enochrus* (*Lumetus*) *ochropterus* (Marsham, 1802)**
***Enochrus* (*Lumetus*) *quadripunctatus* (Herbst, 1797)**
[*Enochrus* (*Lumetus*) *segmentinotatus* (Kuwert, 1888)]; **C19**
***Enochrus* (*Lumetus*) *testaceus* (Fabricius, 1801)**
***Enochrus* (*Methydrus*) *affinis* (Thunberg, 1794)**
***Enochrus* (*Methydrus*) *coarctatus* (Gredler, 1863)**
***Enochrus* (*Methydrus*) *nigritus* (Sharp, 1873)**

Hydrophilinae Latreille, 1802
Berosini Mulsant, 1844

***Berosus* (*Berosus*) *affinis* Brullé, 1835; C20**
***Berosus* (*Berosus*) *luridus* (Linnaeus, 1760)**
***Berosus* (*Berosus*) *signaticollis* (Charpentier, 1825)**
***Berosus* (*Enoplurus*) *frontifoveatus* Kuwert, 1888; C21**
[*Berosus* (*Enoplurus*) *guttalis* Rey, 1883]; **C22**
[*Berosus* (*Enoplurus*) *spinosus* (Steven, 1808)]; **C23**

Hydrobiusini Mulsant, 1844

***Hydrobius fuscipes* (Linnaeus, 1758)**
[*Limnoxenus niger* (Gmelin, 1790)]; **C24**

Hydrophilini Latreille, 1802

***Hydrochara caraboides* (Linnaeus, 1758)**
[*Hydrochara flavipes* (Steven, 1808)]; **C25**
***Hydrophilus* (*Hydrophilus*) *aterrimus* Eschscholtz, 1822; C26**
***Hydrophilus* (*Hydrophilus*) *piceus* (Linnaeus, 1758)**

Laccobiini Houlbert, 1922

***Laccobius* (*Dimorpholaccobius*) *albescens* (Rottenberg, 1874)**
[*Laccobius* (*Dimorpholaccobius*) *atrocephalus atrocephalus* Reitter, 1872]; **C27**
***Laccobius* (*Dimorpholaccobius*) *bipunctatus* (Fabricius, 1775)**
***Laccobius* (*Dimorpholaccobius*) *neapolitanus* Rottenberg, 1874; C28**
***Laccobius* (*Dimorpholaccobius*) *obscuratus obscuratus* Rottenberg, 1874**
***Laccobius* (*Dimorpholaccobius*) *sinuatus sinuatus* Motschulsky, 1849**
***Laccobius* (*Dimorpholaccobius*) *striatulus* (Fabricius, 1801)**
[*Laccobius* (*Hydroxenus*) *femoralis mulsanti* Zaitzev, 1908]; **C29**
***Laccobius* (*Laccobius*) *colon* (Stephens, 1829); C30**
***Laccobius* (*Laccobius*) *minutus* (Linnaeus, 1758)**
***Laccobius* (*Microlaccobius*) *alternus* Motschulsky, 1855**
***Laccobius* (*Microlaccobius*) *gracilis gracilis* Motschulsky, 1855; C31**
***Laccobius* (*Microlaccobius*) *thermarius thermarius* Tournier, 1878; C32**
[*Paracymus aeneus* (Germar, 1824)]; **C33**
***Paracymus scutellaris* (Rosenhauer, 1856); C34**

Sphaeridiinae Latreille, 1802
Coelostomatini L. Heyden, 1891

***Coelostoma* (*Coelostoma*) *hispanicum* (Küster, 1848); C35**
***Coelostoma* (*Coelostoma*) *orbiculare* (Fabricius, 1775)**
***Dactylosternum abdominale* (Fabricius, 1792); C36**

Megasternini Mulsant, 1844

***Cercyon* (*Cercyon*) *alpinus* Vogt, 1969; C37**
***Cercyon* (*Cercyon*) *bifenestratus* Küster, 1851; C38**
***Cercyon* (*Cercyon*) *castaneipennis* Vorst, 2009; C39**
***Cercyon* (*Cercyon*) *convexiusculus* Stephens, 1829**
***Cercyon* (*Cercyon*) *granarius* Erichson, 1837; C40**
***Cercyon* (*Cercyon*) *haemorrhoidalis* (Fabricius, 1775)**
***Cercyon* (*Cercyon*) *impressus* (Sturm, 1807)**
***Cercyon* (*Cercyon*) *lateralis* (Marsham, 1802)**
[*Cercyon* (*Cercyon*) *littoralis* (Gyllenhal, 1808)]; **C41**
***Cercyon* (*Cercyon*) *marinus* Thomson, 1853**
***Cercyon* (*Cercyon*) *melanocephalus* (Linnaeus, 1758)**
***Cercyon* (*Cercyon*) *nigriceps* (Marsham, 1802)**
***Cercyon* (*Cercyon*) *obsoletus* (Gyllenhal, 1808)**
***Cercyon* (*Cercyon*) *pygmaeus* (Illiger, 1801)**
***Cercyon* (*Cercyon*) *quisquilius* (Linnaeus, 1760)**
***Cercyon* (*Cercyon*) *sternalis* Sharp, 1918**
***Cercyon* (*Cercyon*) *tatricus* Endrödy-Younga, 1967; C42**
***Cercyon* (*Cercyon*) *terminatus* (Marsham, 1802)**
[*Cercyon* (*Cercyon*) *tristis* (Illiger, 1801)]; **C43**
***Cercyon* (*Cercyon*) *unipunctatus* (Linnaeus, 1758)**
***Cercyon* (*Dicyrtocercyon*) *ustulatus* (Preyssler, 1790)**
***Cercyon* (*Paracercyon*) *analis* (Paykull, 1798)**
***Cercyon* (*Paracycreon*) *laminatus* Sharp, 1873**
***Cryptopleurum crenatum* (Kugelann, 1794)**
***Cryptopleurum minutum* (Fabricius, 1775)**
***Cryptopleurum subtile* Sharp, 1884**
***Megasternum concinnum* (Marsham, 1802)**
***Megasternum immaculatum* (Stephens, 1829)**
***Pachysternum capense* (Mulsant, 1844); C44**

Sphaeridiini Latreille, 1802

***Sphaeridium bipustulatum* Fabricius, 1781**
***Sphaeridium lunatum* Fabricius, 1792**
***Sphaeridium marginatum* Fabricius, 1787**
***Sphaeridium scarabaeoides* (Linnaeus, 1758)**
***Sphaeridium substriatum* Faldermann, 1838; C45**

SPERCHEIDAE

***Spercheus emarginatus* (Schaller, 1783); C46**

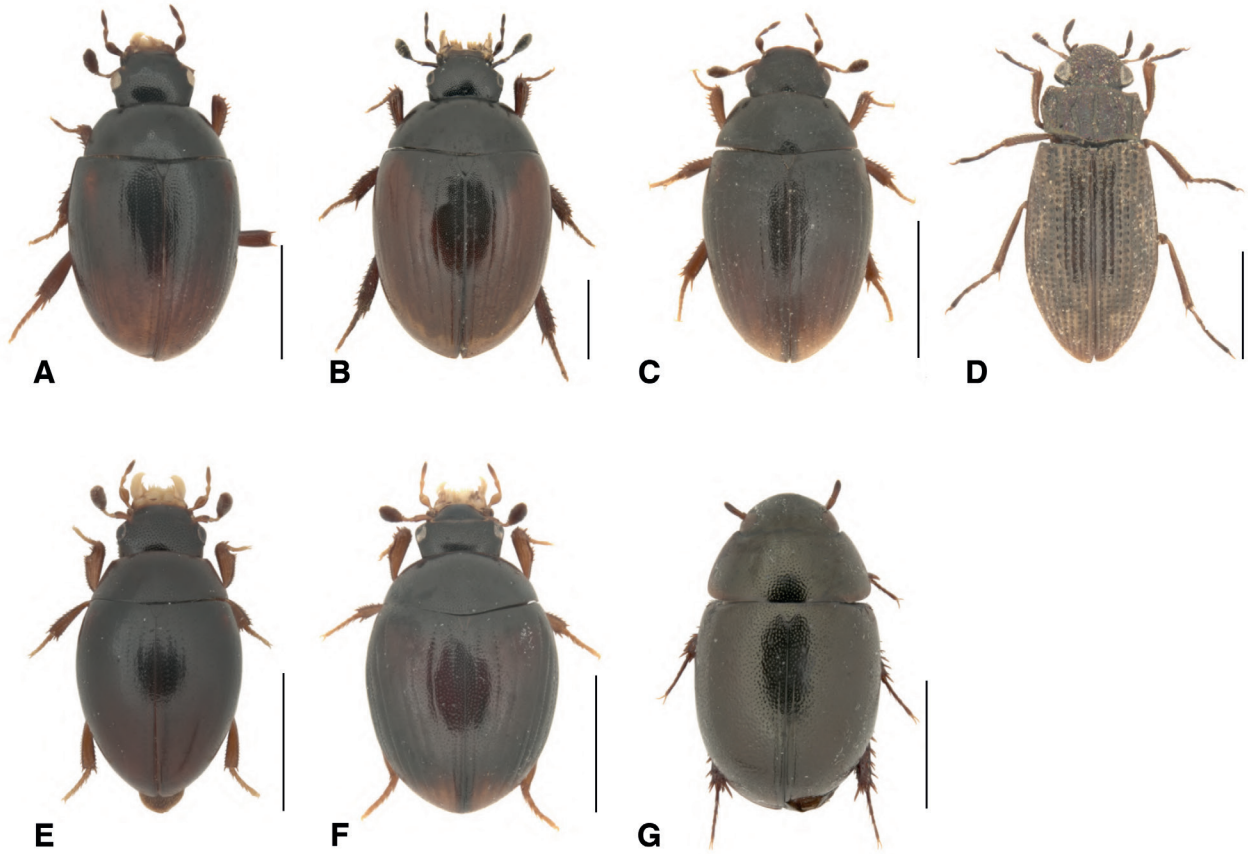

Figure 1. Habitus of the seven species mentioned for the first time in Switzerland. **A.** *Cercyon alpinus*; **B.** *Cercyon castaneipennis*; **C.** *Cercyon tatricus*; **D.** *Helophorus montenegrinus*; **E.** *Megasternum immaculatum*; **F.** *Pachysternum capense*; **G.** *Paracymus scutellaris*. Scale bars: 1 mm. (Photos V. Cosandey).

Commented species

C1) *Georissus* (*Georissus*) *substriatus* Heer, 1841

Examined material. [3)]1 ex., Troinex, leg. Anonymous, MHNG; 4 ex., Büren a. A. [Büren an der Aare], VI.1887, VII.1888, coll. Rätzer A., det. Huber C., NMBE; 1 ex., Chur, VIII.1924, leg. Jörger J. B., det. Besuchet C., NMB; 11 ex., Suisse, Grisons, Untervaz, 11.IX.1924, leg. and coll. Jörger J. B., det. Besuchet C., NMB; 1 ex., Tic., Castione, 5.VII.1943, leg. and coll. Lautner J., MHNG; 1 ex., Locarno, VII.1947, leg. and coll. Linder A., det. Besuchet C., ETH; 1 ex., Rabius, VIII.1953, leg. and coll. Linder A., det. Besuchet C., ETH; 2 ex., Suisse, Berne, Aarberg, VI.1954, leg. and coll. Linder A., det. Besuchet C., ETH, MHNG; 2 ex., Heitenried, VI.1963, leg. and coll. Linder A., det. Besuchet C., ETH; 1 ex., Suisse, Genève, Veyrier, crue de l'Arve, 27.IX.1968, leg. Besuchet C., MHNG; 23 ex., Loderio, 13.VIII.1974, leg. and coll. Scherler P., NMBE; 1 ex., Suisse, Valais, Finges, au bord Rhône, 31.VII.1979, leg. Besuchet C., MHNG.

Published data. [1)]Genf by Chevrier F. (Heer 1841); [1)]Peney bei Genf by Tournier H. (Stierlin and Gautard 1867); Büren by Rätzer A. (Rätzer 1888); Disentis [Rabius] by Linder A. and Untervaz by Jörger J. B. (Linder 1967).

Comment. *Georissus* individuals are rarely collected, probably due to their small size and cryptic habitus. In addition, they have high ecological requirements (Hebauer and Klausnitzer 1998) and are restricted to natural, preserved wetland habitats. The presence of *G. substriatus* in Switzerland is attested by several specimens in collections. However, it has not been observed in the last 40 years. This species, mainly found in southern Europe, should be sought specifically in Switzerland.

C2) [*Georissus* (*Neogeorissus*) *costatus* Laporte, 1840]

Examined material. [3,4,6,8)]1 ex., Alpes, Tessin, leg. Ghidini A., coll. Maerky C., MHNG.

Comment. The only "Swiss" specimen belongs to the problematic collection of C. Maerky (see Monnerat et al. 2015) and was, therefore, not retained as a valid record. This Mediterranean species does not occur in Switzerland.

C3) [*Helophorus* (*Empleurus*) *rufipes* (Bosc, 1791)]

Examined material. [3,8)]1 ex., St-Bernard, coll. Favre E., HGSB; [3,8)]2 ex., St. Bernhard, leg. Venetz I., coll. Dietrich K., ETH; [3,8)]2 ex., Valais, leg. Poncy E., coll. Maerky C., MHNG; [3,8)]1 ex., Waadt, coll. Zschokke A., NMAA; [3,4,6,8)]1 ex., Yverdon, IX.1951, leg. and coll. Sermet A., MZL.

Published data. [1,8)]St. Bernhard ? by Venetz I. (Stierlin and Gautard 1867); [1,8)][Val d'Orvin] by Michaud A. (Michaud 1937).

Comment. This terrestrial species is widespread in Western and Central Europe and North Africa. Since the examined specimens belong to problematic collections and the published data could not be verified, this species is not considered to be part of the Swiss fauna.

C4) *Helophorus* (*Helophorus*) *aequalis* Thomson, 1868 and *Helophorus* (*Helophorus*) *aquaticus* (Linnaeus, 1758)

Comment. *Helophorus aequalis* and *H. aquaticus* have been reported from Switzerland (Fikáček et al. 2015a) with *H. aquaticus* being probably more common (Angus R. comm. pers.). However, we chose not to distinguish these two species since they are virtually impossible to differentiate without the examination of their karyotypes (Angus 1982). Therefore, all Swiss data have been attributed to an aggregate *H. aequalis/aquaticus*.

C5) *Helophorus* (*Kyphohelophorus*) *tuberculatus* Gyllenhal, 1808

Examined material. 1 ex., VD, Ste. Croix, Vraconnaz, X.1969, leg. and det. Toumayeff G., MHNG.

Published data. 1 ex., tourbière de la Vraconne, au-dessus de Ste-Croix, 19.X.1969 by Toumayeff G. (Toumayeff 1980).

Comment. This species is distributed in northern Europe and Asia, as well as in the Nearctic region. In Switzerland, a single specimen was captured in autumn 1969 in a Jura peat bog at 1,100 m a.s.l. (Toumayeff 1980). In France, it has been cited in the Doubs (Bameul and Queney 2014), close to the Swiss locality and was considered not rare in the vicinity of Pontarlier (Sainte-Claire Deville 1935). According to Hansen (1987), this tyrphobiontic species, which could be present in other peat bogs in the Jura Mountains, does not live directly in the water but hides in damp mosses and is generally found in small numbers of individuals.

C6) *Helophorus* (*Rhopalohelophorus*) *asperatus* Rey, 1885

Examined material. [3,4,5,6]1 ex., Basel, leg. Seiler P., coll. Stöcklin N., NMB; [3,4,5,6]1 ex., Basel, NMB; 29 ex., Ticino, Monte Bigorio, leg. and coll. Focarile A., MSNL; 1 ex., Ticino, Monte di Medeglia, leg. and coll. Focarile A., MSNL; 1 ex., Nidau, leg. Mathey A., MHNG; 2 ex., K.S. [Katzensee], 9.X.1883, coll. Riss F., ETH; 2 ex., Katzens. [Katzensee], 15.III.1884, coll. Riss F., ETH; 1 ex., ZH, Buchs, 27.III.1948, leg. and coll. Allenspach V., NMB; 2 ex., Kt. Bern, Hindelbank, V.1963, leg. and coll. Linder A., ETH; 14 ex., Ticino, Tesserte, Gola di Lago, VI.1985, leg. and coll. Focarile A., MSNL; 3 ex., Maggia TI, 4.VII.2022, leg. and coll. Chittaro Y.

Published data. [1)]Stein, Hargarten, Brunnentrog, VI.1960, leg. Frey H. T. (Hugentobler 1966); 2 ♂, Marais de Kloten by Gassmann M., det. Angus R. (Gassmann 1974).

Comment. This species is found throughout western and southern Europe. In Switzerland, only a few specimens are known, mainly from the canton of Ticino. This species inhabits grassy pools in open areas (Angus 1992).

C7) [*Helophorus* (*Rhopalohelophorus*) *croaticus* Kuwert, 1886]

Published data. [1)]Portalban-Cudrefin, Grande Cariçaie, 1992 (Mulhauser 1997).

Comment. A single mention in the literature, without any reference specimen, refers to *H. croaticus* in Switzerland. As no specimens belonging to this species have been found in the collections consulted, the species is currently not listed for Switzerland. Since it is widely distributed in the Palaerctic region (Drost 1988) and present in adjacent areas, notably Alsace (Callot 2001, 2018) and southern Germany (Köhler and Klausnitzer 1998), its presence in Switzerland is possible.

C8) *Helophorus* (*Rhopalohelophorus*) *dorsalis* (Marsham, 1802)

Examined material. [3,4,5,6]1 ex., Basel, coll. Burghold W., NMBE; [3,4,5,6]1 ex., Basel, leg. Anonymous, NMB; 1 ex., Bienne, leg. Mathey A., NMBE; [3,4,6]1 ex., Kt. Basel, leg. Täschler M., ETH; 2 ex., Gränch.bg [Grenchenberg], 25.V.1880, coll. Rätzer A., NMBE; 1 ex., Müllheum, IV.1886, coll. Müller-Rutz J., det. Blöchlinger H., NMTG; 1 ex., Fribourg, Schweinsberg, 1934, leg. and coll. Berhaut J., MHNF; 1 ex., BL, Eptingen, VI.1959, leg. Toumayeff G., MHNG; 3 ex., Thurg. [Thurgovie], Pfyn, bord de la Thur, 7.VIII.1979, leg. Besuchet C., MHNG; 1 ex., Péry, Tscharner, 1995, leg. Anonymous, ETH; 2 ♂, Suchy VD, 14.IV.2018, leg. and coll. Cosandey V.; 1 ♂, 1 ♀, Vuisternens-devant-Romont FR, 30.VII.2022, leg. and coll. Cosandey V.

Published data. [1)]Basel by Bischoff-Ehinger A. and Stierlin G. and [1)]Schaffhausen by Stierlin G. (Stierlin and Gautard 1867); [1)][Val d'Orvin] by Michaud A. (Michaud 1937).

Comment. Although widely distributed in Europe and present in Turkey, *H. dorsalis* is rare in Switzerland, where most of the localities are situated on the Plateau. This species colonizes small, often temporary, muddy pools in woodlands (Hansen 1987; Angus 1992). It has also been captured during dispersal using light traps or nets placed on cars ("autokescher") (Gerend 2014). The recent Swiss records involve specimens caught in ruts created by logging machinery, which corresponds to the typical habitat as described in the literature. It is possible that the sporadicity of its occurrences reflects the difficulty of finding these small temporary bodies of water.

C9) *Helophorus* (*Rhopalohelophorus*) *fauveli* Ganglbauer, 1901

Examined material. 2 ex., Wallis, Gr. St. Bernhard, coll. Cerutti N., MHNF; 2 ex., VS, Val Ferret, coll. Rätzer A., NMBE; 5 ex., BE, Gauli-H. [Gauli-Hütte], VII.1928, leg. Mathey A., NMBE; 1 ex., Mt. Camoghè, 6.VIII.1963,

leg. and coll. Scherler P., NMBE; 3 ex., Valais, Gd. St. Bernard, VII.1971, leg. Toumayeff G., MHNG; 1 ex., Combe du Barasson, 12.VIII.1977, leg. and coll. Scherler P., NMBE; 1 ex., VS, V. Entremont, P. Lacerandes, IX.1978, leg. Toumayeff G., MHNG; 1 ex., Grisons, Val Bondasca, 11.IX.1985, leg. Besuchet C., MHNG; 1 ex., Vieux Emosson, 25.IX.1985, leg. and coll. Scherler P., NMBE; 6 ex., Zernez GR, 10.VI.2014, leg. Blattner L., det. Nagel P., NMB; 1 ex., Maggia TI, 25.VIII.2017, leg. and coll. Cosandey V.; 1 ex., Lavizzara TI, 26.VIII.2017, leg. and coll. Cosandey V.; 1 ex., Val de Bagnes VS, 19.VII.2022, leg. and coll. Sanchez A.

Published data. 2 ex., au-dessus du Col du Grand-St-Bernard, «Jardins du Valais», 24.7.1972 by Toumayeff G. (Toumayeff 1980).

Comment. *Helophorus fauveli* has been found only sporadically in the Italian and Swiss Alps. Curiously, Pirisinu (1981) did not mention this species in Italy. In Switzerland, *H. fauveli* was first detected by Toumayeff (1980), who collected a few specimens in very humid pastures at 2,600 m a.s.l. Its presence in the southwestern and in eastern Swiss Alps suggests that it may also be present in France and Austria. Targeted surveys should be carried out in these two countries. Today, it is known from a dozen high-altitude localities scattered across the Alps. Potentially, *H. fauveli* may be just aberrant specimens of *H. nivalis* (Shatrovskiy et al. 2023).

C10) [*Helophorus* (*Rhopalohelophorus*) *longitarsis* Wollaston, 1864]

Published data. [2)]au-dessus de Dorénaz and [2)]Guercet aux Champagnes de Fully by Favre E. (Favre 1890).

Comment. This species was only reported from Switzerland by Favre (1890), under the name (now synonymous) *H. erichsoni* Bach, 1866. The specimens of this species held in the collection of the HGSB, where Favre's collection is housed, happened to be *Helophorus granularis*. Even if its presence remains possible, given its wide distribution, *H. longitarsis* is not included in the Swiss list.

C11) *Helophorus* (*Rhopalohelophorus*) *minutus* Fabricius, 1775

Examined material. 5 ex., Martigny, coll. Rätzer A., NMBE; [3)]1 ex., Suisse, Nidau, 5.VII., coll Maerky C., MHNG; 6 ex., Ch. Fully [Champagne de Fully], coll. Cerutti N., MHNF; 1 ex., Kt. Wallis, Martigny, V.1890, leg. Anonymous, coll. Linder A., ETH; 1 ex., Scanfs, VII.1920, leg. and coll. Handschin E., BNM; 1 ex., Kt. Wallis, Martigny, VI.1939, leg. and coll. Linder A., ETH; 2 ex., Klotener Ried, 5.V.1967, 11.VII.1967, leg. Gassmann M., ETH; 1 ex., Vaud, Nyon, Changins, VI.1968, leg. Station fédérale de recherches agronomiques Changins, MHNG; 1 ex., Kt. Thurgau, Frauenfeld, VIII.1970, leg. and coll. Linder A., ETH; 1 ex., GE, Bois de Jussy, 3.VII.1972, leg. Vit S., MHNG; 2 ex., Hochdorf, Siedereiteich, 15.-20.VIII.1979, leg. Rezbanyai-Reser L., det. Herger P., NMLU; 11 ex., Ticino, Bolle di Magadino, 5.VII.1980, 11.VII.1980, 12.VII.1980, 7.VI.1981, 14.VI.1981, leg. Giacinto L., MSNL; 1 ex., SZ, Lauerz, Steinen, VII.1981, leg. Toumayeff G., MHNG; 1 ex., Egg, Litihof, Siedereiteich, 26.-31.VIII.1981, leg. Rezbanyai-Reser L., det. Herger P., NMLU; 2 ex., Valais, Barges près Vouvry, VIII.-X.1985, VII.-IX.1991, leg. Station fédérale de recherches agronomiques Changins, MHNG; 1 ex., Jura, Courtételle, IV.-V.1986, leg. Station fédérale de recherches agronomiques Changins, MHNG; 5 ex., Jura, Bonfol, 22.VII.1998, leg. Carron G., ETH; 51 ex., JU, Neuf Etang, 22.VII.1998, 4.IX.1998, leg. and det. Carron G.; [1)]1 ♂., Bernex GE, 13.VI.2006, leg. Anonymous, det. Demierre E.

Published data. [1)]Stein, Hargarten, Brunnentrog, VII.1965, leg. Frey H. T. (Hugentobler 1966); 6 ex., Marais de Kloten by Gassmann M., det. Angus R. (Gassmann 1974); 51 ex., Champ de Manche, 1998 by Carron G. (Carron 1999).

Comment. This species is widespread in Europe and North Africa. In Switzerland, it is quite rare but is known from specimens from most regions. It seems restricted to lowland (Queney and Prévost 2021) and relatively thermophilic habitats. It is found mainly in grassy pools (Angus 1992).

C12) *Helophorus* (*Rhopalohelophorus*) *montenegrinus* Kuwert, 1885; Fig. 1D

Examined material. [3,4,6)]1 ex., Kt. Zürich, leg. Täschler M., coll. Linder A., ETH; 1 ♂, 1 ♀, Chiasso TI, 22.IV.2018, leg. and coll. Chittaro Y.; 1 ♂, Stabio TI, 21.X.2021, leg. and coll. Cosandey V.; 2 ex., Coldrerio TI, 22.V.2023, leg. and coll. Chittaro Y.; 1 ex., Stabio TI, 22.V.2023, leg. and coll. Chittaro Y.

Comment. This species is new for Switzerland. A few specimens of *H. montenegrinus* were very recently collected in the far south of Switzerland (canton of Ticino). Since it is mainly distributed in the Mediterranean countries of Europe, its presence in southern Switzerland is not surprising. The occurrence from Zurich is doubtful since it concerns a specimen from a problematic collection.

C13) [*Helophorus* (*Rhopalohelophorus*) *nanus* Sturm, 1836]

Published data. [1)]am Irchel in Graben by Heer O. and [1)]Nyon by Mon. (Heer 1841); [1)]Aarau by Frey-Gessner E., [1)]Basel by Bischoff-Ehinger A. and [1)]Schaffhausen by Stierlin G. (Stierlin and Gautard 1867); [1)]Müllheim, IV.1886 by Müller-Rutz J. and [1)]Winkeln, Breitfeld, II.1957 by Hugentobler H. (Hugentobler 1966).

Comment. None of the numerous literature citations are reliable, as not one is supported by specimens in any Swiss collection. It is very likely that specimens of *H. pumilio* have been misidentified as *H. nanus*. Although this species is widely distributed in the Palaearctic region outside the Mediterranean (Angus 1992), it is currently not considered to be part of the Swiss fauna. However, it may be present in Switzerland and a future discovery of this species is possible.

C14) *Helophorus* (*Rhopalohelophorus*) *strigifrons* Thomson, 1868

Examined material. 2 ex., Lausanne, 24.VI.1896, coll. Gaud A., MZL; 1 ex., Basel, V.1908, leg. Jörger J. B, NMB; 15 ex., Kt. Bern, Uettligen, V.1932, IV.1934, leg. and coll. Linder A., ETH; 1 ex., Val Milar, 23.VII.1936 leg. and coll. Allenspach V., NMB; 1 ex., VD, Prévondavaux, IX.1961, leg. Toumayef G., MHNG; 2 ex., VD, Gimel, V.1964, leg. Toumayeff G., MHNG; 7 ex., VD, Jura, Lac Ter, VIII.1964, leg. Toumayeff G., MHNG; 5 ex., VD, Ballens, V.1972, VII.1973, leg. Toumayeff G., MHNG; 1 ex., VD, Gimel, Sézeau, III.1979, leg. Toumayeff G., MHNG; 2 ex., Vaud, Le Séchey, Lac Ter, 21.VI.1989, leg. Besuchet C., MHNG; 1 ♂, 1 ♀, Le Chenit VD, 1.XI.2017, leg. and coll. Chittaro Y.; 1 ♂, Le Locle NE, 23.XI.2017, leg. and coll. Chittaro Y.; 1 ♂, Le Chenit VD, 16.VI.2020, leg. and coll. Chittaro Y.; 1 ♂, Les Ponts-de-Martel NE, 23.VI.2020, leg. and coll. Chittaro Y.; 1 ♂, Chavannes-de-Bogis VD, 7.V.2021, leg. and coll. Chittaro Y.; 2 ex., Le Chenit VD, 17.V.2022, leg., det. and coll. Chittaro Y.

Comment. Most of the Swiss specimens come from the west of the country, with the exception of one collected in the canton of Grisons. *Helophorus strigifrons* is widely distributed in Europe but absent from the Mediterranean region (Angus 1992).

C15) *Hydrochus angustatus angustatus* Germar, 1824

Examined material. [3)]1 ex., Basel, leg. Anonymous, NMB; [3)]1 ex., Verrières, 18.IV.1901, leg. Anonymous, det. Berge Henegowen A. L., MHNG; 6 ex., Versoix, 2002, 7.VI.2003, 2004, 22.V.2005, leg. and det. Carron G., ETH, LEBA; 1 ex., Rances GE, 20.V.2004, leg. and det. Carron G., ETH; 6 ex., Versoix GE, 24.IV.2020, leg. and coll. Cosandey V.; 4 ex., 2 ♂, Versoix GE, 19.V.2020, leg. and coll. Chittaro Y.; 1 ex., 1 ♂, Bernex GE, 19.V.2020, leg. and coll. Chittaro Y.

Published data. [1)]Basel by Imhoff L. (Stierlin and Gautard 1867).

Comment. Distributed throughout Western Europe, this species reaches Switzerland in the canton of Geneva, where it is only known from a few specimens. This species is present in pools rich in plants and detritus, often in quarries. It is easiest to find in spring when the water level is high (Hebauer and Klausnitzer 1998). These ecological traits are corroborated by Swiss data.

C16) [*Hydrochus brevis* (Herbst, 1793)]

Published data. [1)]Bern by Perty M. (Heer 1841); [1)]Basel by Bischoff-Ehinger A. (Stierlin and Gautard 1867).

Comment. The only two Swiss mentions of *H. brevis* originate from very old publications, and no specimens were found in the examined collections. It is likely that the citations refer to misidentified *H. crenatus*. We suggest removing this species from the list of the Swiss fauna, even though its presence in Switzerland remains possible, given its wide Palaearctic distribution and its presence in southern Germany (Köhler and Klausnitzer 1998), Alsace (Callot 2018), and South Tyrol (Kahlen and Hellrigl 1996). This species is becoming rarer in the southern part of its distributional range (Hebauer and Klausnitzer 1998).

C17) *Anacaena bipustulata* (Marsham, 1802)

Examined material. 1 ex., Chiasso, leg. and coll. Fontana P., MSNL; [4,6)]1 ex., Marly, leg. Anonymous, coll. Bugnion E., det. Carron G., MZL; 1 ex., Genève, IV., leg. and coll. Toumayeff G., det. Carron G., MHNG; 1 ex., Chiasso, 7.V.1928, leg. and coll. Fontana P., MSNL; 1 ex., Dardagny GE, VI.2009, leg. Dupont N., det. Brancucci M.; 1 ex., Vandoeuvres GE, 2.IV.2012, leg. Anonymous, det. Demierre E.; 2 ex., Russin GE, 18.VIII.2021, leg. and coll. Cosandey V.; 8 ex., Perly-Certoux GE, 24.IX.2021, leg. and coll. Cosandey V.; 5 ex., Russin GE, 28.IV.2022, leg. and coll. Cosandey V.; 2 ex., Versoix GE, 6.IX.2023, leg. and coll. Chittaro Y.

Published data. [1)]au dessus de Broccard by Favre E., [1)]Jorat près Lausanne and [1)]Zürich by Bugnion E. (Favre 1890); [1)]Frauenfeld, VI.1956, [2)]Wittenbach, Kronbühl, XI.1956, [1)]Goldach, Mötteliweiher, X.1957, [2)]Altenrhein b. Strandbad, X.1958 and [1)]Sulgen, Weinmoos, V.1962 by Hugentobler H. (Hugentobler 1966); bords de l'Aire et de l'Allondon by Cosandey V. (Cosandey 2023).

Comment. This thermophilic species is widespread in Europe and North Africa, being more common in the southwestern part of its distribution (Hebauer and Klausnitzer 1998). Recent prospections have shown that it reaches the southwest of Switzerland in the canton of Geneva (Cosandey 2023), while historical specimens attest its presence in the canton of Ticino. The occurrence from Marly is doubtful, as the locality may refer to one in France and not one on the Swiss Plateau. Most of the published data are not attested by specimens in collections, while the specimens cited by Hugentobler (1966) that could be found in his collection were misindentified specimens of *Anacaea limbata*.

C18) *Cymbiodyta marginella* (Fabricius, 1792)

Examined material. 1 ex., Carouge, leg. Anonymous, MHNG; [1)]2 ex., Burgäschi, IV.1944, leg. Peez A., MCB; 1 ex., Hochdorf, Siedereiteich, 15.-20.VIII.1979, leg. Herger P., NMLU; 1 ex., Jura, Bonfol, Champ de manche, 4.IX.1998, leg. and det. Carron G., ETH; 2 ex., Stein am Rhein SH, 11.V.2022, leg. and coll. Chittaro Y.; 1 ex., Ramsen SH, 2.V.2023, leg. and coll. Chittaro Y.; 3 ex., Schaffhausen SH, 3.V.2023, leg. and coll. Chittaro Y.; 1 ex., Bonfol JU, 12.VI.2023, leg. and coll. Chittaro Y.; 1 ex., Marthalen ZH, 12.IX.2023, leg. and coll. Sanchez A.

Published data. [1)]Bern by Ougspurger F. and Perty M., [1)]Dübendorf by Bremi-Wolf J. J., [1)]Katzensee by Heer O., [1)]Lausanne by Mellet L., [1)]Nyon by Ter. and [1)]Pomy by Mellet L. (Heer 1841); [1)]Aigle by Heer O., [1)]Basel by Bischoff-Ehinger A. and [1)]Schaffhausen by Stierlin

G. (Stierlin and Gautard 1867); [1)]Buchser-See by Rietmann O. (Täschler 1872); [1)]Morges by Bugnion E. (Stierlin 1883); [2)]Martigny and [1)]Guercet by Favre E. (Favre 1890); [1)]Burgäschisee bei Herzogenbuchsee, [2)]Villeneuve 1938 and [2)]Zollikofen 1938 by Linder A. (Linder 1946); Bonfol, Champ de Manche by Carron G. (Carron 1999).

Comment. *Cymbiodyta marginella* is widely distributed in the Palaearctic region (Smetana 1974; Toussaint and Short 2022) but is only known from a few sparse occurrences in Switzerland. Citations in the literature may, in part, refer to misidentified *Enochrus* species. This is the case with the specimens from Zollikofen and Villeneuve, which turned out to be *Enochrus affinis*, and the specimen from Martigny which is an *E. coarctus*. With the exception of an old occurrence in the canton of Geneva, *Cymbiodyta marginella* has only been recorded in northern Switzerland. Recent targeted surveys have found this species in a few localities in the canton of Jura, Schaffhausen and Zurich.

C19) [*Enochrus* (*Lumetus*) *segmentinotatus* (Kuwert, 1888)]

Examined material. [3,4,6,8)]3 ex., Suisse, Argovie, leg. Frey-Gessner E., coll. Maerky C., MHNG; [4,6,8)]1 ex., Aïre, 20.III.1920, leg. and coll. van de Gümster J., MHNG.

Comment. The first specimen cited here belongs to C. Maerky's problematic collection (see Monnerat et al. 2015) and is, therefore, not retained as a valid record. Although it does not originate from a notoriously problematic collection, the second specimen cannot be retained either because *E. segmentinotatus* is a Mediterranean species, whose closest occurrences are situated in coastal areas.

C20) *Berosus* (*Berosus*) *affinis* Brullé, 1835

Examined material. 1 ex., Genève, Laconnex, VI.1985, leg. Agroscope, MHNG.

Published data. [1)]Yvonand-Estavayer-le-lac, Grande Cariçaie, 1995 (Mulhauser 1997).

Comment. This species is distributed in the Western Palaearctic and is common in the Mediterranean region (Schödl 1993). It reaches southwest Switzerland in the canton of Geneva, where a single specimen was caught in 1985 using a light trap. No specimen could be associated with the literature occurrence, which concerns likely a misidentified specimen of *Berosus*.

C21) *Berosus* (*Enoplurus*) *frontifoveatus* Kuwert, 1888

Examined material. 1 ex., Fully, leg. and coll. Rätzer A., NMBE; [3)]1 ex., Genève, leg. Sechehaye A., coll. Maerky C., MHNG; 1 ex., Guercenet [Guercet], coll. Favre E., HGSB; 5 ex., Martigny, coll. Favre E., HGSB; [3,8)]1 ex., Murten, leg. Anonymous, NMAA; [3)]1 ex., Wallis, leg. Anonymous, MHNG; 5 ex., Ch. Fully [Champagne de Fully], 20.V.1890, coll. Cerutti N., MHNF; 5 ex., Fully, 20.V.1890, coll. Cerutti N., MHNF; 5 ex., Fully, 22.V.1890, coll. Cerutti N., MHNF; 10 ex., Ch. Fully [Champagne de Fully], 24.V.1890, coll. Cerutti N., MHNF; 3 ex., VS, Fully, 24.V.1890, leg. and coll. Rätzer A., NMBE; 8 ex., VS, Fully, 30.V.1890, leg. and coll. Mathey A. and Rätzer A., NMBE; 4 ex., Kt. Wallis, Martigny, V.1890, leg. Anonymous, coll. Linder A., ETH; 2 ex., Suisse, Tessin, Mezzana, 5.VIII.1965, leg. Agroscope, MHNG; 2 ex., CH, TI, Coldrerio-Süd, Molino, V. d. Motta, 21.-31.VII.1988, leg. Rezbanyai-Reser L., NMLU; 2 ex., CH, TI, Monte Albano, San Pietro, 1.-10.VIII.1993, leg. Hächler M., MHNG; 1 ex., CH, TI, Seseglio, Cámpora, 21.-31.VIII.1997, leg. Rezbanyai-Reser L., NMLU.

Comment. *Berosus frontifoveatus* has regularly been misidentified as *B. spinosus* in the Swiss collections (see also the comment under *B. spinosus*). This themophilous species is widely distributed in the Mediterranean region as well as in Central Europe and Asia. In Switzerland, it appears to be restricted to the warmer regions of southern Switzerland, where a few specimens have been found. It may also be present in the Basel region, as suggested by occurrences in Alsace (Callot 2001, 2018).

C22) [*Berosus* (*Enoplurus*) *guttalis* Rey, 1883]

Examined material. [3,4,6,8)]1 ♀, Genève, Sionnet, leg. and coll. Maerky C., MHNG.

Published data. [2,8)]Champagnes de Fully, [1,8)]Econaz près Riddes [Ecône] and [2,8)]Guercet by Favre E. (Favre 1890).

Comment. This species is cited from the western Mediterranean region (southern France (Bameul and Queney 2014), Spain, North Africa) and Turkey. On the three occurrences cited by Favre (1890), two turned out to concern misidentified *Berosus frontifoveatus*, while no specimen could not be found for the third one in Favre's collection. The only specimen labelled from Switzerland is a female that must be considered as doubtful as it belongs to the problematic collection of Charles Maerky (see Monnerat et al. 2015). Consequently, *B. guttalis* is not considered to belong to the Swiss fauna.

C23) [*Berosus* (*Enoplurus*) *spinosus* (Steven, 1808)]

Examined material. [3,4,6)]1 ex., Schaffhausen ? (written with «?» on the original label), leg. Anonymous, ETH; [2?)]1 ♀, Suisse, Tessin, Mezzana, 7.IX.1965, leg. Agroscope, MHNG.

Published data. [1)]Aigle by Chavannes D.-A. and [1)]Nyon par Ter. (Heer 1841); [1)]Martigny by Favre E. (Stierlin 1883); [1)]Guercet by Favre E. (Favre 1890); [2)]1 ♂, Seseglio, VIII.1997 by Rezbanyai-Reser L. (Herger and Germann 2017).

Comment. This halophilic species (Hebauer and Klausnitzer 1998) is widely distributed in the Palaearctic region and has been recorded in most countries surrounding Switzerland, with the exception of France (Schödl 1991; Bameul and Queney 2014). The published data from Seseglio (TI) (Herger and Germann 2017) corresponds to a misidentified specimen of *B. frontifoveatus*. The only labeled specimen from Switzerland is a female, and its specific identification cannot be confirmed. For the time

being, we, therefore, propose to consider this species as absent from Switzerland without further information.

C24) [*Limnoxenus niger* (Gmelin, 1790)]

Examined material. [3,4,6)]1 ex., Genève, leg. Anonymous, coll. Maerky C., MHNG; [3,4,6)]1 ex., Kt. Genf, leg. Täschler M., coll. Linder A., ETH.

Published data. [1)]Genf by Chevrier F. (Heer 1841).

Comment. All specimens examined belong to problematic collections that should not be taken into account, and the very old literature data (under *Hydrobius oblongus* Herbst) cannot be verified. Although this species is widely distributed in the western Palaearctic region, it is absent from Switzerland.

C25) [*Hydrochara flavipes* (Steven, 1808)]

Examined material. [3,4,6,8)]2 ex., Genève, leg. Sechehaye A. and Anonymous, coll. Maerky C., MHNG; [3,4,6,8)]1 ex., Genève, Onex, leg. Frey-Gessner E., coll. Maerky C., MHNG.

Comment. All the examined specimens belong to Charles Maerky's problematic collection and must, therefore, be considered doubtful. *Hydrochara flavipes* is a species adapted to dry environments. It has a Mediterranean distribution, which extends into Central Asia (Smetana 1980), and does not occur in Switzerland.

C26) *Hydrophilus* (*Hydrophilus*) *aterrimus* Eschscholtz, 1822

Examined material. 1 ex., Bern, leg. and coll. Burghold W., NMBE; 2 ex., Fully, 20.V.1890, coll. Favre E., HGSB; 1 ex., Martigny, leg. Anonymous, MZL; 1 ex., Kt. Wallis, Martigny, leg. and coll. Linder A., ETH; [3)]1 ex., Suisse, Martigny, leg. Poncy E., coll. Maerky C., MHNG; [3)]1 ex., Suisse, Morat, leg. Fries A., coll. Maerky C., MHNG; 1 ex., Morgins de Loës, leg. and coll. Bugnion E., MZL; 3 ex., Villeneuve, leg. and coll. Gaud A., MHNG, MZL; 1 ex., Dorigny, 8.X.1879, leg. and coll. Bugnion E., MZL; 1 ex., Oerlikon, 9.IV.1884, leg. Anonymous, ETH; 1 ex., Oerlikon, 23.IV.1885, coll. Nägeli A., NMSO; 1 ex., Villeneuve [VD], 4.VI.1888, leg. and coll. Mathey A., NMBE; 1 ex., Villeneuve [VD], VI.1887, leg. Gaud A., coll. Bugnion E., MZL; 4 ex., Fully, 16.V.1890, 20.V.1890, leg. and coll. Rätzer A., NMBE; 1 ex., Ch. Fully [Champagne de Fully], 19.V.1890, coll. Cerutti N., MHNF; 1 ex., Ch. Fully [Champagne de Fully], 20.V.1890, coll. Cerutti N., MHNF; 1 ex., Kt. Wallis, Martigny, V. 1890, leg. Anonymous, coll. Linder A., ETH; 1 ex., Zürich, 1.V.1895, coll. Nägeli A., NMSO; 1 ex., TG, Untersee, 10.V.1910, leg. and coll. Spälti A., MHNG; 3 ex., Zürich, Katzensee, 1910, leg. Rimoldi C., coll. Allenspach V., NMB; 1 ex., Vaud, Roche, 28.V.1944, leg. and coll. Pochon H., MHNF; 1 ex., Vaud, Villeneuve, Gr. Canal, 30.IV.1946, leg. Anonymous, MHNG; 1 ex., Reggenberg, 29.VII.1952, leg. Anonymous, coll. Spälti A., MHNG; 1 ex., Helv., TG, Ermatingen, 16.IX.1961, leg. Sauter W., ETH; 2 ex., Altenrhein, 27.VIII.1968, leg. and coll. Spälti A., MHNG; 1 ex., Oerlikon, 23.IV.1985, leg. Anonymous, MHNG.

Published data. [1)]Malans and [1)]Ragatz [Bad Ragaz] by Amstein J. G. and [1)]Zürichsee by Heer O. (Heer 1841); [1)]Basel by Bischoff-Ehinger A. and [1)]Schaffhausen by Stierlin G. (Stierlin and Gautard 1867).

Comment. Only old specimens confirm the presence of *H. aterrimus* in Switzerland. It was last recorded in 1985 on the eastern Swiss Plateau, where surveys should be urgently carried out to determine whether the species is still present in Switzerland. This species is declining in Central Europe (Hebauer and Klausnitzer 1998) and may be extinct in France (Bameul and Queney 2014).

C27) [*Laccobius* (*Dimorpholaccobius*) *atrocephalus atrocephalus* Reitter, 1872]

Published data. [2)]3 ex., Magadino, X.1966, leg. Linder A. (Allenspach 1978).

Comment. The three specimens listed in Allenspach's publication correspond to *Laccobius albescens*. Known only from Italy and Spain in Europe, *L. atrocephalus atrocephalus* does not belong to the Swiss fauna.

C28) *Laccobius* (*Dimorpholaccobius*) *neapolitanus* Rottenberg, 1874

Examined material. 3 ex., Chiasso, leg. and coll. Fontana P., MSNL; [3)]1 ex., Genève, leg. Sechehaye A., coll. Maerky C., MHNG; [3)]1 ex., Suisse, leg. Sechehaye A., coll. Maerky C., MHNG; 3 ex., Chiasso, 1.IV., leg. and coll. Fontana P., MSNL; 4 ex., Chiasso, III.1914, leg. and coll. Fontana P., MSNL; 1 ex., Fusio, VII.1923, leg. and coll. Fontana P., MSNL; 1 ex., Fracherets, 23.XI.1947, leg. and coll. Besuchet C., MZL; 1 ex., Suisse, Tessin, Scudellate, leg. and coll. Besuchet C., MZL; 1 ex., GE, L. Baillets, London, 14.VII.1954, leg. and coll. Rehfous M., MHNG; 2 ex., GE, Russin, London, 17.IX.1955, leg. and coll. Rehfous M., MHNG; 1 ex., St. Gallen, Goldach, VI.1956, leg. and coll. Toumayeff G., MHNG; 2 ex., BE, Belp, Au, VI.1958, leg. and coll. Toumayeff G., MHNG; 2 ex., TI, Rancate, VIII.1963, leg. and coll. Toumayeff G., MHNG; 1 ex., Suisse, VD, Jura, Lac Ter, VIII.1964, leg. and coll. Toumayeff G., MHNG; 2 ex., Suisse, VD, Bercher, Mentue, V.1965, leg. and coll. Toumayeff G., MHNG; 1 ex., TI, s/Rovio, VI.1968, leg. and coll. Toumayeff G., MHNG; 2 ex., TI, s/Rovio, VII.1968, leg. and coll. Toumayeff G., MHNG; 1 ex., Rovio, 29.VII.1974, leg. Scherler P., det Carron G., NMBE; 2 ex., Caneggio, 6.VIII.1975, leg. Scherler P., det. Carron G., NMBE; 1 ex., VD, Bavois, Bernoise, VIII.1982, leg. and coll. Toumayeff G., MHNG; 1 ex., TI, Sessa, Bach-Ufer an der Lisora, 17.-22.V.1990, leg. Kiener S., det. Hebauer F., NMBE; 1 ex., TI, Melezza-Ufer zwischen Intragna und Tegna, 4.IV.1991, leg. Kiener S., det. Hebauer F., NMBE; 1 ♂, Chiasso TI, 22.IV.2018, leg. and coll. Chittaro Y.; 1 ♂, Lucens VD, 25.IV.2021, leg. and coll. Cosandey V.; 2 ♂, Zwischbergen VS, 6.VIII.2021, leg. and coll. Sanchez A.;

1 ♂, Plasselb FR, 12.IX.2021, leg. and coll. Cosandey V.; 1 ♂, Lugano TI, 19.X.2021, leg. and coll. Cosandey V.; 1 ♂, Mendrisio TI, 21.X.2021, leg. and coll. Cosandey V.; 1 ♂, Coldrerio TI, 22.V.2023, leg. and coll. Chittaro Y.

Published data. [1)]Grangettes, 1960 (Naceur 1997)

Comment. This species is distributed in Central and southern Europe and North Africa. In Switzerland, its presence is mainly attested by specimens from the west and south of the country. Specimens have been caught in small streams and springs. The ecological requirements of *L. neapolitanus* are unclear and sometimes contradictory (Hebauer and Klausnitzer 1998).

C29) [*Laccobius* (*Hydroxenus*) *femoralis mulsanti* Zaitzev, 1908]

Examined material. [3,4,6,8)]1 ex., Suisse, Bienne, 6.VI., leg. and coll. Maerky C., MHNG; [3,4,6,8)]1 ex., Genève, Rouelbeau, 22.VI., leg. and coll. Maerky C., MHNG; [3,4,6,8)]3 ex., Genève, Peney, 7.VII., leg. and coll. Maerky C., MHNG.

Comment. All the examined specimens belong to the problematic collection of Charles Maerky (see Monnerat et al. 2015) and should, therefore, be considered as doubtful. This Mediterranean species does not belong to the Swiss fauna. *Laccobius femoralis* is represented by the nominotypical subspecies in Corsica, Sicily, Sardinia, and Campania (Bameul and Queney 2014), whereas the subspecies *mulsanti* is more widely distributed in the Iberian Peninsula, France, Italy, and North Africa.

C30) *Laccobius* (*Laccobius*) *colon* (Stephens, 1829)

Examined material. 1 ex., Stein a. Rhein, Ufer d. Rhein, leg. and coll. Böschenstein A., NMSH; 1 ex., Büren, V.1894, leg. and coll. Rätzer A., det. Carron G., NMBE; 1 ex., Stein a. Rh., Alm. Hosen, 22.IV.1913, leg. and coll. Böschenstein A., NMSH; 1 ex., Helv., K. Zü., Hänsiried, 17.IV.1932, leg. and coll. Lautner J., NMB; 1 ex., Kt. Berne, Busswil, 23.IV.1938, leg. and coll. Pochon H., MHNF; 3 ex., Zürich Umg., Katzens. [Katzensee], 14.IV.1941, leg. and coll. Wolf J.-P., ETH; 1 ex., Zch., Affoltern, Grube, 10.V.1941, leg. and coll. Wolf J.-P., ETH; 1 ex., CH, VD, Bavois, 15.IV.1989, leg. and coll. Bugnion E., MZL; 1 ex., CH, VD, Chavornay, 15.IV.1989, leg. and coll. Bugnion E., MZL; 4 ex., Chavornay, 19.X.1989, leg. Scherler P., NMBE; 2 ♂, Le Chenit VD, 16.VI.2020, leg. and coll. Chittaro Y.

Published data. [2)]Scuol-Sent, 27.VII.1921 by Handschin E., [1)]Ravitschana, 5.IX.1934 and [2)]Il Fuorn, 13.IX.1934 by Nadig A. (Handschin 1963).

Comment. Widely distributed in the Palaearctic region, this species is rare in Switzerland, where it is known only from a few isolated specimens from the Plateau and the Jura mountains. Two specimens mentioned in the literature were found in the Handschin collection and were misidentified *L. obscuratus* (individual from Scuol-Sent) and *L. albescens* (individual from Il Fuorn). *Laccobius colon* is rare and sporadic in Germany as well (Hebauer and Klausnitzer 1998).

C31) *Laccobius* (*Microlaccobius*) *gracilis gracilis* Motschulsky, 1855

Examined material. 4 ex., Chiasso, leg. and coll. Fontana P., MSNL; [3)]1 ex., Helvet. [Helvetia], leg. and coll. Huguenin G., ETH; [3)]2 ex., Baden, coll. Killias E., BNM; [3)]1 ex., Zürich, leg. Anonymous, MHNG; 2 ex., Greifensee, 3.VIII.1857, leg. and coll. Dietrich K., ETH; 2 ex., im Wasser der Quelle v. Baden, VII.1897, leg. Anonymous, ETH; 1 ex., FR, Marly, 1.V.1944, leg. and coll. Allenspach V., NMB; 8 ex., Russin, Allondon, 18.IX.1955, leg. and coll. Rehfous M., MHNG; 2 ex., Russin, Allondon, 8.X.1955, 5.V.1956, leg. and coll. Rehfous M., MHNG; 3 ex., St. Gallen, Goldach, VI.1956, leg. and coll. Toumayeff G., MHNG; 1 ex., Kt. St. Gallen, St. Gallen, VI.1956, leg. and coll. Linder A., ETH; 2 ex., Lucens, 27.VII.1959, leg. Scherler P., NMBE; 1 ex., TI, Coldrerio-Süd, V. d. Motta, Molino, 21.-31.VII.1988, leg. Rezbanyai-Reser L., NMLU; 24 ex., Genève, Chancy, La Laire, 19.IX.1990, leg. Besuchet C., MHNG; 1 ex., Suisse, Genève, Les Baillets, Allondon, 27.IX.1990, leg. Besuchet C., MHNG; 5 ex., Russin GE, 20.IX.2004, leg. and det. Carron G., ETH; 1 ♂, Russin GE, 8.IV.2020, leg. and coll. Chittaro Y.; 3 ex., Russin GE, 24.IX.2021, leg. and coll. Cosandey V.; 2 ex., Chancy GE, 6.V.2022, leg. and coll. Cosandey V.

Published data. Chiasso by Fontana P. (Fontana 1922); St. Gallen, Goldachgebiet, VI.1956, coll. Toumayeff G. and Linder A. (Hugentobler 1966).

Comment. This rheophilous species seems to have high environmental requirements and has only been found in a few well-preserved rivers in Switzerland. *Laccobius gracilis* is probably more thermophilic than the closely related species *L. alternus*. Both species are widespread in Europe but less common north of the Alps (Hebauer and Klausnitzer 1998).

C32) *Laccobius* (*Microlaccobius*) *thermarius thermarius* Tournier, 1878

Examined material. [3,4,6,8)]7 ex., Suisse, Baden, leg. Tournier H., coll. Maerky C., MHNG.

Published data. Thermen von Baden im Aargau (Stierlin 1900); Terme di Baden (Gentili 1975).

Comment. Worldwide, *L. thermarius* is only known from two localities, where it is represented by two subspecies: the nominotypical subspecies *thermarius* described by Tournier in 1878 from specimens collected in Baden (AG) in Switzerland and the subspecies *jelineki* described by Gentili in 1975 based on specimens from Bojnice, in western Slovaquia. Both localities are thermal sites with temperatures above 20 °C (Gentili and Chiesa 1975). The type locality of the nominotypical subspecies is now completely urbanized, and the springs are used for thermal baths. It is not certain that the species still exists in Switzerland.

C33) [*Paracymus aeneus* (Germar, 1824)]

Examined material. [3,4,6)]2 ex., Kt. Genf, leg. Täschler M., coll. Linder A., ETH.

Published data. [1)]Genf [Genève] (Stierlin 1900).

Comment. The two specimens examined belong to Max Täschler's problematic collection (see Monnerat et al. 2015) and are, therefore, not retained as valid records, while the occurrence originating from literature is not verifiable. Although widely distributed in the Palaearctic region, this halobiontic species (Hebauer and Klausnitzer 1998) is not included in the Swiss list.

C34) *Paracymus scutellaris* (Rosenhauer, 1856); Fig. 1G

Examined material. [3)]1 ex., Genève, leg. Anonymous, coll. Maerky C., MHNG; 1 ex., Suisse, Genève, Hermance, 11.X.1961, leg. Besuchet C., MHNG.

Comment. This species is widespread in Europe, North Africa, Cyprus, and Turkey. The presence of *P. scutellaris* in Switzerland is presented here for the first time, based on a single specimen caught "in mosses" (probably by sifting) in the canton of Geneva in 1961. The other examined specimen belongs to the collection of C. Maerky and is, therefore, doubtful.

C35) *Coelostoma* (*Coelostoma*) *hispanicum* (Küster, 1848)

Examined material. [3,5)]1 ex., Genf [Genève], leg. and coll. Lasserre H., ETH; 5 ex., Riva S. Vitale, 8.VI.1928, leg. and coll. Fontana P., MSNL; 1 ex., Melano, 29.VIII.1989, leg. and coll. Scherler P., NMBE; 3 ex., Cartigny GE, 25.-26.V.2020, 18.VIII.2021, leg. and coll. Chittaro Y. and Cosandey V.

Published data. Moulin de Vert, Cartigny, 2021 by Cosandey V. (Cosandey 2023).

Comment. This Mediterranean species reaches the south of Switzerland in the cantons of Geneva and Ticino, where it is rare and localized. Although a few specimens were caught a few decades ago, *C. hispanicum* was only mentioned for the first time in Switzerland very recently (Cosandey 2023).

C36) *Dactylosternum abdominale* (Fabricius, 1792)

Examined material. 2 ex., Genève, Cointrin, X.1950, leg. and coll. Toumayeff G., MHNG; 7 ex., VD, Commugny, 22.IX.1963, 20.X.1963, 14.XI.1963, leg. Steffen J., MHNG; 1 ex., Suisse, Vaud, Bremblens, VIII.1983, leg. Agroscope, MHNG; 3 ex., CH, VS, Conthey, 1.-10.VIII.1988, 11.-20.VIII.1988, 21.-31.VIII.1988, leg. Hächler M., det. Herger P., NMLU; 5 ex., VD, Orny, IX.1988, leg. Toumayeff G., coll. Toumayeff G. and Scherler P., MHNG, NMBE; 1 ex., Genève, Lullier, VIII.1994, leg. Besuchet C., MHNG; 1 ex., Münsterlingen TG, 31.VIII.2014, leg., det. and coll. Eismann B.; 1 ex., Ingenbohl SZ, 29.VII.2018, leg., det. and coll. Graf R.; 1 ex., Signy-Avenex VD, 11.X.2019, leg., det. and coll. Breitenmoser S.; 1 ex., Morges VD, 27.VI.2020, leg. and coll. Chittaro Y.; 25 ex., Essertines-sur-Yverdon VD, 16.IX.2023, leg. and coll. Chittaro Y.

Published data. 2 ex., in der Nähe des Flugplatzes Cointrin-Genf, X.1950, leg. Toumayeff G. (Linder 1953); 3 ex., Conthey, VIII.1988 by Rezbanyai-Reser L. (Herger and Germann 2017).

Comment. This species originated from the Afrotropical region and has now a cosmoplitan distribution (Knisch 1924; Hansen 1999). The first specimens found in Switzerland were collected in 1950. Although generally found in small numbers, the species now appears to be widespread on the Swiss Plateau and arrives in Valais.

C37) *Cercyon* (*Cercyon*) *alpinus* Vogt, 1969; Fig. 1A

Examined material. 1 ex., SZ, Brunnen, VIII., leg. and coll. Toumayeff G., MHNG; 1 ex., Rigi, 13.VI.1912, leg. and coll. Jörger J. B., NMB; 1 ex., Montana, 1934, leg. and coll. Julliard C., MHNG; 5 ex., Kt. Bern, Hasliberg, VIII.1938, leg. and coll. Linder A., ETH; 1 ex., BE, Axalp, VII.1944, leg. and coll. Allenspach V., NMB; 1 ex., Suisse, GR, Bergün, Uglix, VIII.1967, leg. and coll. Toumayeff G., MHNG; 1 ex., CH, LU, Escholzmatt, 15.V.1975, leg. Portmann F., NMLU; 1 ex., Suisse, Obwald, Stöckalp, 2.X.1987, leg. Löbl I., MHNG.

Comment. This species is known from many mountain ranges in Europe (Abruzzi, Alps, Carpathians, Dinaric Alps) (Fikáček 2006). Here, we present the first occurrences of this species in Switzerland, all from the Alps. Most of these specimens were collected a long time ago but had gone unnoticed, confused in collection with other *Cercyon* species.

C38) *Cercyon* (*Cercyon*) *bifenestratus* Küster, 1851

Examined material. 2 ex., CH, BE, Ins, Landw. Schule, 23.VII.1977, leg. Rezbanyai-Reser L., det. Herger P., NMLU.

Published data. [2)]Chiasso, by Fontana P. (Fontana 1922).

Comment. This species is extremely rare in Switzerland and has only been collected once using a light trap in the wetlands of the Seeland, where it is probably associated with the remnants of sand dunes. The specimen announced as *C. bifenestratus* by Fontana (1922), and identified as such in his collection, was in fact *C. haemorrhoidalis*. The species is also rare in France (Bameul and Queney 2014).

C39) *Cercyon* (*Cercyon*) *castaneipennis* Vorst, 2009; Fig. 1B

Examined material. [3)]1 ex., Aarau, leg. Anonymous, NMAA; 1 ex., Chandolin, coll. Cerutti N., MHNF; 1 ex., Martigny, coll. Favre E., HGSB; 1 ex., Susten, leg. and coll. Benteli F., NMBE; 1 ex., Stalden, 25.V.1913, leg. and coll. Mathey A., NMBE; 2 ex., Ajoie, VII.1917, leg.

and coll. Mathey A., NMBE; 1 ex., Ayer, 19.VIII.1959, leg. and coll. Scherler P., NMBE; 3 ex., St-Légier, 10.XII.1960, leg. and coll. Scherler P., NMBE; 1 ex., Zermatt, 16.VIII.1961, leg. and coll. Rehfous M., MHNG; 1 ex., Novazzano, 6.VIII.1974, leg. and coll. Scherler P., NMBE; 1 ex., CH, BE, Lützelflüh-Egg, 12.VII.1995, leg. and coll. Kobel E., NMBE; 1 ex., Scuol GR, 29.IV.2015, leg. and coll. Chittaro Y., det. Büche B.; 1 ex., Vaz/Obervaz GR, 7.V.2016, leg. and coll. Cosandey V.; 1 ex., Bonaduz GR, 8.VII.2016, leg. and coll. Cosandey V.; 1 ex., Valsot GR, 8.VII.2016, leg. and coll. Cosandey V.; 1 ex. Köniz BE, 4.V.2019, leg. and coll. Cosandey V.; 3 ex., Schaffhausen SH, 12.V.2019, leg. and coll. Cosandey V.; 1 ex., Quarten SG, 18.V.2019, leg. and coll. Cosandey V.; 1 ex., S-chanf GR, 14.IX.2019, leg. and coll. Cosandey V.; 2 ex., Ennetbürgen NW, 19.VI.2021, leg. and coll. Cosandey V.; 1 ex., Ayent VS, 18.VI.2022, leg. and coll. Cosandey V.

Comment. This species has only recently been described (Vorst 2009). Previously, *C. castaneipennis* and *C. obsoletus* were grouped together under the nomen *C. lugubris* (Olivier, 1790), which was a misinterpretation of *Dermestes lugubris* Fourcroy, 1775 (Vorst 2009). Despite its presence being attested by old specimens collected before 1950, *C. castaneipennis* is mentioned here for the time in Switzerland, where it is present in most regions. This species may have been expanding recently into Western Europe (Vorst 2009).

C40) *Cercyon* (*Cercyon*) *granarius* Erichson, 1837

Examined material. 2 ex., BE, Nidau, 4.IX.1911, 14.X.1915, leg. and coll. Mathey A., NMBE; 5 ex., Kt. Bern, Aarwangen, III.1928, V.1928, VII.1928, VII.1929, leg. and coll. Linder A., ETH; 1 ex., Lucerne, V.1933, leg. and coll. Toumayeff G., MHNG; 3 ex., Kt. Bern, Uettligen, IX.1940, X.1943, leg. and coll. Linder A., ETH; 1 ex., ZH, Niederglatt, IX.1952, leg. and coll. Toumayeff G., MHNG; 1 ex., Überlingen am Bodensee, 26.III.1961, leg. Horion A., det. Bouwer R., SMNS; 1 ex., Suisse, FG [Fribourg], Lussy, V.1972, leg. and coll. Toumayeff G., MHNG; 2 ex., Lac des Taillères, 25.IX.1977, leg. Scherler P., NMBE; 1 ex., FG [Fribourg], Siviriez, La Pierra, VI.1978, leg. and coll. Toumayeff G., MHNG; 1 ex., VD, Bavois, Bernoise, X.1984, leg. and coll. Toumayeff G., MHNG; 1 ex., Suisse, Genève, Bois de Jussy, marais, 18.V.1989, leg. Besuchet C., MHNG; 1 ex., CH, LU, Wauwilermoos, VI.1996, leg. Rezbanyai-Reser L., NMLU; 1 ex., Hemishofen SH, 31.X.2018, leg. Claude F., coll. Chittaro Y.; 6 ex., Siviriez FR, 22.VI.2021, leg. and coll. Cosandey V.; 1 ♂, Chavannes-de-Bogis VD, 10.IX.2021, leg. and coll. Chittaro Y.

Published data. [1)]Genf (Heer 1841); [1)]Matzingen, Junkholz, IV.1954 by Hugentobler H. (Hugentobler 1966).

Comment. While this species is widely distributed in the Palaearctic region, it is only known from a few Swiss specimens, almost all from the Plateau. *Cercyon granarius* is found sporadically in wetlands.

C41) [*Cercyon* (*Cercyon*) *littoralis* (Gyllenhal, 1808)]

Examined material. [3,4,6,8)]1 ex., Genève, Sionnet, 2.V., leg. and coll. Maerky C., MHNG.

Published data. [1,8)]VS, Inden D, 16.IX.1992, leg. Uhlig M. (Uhlig and Uhlig 2006).

Comment. The only examined specimen with "a Swiss label" belongs to the problematic collection of Charles Maerky, which should not be considered (Monnerat et al. 2015). The specimens mentioned in the literature were probably misidentified, but we could not check them. Although widely distributed in the Palaearctic region, this species is restricted to coastal environments (Freude 2011), habitats that obviously do not exist in Switzerland.

C42) *Cercyon* (*Cercyon*) *tatricus* Endrödy-Younga, 1967; Fig. 1C

Examined material. 2 ex., Alp Tablasot, 8.VIII.1918, leg. and coll. Handschin E., BNM; 2 ex., Murtera, Abstieg, 11.VIII.1918, leg. and coll. Handschin E., BNM; 2 ex., Alp Tavrü, 12.VIII.1918, leg. and coll. Handschin E., BNM; 2 ex., Tavrü, 30.VII.1920, leg. and coll. Handschin E., BNM; 2 ex., Davoser Berge, Bergalp, 5.IX.1934, leg. and coll. Wolf J.-P., ETH; 1 ex., Suisse, Grisons, Flüela-nord, 20.IX.1965, leg. Comellini A., MHNG; 2 ex., Suisse, Grisons, s/Samnaun, 26.VIII.1968, leg. Besuchet C., MHNG; 1 ex., Suisse, Grisons, Maloja, Lac de Cavloc, 27.VIII.1968, leg. Besuchet C., MHNG; 6 ex., CH, UR, Klausenpass, Hint. Rustigen, 20.VII.1969, leg. and det. Herger P., NMLU; 8 ex., Suisse, Grisons, s/Pontresina, 9.IX.1985, leg. Besuchet C., MHNG; 1 ex., Suisse, Grisons, Casaccia, 12.IX.1985, leg. Besuchet C., MHNG; 9 ex., Suisse, Uri, Klausen, 25.IX.1985, leg. Besuchet C., MHNG; 1 ex., UR, Klausenpass, Claridenböderli, 29.VII.1995, leg. Kobel E., NMBE.

Comment. This species, described from the High Tatra (Slovakia), is only known from the Carpathian Mountains (Romania, Ukraine), from the Eastern Palaearctic region (Eastern Siberia and Russian Far East) (Fikáček 2006) and now also from Switzerland. In the latter country, *C. tatricus* appears to be restricted to the eastern Alps, mainly between 1800 and 2200 m a.s.l.

C43) [*Cercyon* (*Cercyon*) *tristis* (Illiger, 1801)]

Published data. [2)]Chiasso by Fontana P. (Fontana 1947); [1,2?)]Alp Tavrü, 30.VII.1920 by Handschin E. (Handschin 1963).

Comment. The data mentioned by Fontana (1947) as *C. tristis* (identified as such in his collection) actually turned out to be specimens of *C. analis* (4 ex.) and *C. convexisculus* (2 ex.), and the specimens mentioned by Handschin (1963) were not found in the collections examined, but they probably relate to other species in the genus. *Cercyon tristis* is currently not retained for the Swiss fauna, although it remains potentially present, given its wide Palaearctic distribution.

C44) *Pachysternum capense* (Mulsant, 1844); Fig. 1F

Examined material. 1 ex., Mendrisio TI, 24.X.2015, leg. and coll. Cosandey V.; 2 ex., Chiasso TI, 24.X.2015, leg. and coll. Cosandey V.; 1 ex., Lugano TI, 25.X.2015, leg. and coll. Cosandey V.

Comment. This species is native to sub-Saharan Africa (Lökkös et al. 2014). Now almost cosmopolitan, it has been recorded in many European countries in recent decades: it has been present in Greece since 1997 (Fikáček and Boukal 2004), Italy since 2001 (Hebauer 2006), France since 2005 (Queney 2009), Hungary since 2006 (Lökkös et al. 2014), and Romania since 2009 (Lökkös et al. 2014). The specimens collected in 2015 in the south of the canton of Ticino are the first records for Switzerland.

C45) *Sphaeridium substriatum* Faldermann, 1838

Examined material. 1 ex., Chiasso, leg. and coll. Fontana, MSNL; 1 ex., Martigny, coll. Cerutti N., MHNF; [3)]1 ex., Genève, Rouelbeau, 22.VII., leg. and coll. Maerky C., MHNG; 1 ex., Sion, V.1851, leg. Anonymous, MZL; 1 ex., Valais, Niouc, 10.VI.1936, leg and coll. Julliard C., MHNG; 5 ex., Filisur, 21.VII.1937, 15.VIII.1937, 10.VII.1938, leg. and coll. Wolf J.-P., ETH; 1 ex., Les Follaterres [Les Follatères], 2.VIII.1949, leg. Besuchet C., MZL; 1 ex., Valais, Leuk, 5.VI.1958, leg. and coll. Pochon H., MHNF; 1 ♂, Chiasso TI, 24.X.2015, leg. and coll. Cosandey V.; 1 ♂, 1 ♀, Locarno TI, 27.IX.2021, leg. and coll. Sanchez A.

Comment. Althoug widely distributed in the Palaearctic region, this species is only found in the most thermophilic regions of Switzerland. Unlike the other species of the genus *Sphaeridium*, *S. substriatum* is not abundant in Switzerland.

C46) *Spercheus emarginatus* (Schaller, 1783)

Examined material. [3)]2 ex., Basel, coll. Benteli F., NMBE; [3)]9 ex., Basel, coll. Rätzer A., NMBE; 1 ex., Kt. Waadt, Villeneuve, X.1944, leg. and coll. Linder A., ETH; 1 ex., Egnach, Bodensee, 30.X.1964, leg. Kless J., MHNG; 1 ex., Staad, 7.VIII.1974, leg. and coll. Spälti A., MHNG; 1 ex., Les Grangettes, 19.XI.1987, leg. and coll. Scherler P., NMBE; 3 ex., Noville, Les Grangettes, Grand canal, 27.VIII.1992, leg. Naceur N., MHNG.

Published data. [1)]Malans by Amstein J.-G. (Heer 1841); 1 ex., Villeneuve [VD], 10.1944 by Peez A. (Linder 1946); Egnach b. Luxburg, X.1964, leg. Kless J. (Hugentobler 1966); Grangettes, 1992, 1993, 1997 by Naceur N. (Naceur 1997).

Comment. Although widely distributed in the Palaearctic region, this species has been very rarely found in Switzerland. It colonizes eutrophic ponds such as reedbeds and oxbow lakes (Hebauer and Klausnitzer 1998). According to Buhk (1910), it is mainly overlooked because of its cryptic coloration and quiet behavior, with beetles remaining motionless for long periods when caught in a net. In Switzerland, *S. emarginatus* seems to be restricted to lowland areas and has been found mainly near large pieces of water.

Discussion

This study is the first annotated list focusing on the Swiss Hydrophiloidea. Based on a large and robust dataset, the faunal knowledge of this group in Switzerland can now be considered solid. Occurrence maps for the accepted species are available on the info fauna map server (www.infofauna.ch; https://lepus.infofauna.ch/carto), showing the distribution of Hydrophiloidea in Switzerland. All the data have been transmitted to GBIF, making this work part of a global understanding of biodiversity. This study is part of a wider project to update our knowledge of the fauna of aquatic beetles in Switzerland but is also a further step towards a complete comprehension of the beetle fauna of Switzerland (see, for example, Chittaro et al. 2021; Sanchez and Chittaro al. 2022).

According to our results, a total of 105 species of Hydrophiloidea belong to the Swiss fauna. As observed worldwide, Hydrophilidae is the most diverse family of Hydrophiloidea in Switzerland (76 species), followed by Helophoridae (21), Hydrochidae (4), Georissidae (3), and Spercheidae (1). Seven species are mentioned for the first time in the country, while 16 species mentioned from Switzerland in the past have been withdrawn from the species list or considered doubtful. The presence of several species that had gone unnoticed in Switzerland (even though collected specimens had sometimes been deposited in museums for decades) was revealed by an exhaustive revision of collections, as in the case of *Coelostoma hispanicum* (Cosandey 2023). Additional examples provided by this study are found in thermophilic (*Sphaeridium substriatum*) and alpine (*Cercyon alpinus*, *C. tatricus*) Sphaeridiinae. In addition, recent descriptions of *Anacaena lohsei*, another alpine species, based in part on material from Switzerland, and *Cercyon castaneipennis* show the lack of knowledge of this group, even in well-studied regions such as Central Europe (Berge Henegouwen and Hebauer 1989; Vorst 2009). Another new species for Switzerland is *Pachysternum capense*, a now cosmopolitan species like *Cercyon laminatus* and *Cryptopleurum subtile*, which were already known to be in Switzerland. The potential expansion of *Pachysternum capense*, which is well documented in Europe (see comment C44), will be interesting to follow in Switzerland.

Among the species present in Switzerland, several only occur at high altitudes in mountainous habitats (such as *Cercyon alpinus*, *C. tatricus*, *Crenitis punctatostriata*) and some are sub-endemic (*Anacaena lohsei*, *Helophorus fauveli*), underlying the importance of this country for the conservation of some rare, localized, and highly specialized species. On the other hand, a significant part of Swiss wetlands (80% to 88% nationwide) has been destroyed over the last century (Küchler et al. 2018), drained to gain arable land and to extend urban areas, and 90% of wetland types are on the Swiss red list of habitat types (Delarze et al. 2016). It is reasonable to assume that aquatic beetles may have been heavily impacted. Besides the aquatic species, a significant proportion of Hydrophilidae, most of which are Sphaeridiinae, feed

on mammal dung. Unlike Scarabaeidae dung beetles (Floate et al. 2005), Sphaeridiinae do not seem to suffer directly from the use of veterinary parasiticides but are mainly affected by the reduction in number of fly larvae in dung patches (Cook and Gerhardt 1977). Although several species appear to be in steep decline (*Berosus* spp., *Hydrophilus piceus*) or may already be extinct (*Hydrophilus aterrimus* or *Laccobius thermarius*), there is no Hydrophiloidea red list for Switzerland, unlike for other aquatic beetle groups such as the Hydradephaga (Brancucci 1994). There is however an urgent need for a better understanding of factors threatening the Hydrophiloidea. The elaboration of a red list based on historical data provided by our study as well as recent and prospective data is the best way to reach this goal.

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