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The Dipsocoromorpha (Heteroptera) of Switzerland

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Pachycoleus pusillimus is recorded for the first time for Switzerland. Additional distributional data are given for *Ceratocombus coleoptratus* and *Pachycoleus waltli*.

Keywords: Heteroptera, Ceratocombidae, Dipsocoridae, *Ceratocombus*, *Cryptostemma*, *Pachycoleus*, *alienum*, *coleoptratus*, *pusillimus*, *waltli*, Switzerland, first record.

INTRODUCTION

The Dipsocoromorpha are tiny predatory bugs that are mostly associated with moist habitats, either wet mosses or the edges of running water. The European fauna comprises only eleven species in two families, the Ceratocombidae and the Dipsocoridae (Kerzhner 1995). They differ from the other Heteroptera family groups by retaining very conservative features in construction of the wings and the possession of the most complex external genitalia seen in Heteroptera. All of the Palaearctic representatives of the Ceratocombidae belong to the genus *Ceratocombus*, while the Dipsocoridae comprise the genera *Alpagut*, *Cryptostemma* and *Pachycoleus* (Heiss & Péricart 2007; Aukema *et al.* 2013). All species are captured infrequently, and Kerzhner (1995) listed only two species for Switzerland: *Ceratocombus coleoptratus* and *Cryptostemma alienum*. A third species, *Pachycoleus waltli* Fieber, 1860, was added a few years ago (Heiss & Péricart 2007; Hollier 2012).

Due to the cryptic habits of these species there are very few published records for Switzerland.

The data presented come from two sources. The first is a series of samples collected by the coleopterists Anton Comellini, Ivan Löbl and especially Claude Besuchet in Switzerland, mainly by sieving moss and litter, and housed in the Muséum d'histoire naturelle, Genève (MHNG). The second is a series of samples collected using pitfall traps during several projects of the Swiss Federal Institute for Forest, Snow and Landscape Research WSL (WSL).

MATERIALS AND METHODS

In the MHNG samples, 146 samples of Hemiptera stored in 75 % alcohol were examined, and the adult Dipsocoromorpha identified by the first author using the keys in Heiss & Péricart (2007). Determination of Dipsocoromorpha in the WSL pitfall samples, stored in 70 % alcohol, was done by the second author.

Abbreviations:

For the distribution data in Switzerland we use the automotive canton codes. Collectors: Al. = Matthias Albrecht, Be. = Claude Besuchet, Co. = Anton Comellini, We. = Beat Wermelinger.

The nomenclature follows Heiss & Péricart (2007) and Aukema *et al.* (2013).

RESULTS

Ceratocombus coleoptratus (Zetterstedt, 1819)

(Fig. 1)

The body length of this dark-brown coloured species lies between 1.5 mm and 2.3 mm. These predatory insects generally live in leaf litter in moist habitats, but sometimes occur in dry habitats where they may be found in moss cushions, in litter below conifers, and amongst decomposing leaves and grasses. Consequently, most records are from pitfall traps. They are sometimes also found in decayed wood. In Southern Germany they have two generations a year and overwinter as eggs (Heckmann & Rieger 2001). In the Dipsocoromorpha *C. coleoptratus* is the most frequently captured species and records exist from almost all European countries (Heiss & Péricart 2007) and four cantons in Switzerland. Published records are for BE (Frey-Gessner 1869), SH (Di Giulio *et al.* 2000), TI (Otto 1994; Giacalone *et al.* 2002) and VS (Joris 2002; Heckmann 2011). MHNG has old specimens from Bern labeled «Burgdorf», possibly the specimens from Meienmoos (leg. Meyer-Dür) cited in Frey-Gessner (1869).

AG: Aristau, Steinmatten, artificial meadow, 10.VI.2003: 2 ♂, 24.VI.2003: 1 ♂, leg. Al.
Berikon, Dungelen, ecological compensation area, meadow, 24.VI.2003: 1 ♂, leg. Al.
Schlossrued, Deckbungart, ecological compensation area, meadow, 25.VI.2003: 1 ♂, leg. Al.
Schlossrued, Pfaffenberg, ecological compensation area, meadow, 11.VI.2003: 4 ♂♂, 25.VI.2003: 5 ♂♂, 2 ♀♀, 9.VII.2003: 1 ♂, 1 ♀, leg. Al.
Schlossrued, Pfaffenberg, meadows, 12.VI.2003: 3 ♂, 26.VI.2003: 3 ♂♂, 9.VII.2003: 1 ♂, leg. Al.
Schlossrued, Suren, meadow, 3.IX.2003: 1 ♂, leg. Al.
Vordemwald, Wald, 2005: 1 ♂ (the finds were pooled over the whole year), leg. We.
BL: Rheinach, Tschuppen, artificial meadow, 12.VI.2003: 1 ♂, leg. Al.
TI: Magadino, Bolle di Magadino, forest, 2000: 1 ♂, 2005: 2 ♂♂ (the finds were pooled over the whole year), leg. We.
Magadino, Bolle di Magadino, open country, 2005: 1 ♂ (the finds were pooled over the whole year), leg. We.
Magadino, marsh, 6.VII.1975: 1 ♂, leg. Be.
VD: Bavais, 14.X.1977: 1 ♀, leg. Be.
ZH: Affoltern am Albis, Äspli, ecological compensation area, meadow, 24.VI.2003: 11 ♂♂, 1 ♀, 8.VII.2003: 1 ♀, 19.VIII.2003: 1 ♀, 16.IX.2003: 1 ♂, 1 ♀, leg. Al.
Affoltern am Albis, Äspli, meadows, 10.VI.2003: 1 ♂, 24.VI.2003: 11 ♂♂, 5 ♀, 8.VII.2003: 1 ♀, 22.VII.2003: 1 ♀, 5.VIII.2003: 1 ♂, 16.IX.2003: 1 ♀, leg. Al.
Affoltern am Albis, Loh, ecological compensation area, meadow, 24.VI.2003: 1 ♂, leg. Al.

Cryptostemma alienum Herrich-Schaeffer, 1835

With a body-length up to 2.8 mm this is the largest European species in the group. It lives close to the edge of running water or in the riparian zone of lakes and ponds where it is found under stones. They are able to survive if their habitat is submerged

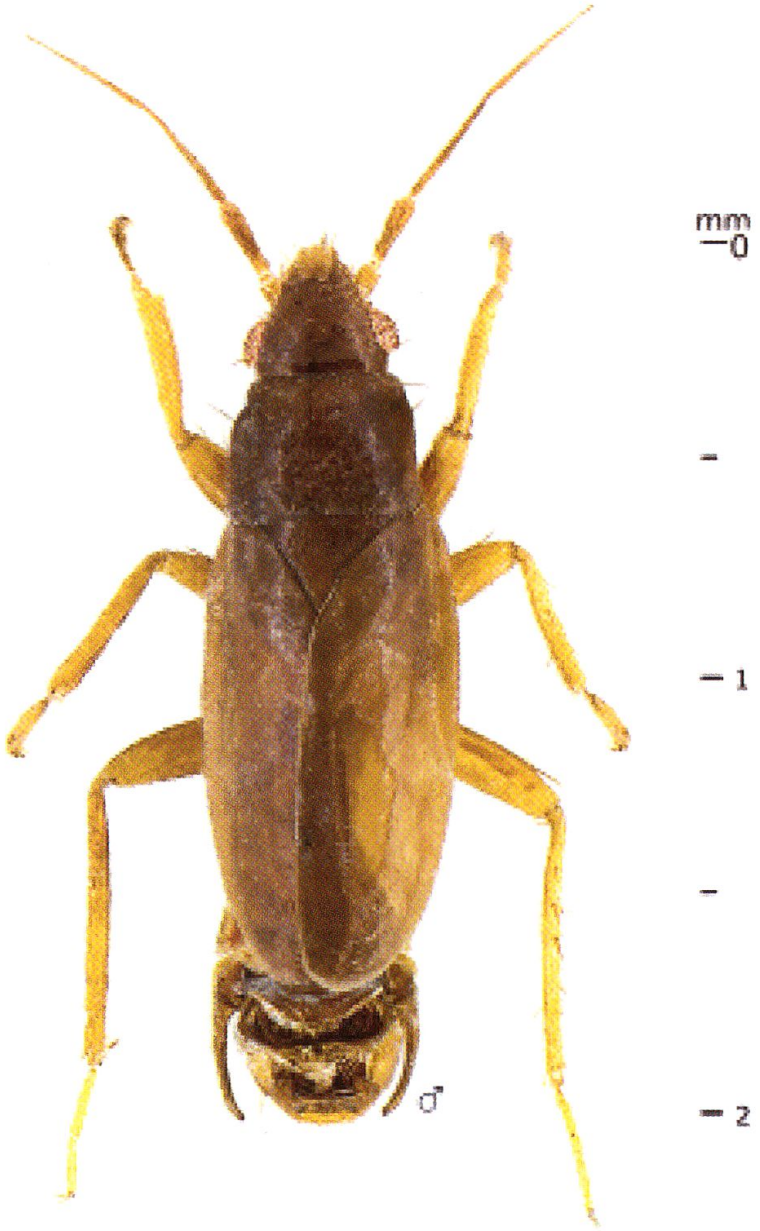

Fig 1: *Ceratocombus coleoptratus*, male from Steinmatten near Aristau in the canton Aargau, B. Wermelinger leg., photograph by G. Strauss. The paratergites of the 8th abdominal segment are finger-shaped and reach the apex of the genital segment. They are believed to be used in copulation.

using plastron respiration. They feed on small invertebrates including dead ones, and overwinter as adults.

This species is known from the surrounding countries of France, Germany, Austria and Italy (Kerzhner 1995). The first Swiss record was from Basle (precise canton not indicated) by Meyer-Dür (1843). Later finds concern AG (Frey-Gessner 1871; Heiss & Péricart 2007), BS (Frey-Gessner 1864), GE (Hollier 2012), TG (Heckmann & Blöchlinger 2011) and VD (Frey-Gessner 1864).

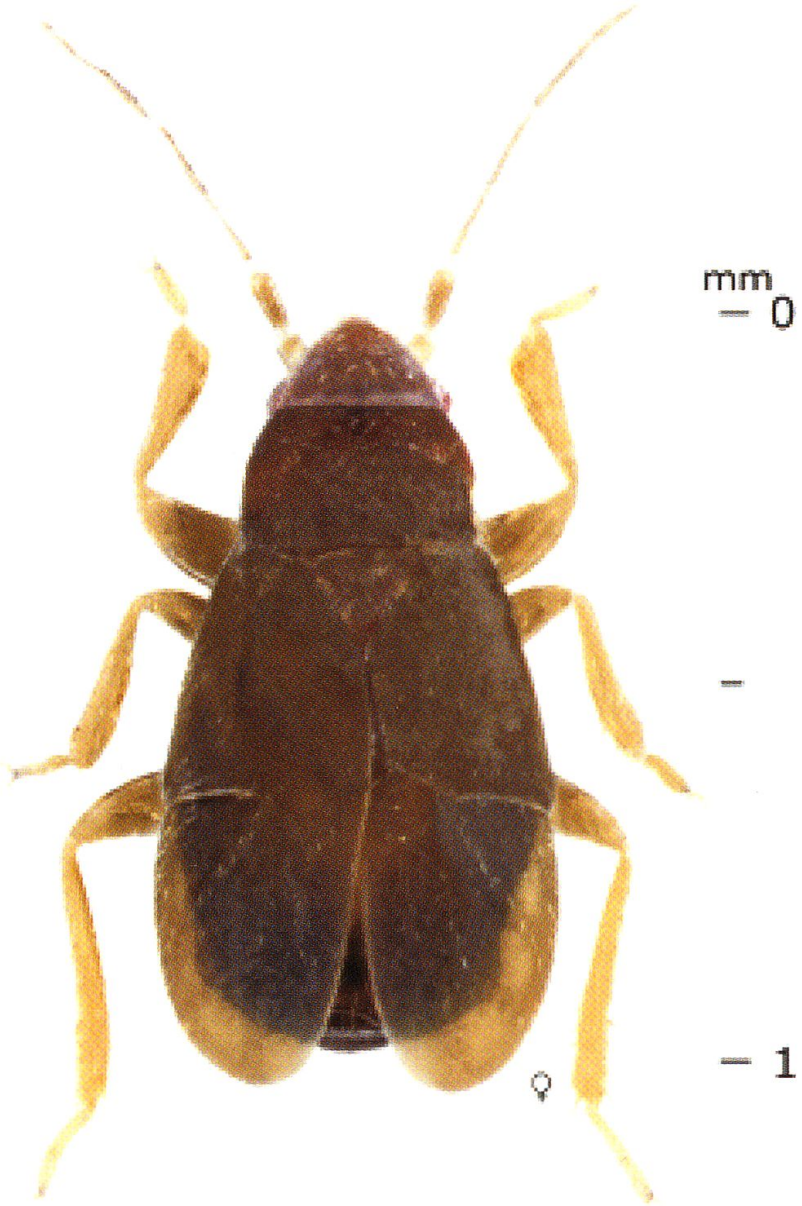

Fig. 2: *Pachycoleus pusillimus*, female from Schiermonnikoog, Friesland in the Netherlands, B. Aukema leg., photograph by G. Strauss. This species is the smallest Central European true bug.

Pachycoleus pusillimus (J. Sahlberg, 1870)

(Fig. 2)

P. pusillimus with a body-length between 0.9 mm and 1.4 mm is the smallest Central European true bug. It lives in bogs, fens and wet meadows in *Sphagnum* and other mosses.

New record for the fauna of Switzerland. In the adjacent countries the species is recorded from north and east of Germany, from south and east of Austria, south

and west of France and the north of Italy (Heiss & Péricart 2007). The two new finds therefore fit perfectly in the known distribution area.

GE: Verbois, pièges, 17.III.1966: 1 ♂, leg. Co.
VS: Hameau de Ninda, above Savièse, 1140 m, mousses dans marais, 25.IX.1997: 2 ♂♂, 4 ♀♀, leg. Be. (with *Hebrus ruficeps* Thomson, 1871).

Pachycoleus waltli Fieber, 1860

(Fig. 3)

P. waltli is slightly bigger than *P. pusillimus* and prefers similar habitats. In the neighbouring regions it is known from Baden-Wurttemberg, Bavaria, Vorarlberg, Piedmont, Lombardy and Trentino-Alto Adige (Heckmann & Rieger 2001; Heiss & Péricart 2007). In Switzerland it has been recorded from GE by Heiss & Péricart (2007) and Hollier (2012).

AG: Schlossrued, Deckbungart, ecological compensation area, meadow, 27.V.2003: 1 ♂, 12.VI.2003, 1 ♀, leg. Al.
GE: Peney, piège, 15.III.1966: 1 ♂, 1 ♀, leg. Co.
LU: Eigental, near Eigenthal (village), Forenmoos, 970 m, Sphagnum, 2.VIII.1996: 1 ♂, 2 ♀, 10 nymphs leg. Be. (with *Hebrus ruficeps* Thomson, 1871).
Finsterwald, 1100 m, Hochmoor, 2.IX.1997: 22 ♂♂, 16 ♀♀, 6 nymphs, leg. Be. (with *Hebrus ruficeps* Thomson, 1871).
TI: Campra s/Olivone, 1430 m, *Sphagnum*, 12.VII.1995: 1 ♂, 3 ♀♀, 26 nymphs, leg. Be.
VS: Praz-de-Fort, 1200 m, 9.VI.1976: 4 ♂♂, 4 ♀♀, leg. Be.
ZG: Steinhausen, Zürcherhof, ecological compensation area, meadow, 8.VII.2003: 3 ♂♂, leg. Al.

DISCUSSION

The Dipsocoromorpha are rare in Switzerland, with only nine of the 146 samples in the MHNG and three of the 49 sampling sites in WSL projects containing the group, but the material examined shows that they can be locally abundant. Our investigations also confirm the much broader ecological range of *Ceratocombus coleoptratus* compared to the two *Pachycoleus* species which are much more dependent on undisturbed *Sphagnum* cover. It is interesting to note that *Hebrus ruficeps* Thomson, 1871 was also taken in three of the MHNG samples containing *Pachycoleus* species, an indication of the semi-aquatic nature of their habitats already noted by Heiss & Péricart (2007).

The apparent rarity of these tiny bugs in general is mainly due to the inefficiency of the methods normally used by Heteropterists, such as beating and sweeping, in collecting them. It is clear, however, that pitfall traps and sieving are very effective for the three species for which we provide new data. *Cryptostemma alienum* can only be detected by turning stones in riparian zones in suitable biotopes.

RESUME

Pachycoleus pusillimus est signalé pour la première fois en Suisse. Nouvelles informations sur la distribution de *Ceratocombus coleoptratus* et *Pachycoleus waltli* sont fournis.

ZUSAMMENFASSUNG

Pachycoleus pusillimus wurde zum ersten Mal für die Schweiz nachgewiesen. Ergänzende Verbreitungsangaben werden für *Ceratocombus coleoptratus* und *Pachycoleus waltli* gegeben.

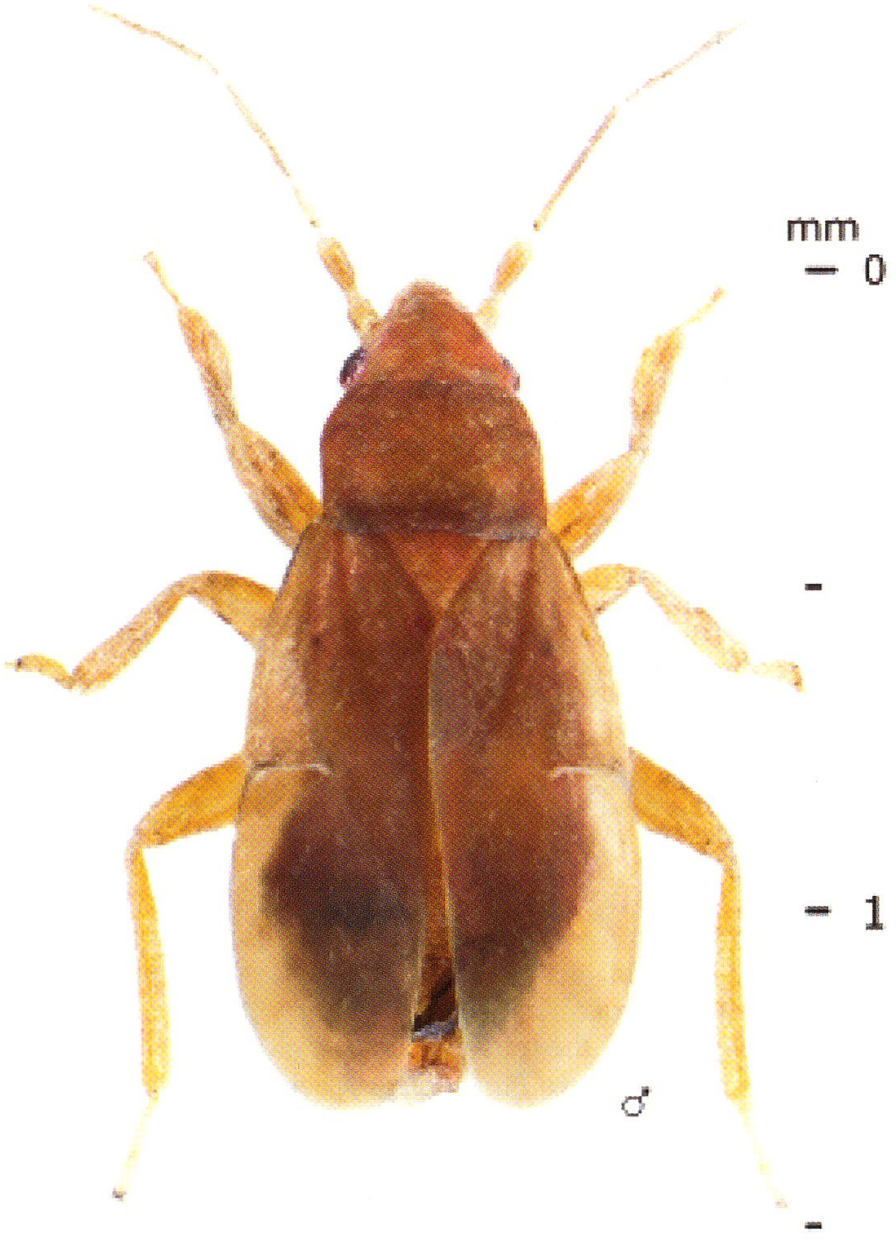

Fig 3: *Pachycoleus waltli*, male from Steinhausen, Zürcherhof in the canton Zug, M. Albrecht leg., photograph by G. Strauss.

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