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## **On *Oxypoda besucheti* FOCARILE (Coleoptera: Staphylinidae: Aleocharinae: Oxypodini)**

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**A b s t r a c t :** Based on a study of type material and numerous additional specimens from several localities in southern Switzerland (Ticino, Grisons) and northern Italy (Lombardia: Alpi Orobie) a new combination and a new synonymy are proposed: *Tectusa besucheti* (FOCARILE, 1982), nov.comb. (ex *Oxypoda* MANNERHEIM, 1830) = *T. orobiana* ASSING, 2012, nov.syn. The intraspecific variation of the aedeagal morphology is described, discussed, and illustrated. The distribution of *T. besucheti* is mapped. The habitat of this alpine species is described and illustrated.

**K e y w o r d s :** Coleoptera, Staphylinidae, Aleocharinae, Oxypodini, *Oxypoda*, *Tectusa*, Palaearctic region, Alps, taxonomy, new combination, new synonymy, distribution.

### **Introduction**

*Tectusa* BERNHAUER, 1899, an oxypodine genus whose distribution is confined to the West Palaearctic region, currently includes 47 described species, all of them micropterous. Eight species, two of them of doubtful generic assignment, have been recorded from the Alps (ASSING 2012). The vast majority of *Tectusa* species is locally endemic to mountain ranges or even individual mountains and found in subalpine and alpine habitats. For a more detailed account see ASSING (2012).

When describing *T. orobiana* ASSING, 2012 from the Alpi Orobie (North Italy: Lombardia), I was unaware of *Oxypoda besucheti* FOCARILE, 1982, whose original description is based on three specimens from two mountains on the other side of Valtellina and Lago di Como on both sides of the Ticino valley in southern Ticino (Switzerland). Numerous specimens of *Tectusa* recently collected in several mountains in southern Ticino and Grisons by Alexander Szallies (Zürcher Hochschule Wädenswil) and forwarded to me for examination finally provided an opportunity to clarify the identity of *Oxypoda besucheti* and to study the status of *Tectusa orobiana*.

### **Material and methods**

The material treated in this study is deposited in the following collections:  
MHNG ..... Muséum d'Histoire Naturelle, Genève (G. Cuccodoro)

TLMFI ..... Tiroler Landesmuseum Ferdinandeum, Innsbruck (M. Kahlen)

cAss..... author's private collection

cSza..... collection Alexander Szallies, Wädenswil, to be deposited in Burgermuseum Bern

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena). The images were taken with a digital camera (Nikon Coolpix 995). Maps 1 and 2 were created using MapCreator 2.0 (primap) software and Google Earth, respectively.

## Results and discussion

An examination of the type material of *Oxypoda besucheti* and of *Tectusa orobiana*, as well as of additional material from various mountain ranges in the south of Ticino and Grisons (Maps 1-2) revealed that these populations are practically identical regarding their external and secondary sexual characters. Moreover, they can be distinguished based neither on internal structures of the median lobe of the aedeagus nor on the shapes of the parameres and the spermatheca (Figs 29-34). There are, however, slight differences in the shape of the median lobe, especially regarding the shapes of the apex ("va" in Figs 1-4) and of the lateral carinae ("lc") of the ventral process, and of the crista apicalis ("ca").

Except for the material from Monte Tamaro, which was found between 1800 and 1962 m, none of the specimens was collected below an altitude of 2000 m, the altitudes ranging from 2000 to 2650 m, and all of them were found in alpine or extrazonal alpine-like habitats. On the other hand, the mountain ranges in the region are separated by deep valleys (main portion of Valtellina: 200-400 m; Lago di Como: ~200 m; Piano di Chiavenna: 200-330 m; Val Levantina/Val Blénio Riviera: 250-600 m). These mountains are inhabited also by locally endemic species of *Leptusa* KRAATZ, 1856, e.g., the recently described *L. calancensis* SZALLIES, 2014

The shapes of the apex and of the lateral carinae of the ventral process and of the crista apicalis of the aedeagus appear to be constant among specimens from the same locality (Figs 6-22), and the differences are particularly pronounced between the populations of the mountains to the north of Lago di Maggiore (i.e., where the type locality of *O. besucheti* is situated) and those of Pizzo Paglia (to the northwest of Lago di Como). Nevertheless, they do not correspond to distinct, geographically plausible distributions.

It can be inferred that the gene pools of the different populations are isolated today, and have been so at least since the last glacial period. The morphological and zoogeographic data, however, do not support the hypothesis that the different morphs represent distinct species. The studied populations may represent a ring species ("Rassenkreis"), but additional evidence, in particular molecular data would be needed to confirm this. In consequence, for the time being, the examined material is attributed to the same species.

***Tectusa besucheti* (FOCARILE, 1982), nov.comb.** (Figs 1-36, Map 2)

*Oxypoda* (subgen.?) *besucheti* FOCARILE, 1981: 549 ff.

*Tectusa orobiana* ASSING, 2012: 988 ff.; **nov.syn.**

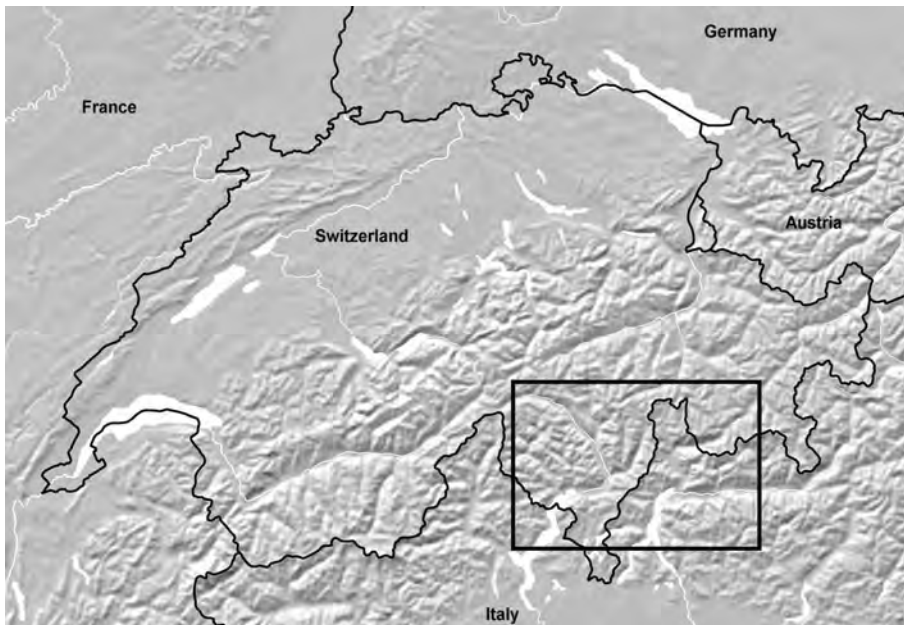
Type material examined: Holotype ♂: "Typus / Helvetia/TI (Val Verzasca)

Pizzo Vogorno vers. Nord, 20-2300 Focarile / *Oxygoda besucheti* Foc. / *Leptusina besucheti* (Focarile), det. Zerche 1995 / Holotypus / *Tectusa besucheti* (Focarile), det. V. Assing 2016" (MHNG). Paratype ♀: same data as holotype (MHNG).

**A d d i t i o n a l m a t e r i a l e x a m i n e d :** Switzerland: Ticino: 19♂♂, 15♀♀, Lavizzara, Monte Zuccherò, E Passo di Chènt, 46°21'02"N, 8°41'47"E, 2200 m, 10.VII.2015, leg. Szallies (cAss, cSza); 1♀, Prato, Alpe Campolungo, Lago di Leit, 2000-2300 m, 5.VII.2006, leg. Szallies (cSza); 8♂♂, 11♀♀, Indemini, Monte Tamarò, north slope, 46°06'17"N, 8°52'03"E, 1850-1962 m, 19.VI.2013, leg. Szallies (cSza, cAss); 6♂♂, 3♀♀, Cadenazzo, Camoghè, west slope, 46°08'07"N, 9°03'53"E, 2200 m, 22.VI.2013, leg. Szallies (cSza, cAss). G r i s o u s : 16♂♂, 7♀♀, Leggia, Pizzo Paglia, north slope, 46°14'04"N, 9°13'05"E, 2400 m, 16.VII.2015, leg. A. Szallies (cSza, cAss); 3♂♂, 1♀, Roveredo, Cima di Cugn, north slope, 46°10'18"N, 9°09'35"E, 2150 m, 14.VII.2013, leg. Szallies (cSza, cAss); 4♂♂, 2♀♀, 1 teneral ex., Calanca, San Vittore, NE Torrone Rosso, 46°17'54"N, 9°04'08"E, 2500 m, 5.VII.2013, leg. Szallies (cSza, cAss); 1♂ [aedeagus damaged], Rosso, Fil de Dragiva, north slope, 46°22'32"N, 9°10'03"E, 2400-2500 m, 4.VIII.2013, leg. Szallies (cAss); 1♀ [teneral], Calanca, Arvigo Campedell, 46°19'42"N, 9°04'01"E, 2400-2500 m, 26.VII.2013, leg. Szallies (cSza); 1♀, Calanca, Cauco Piz de Groven, 46°19'24"N, 9°09'32"E, 2500-2600 m, 11.7.2013, leg. Szallies (cSza); 1♀, Puschlav, Brusio Alp Pescia, 46°13'48"N, 10°03'05"E, 2500-2650 m, 22.VII.2013, leg. Szallies (cSza); 2♂♂, 1♀, Bernina, Munt Pers, NE-slope, Las Collinas, 2600 m, grass, 27.VI.1992, leg. Kahlen (TLMFI).

**C o m m e n t :** The original description is based on a male holotype and a female allotype from "Suisse - Tessin, Pizzo di Vogorno dans le Val Verzasca... 2260 m" and a male paratype from "Tessin, Forcarella del Lago à l'ouest de Cima di Biasca... 2270 m" (FOCARILE 1982). An examination of the types and of the additional material revealed that *O. besucheti* belongs to *Tectusa*, not to *Oxygoda* MANNERHEIM, 1830.

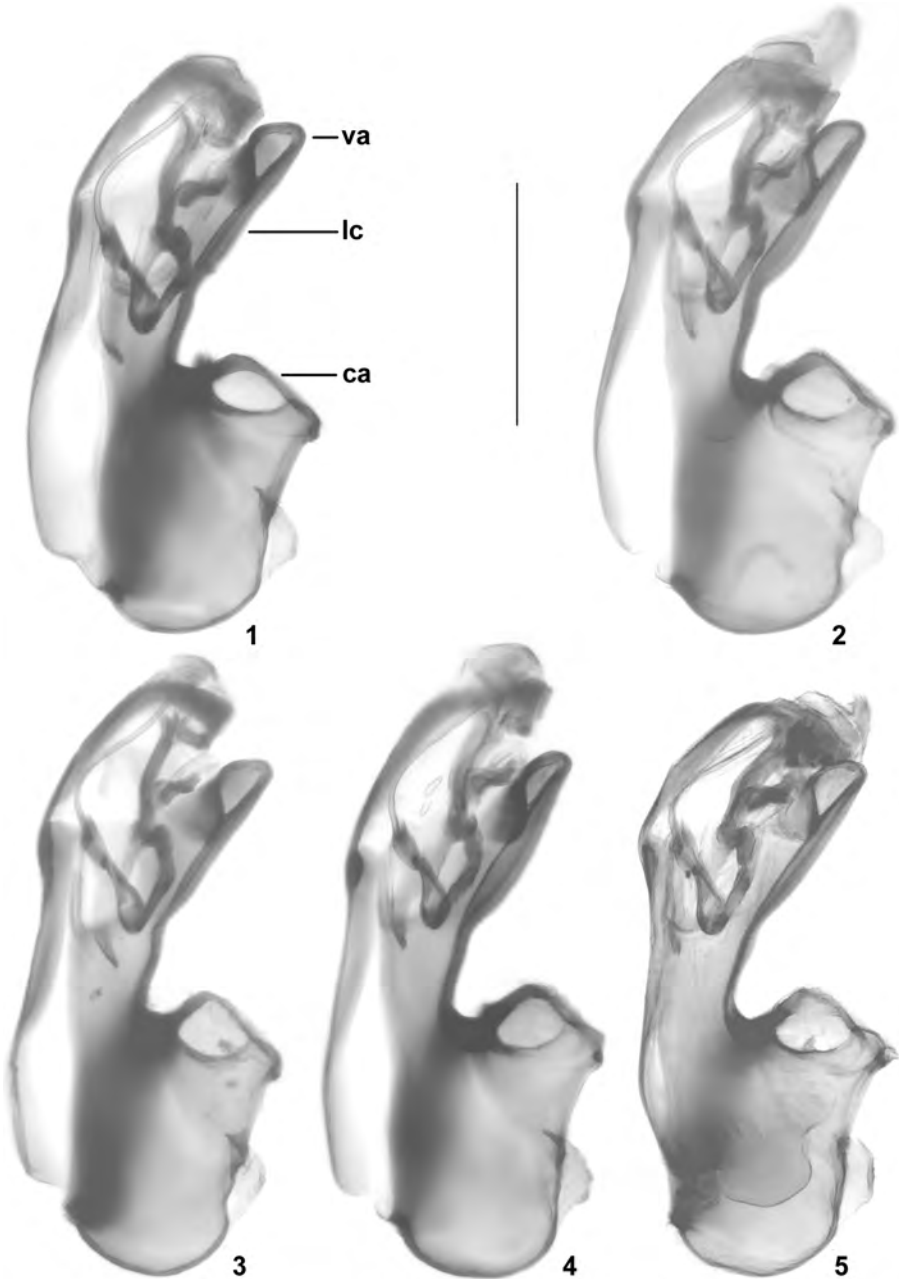
A full redescription of external (Fig. 35) and secondary sexual characters is unnecessary. For details see the description of *T. orobiana* in ASSING (2012).



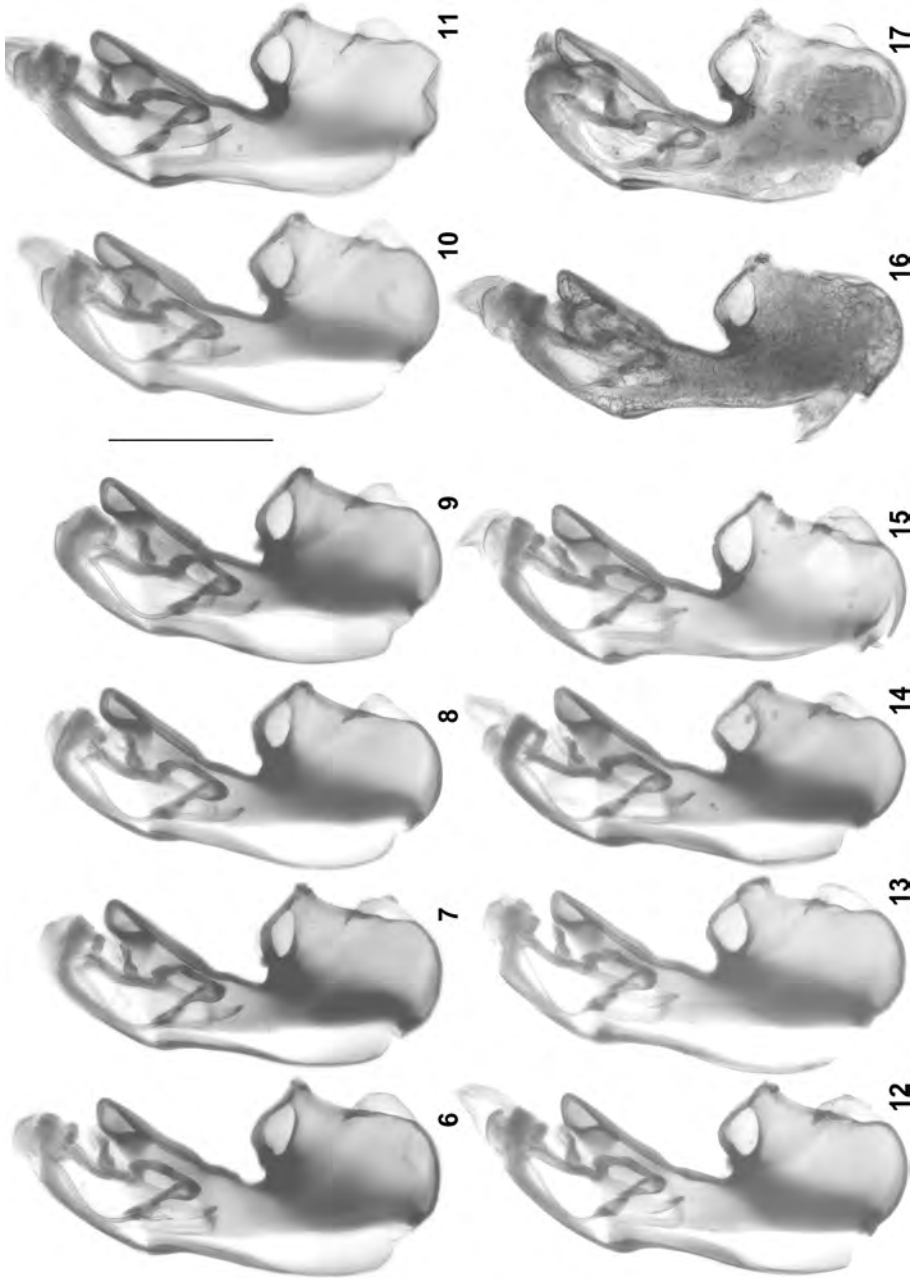
**Map 1:** Geographic position of the study region.



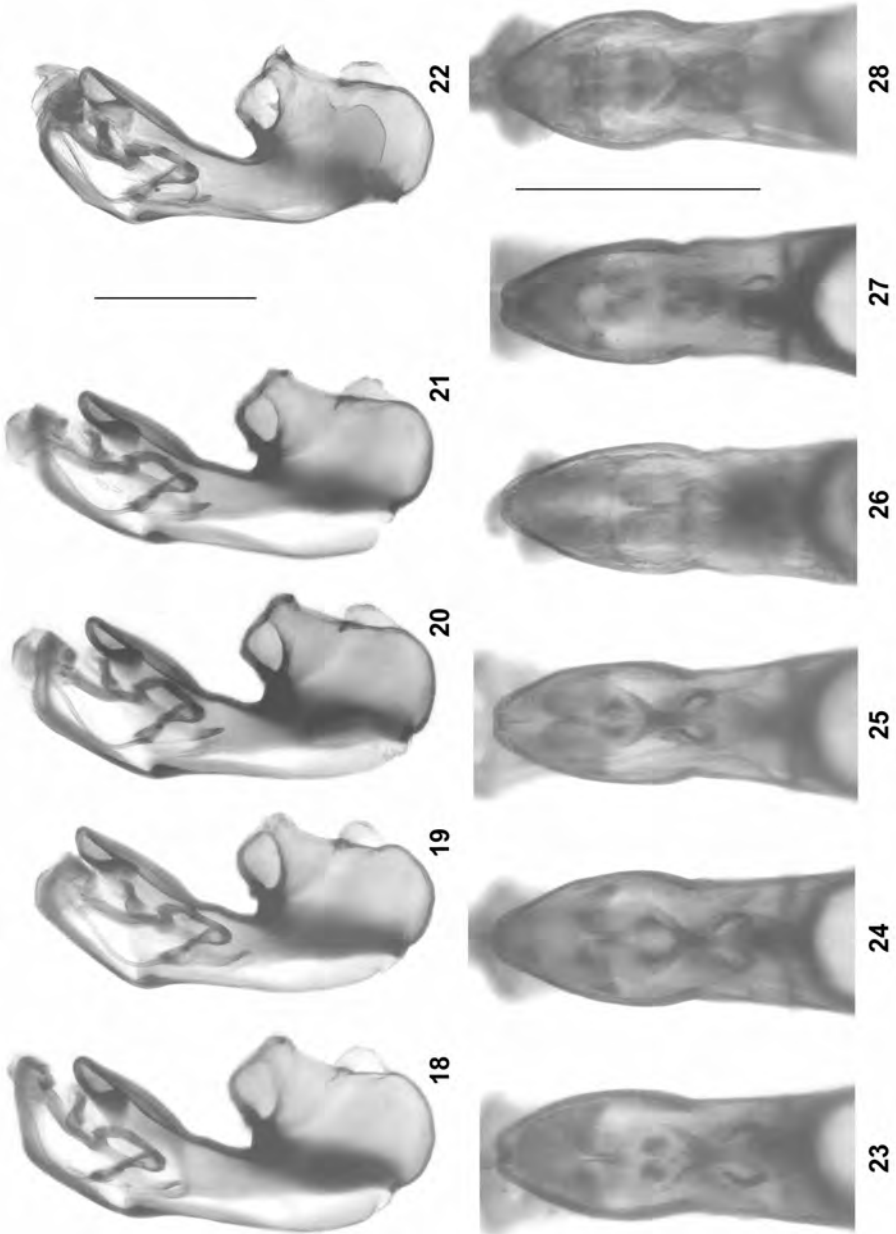
Map 2: Localities where material of the *Tectusa besucheti* was collected.



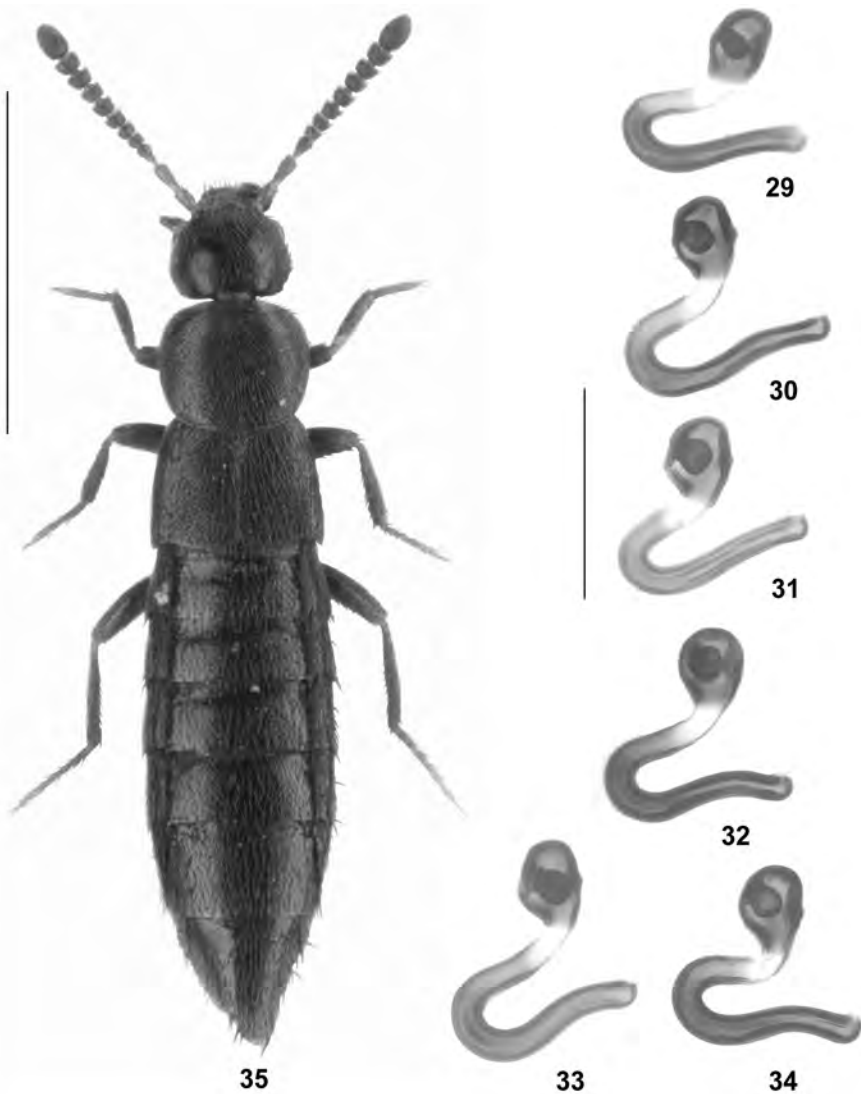
**Figs 1-5:** Median lobe of aedeagus in lateral view of males from Monte Zucchero (1), Torrone Rosso (2), Monte Tamaro (3), Pizzo Paglia (4), and of holotype of *T. orobiana* (5). Abbreviations: va = apex of ventral process; lc = lateral carina; ca = crista apicalis. Scale bar: 0.2 mm.



**Figs 6-17:** Median lobe of aedeagus in lateral view of males from Monte Zucchero (6-9), Torrone Rosso (10-11), Monte Tamaro (12-15), Camoghè (16), and Cima di Cugn (17). Scale bar: 0.2 mm.



**Figs 18-28:** Median lobe of aedeagus in lateral view (18-22) and ventral process in ventral view (23-28) of males from Monte Paglia (18-21, 27), Alpi Orobie (*T. orobiana*) (22, 28), Monte Zuchero (23), Torrone Rosso (24), Monte Tamaro (25), and Cima di Cugn (26). Scale bars: 0.2 mm.



**Figs 29-35:** Spermatheca of females from Monte Zucchero (29-30), Pizzo Paglia (31-33), and Alpi Orobie (34); habitus (35). Scale bars: 35: 1.0 mm; 29-34: 0.2 mm. Habitus photo: A. Szallies.

**Intraspecific variation:** In the material from Pizzo Vogorno, Monte Zucchero, Monte Tamaro, and from Camoghè, the median lobe is characterized by an apically obliquely truncate (lateral view) and medially incised (ventral view) ventral process, weakly pronounced lateral carinae of the ventral process, and a relatively narrow crista apicalis (Figs 1, 3, 6-9, 12-16, 23, 25).

The median lobe of the male from the Alpi Orobie (holotype of *T. orobiana*) is characterized by a pronounced crista apicalis and the shape of the ventral process (apically not



obliquely truncate, but rounded in lateral view; less slender and medio-apically not incised in ventral view) (Figs 5, 22, 28).

In the material from Pizzo Paglia and Cima di Cugn (Figs 4, 17-21, 27), the ventral process of the aedeagus has pronounced lateral folds and a slender apex.

The aedeagus of the males from Torrone Rosso is characterized by an apically rounded (not obliquely truncate) ventral process (lateral view) and by the shape of the crista apicalis (larger and of more rhomboid shape) (Figs 2, 10-11, 24).

**Distribution and natural history:** *Tectusa besucheti* is remarkably widespread in the south of Ticino and Grisons (Switzerland), and in the Alpi Orobie (Italy: Lombardia) (Maps 1-2). The examined material was found at altitudes between 1800 and 2650 m. According to SZALLIES (pers. comm.), *T. besucheti* is typically collected from under stones or from small hollows in very fine gravel in places without, or with little, humus usually near melting snow (Fig. 36), only exceptionally after the snow has disappeared. The specimens were not observed in completely wet spots, but in damp places that had been free of snow for a while.

### Acknowledgements

The present article would not have been possible out without the remarkable material collected by Alexander Szallies (Wädenswil), who also provided coordinates of most localities, information on how he collected the material, as well as habitus and habitat photos. I am indebted to Manfred Kahlen (Innsbruck) for most helpful comments on an earlier version of the manuscript and on the geological history of the region under study, to Alexander Szallies for additional suggestions, and to Benedikt Feldmann (Münster) for proof-reading the final version of the manuscript.

### Zusammenfassung

Eine Revision von Typen und weiterem Material von mehreren Fundorten in der Südschweiz (Tessin, Graubünden) und in Norditalien (Lombardei: Alpi Orobie) ergab folgende Neukombination und Synonymie: *Tectusa besucheti* (FOCARILE, 1982), nov.comb. (ex *Oxyptoda* MANNERHEIM, 1830) = *T. orobiana* ASSING, 2012, nov.syn. Die intraspezifische Variabilität des Aedoeagus wird beschrieben, diskutiert und abgebildet. Die Verbreitung von *T. besucheti* wird anhand einer Verbreitungskarte illustriert. Die Fundumstände werden beschrieben und abgebildet.

### References

- ASSING V. (2012): A new species of *Tectusa* from the Alpi Orobie, Italy (Coleoptera: Staphylinidae: Aleocharinae). — Linzer Biologische Beiträge **44** (2): 987-991.
- FOCARILE A. (1982): Note sur quelques Coléoptères Staphylinides de la Suisse et des Alpes occidentales. — Revue Suisse de Zoologie **89** (2): 543-552.

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**Fig. 36:** Habitats where numerous specimens of *T. besucheti* were collected. Above: Monte Zucchero. Below: Pizzo Paglia. Photos: A. Szallies.