

Research article

Submitted: May 14th, 2015 - Accepted: October 27th, 2015 - Published: December 31st, 2015
<http://zoobank.org/0D7B9B1F-6AB9-48C2-B182-42D58B88F6FB>

***Philorhizus occitanus* sp. n. from the South-Western Alps (Piedmont, Italy) (Coleoptera: Carabidae, Dromiini)**

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Abstract

Philorhizus occitanus sp. n. from the South-Western Alps (Ellero Valley and Maira Valley) is described. This new species is similar to *P. crucifer* and *P. notatus* as far as the external morphology is concerned, but it is distinguished by the color pattern and the shape of elytra, as well as by the features of the median lobe of aedeagus. *P. liguricus*, which is easily distinguished from *P. occitanus* sp. n. by the external morphology, was already recorded from the South-Western Alps and from the Ligurian Apennines. *P. occitanus* sp. n. is a likely close relative of *P. notatus*, although the affinities of this relict flightless new species remain uncertain.

Key Words: Coleoptera, Carabidae, Dromiini, Italy, South-Western Alps, Ligurian Alps, Cottian Alps, new species.

Introduction

The genus *Philorhizus* Hope, 1938 (Carabidae, Lebiinae) currently includes about 50 species so far known, most of them distributed in the Western Palearctic Region (Sciaky 1991; Lorenz 2005). Seven species are recorded from Italy (a further one is doubtful), with two interesting endemic taxa localized in montane habitats, the first one in the Maritime and Ligurian Alps as well as in the Ligurian Apennines (*P. liguricus* Sciaky, 1991) and the second in Sicily mountains and in Aspromonte (*P. brandmayri* Sciaky, 1991). Other species with restricted montane distribution are recorded from massifs of Macaronesia, Spain, France, Balcanic Peninsula, Greece and Caucasus, all of them micropterous, probable relict elements of ancient faunas more widely spread in the past and survived in pleistocenic refugia (Wrase & Assmann 2008).

The strict localization, the rarity and the small size of these species, usually not exceeding 3.5 mm in length, make still possible the discovery of new taxa, as the recent records of *P. lompei* Wrase, 2005 and *P. marggii* Wrase & Assmann, 2008 on the Peloponnese mounts, in Greece, and of *P. tinauti* Anichtchenko, 2005 in Andalusia, Spain.

In the summer 2013 one of the authors (G.A.) collected at high altitude, during a faunistic survey concerning the mounts of the Ellero Valley (Ligurian Alps) carried

out together with the other authors (Bisio et al. 2015), a *Philorhizus* male specimen which at an indepth study revealed to belong to an unknown species. Unfortunately, the subsequent research conducted in the same site did not lead to further discoveries. Another female specimen referable to the same species, deposited in collection Giachino, was wrongly cited as *P. liguricus* by Bisio & Giuntelli (2011); in fact, the latter species was already recorded from the Maritime and Ligurian Alps, with many records from the Tanaro Valley, bordering the Ellero Valley (Sciaky 1991).

Materials and methods

The specimens examined in this study are deposited in the collections hereafter listed: CAI = Collection G. Allegro (Moncalvo, Asti), CGi = Collection P.M. Giachino (Torino).

Abbreviations of the morphometrics reported in table 1: TL = overall length from labrum to apex of elytra; HMW = maximum width of head in correspondence of eyes; LA = length of antennae; PL = length of pronotum at the median line; PMW = maximum width of pronotum; EL = length of elytra from base of scutellum to sutural angle; EW = maximum width of elytra; LE = length of aedeagus.

Table 1 – Morphometrics of holotypus ♂ and paratypus ♀ of *Philorhizus occitanus* sp. n.

	TL	HMW	LA	PL	PMW	EL	EW	LE
HT♂	2.78	0.60	1.50	0.50	0.65	1.65	1.15	0.65
PT♀	3.01	0.63	1.51	0.56	0.70	1.79	1.32	–

The images illustrating the article were taken with a Leica DFC295 camera mounted on a Leica M205 C Stereomicroscope, using the software Leica Application System V4.0.

***Philorhizus occitanus* sp. n.**

(Figs 1, 2, 5, 8)

Locus typicus: Italia, Piemonte, Alpi Liguri, Val Ellero (CN), Cima Cars versante Nord, 44.13.38.2N, 7.42.04.0E, 1836 m (Fig. 10).

Type series. Holotypus ♂: Alpi Liguri, Val Ellero (CN), Cima Cars versante Nord, 1836 m, 30 Jul 2013, G. Allegro legit (CAI). Paratypus: 1 ♀, Val Maira, Aceglio (CN), 1200 m, vaglio di *Corylus*, 1 Aug 1999, B. Osella legit (CGi).

Diagnosis. A small-sized *Philorhizus* species (TL: 2.78–3.01 mm) (Fig. 1), micropterous, with pronotum and elytral color pattern similar to *P. notatus* (Stephens, 1828) and *P. crucifer* (Lucas, 1846) (Figs 2–4), but easily distinguished from these by the smaller size, the lesser extension of the yellow apical spots on elytra (Figs 2–4) and, main of all, by the slenderer shape of the median lobe of aedeagus, which also shows more rounded apex, sides longitudinally distinctly sinuate and differently shaped sclerites in the endophallus (Figs 5–7).

Description. Overall length: 2.78 mm (HT ♂), 3.01 mm (PT ♀). Color: head black, pronotum reddish-brown with margins and hind angles yellowish, basal half of elytra yellow and posterior half black-brown, excepted for a small apical yellow spot (Fig. 1). The morphometrics concerning the two specimens of the typical series are reported in table 1.

Head: hardly narrower than pronotum, obliquely narrowed behind eyes, with microsculpture in isodiametric meshes. Eyes relatively small and scarcely convex, temples long and linearly convergent backwards (more convex and angulately narrowed in PT ♀).

Pronotum: moderately transverse (PMW/PL=1.25–1.30), as wide at the base as at the anterior margin, with microsculpture in transversal meshes. Sides distinctly sinuate towards base, front angles scarcely prominent, basal angles nearly right and blunt at apex. Two lateral setae on

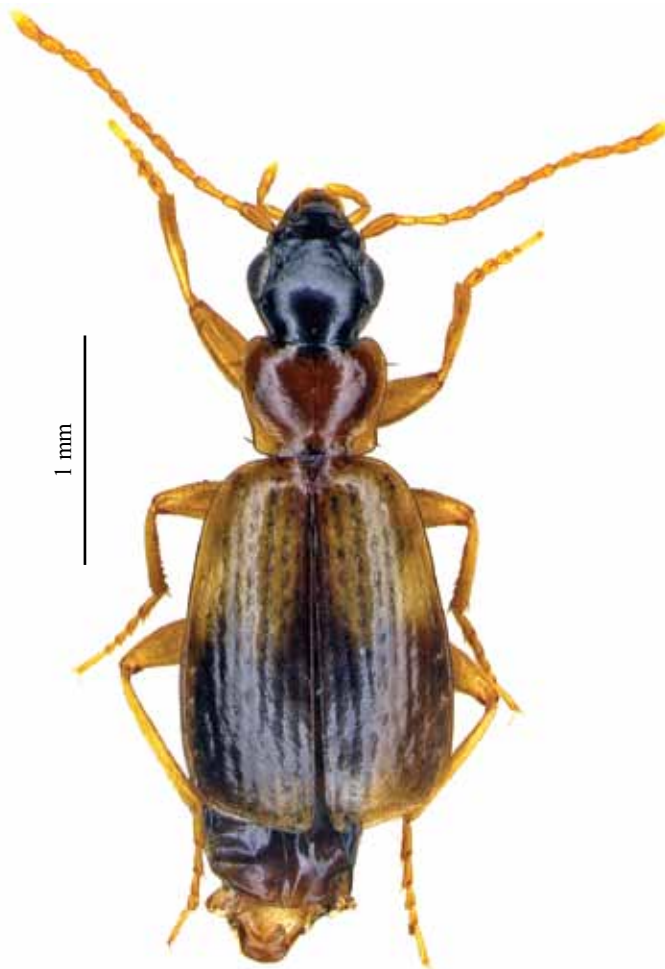


Fig. 1 – Habitus of *Philorhizus occitanus* sp. n., holotypus ♂.

each side, one at the hind angles and the other at about 3/4 from base (Fig. 8).

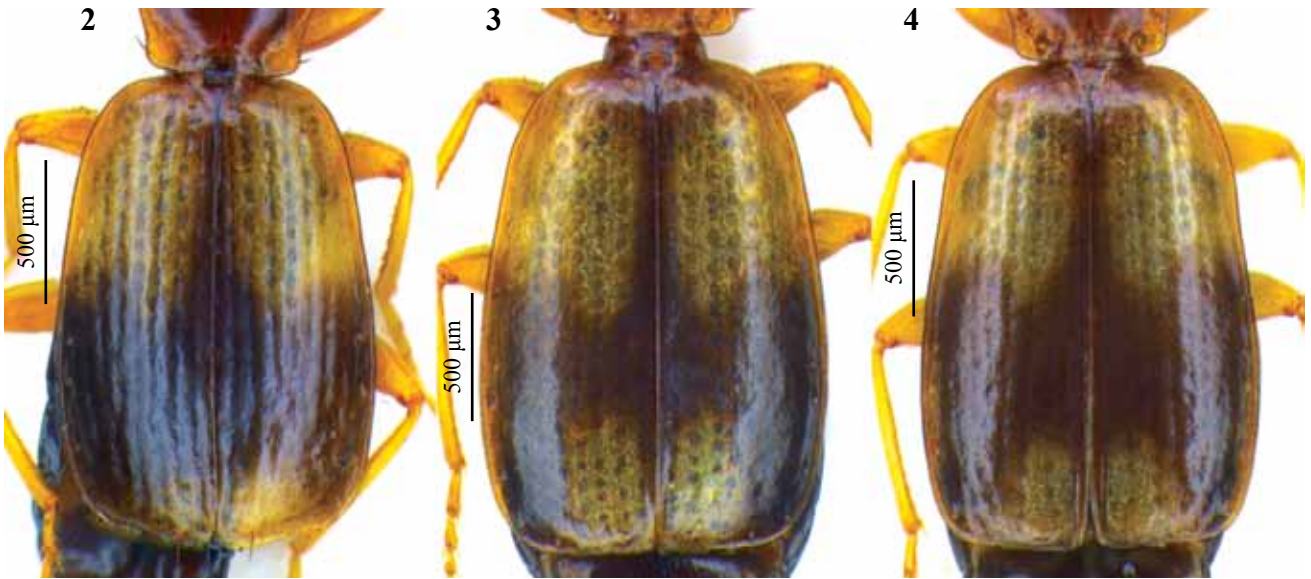
Appendices: antennae, mouth parts and legs yellowish. Antennae moderately long, with antennomeres normally developed. Antennomeres 4–11 with pubescence thin and dense.

Elytra: relatively short, distinctly widened and obliquely truncated backwards. Humeri rounded. A transversal black-brown belt almost entirely covers the posterior half, with yellow apical spots very small. Microsculpture in isodiametric meshes, tending to become transversal towards apex (Fig. 2).

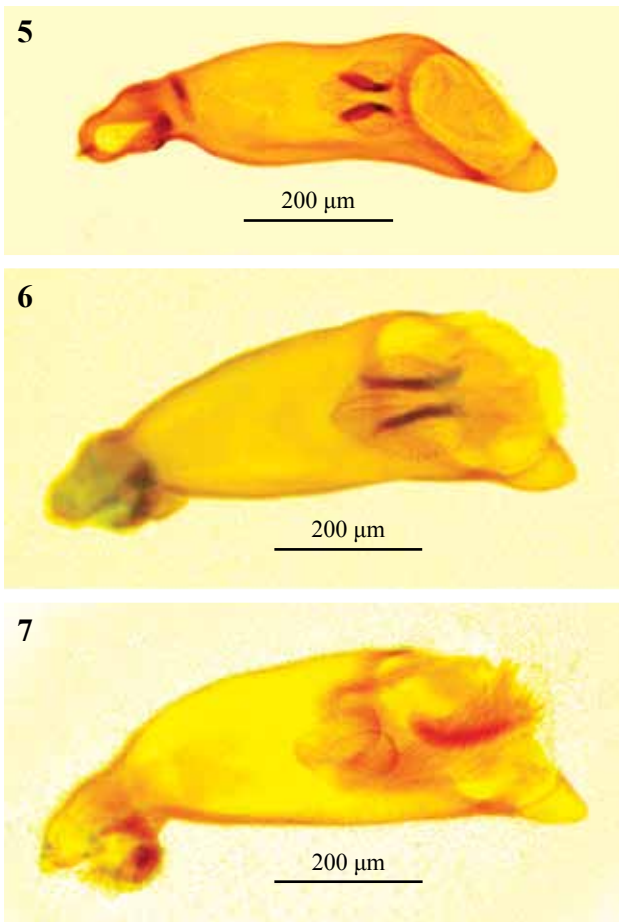
Metathoracic wings: rudimentary, strongly reduced.

Aedeagus: slender, moderately widened from base to apex, which is widely rounded; the sides of the median lobe are markedly sinuate at about half of length. Endophallus with two longitudinal sclerites, short, divergent and located just over half (Fig. 5).

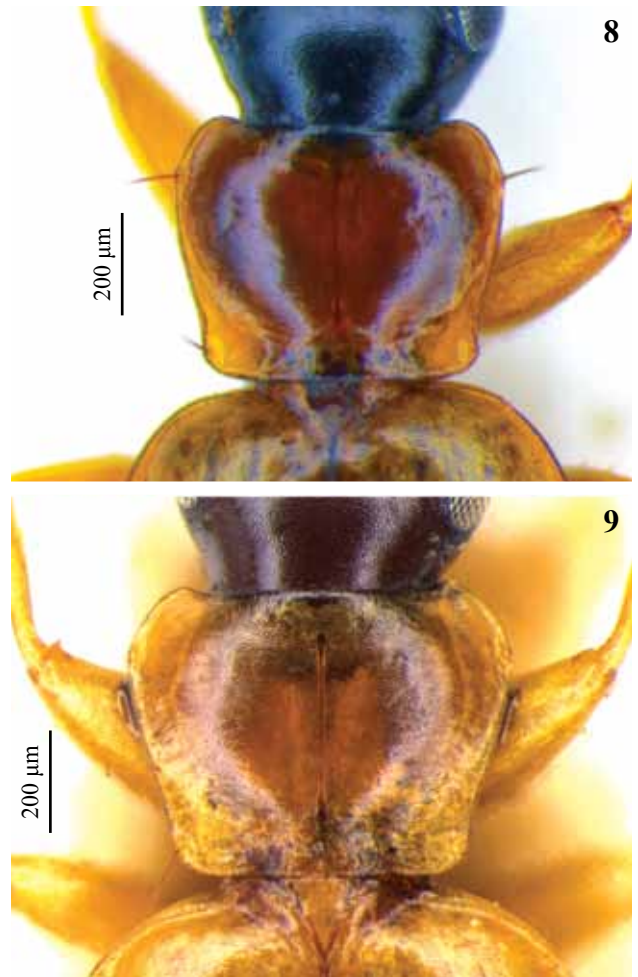
Etymology. “*occitanus*” from the name of the ethno-linguistic entity including the peoples inhabiting the Ellero Valley, the Maira Valley and some other valleys of the Ligurian, Maritime and Cottian Alps.



Figs 2-4 – Elytral shape of *Philorhizus* spp.: **2**, *P. occitanus* sp. n. HT; **3**, *P. notatus* from Sangone Valley, Piedmont, Cottian Alps; **4**, *P. crucifer confusus* from Soana Valley, Piedmont, Cottian Alps.



Figs 5-7 – Aedeagus in lateral view of *Philorhizus* spp.: **5**, *P. occitanus* sp. n. HT; **6**, *P. notatus* from Sangone Valley, Piedmont, Cottian Alps; **7**, *P. crucifer confusus* from Soana Valley, Piedmont, Cottian Alps.



Figs 8-9 – Pronotum shape of *Philorhizus* spp.: **8**, *P. occitanus* sp. n. HT; **9**, *P. liguricus* from Argentina Valley, Ligurian Alps.



Fig. 10 – Eller Valley, Cima Cars northern slope, locus typicus of *Philorhizus occitanus* sp. n.

Distribution. Currently *P. occitanus* sp. n. is recorded from the typical locality, that is the North slope of Cima Cars, in Eller Valley (Ligurian Alps, Piedmont) and from Acceglio, in Maira Valley (Cottian Alps, Piedmont).

Ecology. The holotypus ♂ of *P. occitanus* sp. n. was observed wandering on soil in alpine grassland (1836 m), while the paratypus ♀ was collected by sifting *Corylus* litter at 1200 m. The diversity between the two collecting sites does not allow to make assumptions about the habitat preferred by the new species.

Comparative notes. *P. occitanus* sp. n. could be confused, both on account of the similar external morphology and of the presence of two longitudinal sclerites in the endophallus of aedeagus, with *P. notatus*. It can be distinguished from the latter mainly by the smaller size, the lesser extension of the apical yellow spots on elytra and, primarily, by the slenderer shape of the median lobe of aedeagus, which moreover shows more rounded apex, sides markedly sinuate and inner longitudinal sclerites shorter and divergent (Figs 5-6). *P. paulo* Wrase, 1995, distributed in the Cantabrian Cordillera (Northern Spain), shows a median lobe of aedeagus similar to the one of *P. occitanus* sp. n., sinuated at about half of length and with the endophallus provided with two longitudinal sclerites; however the adult of *P. paulo* is easily distinguished by the larger size (3.1-3.8 mm) and the unicolorous brown-yellowish elytra,

sometimes just blackened at suture. The second species recorded from the South-Western Alps, *P. liguricus*, is distinguished by the shape of elytra, which are shorter and more rounded at sides, with apical yellow spots extended up to the sides, by pronotum distinctly more transverse with basal angles obtuse (Fig. 9) and by aedeagus with different shape and different structure of the sclerites in the endophallus (Sciaky 1991).

The key to the species of *Philorhizus* distributed in the Palaearctic Region given by Sciaky (1991) should be changed at couplet 11 as follows:

- 11 Structure of the endophallus of the aedeagus made by several sclerotized scales more or less in clover leaf shape12
- Structure of the endophallus of the aedeagus made by two elongated sclerites longitudinally located just over half11'
- 11' Apical yellow spot covering about 1/4 of elytral length; elytra almost linearly truncated at apex. Median lobe of aedeagus thick, with sclerites of the endophallus as long as 1/5 of the median lobe
.....*notatus* (Stephens, 1828)
- Apical yellow spot hardly covering the elytral apex; elytra obliquely truncated at apex. Median lobe of aedeagus slender, sinuate at sides, with sclerites of the endophallus shorter than 1/8 of the median lobe
.....*occitanus* sp. n.

Conclusions

P. occitanus sp. n. is probably a relict element survived in Pleistocenic refugia along the South-Western Alps, like many other endemic elements already recorded from these same alpine areas. Its affinities are unclear, although *P. notatus*, which is widely distributed in the Palaearctic Region, is a likely close relative as the two species share many external morphological features as well as some morphological characters of male genitalia.

On the contrary *P. paulo*, which shows a morphology of male genitalia very similar to *P. occitanus*, is unlikely to be strictly related as it is very different as far as the external morphology is concerned and, moreover, its distribution is widely disjunct from *P. occitanus* sp. n., being strictly localized in a montane massif of Western Europe (Iberian Peninsula). Sciaky (1991) considered that the *Philorhizus* species restricted to alpine habitats probably represent relict elements at present isolated inside the genus.

Acknowledgements – A special thank to Riccardo Sciaky for the loan of the specimens of *Philorhizus liguricus* and *P. paulo*, to David Wrase for his valuable advice and to Achille Casale and Augusto Vigna Taglianti for revising the manuscript.

References

- Anichtchenko A. 2005. Especies nuevas y poco conocidas de *Philorhizus* Hope, 1838 (Coleoptera, Carabidae) de España. Boletín de la SAE, 12: 46–50.
- Bisio L., Giachino P.M., Allegro G., Giuntelli P. 2015. I Coleotteri Carabidi della Val Ellero e della Val Maudagna (Alpi Liguri) (Coleoptera Carabidae). Rivista Piemontese di Storia Naturale, 36: 171–214.
- Bisio L., Giuntelli P. 2011. I Coleotteri Carabidi della Val Maira (Coleoptera Carabidae). Rivista Piemontese di Storia Naturale, 32: 173–226.
- Lorenz W. 2005. Systematic list of extant ground beetles of the world (Insecta Coleoptera ‘Geadephaga’: Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). Second Edition. Tutzing, 530 pp.
- Sciaky R. 1991. Revisione dei *Philorhizus* della regione paleartica con descrizione di quattro nuovi taxa. Memorie della Società entomologica italiana, 69: 53–78.
- Wrase D.W. 1995. Taxonomische und faunistische Bemerkungen über einige paläarktische Carabiden-Arten (Coleoptera, Carabidae, Lebiini). Linzer biologische Beiträge, 27/1: 337–366.
- Wrase D.W. 2005. Description of a new *Philorhizus* species from Greece and faunistic notes on other species previously described (Coleoptera, Carabidae, Lebiini). Linzer biologische Beiträge, 37/1: 807–813.
- Wrase D.W., Assmann T. 2008. A new species of *Philorhizus* Hope, 1838 from Greece (Coleoptera, Carabidae, Lebiini). ZooKeys, 3: 1–10.

