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Two poorly known species of Cantharidae: *Cantharomorphus longipes* Fiori, 1914 and *Simplexonycha rufidens* (Marseul, 1864) gen. nov. et comb. nov. (Coleoptera, Cantharidae, Cantharinae)

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The taxonomic position of both species *Cantharomorphus longipes* Fiori, 1914 from Sicily and the former *Cantharomorphus rufidens* (Marseul, 1864) from Corsica and Sardinia have been considered. The comparison between the two highlights the need to establish a new genus for the latter taxon, which has been named *Simplexonycha* gen. nov. and includes only the species *Simplexonycha rufidens* (Marseul, 1864) comb. nov. Several information and photographs of both species, as well as description of the female of *Cantharomorphus longipes*, until now unknown, are also supplied.

Key words: Soldier beetles, entomology, *Ancistronycha*, *Cantharis*, new genus.

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INTRODUCTION

In 1864 Marseul described *Ancistronycha rufidens* from Corsica – France (Marseul 1864: page 13 and page 20), a species subsequently reported also from Sardinia – Italy, by several Authors (Pic 1914: 52; Hicker 1925: 498; Luigioni 1929: 603; Porta 1929: 50; Liberti 1995: 7 and 15; Kazantsev & Brancucci 2007: 247; Constantin 2014a: 99, 2014b: 441; Fanti 2014: 72, 2021: checklist).

In spite of all the above listed papers, *Ancistronycha rufidens* remained, for anatomy and sistematics, largely unknown and little has been published on these topics until Kazantsev (2005), who noticed that this species has little in common with genus *Ancistronycha* Märkel, 1852 except for male claws simple and elytra colour metallic blue so transferring it to the genus *Cantharomorphus* Fiori, 1914 (Kazantsev 2005: 204).

Genus *Cantharomorphus*, on the other hand, was created by Fiori (1914: 82–83) as an endemic Sicilian genus (Liberti 1995: 8 and 15; Fanti 2014: 72) just for *Cantharomorphus longipes* Fiori, 1914, a poorly known species too: Porta (1929: 57) indeed simply reported the original description, as well as Sparacio (1997: 68–69) where only a few of the Fiori's notes have been included.

Such a new *C. rufidens* systematic positioning, considered doubtful by Fanti (2014: 72), and by Constantin (2014a: 99), who provided differential characters from *Ancistronycha* and reported three new Corsican collection localities.

Aim of the present paper is to compare the two species and propose a new genus for *C. rufidens*. It must be added here, however, that in the author's opinion the higher systematics of subfamily Cantharinae (at genus level) should be revised: too much attention has been paid indeed, in the past, to claws structure and not enough to aedeagical characters which, apparently, may not always be in agreement with the former.

MATERIALS AND METHODS

I have studied all the literature concerning the two species. The specimens have been reprepared and in some I have extracted the aedeagus for an in-depth study. These specimens including those of colleagues were viewed with a Carton 0.8-40x stereomicroscope. Plates were assembled with Ulead PhotoImpact Viewer SE program.

The known collection localities below reported are both taken from literature and from materials studied by the writer.

Cantharomorphus longipes:

Sicily:
Palermo prov.: Polizzi Generosa near Piano Quacella (Fiori 1914: 85–86; Luigioni 1929: 607; Porta 1929: 57; Moscardini 1968: 82; Sparacio 1997: 69; Fanti, 2014: 72); Castelbuono (Luigioni 1929: 607); Isnello – Piano Zucchi, 1280 m (A. Kopetz collection).
Messina prov.: Portella Femmina Morta in the Nebrodi Mountain Range, 1550 m. (L. Saltini collection).

Simplexonycha rufidens:

Corsica:
forêt d'Aïtone; Saint-Florent; forêt de l'Ospedale (Constantin 2014a: 99).

Sardinia:
Gennargentu; Supramonte of Orgosolo; Talana (Fanti 2014: 72).
Monte Limbara, Vallicciola, 1100 m.; SS125 – crossroads for S. Pantaleo (G. Pezzi collection).

SYSTEMATIC

Family Cantharidae Imhoff, 1856
Subfamily Cantharinae Imhoff, 1856
Tribe Cantharini Imhoff, 1856

Genus *Cantharomorphus* Fiori, 1914: 82

Type species. *Cantharomorphus longipes* Fiori, 1914 [by monotypy].

Description. The genus is characterized by a combination of external characters (Fiori 1914: 82–86; Porta 1929: 57; Fanti 2020: 149; present work): large size (14-15 mm); body shape slender; antennae and legs very long; elytra elongated and rather narrow; head strongly restricted posteriorly; eyes large and protruded; pronotum transverse, strongly or rather rounded at sides; sternites V–VI with a median notch [the penultimate sternite notch should allows the abduction motion of the anal segment, as Fiori (1914: 83) suggests in his description]; both tarsomeres III–IV bilobed (a character that Fiori reports only for tarsomere IV); male claws as follow: front legs internal claw with a very long and slender tooth with rounded apex (please note that in Fiori description the tooth is smaller and rounded although in the drawing it appears rather robust); external claw of middle legs fitted with a small, rounded tooth; external claw of posterior legs with a very small and rounded tooth (helpless in Fiori), female claws as follow: front legs internal claw with a very long and slender tooth; internal claw of middle legs with a slender tooth, only slightly shorter than the one of front legs one; posterior legs claws simple, without tooth.

The *Cantharomorphus* aedeagus clearly belongs to the *Cantharis* type: dorsal plate well developed, bilobated at apex and concave in the middle, parameres elongated although not reaching (namely shorter than) the dorsal plate apex.

Cantharomorphus longipes Fiori, 1914
(Figs. 1–2)

Cantharomorphus longipes Fiori, 1914: 83. *Locus typicus*: "a non molta distanza da Polizzi (versante sud delle Madonie), lungo la mulattiera che attraversa questa catena di monti, passando pel piano Quacella, ad ovest del monte omonimo" = rather close to Polizzi (south slope of the Madonie), on the mule track that crosses this mountain group, passing through Piano Quacella, on the west of the homonymous mount.

= *Cantharomorphus longiceps* Liberti, 1995: 8 (**incorrect spelling)**; Sparacio, 1997: 68, 69 (in the Fig. 77) (**incorrect spelling)**; Sabella & Sparacio, 2004: 496 **(incorrect spelling)**

Fig. 1. *Cantharomorphus longipes* Fiori, 1914. A: male, dorsal view (photo of Lucio Saltini); B: female, dorsal view (photo of Andreas Kopetz).

Size. 14-15 mm (Fiori 1914; Porta 1929; Sparacio 1997; present work).

Variability. The pronotum can be variable and as already pointed out by Fiori the central black spot can undergo reduction or enlargement (Fiori 1914: 83). The male holotype, in fact, has a pronotum with a central black mark enlarged at the base, with three small spots testaceous-reddish (Fiori 1914: 83 and Fig. 27A) in the middle (the central one linear and the other two slightly wider and almost half-moon). These

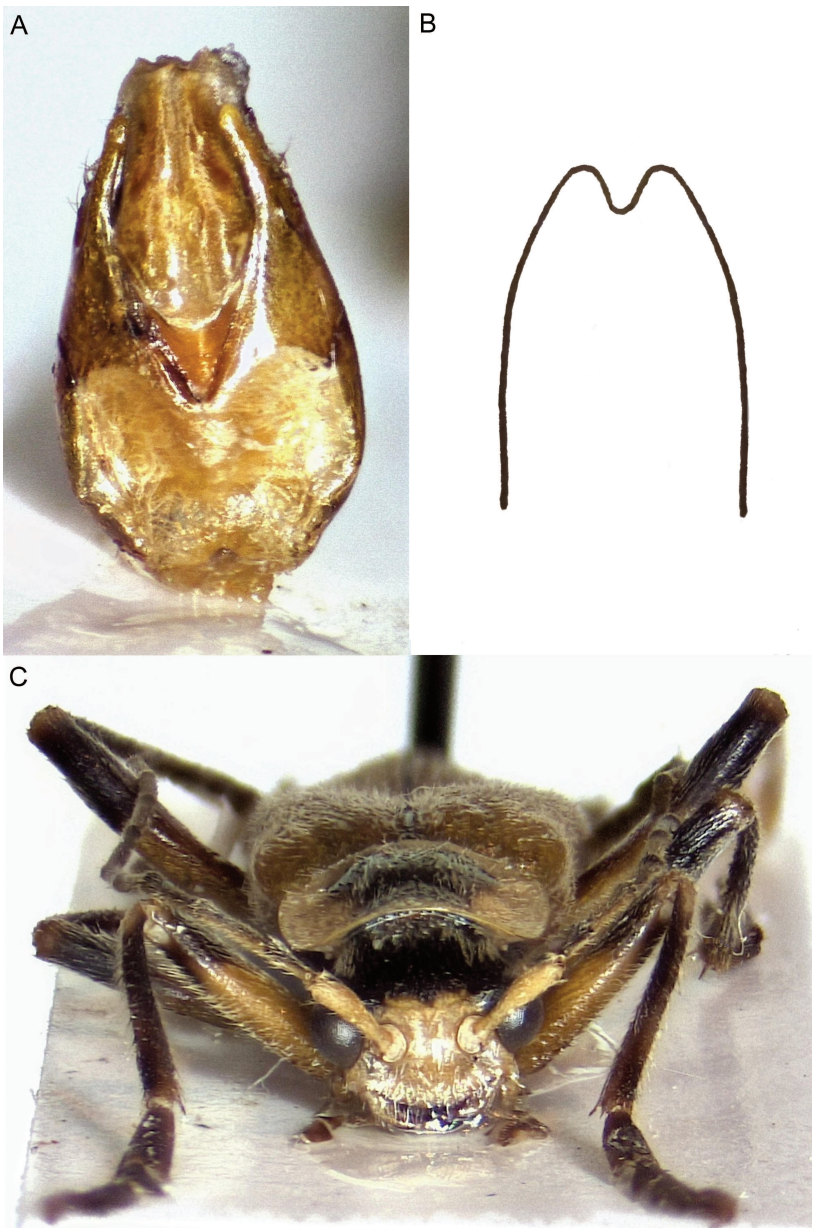

Fig. 2. *Cantharomorphus longipes* Fiori, 1914. A: aedeagus, ventral view (photo of Lucio Saltini); B: drawing of aedeagus, dorsal view; C: male, front view (photo of Lucio Saltini).

spots in a female are much larger and more developed and also totally confluent. In a male the black mark is totally devoid of testaceous spots and therefore identical to that of *Cantharis decipiens* (Baudi di Selve, 1872).

Pronotum also has strongly rounded sides and anterior margin (Fiori 1914: 84), but in a male the anterior margin and sides may be less round.

Head is basically black behind the eyes (Fiori 1914: 83 and Fig. 27A), but sometimes the black extension does not reach the base which is brown-testaceous.

Antennae have the first two antennomeres testaceous and the base of the subsequent antennomeres, these with darkened apexes, or other times antennae can be almost completely black.

Legs have black femora towards the knees and black tibiae at the base, with the extension of the black that can significantly increase both in the femora and in the tibiae. The tarsomeres can be almost completely testaceous as against to be all black.

Description of the female. Similar to male for shape and colour, but shorter antennae and elytra not reaching the last abdominal segment. Yellowish-brown with black mark in the middle of pronotum equipped with confluent brown-testaceous spots, head blackish between the antennae, legs and antennae testaceous with blackish parts. Size (in mm): total length: 15; pronotum length 2.2, pronotum width 2.7; elytra width 3.1 (at shoulders).

Slender. Head transverse, strongly restricted posteriorly, pubescent. Eyes rounded and bulging, inserted in the upper-lateral part of the head. Mandibles falciform, internal edge smooth. Maxillary palps 4-segmented with the last palpomere securiform. Labial palps 3-segmented with the last palpomere elongated and securiform. Antennae 11-segmented, filiform, relatively short, reaching the elytral middle, pubescent; antennomere I club-shaped; antennomere II elongated, about 1.8 times shorter than first; antennomere III slightly longer and sturdier than second; antennomere IV very elongated (the longest); antennomeres V–IX sub-equal, longer than third; antennomere X just shorter than previous ones; antennomere XI slightly shorter than previous one, with rounded apex. Pronotum wider than long, and clearly wider than head, anterior margin and lateral sides strongly rounded, posterior margin mearly straight, all margins and sides thinely but evidently bordered, pronotal surface pubescent with light and shallow punctuation. Scutellum short, more or less triangular. Elytra elongated, slightly wider than pronotum, reaching about the middle of the penultimate abdominal segment, parallel-sided, apex rounded, slightly wrinkled and pubescent. Metathoracic wings slightly infuscate, and just longer than elytra. Sternites transverse, brown-greyish. Last abdominal segment triangular. Legs slender with the posterior legs very elongated; femora enlarged; tibiae longer than femora, cylindrical, with spurs apically; tarsal formula 5-5-5; protarsomere I robust and relatively short, meso- and metatarsomere I longer and thinner than protarsomere I; tarsomeres II–III sub-equal, bilobed (especially so the tarsomere III), shorter than tarsomere I; tarsomere IV strongly bilobed, heart-shaped; tarsomere V elongated, thin, curved; internal claw of anterior and middle legs with a slender and long tooth (similar to *Ancistronycha*), claws of posterior legs without tooth.

Note. *Cantharomorphus longipes* is a Sicilian endemism, described on a single male from the Madonie (Fiori 1914: 83 and 85–86; Moscardini 1968: 82; Sparacio 1997: 69; Fanti 2014: 72, 2020: 149).

Moscardini (1968: 82) wrote that he was not aware of any further discoveries (see also Fanti 2014: 72). In fact, it appears uncommon (Sparacio 1997: 69) and only a few specimens of it are known. The finding on the Nebrodi mount suggests that this species might be more widespread than expected, although rare.

Based on literature data, Sabella & Sparacio (2004: 496) advance that it may probably live in forests and that it might be a phytophagous taxon. The writer's idea, on the other hand, is

that *C. longipes*, as well as many other Cantharinae species, could rather be a predator feeding on small arthropods. From the labels, it appears that adults fly in May–June (15.v-18.vi).

The iconography of this species is rather complete: Fiori (1914: Fig. 27A–G) draws part of the *habitus* (head, pronotum, part of antennae and scutellum), last sternites, the claws of all three legs, maxillary and labial palps, while Sparacio (1997: Fig. 77 at the page 69) provides a drawing of the entire *habitus*.

Genus *Simplexonycha* gen. nov.

Type species. *Ancistronycha rufidens* Marseul, 1864 = *Simplexonycha rufidens* (Marseul, 1864) (genus at present monotypic).

Etymology. The epithet, feminine in gender, comes from the Latin words "*simplex*" = simple, in relation to the claws that are simple (without teeth) in both sexes, and "*ŏnўcha*" = claw.

The term *onycha* forms the ending of several Cantharidae genera (as for example *Ancistronycha*, *Rhagonycha*) with reference to the morphology of the claws considered important in the subfamily's systematics.

Description. A genus characterized by a unique set of external characters: last maxillary palpomere securiform; mandibles internal edge smooth; claws simple (free from basal teeth) in both sexes; pronotum without lobes and/or notches at sides; elytra elongated with blue metallic reflections; slender tarsomeres (bilobed shape of tarsomeres III–IV slightly evident) and head moderately restricted behind eyes.

On the other hand the aedeagus is close to the *Cantharis* type, with the dorsal plate well developed. No other genus of the western Palaearctic has this same combination of characters.

Differential diagnosis. *Simplexonycha* differs from *Ancistronycha* for pronotum with anterior and posterior borders more or less straight and finely marginated, for aedeagus with a well developed dorsal plate and thinner laterophysis and for external claws of the female without a talon-shaped basal tooth (Kazantsev 2005; Constantin 2014a).

It differs from *Cantharomorphus* for the simple claws in both sexes, head less restricted behind eyes, pronotum less rounded, tarsi longer and slender with tarsomeres III–IV less evidently bilobed and for the different median notch of last sternites. A further character could be the colour of the abdomen in both sexes: *Simplexonycha* is ventrally reddish (Marseul 1864: 20; Porta 1929: 50), while *C. longipes* is brown-greyish (Fiori 1914: 85; Porta 1929: 57).

Simplexonycha rufidens (Marseul, 1864) **comb. nov.**
(Figs. 3–4).

Ancistronycha rufidens Marseul, 1864: 13 (in the synoptic table), 20 (description). *Locus typicus*: "Corse".

= *Cantharis rufidens v. nov. Fiorii* Pic, 1914: 52. *Locus typicus*: "Italie" [variety with a more completely dark head and less transverse pronotum (Pic 1914; Porta 1929). "Italie" is obviously to be restricted to Sardinia only]. [synonymized by: Luigioni 1929: 603; Porta 1929: 50; Kazantsev 2007: 48].

Size. 10-11.5 mm (Marseul 1864; Porta 1929; present work).

Variability. Pronotum is usually reddish with a rather variable, narrow, blackish margin on both anterior and posterior borders (Marseul 1864: 20; Porta 1929: 50): at times, however, the posterior one may be lacking or reduced.

Re-description. Slender taxon. Head blackish with blue reflections, transverse, little restricted behind eyes, pubescent, partially covered by the pronotum. Eyes globular, prominent, convex, inserted in the upper-lateral part of the head. Maxillary palps 4-segmented with the last palpomere securiform. Labial palps 3-segmented. Mandibles smooth, falciform, reddish-orange. Antennae blackish with blue reflections, 11-segmented, filiform, thin, rather long, pubescent;

antennomere I club-shaped; antennomere II short; antennomere III robust, over 3.0 times longer than second; antennomeres IV–XI elongated, thin, subequal in length; antennomere XI rounded at apex. Pronotum transverse, slightly wider than head, strongly pubescent, reddish-orange with anterior and posterior margins finely blackish, margins rather straight and finely bordered, sides almost straight, corners strongly rounded. Scutellar shield blackish, triangular-shaped. Elytra blackish with blue reflections, strongly wider than pronotum, parallel-sided not dehiscent, rounded apexes, strongly pubescent. Hind wings about as long as elytra. Metasternum blackish, pubescent. Abdominal segments transverse, reddish-orange, pubescent. Legs elongated, thin, blackish with blue reflections, pubescent; meso- and metatibiae longer than meso- and metafemora, tibiae with apical spur (very long, thin, curved); tarsal formula 5-5-5, tarsomeres thin and elongated, tarsomere I long, tarsomeres II–III subequal in length and shorter than previous one, tarsomeres III–IV little bilobed, tarsomere V thin and curved, claws simple without teeth.

Females differ from males in having shorter antennae and wider last sternite.

Description (Marseul 1864).

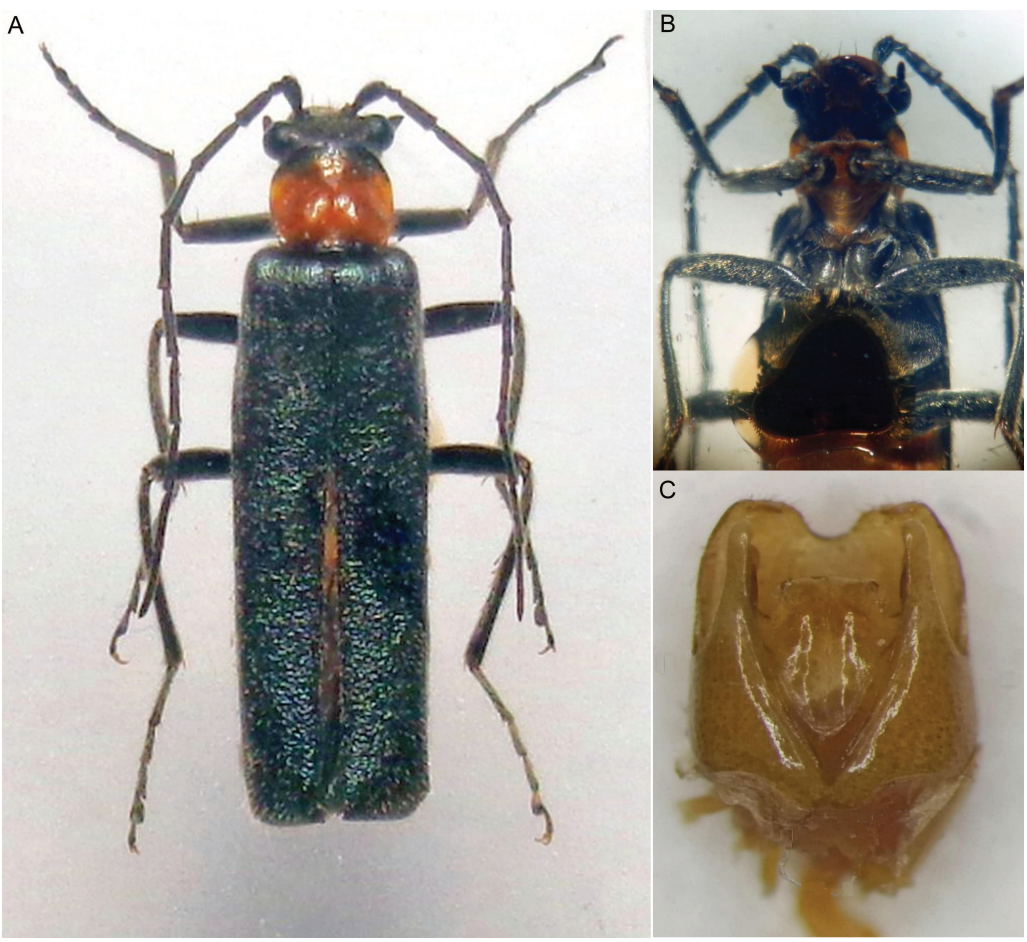

Fig. 3. *Simplexonycha rufidens* (Marseul, 1864). A: male, dorsal view (photo of Giorgio Pezzi); B: part of ventral view (photo of Giorgio Pezzi); C: aedeagus, ventral view (photo of Andrea Petrioli).

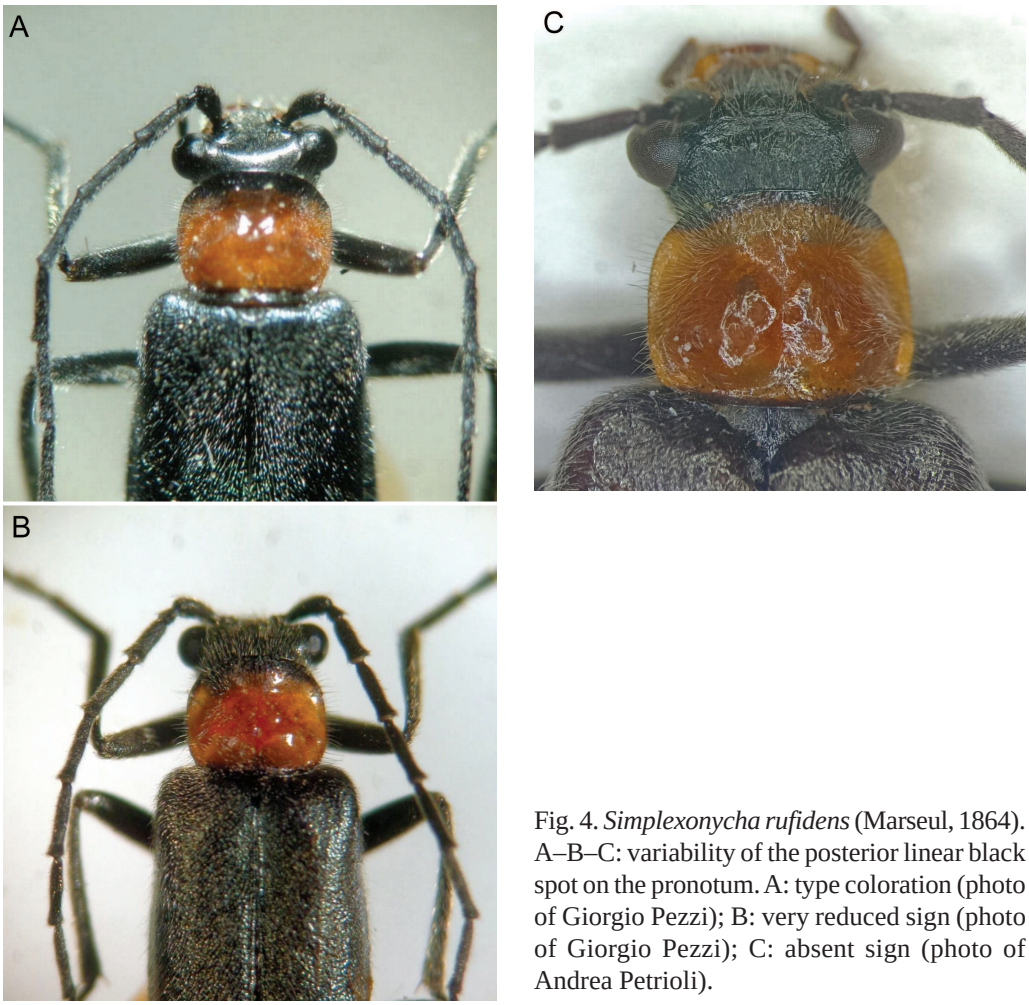

Fig. 4. *Simplexonycha rufidens* (Marseul, 1864). A–B–C: variability of the posterior linear black spot on the pronotum. A: type coloration (photo of Giorgio Pezzi); B: very reduced sign (photo of Giorgio Pezzi); C: absent sign (photo of Andrea Petrioli).

Note. *Simplexonycha rufidens* is Sardinian-Corsican endemism. Apparently rare in both islands, it is known from various localities. It seems to be more frequent on mountains (Luigioni 1929: 603; Constantin 2014b: 441) often in humid places (even if small). However, both ecology and distribution remain, unfortunately, poorly known. The adults fly in April-June.

DISCUSSION

C. rufidens differs in numerous characters from *C. longipes*, above all the edeagic form and the claws simple without teeth in both sexes, therefore it was necessary to establish the new genus *Simplexonycha* gen. nov. with the species *S. rufidens* comb. nov.

New findings and studies on both these genera (*Cantharomorphus* and *Simplexonycha*) and species are highly desirable, as well as biological (pre-imaginal stages, way of life) and ecological studies. Given their rarity together with the limited distributions, it appears also very important to better understand their conservation category: for example, only *C. longipes* was given the "Rare and Vulnerable" category by Sabella & Sparacio (2004: 496); although the writer fully agree, it must be said that the ground for such inclusion certainly is insufficiently do-

cumented. This taxon with the finding from Nebrodi of Lucio Saltini appears to be more widespread than expected, although rare.

The phylogenetic relationships of *Simplexonycha* gen. nov. and *Cantharomorphus* are difficult to frame and remain obscure to the writer. Both genera are monotypic and this might witness their relic character.

Cantharomorphus might be regarded as intermediate between tribe Cantharini Imhoff, 1856 and tribe Podabrini Gistel, 1856. It is very close indeed to genus *Cantharis* Linnaeus, 1758 and shares with it several important characters as general appearance, pronotum shape and aedeagus structure, however the large size, the elongated shape and the head shrinkage behind eyes (forming a visible neck) remind of genus *Podabrus* Dejean, 1833 (Fiori 1914: 82).

Armidia Mulsant, 1862 too might remind *Cantharomorphus* for elongated and slender shape, long legs, and head with a visible neck but the intermediate and posterior legs claws are apically bifid, and the aedeagus structure is well different.

The writer cannot find any affinity between *Cantharomorphus* and *Rhagonycha* as highlighted by Fiori (1914: 82).

The elytral metallic blue colour and reflections of *Simplexonycha* are also present in several *Ancistronycha* species, but they are present (although rather rarely) in other genera too [as, for example, in *Cantharis paganettii* (Flach, 1907)]. The simple claws (without teeth) in both sexes are a rare character in the panorama of the palaearctic soldier beetles, only present in *Occathemus* Švihla, 1999 and *Podistra* (*Pseudoabsidia*) Wittmer, 1969 with these two having different pronotum and aedeagus.

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