

## ***Rhizotrogus tatianae* a new species from Mount Etna (Sicily, Italy) (Coleoptera Scarabaeidae Melolonthinae)**

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### **ABSTRACT**

*Rhizotrogus tatianae* a new species from Mount Etna (Sicily, Italy) is here described and illustrated (Coleoptera Scarabaeidae Melolonthinae). It is similar to *R. romanoi* Sabatinelli, 1975, endemic of Sicily and Calabria (Madonie and Nebrodi Mountains), from which it differs by some characters of external morphology and genitalia. Both of these species belong to the *R. aestivus* (Olivier, 1789) group, a species widespread throughout almost all of Europe up to Asia Minor including almost all regions of continental and peninsular Italy. *Rhizotrogus tatianae* n. sp. is a crepuscular species found in a forest environment.

### **KEY WORDS**

New species; taxonomy; biodiversity; Mount Etna; Italy.

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### **INTRODUCTION**

The Rhizotrogini Burmeister, 1855 (Scarabaeidae Melolonthinae) have numerous endemic species in Sicily (Italy). Among them there are two endemic species of *Rhizotrogus* Latreille, 1825 (*R. romanoi* Sabatinelli, 1975 and *R. siculus* Baraud, 1970). The genus *Rhizotrogus* Latreille, 1825 globally includes about 45 species mainly distributed in the western Mediterranean area, with a few species reaching central Europe or the central Mediterranean area (Coca-Abia, 2003; Bezděk, 2016).

Currently, the Italian fauna includes about ten species, three of which reported in Sicily (Ballerio et al., 2014; Carpaneto et al., 2021; Uliana & Galzerati, 2022).

Recent biodiversity surveys conducted in the Mount Etna area allowed us to obtain new data on

a new population of *Rhizotrogus* which is described in this work.

### **MATERIAL AND METHODS**

The sampling was carried out in a clearing of the Bosco di Maletto (Catania, Sicily, Italy), on the northern slopes of Mount Etna at an altitude of approximately 1,200 m. The biotope is a forest with a tree cover made of species typical to the supra-Mediterranean bioclimatic zone (*Quercus ilex* L., *Quercus cerris* L., *Pinus nigra* ssp. *laricio* (Poir.) Mair) plus some scattered specimens of *Betula aetnensis* Raf.).

Adults of the new species were attracted with two kinds of light traps: one consisting of a white sheet placed on the ground and illuminated with a 20 Watt black light lamp (Wood light) and a 10 Watt

cold white light lamp (color temperature 6500 degrees Kelvin) powered by 20,000 mha lithium batteries; the other consisting of a white umbrella illuminated by a 10 watt UV LED with an emission frequency between 390 and 405 nm.

The specimens were classified in laboratory with the aid of an Optika stereomicroscope. Photos of the habitat, habitus and other morphological characters were taken with a Canon Eos 100D camera and mounted on a Manfrotto micro-slider movement system. The images were then processed with CombineZP software and enhanced with Photoshop CS6 software.

ACRONYMS AND ABBREVIATIONS. Vittorio Aliquò collection, currently housed at the Museum of Zoology “Pietro Doderlein”, University of Palermo, Italy (CVA); Calogero Muscarella collection, Palermo, Italy (CMC); Museo Civico di Storia Naturale “Giacomo Doria”, Genova, Italy (MCSNG); Museum of Zoology “Pietro Doderlein”, University of Palermo, Italy (MZUP); Andrea Petrioli collection, Asciano, Italy (CAP); Marcello Romano collection, Capaci, Palermo, Italy (CMR); Ignazio Sparacio collection, Palermo, Italy (CIS); asl: above sea level .

## RESULTS

### *Systematics*

Ordo COLEOPTERA Linnaeus, 1758  
 Familia SCARABAEIDAE Latreille, 1802  
 Subfamilia MELOLONTHINAE Samouelle, 1819  
 Tribus RHIZOTROGINI Burmeister, 1855  
 Genus *Rhizotrogus* Latreille, 1825

#### *Rhizotrogus tataniae* n. sp.

<https://www.zoobank.org/71C1931D-016F-4F3C-8D6C-FAC51ED442E4>

TYPE MATERIAL. HOLOTYPE. ITALY • 1 specimen, male; Sicily, Bronte (Catania), Bosco di Malletto; 1200 m asl; 14 Jun. 2022; legit C. Muscarella; Fig. 1; MCSNG. PARATYPES. ITALY • 1 specimen, male; same data of the holotype; 26 Jun. 2023; MZUP • 14 specimens; same data of the holotype; 26 Jun. 2023; CMC • 14 specimens; same data of the holotype; Figs. 2, 5, 7, 9, 10, 13, 14, 20; CIS.

OTHER MATERIAL EXAMINED. *Rhizotrogus romanoi* Sabatinelli, 1975. ITALY • 12 specimens; Sicily,

Madonie Mountains, Piano Battaglia; 1500–1600 m asl; 1 Jun. 1972, 21 May 1973, 31 May 1973, 15 May 1994; CVA • 6 specimens; same data as previous; 17 Sep. 1972, 31 May 1973, 1 Jun. 1972, 24 Apr. 1982, 18 Jun. 1980; CMR • 11 specimens (7 males and 4 females); same data as previous; 18 Jun. 1980; legit I. Sparacio; CSI • 2 specimens; same data as previous; 25 May 1985; legit V. Aliquò; CMC • 1 specimen male; Sicily, Madonie Mountains, Piano Sempria; 1400 m asl; 20 Jun. 1984; legit I. Sparacio; CIS • 2 specimens males; Nebrodi Mountains, Mount Soro; 1400 m asl; 18 Jun. 1974; legit M. Romano; CMR • 1 specimen female; same data as previous; 18 Jun. 1987; legit I. Sparacio; CIS • 1 specimen male; Messina, Nebrodi, Portella dell'Obolo; 1500 m asl; 1 Oct. 1999, legit A. Petrioli; CAP.

*Rhizotrogus aestivus* (Olivier, 1789). FRANCE • 1 specimen; Huy; 7 Apr. 1994; CIS • 1 specimen; Bouge; 24 Apr. 1993; CIS.

NORTH MACEDONIA • 1 specimen; Bistra, Planiuna; 6 Jun. 1978; legit J. Hladil; CMC • 1 specimen; Monte Galicica, 2 May 1977; legit J. Hladil; CMC.

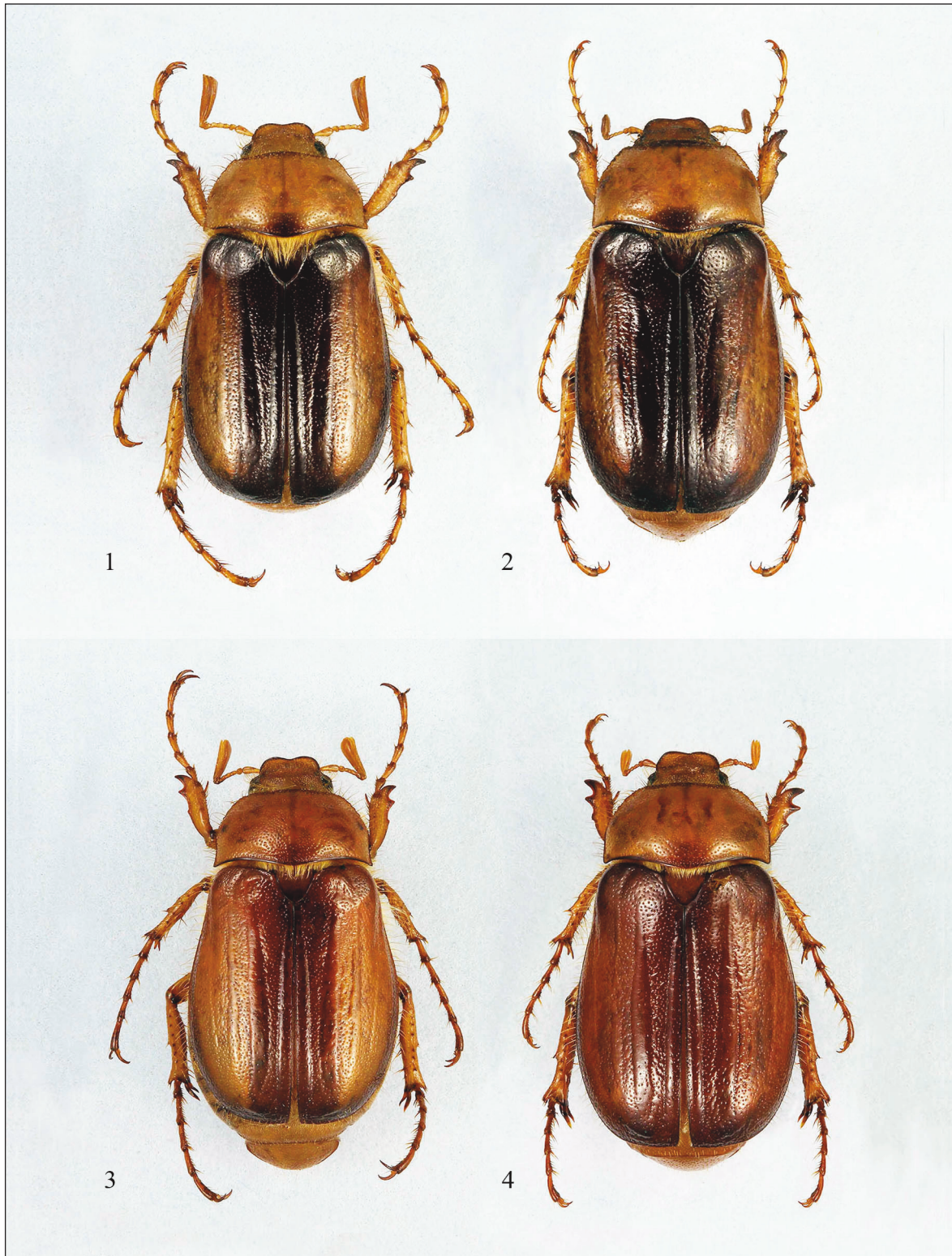
CZECH REPUBLIC • 1 specimen; Moravia, Adamov; Jun. 1979; legit J. Hladil; CMC.

SLOVAKIA • 1 specimen; Kovakov; Jun. 1979; legit J. Hladil; CMC.

TÜRKIYE • 1 specimen; Isparta, Dravaz Dag; 1100 m asl; Jun. 1996; CMC.

ITALY • 1 specimen male; Emilia Romagna, Parco Regionale Abbazia di Monteveglio; 293 m asl; 4 May. 2013; legit M. Trentin; CMC • 1 specimen male; same data; 300 m asl; 11–13 Apr. 2017; CMC.

DESCRIPTION OF THE HOLOTYPE (Fig. 1). Body length including head and pygidium 16.8 mm. Dorsal side brown with elytra having basis, humeri, lateral edges and a wide central stripe covering elytral suture and the second interstria black. Anterior and posterior margins of pronotum black. Antennae, legs and ventral side light brown; apex of legs and tarsi black. Head with large and dense punctation; clypeus subtrapezoidal, margins narrowly raised, anterior margin indented at the middle. Fronto-clypeal suture distinct, slightly raised. Clypeus and frons with tiny, raised, micro-setae; head margins with moderately long, erect setae. Antennae 10-segmented, scape clavate, 0.45 times as long as antennomeres 2–7, antennal club 3-segmented, 1.3 times as long as antennomeres 2–7.



Figures 1, 2. *Rhizotrogus tatianae* n. sp. from Mount Etna: Bronte (Catania), Bosco di Maletto, 1200 m asl (Sicily, Italy). Fig. 1: male holotype. Fig. 2: female paratype. Figures 3, 4. *Rhizotrogus romanoi* from Madonie Mountains, Piano Battaglia, 1500 m asl (Sicily, Italy). Fig. 3: male. Fig. 4: female.



Pronotum subtrapezoidal, 1.9 times as wide as long, with maximum width in the basal third, sides crenulated, anterior angles obtuse, posterior angles slightly protruding, posterior margin protruding backwards towards the middle. Surface glabrous, except for long setae along the anterior and the lateral margins, with sparse and large simple punctures (interpunctural distance 2 to 4 times punctural diameter) mixed to very fine simple punctures; basal bead complete, flattened.

Scutellum sub-triangular, 1.1 times as wide as long, with fine sparse/dense punctures, partially covered by the dense and long setae. Elytra elongate, 1.3 times as wide as long, broadest in the distal half, humeral callus distinct; 1st interstria clearly narrower towards the apex with 2nd stria wider towards the apex; punctures of the 1st and 2nd interstriae large, irregularly shaped, dense; surface glabrous, with long setae only along the lateral and apical margins.

Propygidium with small dense punctures, pygidium with medium-sized and sparse large simple punctures (interpunctural distance 2 to 5 times punctural diameter), mixed to fine punctures (Fig. 5). Abdomen with ventrites hollowed in the middle with small and sparse punctures. Anterior tibia 3-toothed, proximal tooth weak, medial tooth closer to the apical one. Posterior tibiae subrectilinear, internal margin of the apical half slightly excavated (transversal carina located at about half tibial length), with 5 teeth on the dorsal margin (Fig. 7). Metatarsus 1.3 times as long as the metatibia. Claws distinctly curved, with basal denticle not sinuated basally, another basal sinuation dorsally (Figs. 9, 10). Aedeagus as in Figs. 13, 14 with distal third of parameres not sinuated dorsally (in lateral view).

**VARIABILITY.** The male paratypes do not show substantial morphological variation compared to the holotype. Total length varies from 16.5 to 17.2 mm, sometimes darker color, posterior tibiae with 5, rarely 4 or 6, teeth on the dorsal margin.

The female paratypes (Fig. 3) are slightly bigger than males with total body length from 17.5 to 8.5 mm; pronotum more transverse (1.8 times as wide as long) and more elongated elytra (1.38/1.40 times as long as wide); antennae and tarsi shorter: antennal club 3-segmented 1.05 times as long as antennomeres 2–7, metatarsus ca 0.9 as long as metatibia; Propygidium and pygidium with medium-size sparse simple punctures mixed to fine simple punctures.

**DISTRIBUTION.** *Rhizotrogus tatianae* n. sp. is only known from the type locality: Bronte, Bosco di Maletto (Mount Etna, Sicily, Italy) (Figs. 19, 20).

**ETYMOLOGY.** The new species is named after Tatiana Giannilivigni from Palermo (Italy), the first author's wife. Noun in the genitive case.

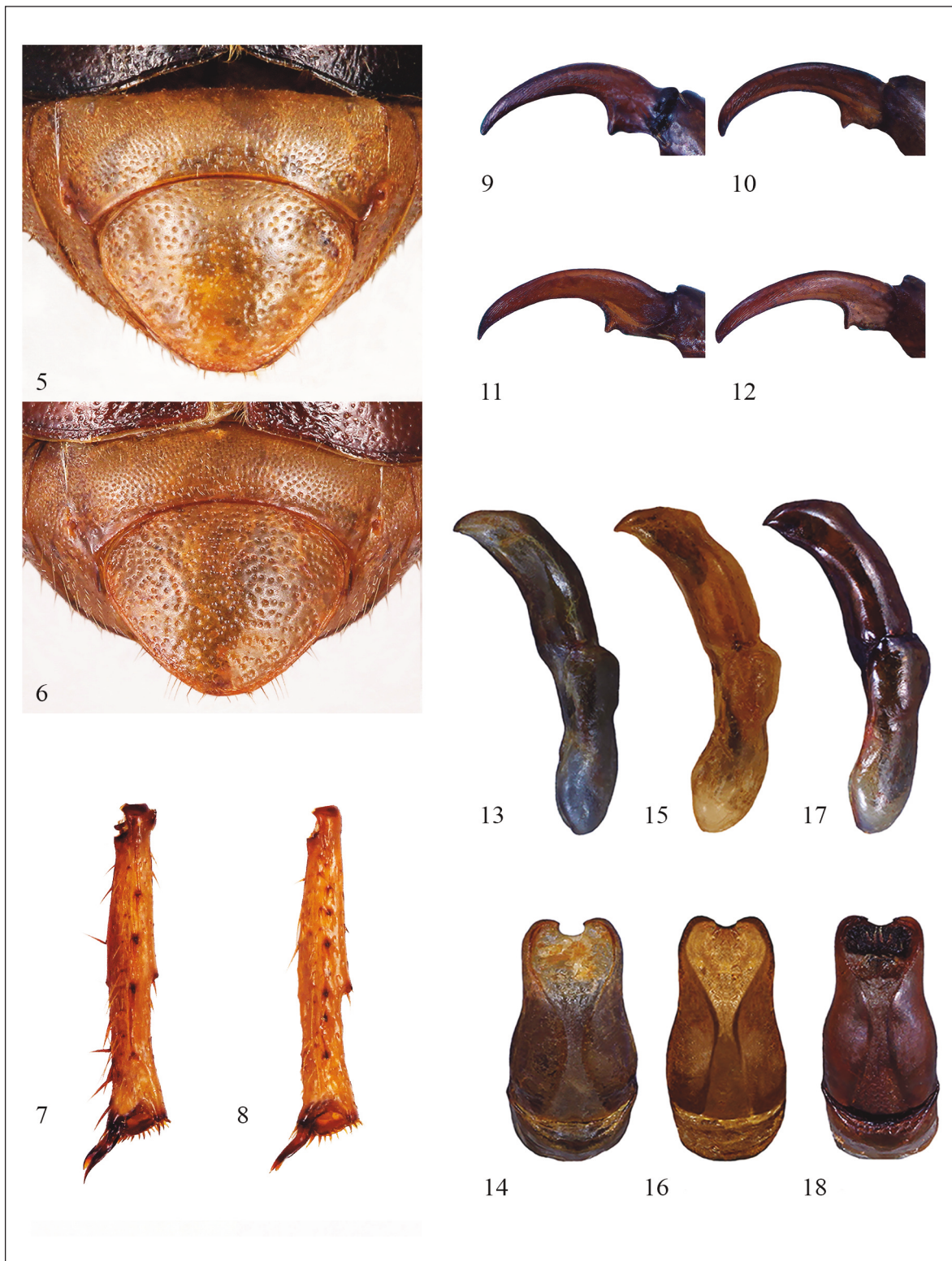
**REMARKS.** *Rhizotrogus tatianae* n. sp. is morphologically very close to *R. romanoi*, an endemic Sicilian species described for the Madonie and Nebrodi Mountains (Sabatinelli, 1975); *Rhizotrogus romanoi* is also known from other locations in the northern Sicilian mountain ridges (Baraud, 1977, 1992; Sparacio 1994; Sabella & Sparacio, 2004; Lapiana & Sparacio, 2006) and is also reported for Calabria by Carpaneto et al. (2021).

*Rhizotrogus romanoi* and *R. tatianae* n. sp. are morphologically similar to *R. aestivus* (Olivier, 1789), a species described for France (Olivier, 1789: “*environs de Paris*”) and widespread throughout almost all of Europe up to Asia Minor including almost all regions of continental and peninsular Italy (Baraud, 1992; Ballerio et al., 2014; Bezděk, 2016; Carpaneto et al., 2021).

*Rhizotrogus tatianae* n. sp. shows a more elongate body, darker color with a wide central black elytral band, 1st interstria clearly narrower towards the apex, posterior tibiae subrectilinear, tarsal claws are distinctly curved, with a basal denticle not sinuate basally and with a dorsal basal sinuation.

In particular, compared to *R. romanoi* the new species also shows the anterior margin of the clypeus less indented, the bigger punctures of pronotum shallower and more sparse, the recumbent setae of the base of pronotum which cover the scutellum are clearly longer, the smaller number of dorsal teeth of the metatibia, the punctuation of the pygidium smaller and more sparse. Aedeagus as in Figs. 15–18.

In *R. romanoi* (Figs. 2, 4) body shape is less elongate, the color is brown or brown with the central reddish-brown elytral band. The pronotum is less elongate, more rectangular (width-length ratio = 2), with maximum width of the pronotum just before the middle, anterior corners not very evident, posterior angles protruding backwards; rear margin slightly protruding backwards from the middle. The double punctuation of the pronotum is deeper and less sparse. Scutellum shorter. Elytra less elongate



Figures 5, 7, 9, 10, 13, 14. *Rhizotrogus tatianae* n. sp. male paratype from Bosco di Maletto (Italy, Sicily). Fig. 5: pygidium. Fig. 7: metatibia, dorsal view. Fig. 9: anterior claws. Fig. 10: posterior claws. Figs. 13, 14: aedeagus. Figures 6, 8, 11, 12, 15-18. *R. romanoi* male from Madonie Mountains, Piano Battaglia (Italy, Sicily). Fig. 6: pygidium. Fig. 8: metatibia, dorsal view. Fig. 11: anterior claws. Fig. 12: posterior claws. Figs. 15, 16: aedeagus. Figs. 17, 18. Nebrodi Mountain: Mount Soro, aedeagus.





Figure 19. Locus typicus of *Rhizotrogus tatianae* n. sp., Mount Etna, Bosco di Maletto (Italy, Sicily).



Figure 20. *Rhizotrogus tatianae* n. sp. from Mount Etna, Bosco di Maletto (Italy, Sicily).

(1.23 times as wide as long), clearly wider and rounded backwards in the posterior half, 1st stria slightly narrowed towards the apex; smaller and more spaced elytral punctures. Pygidium of the male with large-size and dense punctures and micro-punctures (Fig. 6). Posterior tibiae with sinuous internal margin, very hollowed internal margin of the apical half (transversal carina slight clearly after half length) and 6 teeth on the dorsal margin (Fig. 8). Claws with basal tooth clearly sinuated basally and with a small protrusion, in front of the tarsi, very visible (Figs. 11, 12). Ventricle punctures larger and denser. Aedeagus as in Figs. 15–18.

Summarizing the new morphological data with the known bibliography (Sabatinelli, 1975; Baraud, 1992; Ballerio et al., 2014), we can distinguish the species in question as follows:

1. Dorsal surface sub-opaque with dense micropunctuation; clypeus with anterior margin slightly indented at the middle. Pronotum glabrous, except for long setae along the anterior and the lateral margins. Posterior tibiae with teeth on the dorsal margin. Aedeagus with truncated parameres apex (in lateral view).....*R. aestivus*  
- Dorsal surface shiny with sparser micropunctuation; clypeus with anterior margin concave at the middle. Aedeagus with non-truncated parameres apex.....2

2. Body shape less elongate; color brown or brown with the central reddish-brown elytral band; 1st interstria slightly narrowed towards the apex; pygid-

ium of the male with large-size and dense punctures and micro-punctures; posterior tibiae with very hollowed internal margin of the apical half and transversal carina located after half length. Aedeagus with distal third of parameres sinuated dorsally (in lateral view).....*R. romanoi*

3. Body shape more elongate; darker color with a wide central black elytral band, 1st interstria clearly narrower towards the apex; pygidium of the male with medium-sized and sparse large simple punctures and micro-punctures; posterior tibiae subrectilinear, internal margin of the apical half slightly excavated and transversal carina located at about half tibial length; aedeagus with distal third of parameres not sinuated dorsally (in lateral view).....*R. tatianae* n. sp.

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