



On nomenclature and synonymy of *Trichius rosaceus*, *T. gallicus*, and *T. zonatus* (Coleoptera: Scarabaeidae: Cetoniinae: Trichiini)

FRANK-THORSTEN KRELL

Department of Zoology, Denver Museum of Nature & Science, 2001 Colorado Boulevard, Denver, Colorado 80205-5798, U.S.A.

Email: frank.krell@dmns.org

Abstract

The name *Scarabaeus rosaceus* Voet, 1766–1778, currently in use as one of two names for a west Palaearctic *Trichius* species, is unavailable because Voet's work is not consistently binominal. The valid name for the species is *Trichius gallicus* Dejean, 1821 with the Sardinian and North African populations forming the subspecies *T. g. zonatus* Germar, 1831. The lectotype of *Trichius zonatus* Germar is designated.

Key words: bumblebee beetles, lectotype designation, taxonomy, Germar type, Europe, Palaearctic

Introduction

The European fauna west of the Caucasus contains three species of the genus *Trichius* Fabricius, 1775. *Trichius fasciatus* (Linnaeus, 1758) and *T. sexualis* Bedel, 1906 (see Krell 2010) have been known under these undisputed names for over a century. However, there is inconsistency in the valid name used for the third species that has a broad white stripe only on the penultimate sternite of the males. Both *Trichius zonatus* (Germar, 1831) and *Trichius rosaceus* (Voet, 1766–1778) are widely used as the valid names for this species, sometimes with the former name being used for the Sardinian and North African subspecies of this species. Examples of usage are:

for *T. zonatus*—Brakman 1966, Báguena 1967, Machatschke 1969, Stebnicka 1983, Jessop 1986, Mroczkowski & Stefańska 1991, Krell & Fery 1992, Brandstetter & Kapp 1998, Bunalski 1999, Przewoźny 1999, Rößner & Schulze 1999, Frank & Konzelmann 2002, Martin & Pedersen 2002, Micó & Galante 2002, Böhme 2005, Chi-mișliu 2007, Troukens 2007;

for *T. rosaceus*—Janssens 1960, Baraud 1977, Paulian & Baraud 1982, Gangloff 1991, Baraud 1992, Král 1993, Carpaneto & Piatella 1995, Decelle 1995, Sparacio 1995, Inglebert 1997, Krajčák 1999, San Martín *et al.* 2001, Pesarini 2004, Dutto 2005, Smetana 2006; Mertlik 2009, Ballerio *et al.* 2010;

and for *T. rosaceus zonatus*: Baraud 1977, Paulian & Baraud 1982, Chambon *et al.* 1985, Carpaneto & Piatella 1995, Krajčák 1999, Dutto 2005, Lapiana & Sparacio 2006, Smetana 2006, Ballerio *et al.* 2010.

The parallel usage of different names for the same species is undesirable and needs to be resolved. Here, I propose a solution by strictly applying the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1999).

Trichius rosaceus (Voet, 1766–1778) (unavailable) and *Trichius rosaceus* Kraatz, 1891 (junior synonym)

In his *Catalogus Systematicus Coleopterorum*, Johann Eusebius Voet described *Scarabaeus rosaceus* from the Netherlands in the Dutch and French editions, but from Belgium (“Habitat in Belgico.”) in the Latin edition, which, however, belonged to the Austrian Netherlands at the time. The description is on sheet B, which was issued between 1766 and 1778 (Hagen 1857). From description and illustration, it is unclear to which of the three Central European *Trichius* species the author refers. Two species of *Trichius* occur in Belgium and the Netherlands: *Trichius fasciatus* and the one that is currently called *T. rosaceus* or *T. zonatus* (Brakman 1966, Decelle 1995).

Fuessly (1778: 19) synonymized Voet's *Scarabaeus rosaceus* with *Trichius fasciatus* (Linnaeus, 1758). In the German translation of Voet's work, Panzer (1802: 26) followed this interpretation, which also was adopted by Schönherr (1817: 104). However, at the time it was unknown that more than one species of *Trichius* inhabits Europe making this synonymy irrelevant for the interpretation of Voet's species concept. With no collection of Voet being mentioned by Horn *et al.* (1990) original material cannot be traced. Voet's son did possess an insect collection (Smit *et al.* 1986), which, however, did not contain *S. rosaceus* (Voet 1769–1778: 12).

Until Kraatz's (1891) reinstatement Voet's name, *T. rosaceus* had remained largely forgotten. It was then temporarily adopted by Reitter (1894, 1899), and used by other authors (e.g. Bivort 1903, Varendorff 1903). After Bedel (1906) synonymized "*T. rosaceus* Kr., 1891" with "*T. gallicus* Heer, 1841", it went into oblivion again, with the exception of Everts (1922: 315) who used it in parallel with *T. gallicus* and *T. zonatus*. In 1960, Janssens (p. 353) reinstated Voet's name again, explicitly stating its priority. With some delay, *T. rosaceus* (Voet) became used as a valid name (e.g. Baraud, 1977), particularly in western Europe. Stebnicka (1983: 133) spoke against reinstating *T. rosaceus* (Voet) as a valid name, despite having priority, because it had largely been forgotten for two centuries. However, the usage of *T. rosaceus* increased further resulting in this name being currently as widely established as its synonym, *T. zonatus* (see above).

Although several of Voet's names are still in use, previous authors had already recognized that Voet did not adopt binominal nomenclature. Sherborn did not include Voet's names in his *Index Animalium* (Sherborn 1902). Everts (1922: 315) wrote: "Voet volgde nog niet de binominale nomenklatuur." Also Wiebes (1968: 27) noted correctly when discussing the nomenclature of a goliath beetle species: "While this appears to be the first description of the species now known as *Goliathus cacicus*, Voet cannot be maintained as its author, because his work does not satisfy the conditions of Art. 11 of the International Code of Zoological Nomenclature." In the current, 4th edition of the Code (International Commission on Zoological Nomenclature 1999), Article 11.4. requires for the availability of names that "The author must have consistently applied the Principle of Binominal Nomenclature [...] in the work in which the name or nomenclatural act was published." Since Voet used specific names consisting of one to three, occasionally five words, this requirement indeed is not fulfilled; hence the names contained in Voet (1766–1778) are unavailable.

In his German translation of Voet's work, Panzer (1802) added annotations and synonymy. Could Voet's names be available from this edition? Twenty years ago, I doubted the availability of Voet's names from Panzer's work (Krell & Fery 1992) and advised against using the name *Trichius rosaceus*. Certainly, Panzer followed the principles of binominal nomenclature in his own works. He also followed those principles in the synonymy he added to Voet's names: Whenever available he added a binomen from the available literature to Voet's names, but he left Voet's names unchanged, containing one to five words in the specific name. Therefore, Panzer's (1802) translated edition does not fulfill the requirements of Art. 11.4 either. I was unsuccessful in tracing another work published before Germar's (1831) description of the synonymous species *T. zonatus*, from which Voet's names would be available. The first author to make *Trichius rosaceus* available is Kraatz (1891) who therefore is to be considered the author of this name as Bedel (1906) did correctly.

***Trichius gallicus* Dejean, 1821 (valid species name)**

The oldest available name for the species called *Trichius rosaceus* Voet by the authors listed above and others is *Trichius gallicus* Dejean, 1821. Dejean (1821: 61) introduced *Trichius gallicus* as the valid name of *Trichius fasciatus* sensu Olivier. The type locality is Paris. Since no description was given, Dejean's name has long been considered a nomen nudum (Sherborn 1926: 2628; but see Hoeven 1856: 510) and therefore has been credited to Heer (1841), who supposedly was the first to publish a description of *Trichius gallicus*. However, Dejean's (1821) reference to "*Fasciatus*. Ol." fulfils the requirements of Article 12.2.1 (International Commission on Zoological Nomenclature 1999) for availability by indication: "a bibliographic reference to a previously published description or definition". The reference to Olivier's description of *Trichius fasciatus*, even if not fulfilling modern standards for bibliographic references, unambiguously refers to Olivier's (1789: Cétoine 61) description of *Cetonia fasciata*. However, the identity of Olivier's species cannot be determined from the description as it fits any of the European *Trichius* species. The abdomen is described as black, which is true for the females of all European species and also for the males of *T. fasciatus*. In his references, he refers to Voet's description, but also to Linnaeus's *Trichius fascia-*

tus. Olivier certainly subsumed at least two species under the name *Cetonia fasciata*. However, we can unequivocally determine the identity of *Trichius gallicus* Dejean, 1821, since later, Dejean (1829) himself, in a so far overlooked paper, described in detail the three *Trichius* species he mentioned in his catalogue. "*Trichius abdominalis*. Dej." from Austria is the species that we currently know as *Trichius sexualis* Bedel, 1906 (see Krell 2010) since Dejean (1829) describes the male abdomen of this species "dont les taches jaunes de l'avant-dernier segment sont plus grandes [in comparison to *T. gallicus*], et dont les segments antérieurs sont marqués d'une bande transversal, jaune, un peu écrançrée postérieurement dans son milieu." Dejean's *T. fasciatus* is, without doubt, *Trichius fasciatus* (Linnaeus, 1758) as this is the only species occurring in Sweden (Smetana 2006) and, as Dejean (1829) describes "Le dessous de l'abdomen du male n'a aucune tache jaune." *Trichius gallicus* (= *Trichius rosaceus* Kraatz) occurs in the former Swedish territories in Pomerania (Köhler & Klausnitzer 1998), but they were no longer Swedish at the time of publication of Dejean's catalogue (Hacker & Hardenberg 2003), and Dejean (1829) did not know this species from northern Germany. The third species, *T. gallicus*, is identical to the species we currently know as *T. rosaceus* or *T. zonatus*, because the male abdomen of *T. gallicus* "présente les taches jaunes indiquées par MM. Serville et comte de St.-Fargeau." Le Peletier de Saint-Fargeau & Serville (1828: 703) described under "*Trichie fascié, T. fasciatus*", which they misinterpreted, the abdomen of *T. gallicus*: "Le mâle a l'avant-dernier segment de l'abdomen en dessous [...] chargé à sa base de deux sections de cercle garnies d'écailles serrées, jaunâtres." Dejean had distinguished the three central European species correctly. Heer (1841) interpreted Dejean's *Trichius gallicus* correctly. *Trichius gallicus* Dejean, 1821 is the valid name for the species that is currently known as *T. rosaceus* and *T. zonatus*. Until the mid 1900s, *Trichius gallicus* had been in use as valid name mainly in western Europe and North Africa, e.g., by Houlbert & Monnot (1910), Bedel (1911), Martínez de la Escalera (1914), Doflein (1921), Abot (1928; "*T. zonatus* Germ. var. *gallicus* Heer"), Sainte-Claire Deville (1935; "[*zonatus* Germ.] var. *gallicus* Heer"), and Paulian (1941, 1959; "*Trichius zonatus* subsp. *gallicus* Heer"), until it was synonymized with *T. rosaceus* by Janssens (1960: 353). After Janssens, *T. gallicus* has rarely been used, but was not completely forgotten (see Bobîrnac *et al.* 1999: "*Trichius zonatus* Germ., ab. *gallicus* Herr"; Ádám 2003: "*Trichius zonatus* var. *gallicus* Heer, 1841"; Davidts 2006: "*Trichius gallicus*"). The name was used on a French postage due stamp in 1982 (see Lucht 1987). Its reinstatement, even with the different author Dejean, reviving the former use after a gap of 70 years, is unlikely to cause major confusion.

***Trichius zonatus* Germar, 1831 (valid subspecies name), lectotype designation**

The other name currently in use for the species called *Trichius rosaceus* Voet by the authors listed above and others is *Trichius zonatus* Germar, 1831. Germar described *Trichius zonatus* from Sardinia, Greece and Anatolia, Turkey. The distribution indicates that he might have subsumed more than one species under his name, namely the true *T. zonatus* from Sardinia plus one or two species that occur in Greece and Anatolia, because the only species occurring in Sardinia (Carpaneto & Piattella 1995) occurs neither in Greece nor Anatolia (Mikšić 1959; Baraud 1992, Carpaneto *et al.* 2000, Smetana 2006), but Germar's description of the white marks on the penultimate abdominal segment fits perfectly what we today call *T. zonatus* or *T. gallicus* and can be considered a species-specific character. Type material could neither be traced in the Museum für Naturkunde Berlin (J. Frisch *in litt.*, Apr. 2010) nor in the Deutsches Entomologisches Institut Müncheberg (L. Behne *in litt.*, Apr. 2011), nor in the Zoologische Sammlung der Martin-Luther-Universität Halle (K. Schneider *in litt.*, Jan. 2011). In Burmeister's collection in Halle, seven specimens of *T. zonatus* with locality 'Sardinien' are present, but according to Burmeister (1842: 760), he had only three specimens from Sardinia which he had received from Gené as *T. fasciolatus*. Five years after Germar, Gené (1836) described the same Sardinian taxon as *Trichius fasciolatus*, but soon recognized the synonymy himself (Gené 1839) and used *Trichius zonatus* Germar as the valid name.

According to his account, Burmeister did have Germar's types in his collection, a male and a female "aus dem Littoral", but they cannot be identified from the seven Sardinian specimens present today. The Germar collection was split up and distributed by Hermann Rudolph Schaum (Horn *et al.* 1990) who certainly kept Cetoniinae (including Trichiini) for his own collection. Those went via A. Melly to the Muséum d'Histoire Naturelle in Geneva in 1843 (Horn *et al.* 1990) where one of the syntypes of *Trichius zonatus* could be traced. This specimen is a male and is herewith **designated as the lectotype** of *Trichius zonatus* Germar, 1831 (Figs 1–3). The lectotype corresponds to original description and engraving with the exception of the inner spot of the pre-apical yellow band

on the elytra. This spot clearly protrudes toward the apex in the lectotype whereas it is shown as a narrow transversal band in the original engraving. This is well within the intraspecific variation (see Ballerio *et al.* 2010) and might mean that the illustrator used another specimen from the type series. The lectotype has the following labels (Fig. 4): tiny silver quadrate, “zonatus / Germ. typ.” [handwritten by H.R. Schaum], “Schaum. / TYPE” [first line handwritten], “Coll.Melly” [typeset], “LECTOTYPUS / Trichius / zonatus GERMAR 1831 / des. F.-T. Krell 2011” [handwritten on red cardboard].

Identification of the lectotype. The specimen (Figs 1–3) is fragile, but almost complete, with only the left protarsomeres III–V, the right protarsomeres II–V and the left metatarsal claw missing. The male lectotype, bearing a white stripe on each side of the penultimate sternite (Fig. 3), together with the anterior black elytral band being restricted to the humeral region (Fig. 1) and the mesotibiae being only slightly emarginated laterally, is clearly identifiable as the species currently called *T. rosaceus* or *T. zonatus*. The extended black coloration on the posterior part of the elytra (Fig. 1) together with the shorter pronotal setae leaving a small discal area bald indicates that the specimen belongs to the Sardinian-North African subspecies (Paulian & Baraud 1982; Dutto 2005; figures in Baraud 1985 and Ballerio *et al.* 2010).



FIGURES 1–4. Lectotype of *Trichius zonatus* Germar, 1831. Fig. 1, dorsal. Fig. 2, lateral, left side. Fig. 3, ventral. Fig. 4, labels.

Correct synonymy

With the name "*Trichius rosaceus* Voet" being unavailable, and *T. gallicus* being the oldest available name for the species I suggest to apply the name *T. gallicus zonatus* to the Sardinian populations, which would also include the

North African populations. The other Palaearctic populations would be named *T. gallicus gallicus* Dejean.

I propose the following synonymies:

a) at the species level:

Trichius gallicus Dejean, 1821: 61

?= “*Scarabaeus rosaceus*” Voet, 1766–1778: 12 (unavailable and dubious)

= *Trichius zonatus* Germar, 1831 (junior synonym)

= *Trichius fasciolatus* Gené, 1836 (junior synonym)

= *Trichius rosaceus* Kraatz, 1891: 193 (junior synonym)

b) at the subspecies level:

Trichius gallicus gallicus Dejean, 1821: 61

?= “*Scarabaeus rosaceus*” Voet, 1766–1778: 12 (unavailable and dubious)

= *Trichius rosaceus* Kraatz, 1891: 193 (junior synonym)

Trichius gallicus zonatus Germar, 1831

= *Trichius fasciolatus* Gené, 1836 (junior synonym)

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