

Research articleSubmitted: September 6th, 2017 - Accepted: November 24th, 2017 - Published: December 29th, 2017***Breviclypeus*, a new South African Trichiina genus
(Coleoptera: Scarabaeidae, Cetoniinae)**Enrico RICCHIARDI^{1,*}, Renzo PERISSINOTTO², Lynette CLENNELL³¹ Corso A. Tassoni 79/4, 10143 Torino, Italy - alericor@fastwebnet.it² School of Environmental Sciences, Nelson Mandela University - PO Box 77000, Port Elizabeth 6031, South Africa³ Macau Anglican College - 109-117 Avenida Padre Tomas Pereira Taipa, Macau, China

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Abstract

A new genus, *Breviclypeus* gen. nov., endemic to South Africa, is erected. The type species is here designated to be *Agenius rufipennis* Gory & Percheron 1833 (**comb. nov.**). A second species, *Campulipus plagosus* (Péringuey, 1885) is recognized to belong into this new genus (comb. nov.). Consequently, the genus *Campulipus* Kirby, 1827 is now represented by three species only, *Campulipus limbatus* (Olivier, 1789), *Campulipus clavus* (Schaum, 1844) and *Campulipus suturalis* (Waterhouse, 1885). A fourth taxon, *Agenius nobilis* J. Thomson, 1878 is here transferred to *Campulipus* (**comb. nov.**) and synonymized with *C. limbatus* (**syn. nov.**) The two genera not only exhibit key morphological differences, but also occupy different habitats and diverge substantially in their ecology. An updated key of the genera of South African Trichiina is also provided. A separate key is provided for the genus *Breviclypeus*.

Key words: Scarabaeidae, Cetoniinae, *Breviclypeus*, new genus, new synonymy, South Africa.

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Introduction

This work, like previous others (Ricchiardi 1997, 1998, 1999, 2000, 2015; Ricchiardi et al. 2004, 2008, 2013, 2014; Sipek et al. 2012) is aimed at enhancing knowledge of the rich Trichiina entomofauna of South Africa. Including those analysed in this study, the total number of South African Trichiina species currently stands at 39, with the description of a 40th currently in progress (Ricchiardi, in press). These are subdivided into 12 genera, three of which are not endemic to the country, namely *Calometopus* Blanchard, 1850, *Diploa* Kolbe, 1893 and *Myodermum* Burmeister & Schaum, 1840 (Ricchiardi 1997).

A recent review of large numbers of specimens repositied in several museums and private collections has led to the conclusion that the erection of a new genus is actually necessary, in order to account for the broad morphological differences observed among the six member species that currently constitute the genus *Campulipus* Kirby, 1827. Some of these differences were already pointed out by Péringuey (1907), who had included them in his dichotomous key (Péringuey 1907, pag. 301), without though recognising the need for the species attributed at that stage to the genus *Agenius* Serville, 1828 (synonymized with *Campulipus* Kirby, 1827 by Krikken in 1984) to be grouped into two different genera. Upon implementing the separation into separate genera, the species that truly belong

to *Campulipus* are: *C. clavus* (Schaum, 1844), *C. limbatus* (Olivier, 1789), *C. nobilis* (Thomson, 1878; new combination) and *C. suturalis* (Waterhouse, 1885). *Campulipus nobilis* was placed within the genus *Agenius* by Schenkling (1922), but its holotype specimen, repositied in the MNHN, is here recognised as a female of *C. limbatus* (new junior synonym). The remaining species, *C. plagosus* Péringuey, 1885 and *C. rufipennis* (Gory & Percheron, 1833) are now placed in a new genus, *Breviclypeus* Ricchiardi (gen. nov., comb. nov.), on the basis of at least two major synapomorphic characters.

E. Ricchiardi wrote the taxonomical part of this study, including the descriptions of the new genus. Renzo Perissinotto and Lynette Clennell contributed all biological and ecological observations.

Material and methods

Specimens length was measured between the apex of the pygidium and the anterior margin of the pronotum. The specimen width is the maximum elytron width. The clypeus length was measured laterally, between the frontal margin and the antennal basal attachment.

Photographs were taken using a Nikon DigitalSight DS-Fi2 camera attached to a Nikon SMZ25 dissecting microscope, or alternatively with a Nikon Coolpix P7700 at-

tached to one of the eyepieces of a Wild dissecting microscope. All photos were processed with photo stacking software (Zerene Stacker Version 1.04 Build T20510021255, <http://www.zerene.com> [accessed 9 Dec. 2015]) and backgrounds were removed using GIMP 2.8.16, in order to increase contrast. Individual photograms were finally merged to generate composite images using the same GIMP software.

The maps reported in Fig 3 were obtained using Google Earth Pro 7.1.5.1557.

The following abbreviations are used to denote the housing location of the study material:

- DMSA** Durban Natural Science Museum, Durban, South Africa
- ERPC** Enrico Ricchiardi collection, Torino, Italy
- ISAM** Iziko South African Museum, Cape Town, South Africa
- MNHN** Musée National d’Histoire Naturelle, Paris, France
- RPPC** Renzo Perissinotto & Lynette Clennell Private Collection, Port Elizabeth, South Africa
- SANC** South African National Collection of Insects, Pretoria, South Africa

Results

The only revision undertaken so far for the genus *Agenius* Le Peletier & Serville, 1828 (including *Campulipus* Kirby, 1827, as motivated here below) was published by Pé-

ringuey (1907) at the beginning of the previous century. According to this author, *Agenius* included five species, but the number was later increased to six by Schenkling (1922), who added *Agenius nobilis* J. Thomson, 1878, previously unnoticed by Péringuey (1907).

In his literature review, Krikken (1984, p. 40), realised that the correct year of publication of the genus *Agenius* by Le Peletier & Serville was 1828, while Kirby had already erected the genus *Campulipus* in 1827, using the same type species, namely *Melolontha limbata* Olivier, 1789. The latter name was thus regarded as senior to *Agenius*. In the same review, Krikken (1984) indicated that the genus *Campulipus* included nine species, without though naming them. A list of nine species, probably representing the same set intended by Krikken (1984), was eventually published by Krajcik (1999) and included the six highlighted earlier by Schenkling (1922) with the addition of another three, erroneously associated with *Campulipus*. These, however, belongs to the Afrotropical genus *Clastocnemis* Burmeister & Schaum, 1840 and are actually unrelated to *Campulipus*. They are: *Clastocnemis nigrifulus* (Burgeon, 1934); *Clastocnemis simulator* (Burgeon, 1934) and *Clastocnemis tabaccoi* (Burgeon, 1935).

The recent study of numerous material, both old and new, including most type specimens has revealed that two species known as *Campulipus rufipennis* (Gory & Percheron, 1833) and *Campulipus plagosus* (Péringuey, 1885) exhibit several key morphological characters (e.g. shape of male mesotibiae, clypeal structure of both sexes, etc.) that require the erection of a new genus, *Breviclypeus* Ric-



Fig. 1 – Distribution map of the species belonging to *Breviclypeus* gen. nov. **P** (yellow marks), *Breviclypeus plagosus* (Péringuey, 1885); **R** (pink marks), *Breviclypeus rufipennis* (Gory & Percheron, 1833) (Inserted on Google Earth map).

chiardi gen. nov. While *Brevichypeus plagosus* (Péringuey, 1885) comb. nov. is a species widely distributed throughout the eastern and central parts of South Africa, the second species belonging to this genus, *Brevichypeus rufipennis* (Gory & Percheron, 1833) comb. nov., appears to be restricted to the southern part of the Western Cape and is currently known from a few records only. Indeed, Péringuey (1907) had already noted its rarity and remarked as follows: “I have seen two males only of this seemingly rare species”. Since then, most of the new specimens have been collected by two of the authors of this work (RP & LC).

Taxonomy. Genus *Brevichypeus* Ricchiardi gen. nov.

Type species. *Agenius plagosus* Péringuey 1885.

Description (Figs 2, 3)

Head. ♂ black, glabrous, slightly shining, shagreened; ♀ black, glabrous, matt, markedly sculptured but sometimes effaced on clypeus (one ♀ exhibits anterior clypeal margin smooth and external protibial teeth worn – most likely as a result of burrowing into soil). Antennal clubs slightly arched in ♂ and less than 1.5 times the clypeus in length; antennal club of ♀ shorter and virtually straight. Internal antennal club of both sexes with recumbent, thick, short, testaceous setae on external surface. Antennal scapus and clubs black; other segments testaceous. Clypeus broader than long in both sexes, and: ♂, anterior margin centrally

straight, anterior corners strongly rounded, lateral margins rounded, posteriorly narrowing, all margins elevated and rounded; ♀ maximum width at middle of total length; anterior margin tapering.

Pronotum. Hexagonal, centrally prominent at sides, front corner produced and widely rounded, hind corner pointed or rounded, laterally not crenulated, lateral foveas absent, emarginate along full perimeter except at centre of posterior margin; without any cretaceous markings or maculae; ♂ black, glabrous, shiny, covered with scattered, rounded, small punctures; ♀ glabrous on disc; with very scattered, long, laterally erected, black setae on lateral margins. **Scutellum.** Black, as broad as long, arched at sides, apex rounded, covered with large, scattered punctures; or covered with small, scattered punctures.

Elytron. ♂: shiny orange, with a black juxta-sutural band not reaching scutellum, enlarged at middle to form a semi-oval (oval with both elytra combined) black macula; or orange, with a black juxta-sutural band not reaching scutellum, sometimes enlarged at centre; ♀: same colour as male (*B. rufipennis*) or black (*B. plagosus*). Elytron of ♂ occasionally exhibiting small cretaceous macula at centre of disc. Striae in ♂ with row of large, nearly regularly spaced punctures; or with row of small, slightly darker, nearly regularly spaced punctures. Striae in ♀ effaced or with rows of deep, large, regularly spaced punctures. Interstriae in both sexes mainly glabrous, unpunctured, flat, or first 5 and external margin of juxta-sutural interstria raised with

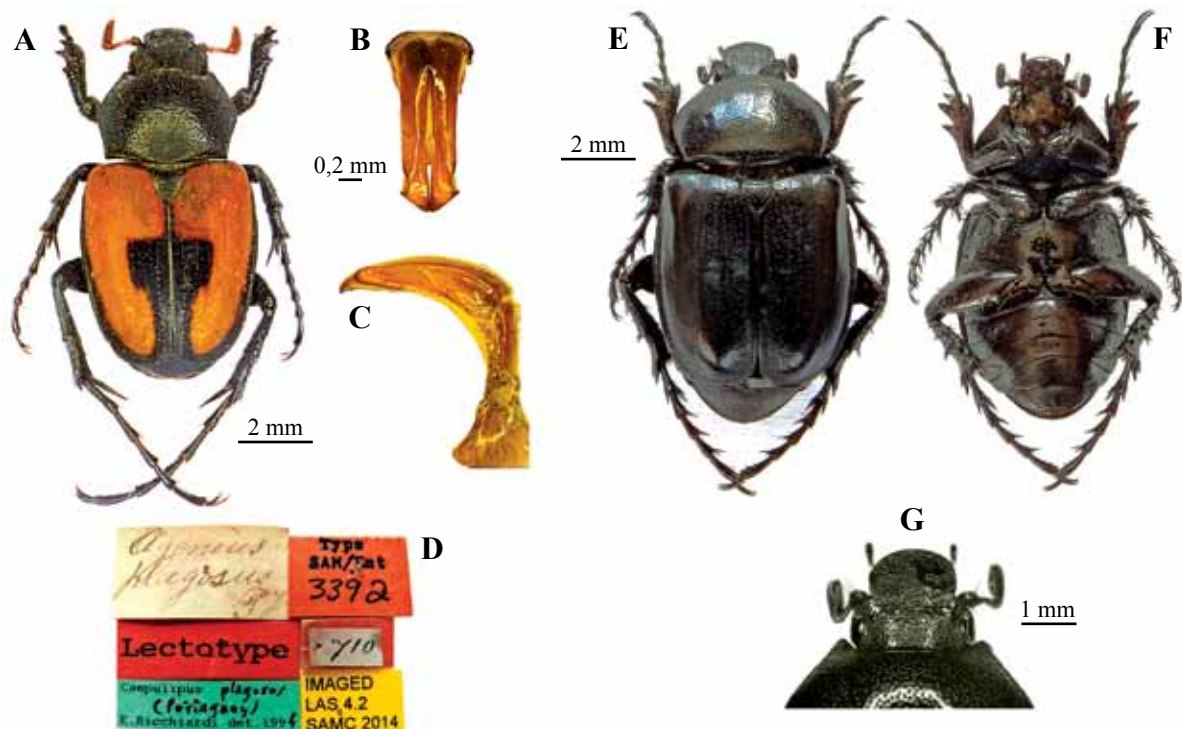


Fig. 2 – *Brevichypeus plagosus* (Péringuey, 1885). Lectotype ♂, here designated (ISAM): A, habitus, dorsal view; B, aedeagus, anterior view; C, aedeagus, lateral view; D, labels; ♀, Umtamvuna: E, habitus, dorsal view; F, habitus, ventral view; G, details of clypeus (Photos: Lynette Clennell).

horizontal and shiny rows. Juxta-sutural margin elevated in both sexes.

Pygidium. Black, wrinkled, nearly matt, without any cretaceous maculae; ♂ triangular, broader than long, dorsal margin semi-circular; ♀ triangular, longer than wide, dorsal and ventral margins rounded, laterally depressed in ventral half.

Abdomen. Black, without any cretaceous markings; ♂ slightly medially depressed, not hollowed longitudinally, anal sternites rounded; ♀ anal sternites shagreened.

Protibia. Black, externally tridentate; first two teeth closer to each other than third; ♀ with protibia larger than in male; ♂ first protarsal segment not laterally dilated, much shorter than second; protibial spur normally developed.

Mesotibia. Black. ♂ nearly straight, strongly enlarged apically, with a marked central tooth. Internal apical spur half as long as external.

Metatibia. Black, first metatarsal segment longer than second; ♂ nearly straight, with strong central tooth, strongly enlarged apically with long, sharp tip at dorsal apical corner; ♀ enlarging towards apex, with central very noticeable tooth, with dorsal apical corner sharply spiny.

Diagnosis. While both genera, *Brevichypeus* and *Campulipus*, exhibit a superficially similar habitus (e.g. elytral ornamentation), they can be separated on the basis of numerous diagnostic characters. In general, *Campulipus* species are also larger in size (12–18 mm) than their *Brevichypeus* counterparts (9–12 mm).

The head of *Campulipus* male is black, with surface covered in small, round punctures and long testaceous setae, generally bent backwards. The head of *Brevichypeus* is also black, shagreened and glabrous. The clypeus of *Campulipus* is as wide (as measured at its maximum width, at mid length of the clypeus) as long, emarginate and raised along the margins. In *Brevichypeus*, however, the clypeus is wider than long, raised and rounded along the entire perimeter, but narrowing posteriorly.

In female *Campulipus*, the clypeus is slightly less wide than long (at maximum width), with the anterior margin narrowing significantly. In female *Brevichypeus* the clypeus is notably wider than long (at maximum width), but again with a narrowing anterior margin. Some female *B. plagosus* specimens exhibit a clypeal shape worn-out due to burrowing activity. In *Campulipus*, the pronotum is emarginate along the entire perimeter in both sexes, and the lateral foveas are always present. In *Brevichypeus*, on the other hand, the lateral foveas are completely lacking and the emargination along the perimeter is interrupted at the centre of the posterior margin. In *Campulipus*, the male pronotum is black (occasionally with two lateral reddish bands not reaching the margins), covered in dense round punctures, effaced at sides and bearing long testaceous setae folded backwards. While the male pronotum of *Brevichypeus* is also black, shining, glabrous and covered in small and scattered punctures. The pronotum of *Campulipus* fe-

male is black and glabrous, apart from its lateral margins where numerous horizontal black setae protrude. In female *Brevichypeus*, the pronotum is also black and glabrous, but it exhibits only a few lateral setae. The scutellum of *Campulipus* is covered in frosted black coating, while that of *Brevichypeus* is not. In male *Campulipus*, the background colour of the elytra is generally reddish-orange, with black ornamentation varying from species to species. The females of *Campulipus* exhibit ornamentation similar to that of their male counterparts (e.g. *C. limbatus*), or at least have some reddish areas on the elytral surface, but can also be completely black and matt. Conversely, the elytral colour in male *Brevichypeus* is dark yellow to reddish-orange, with consistent black ornamentation. In *Brevichypeus* females, the elytral ornamentation can be similar to that of males (*B. rufipennis*) or completely black (*B. plagosus*). In both sexes of *Campulipus*, the protibiae are externally tridentate, with all teeth equally spaced. In *Brevichypeus*, protibiae are also tridentate, but the third tooth is further apart than the other two. The mesotibiae in male *Campulipus* are black and strongly bent, while in male *Brevichypeus* these are black but only slightly arched. Finally, the male metatibiae of *Campulipus* are black, markedly expanded at the apex and bearing a very visible tooth at the centre of the dorsal margin. The metatibiae of male *Brevichypeus* are similar, but exhibit an additional long and sharp tooth at the dorsal corner of the apex. Similarly, the metatibiae of female *Brevichypeus* bear a tooth at the dorso-apical corner, but this is less pronounced than in the male.

Derivatio nominis. The genus name is derived from its characteristically short clypeus, substantially reduced in comparison to that of species belonging to *Campulipus*.

Remarks. No female of either species has been previously described, thus this is the first account of this sex for the genus. Concerning biology/ecology, members of the genus *Brevichypeus* emerge from the soil immediately after substantial rainfall events during spring and summer. Adults have never been observed on either flowers, fruits or sapping trees and, therefore, are most likely non-feeding stages. This is reflected in their period of activity, which is normally restricted to a few days after rain. Males are far more active than females and take off around mid-morning (10:00–11:00), as soon as the temperature has reached a critical threshold of > 23 °C, after climbing up grass stems, blades and/or bush branches to reach a high point within their grassland habitat. They then fly at high speed, but relatively low above the grass searching for female pheromonal signals. Females are generally found crawling on the ground within the grassland and move slowly from one egg-laying point to the next. They are nevertheless fully winged and capable of undertaking substantial flights, particularly towards the end of their life span.

Conversely, within the genus *Campulipus*, both males and females are regularly found feeding on a variety of

flowers either in typical succulent Karoo or fynbos plant species (e.g. *Ruschia* spp., *Delosperma* spp., *Lampranthus* spp.; Mesembryanthemaceae). Thus, most of the day in these species is actually spent renewing their energy reserves, while also mating on the same feeding plants. As a result, individuals remain alive and active for relatively long periods, possibly about 2-4 weeks or longer.

Brevichypeus plagosus (Péringuey, 1885) **comb. nov.**
(Fig. 2)

Type series. Lectotype ♂ ISAM (here designated), MPU, Leydenburg (Lydenburg), SAM-ENT Type 3392.

Other material studied

Republic of South Africa: Western Cape, Swellendam, Tradouw Pass, Nov 1925, 1 ♂ (ISAM), 1 ♂ (ERPC); 1 ♀ (ISAM), Zwartberg Pass, P. Albert Division, 5000-6000', Nov 1929, K.H. Barnard legit; 2 ♂♂ (ERPC), Prince Albert, Nov 1995, R. Lizler legit; 1 ♀ (RPPC), Elandsberg, 11 Nov 2013, R. Perissinotto & L. Clennell legit. **Republic of South Africa:** Eastern Cape, Grahamstown, CP, Faraway Farm, 33°20'S, 26°28'E, 22 Oct 1988, R. Oberprieler legit, 1 ♂ (SANC); Winterberg, 12 Dec 1988, R. Perissinotto & L. Clennell legit, 1 ♂ (ERPC); Bosberg N.R., 15 Mar 1997, R. Perissinotto & L. Clennell legit, 1 ♀ (ERPC); Compassberg, 28 Nov 1997, R. Perissinotto & L. Clennell legit, 1 ♀ (ERPC); Lady Grey, 3 Jan 2013, R. Perissinotto & L. Clennell legit, 1 ♂, 1 ♀ (RPPC); Willowmore, 24 Dec 2004, R. Perissinotto & L. Clennell legit, 1 ♂ (RPPC); Baviaanskloof, 25 Dec 1999, R. Perissinotto & L. Clennell legit, 1 ♀ (RPPC); Hofmeyr, 14 Mar 2015, R. Perissinotto & L. Clennell legit, 1 ♀ (RPPC); Joubertina, 6 Jan 2012, R. Perissinotto & L. Clennell legit, 1 ♀ (RPPC); Sneeuweburg, 20 Dec 1999, R. Perissinotto & L. Clennell legit 1 ♀ (RPPC); Winterberg, 17 Dec 2012, R. Perissinotto & L. Clennell legit, 1 ♀ (RPPC); Nature's Valley, 17 Oct 2015, R. Perissinotto & L. Clennell legit., 1 ♀ (RPPC). **Republic of South Africa:** KwaZulu-Natal, Karkloof Nature Reserve, Melmoth section, DDS -29,28415, DDE 30,28557, 5 Nov 2012, in short, thick grassland with rock patches next to a seep and near a stream, A.J. Armstrong, L. Joubert et al. legit, 1 ♂ (DMSA); Blinkwater Nature Reserve, DDS -29,24038, DDE 30,45993, 18 Nov 2013, in short, rocky grassland with many forbs, hillside, A.J. Armstrong, A. Gomez & L. Mthembu legit, 1 ♂ (DMSA); Nkandla Forest Reserve, 28°45'S, 31°10'E, 22 Oct 1982, P. Reavell legit, 1 ♂ (SANC); Weza, Impetyene grassveld, 30.37S 29.42E, Flowering grassveld, 19 Nov 1989, Endrödy & Klimaszew legit, 1 ♂ (TMSA), 1 ♂ (ERPC); Umtamvuna (30°58'S 30°09'E), 21 Nov 1998, R. Perissinotto & L. Clennell legit, 5 ♂♂ (RPPC), 4 ♂♂, 1 ♀ (ERPC); Bulwer, 5 Nov 2000, R. Perissinotto & L. Clennell legit, 2 ♂♂ (RPPC); Umtamvuna, 7 Nov 1998, R. Perissinotto & L. Clennell legit 1 ♂ (RPPC); same data

but 4 Dec 1999 1 ♂ (RPPC); same data but 3 Dec 1999, 1 ♂ (RPPC); same data but 28 Nov 1999, 1 ♀ (RPPC); Cobham, Drakensberg, 28 Nov 1999, R. Perissinotto & L. Clennell legit., 1 ♀ (RPPC). **Republic of South Africa:** Mpumalanga, Dirkiesdorp, 23 Dec 2005, R. Perissinotto & L. Clennell legit, 1 ♂ (RPPC).

Intersexual differences. Size: ♀ generally slightly larger than ♂.

Colour. ♂: glabrous, black, with antennae flavescent, and elytra pale yellow to reddish, but marginated with black and having a broad sutural band reaching the suture from the apex to the median part, where it expands into a quadrate patch. ♀: glabrous, black, occasionally with humeral umbones faintly reddish-brown.

Head. ♂: clypeus short, concave, slightly arcuate in front, margins reflexed and not thick; head and clypeus glabrous and covered with deep, nearly contiguous punctures. ♀: clypeus virtually flat, slightly elevated at centre; margins not reflexed.

Pronotum. ♂: Black, slightly shiny; covered in large and deep punctures, occasionally scattered; sub-angular laterally shortly before the median part and evenly attenuate thence to the apex or the base, which is bi-sinuate with angles acute; all margins exhibiting continuous groove parallel to edge, except on central part of posterior margin. ♀: black, matt or slightly shiny, with same shape and margins as in male; punctures are however denser, deeper and larger.

Elytra. ♂: slightly widened laterally in the median part, narrower at apex than at base: striae and interstriae marked with lines of round punctures, shallow and not incised. ♀: striae incised and marked with dense, horse-shoe punctures, deeper than in male. Interstriae slightly arched and centrally marked with lines of punctures similar to those of male, occasionally interrupted by roughness.

Mesotibia and metatibia. Tibial apex substantially more expanded in female than in male.

Venter. Substantially more convex in female.

Anal sternites. Longer in female than in male.

Distribution. *Brevichypeus plagosus* is a species with wide distribution range within South Africa, from Mpumalanga and KwaZulu-Natal in the east to the eastern part of the Western Cape (Fig. 1).

Remarks. In his original description, Péringuey (1885) did not specify the number of specimens examined in his work. For this reason, the type specimen deposited at the ISAM (TYPE 3392) is here designated as Lectotype. Judging from available records, the flight period of *B. plagosus* appears to be relatively long, with collecting dates ranging from 22 October to 6 January. On two occasions, two of the authors (RP and LC) have collected females at the end of the summer, on 14 and 15 March, respectively. The first was retrieved from Hofmeyr, but it was already dead and

resting inside the crown of a plant of *Aloe broomii*, where it has been observed that carcasses are preserved in good conditions for long periods. The second was found in the Bosberg Nature Reserve but unfortunately there is no information available on its state (dead or alive) at the time of collection.

***Breviclypeus rufipennis* (Gory et Percheron, 1833) comb. nov.** (Fig. 3)

Type series. Not traced.

Other material studied. Republic of South Africa: Western Cape, Agulhas N.P., Soutanysberg, 13 Sep 2006, R. Perissinotto & L. Clennell legit, 1 ♂, 1 ♀ (ERPC), 2 ♂♂ (RPPC); Pearly Beach, Bredasdorp, SAM-COL-A032085, 1 ♂ (ISAM); Limietberge, 33.33S, 19.07E, Grassnet, 850–1000 m, 7 Nov 1973, Endrödy-Younga legit, 1 ♂ (TMSA).

Remarks. Unfortunately, the holotype designated by Gory for this species has yet to be traced. However, both drawings and description contained in the work of Gory & Percheron (1833, Plate II, Figure 5) match well the specimens included in this study.

B. rufipennis is a species very poorly collected. In-

deed, the majority of specimens currently available have been collected by two of the authors (RP and LC). Already in 1907, Péringuey had defined this species as “rare”. As our knowledge currently stands, the species is only known from three localities, two on the southernmost coastal area of the Western Cape (Cape Agulhas and Pearly Beach) and the third in a mountainous area above the town of Wellington, at an altitude of about 850–1000 m (Limietberge). The female was previously unknown and the recent collection of one specimen in the Agulhas National Park has finally allowed its description and the identification of differences from its male counterpart, as follows. Unlike the pattern observed in the only other species of this genus, *B. plagosus*, where the female elytra are completely black, the elytra of *B. rufipennis* female exhibit an ornamentation similar to that of its male. Among the five males currently known for this species, two have a small cretaceous spot at the centre of each elytral disc and the shape of the anterior part of the black area towards the sutural margin of the elytra is noticeably more expanded than in those males that do not exhibit the cretaceous spots (Fig. 3B).

Intersexual differences

Size. The only known female is significantly longer than the males (12 mm versus 9.5–10 mm).

Colour. ♂: glabrous, black, with antennas flavescent, elytra

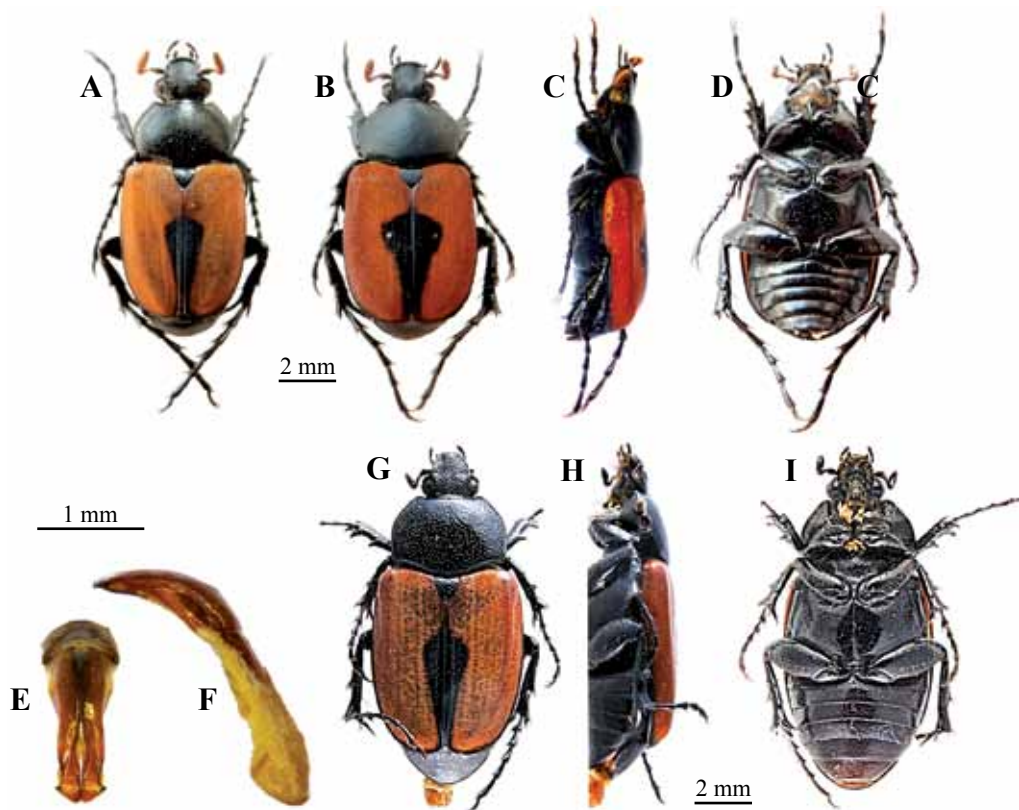


Fig. 3 – *Breviclypeus rufipennis* (Gory & Percheron, 1833), comb. nov. ♂: **A**, dorsal habitus; **B**, ♂ with cretaceous markings on elytral disk; **C**, ditto, lateral view; **D**, ditto, ventral view; **E-F**, ditto, aedeagus in frontal and lateral views; ♀: **G**, dorsal view; **H**, lateral view; **I**, ventral view (Agulhas N.P., Western Cape) (Photos: A-F, Lynette Clennell; G-I, Enrico Ricchiardi).

pale yellow to reddish, not margined with black but with black sutural band reaching the suture from apex to median part, where it expands to assume elliptical shape. ♀: glabrous, colours of elytra as in ♂.

Head. ♂: clypeus short, concave, slightly arcuate in front, margins reflexed and moderately thickened; head and clypeus glabrous and covered with deep, nearly contiguous punctures. ♀: clypeus virtually flat, slightly raised at middle; margins not reflexed; head and clypeus both with rough but shiny surface.

Pronotum. ♂: black, glabrous and shiny; covered in small, shallow and scattered punctures; sub-angular laterally just anterior of median part and evenly attenuate thence to the apex or the base, which is bi-sinuate with angles acute; groove running parallel to the edge on all margins, except at centre of posterior. ♀: black, glabrous and shiny, with shape and margins similar to those of male; punctures as in male.

Elytra. ♂: Slightly expanded laterally in the median part and narrower at apex than at base; striae not incised and interstriae marked with lines of round, shallow punctures. ♀: as in male.

Mesotibia and metatibia. Apex of female tibiae slightly more expanded than in male.

Venter. Substantially more convex in female than in male.

Anal sternites. Longer in female than in male.

Genus *Campulipus* Kirby, 1827

Campulipus limbatus (Olivier, 1789) (Fig. 4)
= *Agenius* Le Peletier & Serville, 1828 (Krikken, 1984)

Last synopsis. Péringuey, 1907 sub *Agenius*.

Type species. *Melolontha limbata* Olivier, 1789, for original designation.

Updated key to South African Trichiina genera

1. Abdominal tergites not covered by elytra in dorsal view *Calometopus* Blanchard, 1850
- Abdominal tergites covered by elytra in dorsal view 2
2. Elytral lateral ridge near lateral margin absent 3
- Elytral lateral ridge present on most of lateral margin 4
3. Posterior pronotal corners widely rounded; mesosternal process present, but not visible in side view
..... *Myodermum* Burmeister et Schaum, 1840
- Posterior pronotal corners rounded or angled; mesosternal process absent *Diploa* Kolbe 1892
4. First metatarsal segment longer than second 5
- First metatarsal segment approximately as long as second .. 9
5. Pronotum length > than 0.5 times elytral length; body large (length 20.3 mm, width 11.0 mm; glabrous, slightly shiny, black *Camapterus* Ricchiardi, 2000
- Pronotum length < than 0.5 times elytral length; body smaller, orange-red, but female often black or dark brown 6
6. Metatibial apex with marked dorsal or ventral projection .. 7

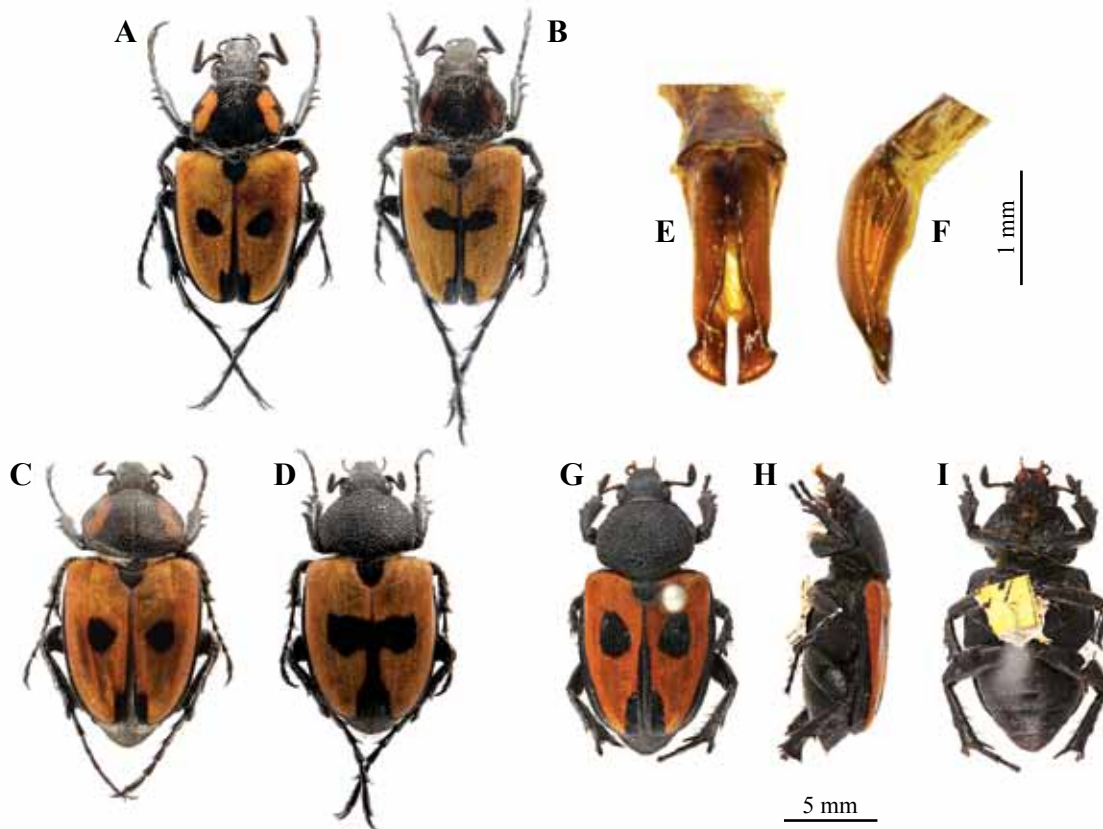


Fig. 4 – *Campulipus limbatus* (Olivier, 1789), Variation of elytral pattern; **A, B** : ♂ habitus, dorsal view; **C, D** : ♀ habitus, dorsal view ; **E, F** : aedeagus. **G, H, I** : *Agenius nobilis* J. Thomson, 1878, Lectotype ♀ (MNHN) (Photos: A-F, Lynette Clennell; G-I, Antoine Mantilleri).

- Metatibia apex without any dorsal or ventral projections, or with poorly developed projection 9
- 7. Metatibial apex with dorsal projection *Breviclypeus* gen. nov.
- Metatibial apex with long, pointed, ventral projection 8
- 8. Metatibial apex of male much longer than single metatibial spur; female metatibial apex truncate with two spurs *Brachagenius* Kraatz, 1890
- Metatibial apex slightly pronounced in male, truncate in female, with two spurs *Elpidus* Péringuey, 1907
- 9. Clypeus as wide as long; mesotibia of male strongly bent outwardly *Campulipus* Kirby, 1827
- Clypeus wider than long; mesotibia of male gently arching outwardly 10
- 10. Metatibial apex strongly enlarged 11
- 11. Metatibial apex slightly enlarged 12
- 11. Metafemora enlarged (maximum width larger than 0.5 its length); length of protarsal claws > 0.8 that of last tarsal segment *Pseudostegopterus* Ricchiardi, 2015
- Metafemora slender (width less than 0.25 its length); length of protarsal claws at least 0.7 that of last tarsal segment *Stegopterus* Burmeister et Schaum, 1840
- 12. Pronotum covered with very scattered setae (even if locally dense); female with normal wings *Stripsipher* Gory et Percheron, 1833
- Pronotum covered with dense, long setae; male elytra light brown; female smaller, completely black or dark brown, brachypterous .. *Eriopeltastes* Burmeister et Schaum, 1840.

Key to *Breviclypeus* species

- 1. Elytra not narrowing at apex, reddish-orange, with narrow sutural black band slightly dilated at centre; female with elytral ornamentation similar to that of male *rufipennis* (Gory et Percheron, 1833)
- Elytra narrowing gently towards apex, testaceous, with median quadrate black patch continuing as broad band along the suture, outer margin black; female black *plagosus* (Péringuey, 1885)

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