Fragmenta entomologica, Roma, 45 (1-2): 17-24 (2013)

A NEW SPECIES OF *TRECHUS* FROM THE ETHIOPIAN PLATEAU (Coleoptera, Carabidae)

PAOLO MAGRINI (*), ÉRIC QUÉINNEC (**) and AUGUSTO VIGNA TAGLIANTI (***)

In the present note we describe a new species of *Trechus* (s. str.) from the Ethiopian Tableland, collected many years ago by one of us (AVT) on the Bale mountains and recently recollected by another one of us (EQ) (Brignoli et al. 1978; Quéinnec in litteris).

The volcanic massif of Bale-Arsi, on the south-eastern end of the high Ethiopic mountains, and on the eastern side of the Rift Valley, covers more than 2600 square kilometers and reaches 4377 m a.s.l. with Mount Tullu Deemtu. On its spurs, starting from about 3500 m, the amplest afroalpine tableland (1000 square Km) spreads out, under extreme climatic conditions. This particular ecosystem is subject to a great range of diurnal temperature, up to 40°C in the dry season (-15°C to +26°C), to fierce winds and to a long rainy season from March to October (Hillmann 1986). It is a hotspot of biodiversity and shows a remarkable concentration of endemisms; it is National Park since 1971 (Hillmann 1986). On the huge Sanetti Plateau, as well as on the inaccessible peaks more to the NW (Mount Sgona, Mount Batu, etc.), the afroalpine vegetation is typified by *Helichrysum splendidum-Alchemilla haumanni* communities, by more or less dense concentrations of giant *Lobelia*, endemic from Ethiopia (*L. rhynchopetalum*) and by sparse and shrubby *Erica* spp. communities (mostly *Erica trimera*), whose size is much reduced by the altitude and climatic conditions (Miehe & Miehe 1994). This natural habitat is dwelled by several endemic mammals: rodents, giant mole-rats, rock hyraxes and the Ethiopian wolf (*Canis simensis*). The insect com-

(*) Museo di Storia Naturale dell'Università di Firenze, Sezione di Zoologia "La Specola", Via Romana,17 - 50125 Firenze (Italy) (freelance). Private: Via Gianfilippo Braccini, 7 - 50141 Firenze (Italy). E-mail: duvalius@paolomagrini.it

(**) Systématique, Adaptation, Evolution, UMR 7138 CNRS, Université P. & M. Curie, 7 quai Saint Bernard-Bat.A, 4ème étage - 439 F-75005 Paris (France).
E-mail: eric.queinnec@snv.jussieu.fr

(***) Dipartimento di Biologia e Biotecnologie "Charles Darwin" (Zoologia), Università degli Studi "Sapienza", Viale dell'Università, 32 - 00185 Roma (Italy).
E-mail: augusto.vignataglianti@uniroma1.it

munities have been little studied; they are well diversified and are mainly composed of Coleoptera, Dermaptera and Diptera adapted to mountain, endogeous or sometimes hypogeous environments. Within Carabids (Coleoptera), several species of endemic Trechinae from the Bale massif were described in recent years (Basilewsky 1974; Magrini & Sciaky 2006; Magrini, Quéinnec & Vigna Taglianti 2012). These papers suggest the high diversification of genus *Trechus* in this massif and the microendemic character of the distribution of its representatives. The new species that we describe in this note was mostly collected in the afroalpine zone of the Bale massif, in strict connection with the *Erica* belt in the top part of Mount Sgona. The species is also present, but apparently less abundantly, in certain areas of the Sanetti Plateau. This micropterous taxon is well characterized by its much convex general shape, its swollen abdomen (of "pseudophysiogastric" look) and by the aedeagus morphology.

MATERIALS AND METHODS. Specimens hereby studied are deposited in CVT: A. Vigna Taglianti collection (Roma, Italy), CM: P. Magrini collection (Firenze, Italy), CQ: É. Quéinnec collection (Paris, France), CO: E. Ollivier collection (Bolbec, France), CA: A. Casale collection (Torino, Italy).

The acronyms used in the tables are reported as follows.

L: total length, from apex of mandibles to extremity of elytra; HMW: maximal width of head at the temporal convexity; LA: length of antennae; PL: length of pronotum, measured along the median line; PMW: maximal width of pronotum; PB: width of the basis of pronotum; EL: length of elytra, measured from scutellar basis to sutural angle; EW: maximal width of elytra; PMW/PL: maximal width/length ratio of pronotum; EL/EW: length/width ratio of elytra; EW/PMW: elytral width/pronotum maximal width ratio; LE: length of aedeagus; AN: length of antennal articles. The macrophotographs in the text were taken by one of us (PM) with a Nikon D2X digital camera, mounted on a Nikon Labophot II binocular microscope, with diaphragmed objectives.

Trechus (s. str.) e r i c a l i s n. sp.

LOCUS TYPICUS. Ethiopia, Oromia Prov., Bale, Goba, Monte Sgona, about 3800 m. a.s.l.

TYPE SERIES. Holotype ♂, Etiopia, Oromia Prov., Bale, Goba, Monte Sgona. loc. 38, about 3800 m a.s.l., 8.XI.1973, leg. A. Vigna Taglianti (CVT). Paratypes: 72 ♂♂ ♀♀,

same data as holotype, leg. A. Vigna Taglianti and P. Brignoli (CVT, CM, CA, CQ); 4 ♂♂, 3 ♀♀, Ethiopia, Oromia Prov., Bale Massif, Goba, Sanetti Plateau, about 4138 m a.s.l., 11.VIII.2011, leg. E. Quéinnec and C. Reeb (CQ, CO).

Trechus ericalis n. sp.	L	LA	L/LA	PMW	PL	PB	PMW/PL	EL	EW	EL/EW	EW/PMW	HMW	LE	AN 1°	AN 2°	AN 3°	AN 4°	AN 11°
Holotype ♂	4,40	2,10	2,09	1,09	0,80	0,86	1,36	2,63	1,96	1,34	1,79	0,80	0,93	0,20	0,17	0,20	0,17	0,24
min.	3,88	1,84	2,06	1,02	0,77	0,80	1,27	2,34	1,80	1,27	1,73	0,80	0,93	0,17	0,16	0,17	0,14	0,20
max.	4,67	2,10	2,29	1,18	0,90	0,93	1,38	2,76	2,09	1,36	1,81	0,86	0,99	0,22	0,19	0,20	0,17	0,24
mean	4,35	2,01	2,15	1,11	0,82	0,88	1,34	2,57	1,95	1,31	1,76	0,83	0,95	0,19	0,17	0,18	0,16	0,22

Description. A micropterous species of medium size: 3.88-4.67 mm (average 4.35 mm; holotype 4.40 mm), dark brown on the body and rusty brown on appendages (fig. 1).

Head rather narrow. Polished integuments, with well evident microsculpture on the whole body: isodiametric on the head, transverse polygonal on pronotum, clearly transverse on elytrae**.** Head, pronotum and temples glabrous. Frontal furrows complete, regular, curved; front and hind edges of clypeus straight. Eyes of medium size, slightly longer than

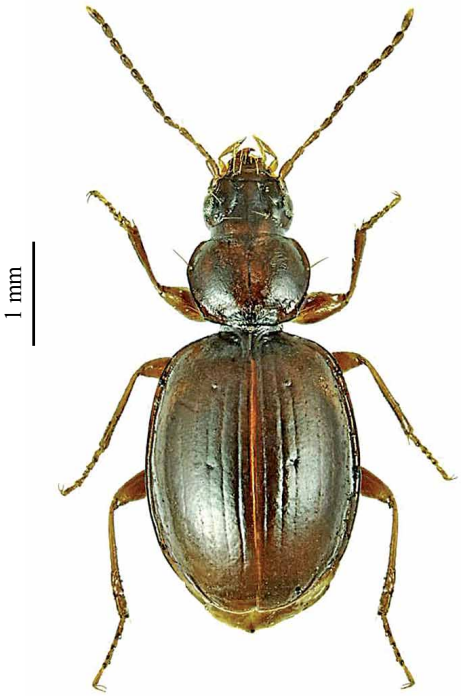


Fig. 1 – *Trechus* (*s. str.*) *ericalis* n.sp. (holotype ♂): habitus, CVT.

temples, maximal width at temporal bulge: 0.80-0.86 mm (average 0.83 mm; holotype 0.80 mm). Head chaetotaxy without notable peculiarities, two big supraorbital setae, close-set and foveolate. Antennae short and slender with apical segment clearly longer. Fore edge of labrum much concave.

Pronotum small, subconvex, larger than long, with sides amplely rounded: maximal width a little ahead of the middle; sinuosity before posterior angles barely evident. Maximal lenght: 1.02-1.18 mm (average 1.11; holotype 1.09 mm); width of base: 0.80-0.93 mm (average 0.88; holotype 0.86 mm); lenght on median line: 0.77-0.90 mm (average 0.82 mm; holotype 0.80 mm); maximal width/length ratio: 1.27-1.38 mm (average 1.34 mm; holotype 1.36 mm). Front angles obtuse and not prominent, hind angles obtuse, with blunt apex but well evident. Lateral furrows wide and regular. Basal edge sinuous, median line deep and well marked, base of pronotum without a clear and continuous transversal ridge. Basal foveae flattened and confluent, with marked microsculpture and granularity. Front marginal setae clearly ahead of the middle; hind setae on apex of hind angle.

Elytrae very wide, convex, glabrous and amplely rounded at apex (pseudophysiogastric). Shoulders rounded. Elytral furrows thin and regular. The first six striae are well visible, sometimes the seventh is evanescent, the others are deleted; interstriae flat. Total width: 1.80-2.09 mm (average 1.95 mm; holotype 1.96); lenght from scutellar basis to apex: 2.34-2.76 mm (average 2.57 mm; holotype 2.63 mm); total lenght/total width ratio: 1.27-1.36 mm (average 1.31 mm; holotype 1,34 mm). Marginal series of umbilicate pores normal: 4+4. Two foveolate discal setae, the front one in normal position at same level of the third humeral or between the third and the fourth, the second at about half of elytral lenght. Apical triangle without noteworthy peculiarities. Elytral width/ pronotum width ratio: 1.73-1.81 mm (average 1.76 mm; holotype 1.79 mm).

Legs ferruginous, short and stout. First two tarsal segments of forelegs in males amplely dilated, hooked on inner edge, with adhesive hairs on the lower face. Fore tibiae deeply sulcate on their whole length. First tarsal segment of hind legs as long the subsequent two together.

Aedeagus: big, 0.93-0.99 mm long (average 0.95 mm; holotype 0.93 mm) (figs. 2, 4), stout and little curved; basal bulb rather small; sagittal wing lacking or barely hinted; apical tip in lateral view with small, thin button slanting upwards. Aedeagus in ventral view wide and straight, lateral edges straight and apex clearly triangular (fig. 3).

Copulatory piece: big, made of a triangular lamina, with apex more or less sharpened in lateral view; curved in ventral view (figs 2-4).

Paramera: short and stout, each bearing four apical setae (fig. 6).

IX urite: lenghtened oval and stout (fig. 5).

Female genitalia: ovipositor with gonocoxite 2 triangular, rather long and hooked, with a big sternal sensory fovea and two ensiform setae near the internal edge, one longer than the other (fig. 7).

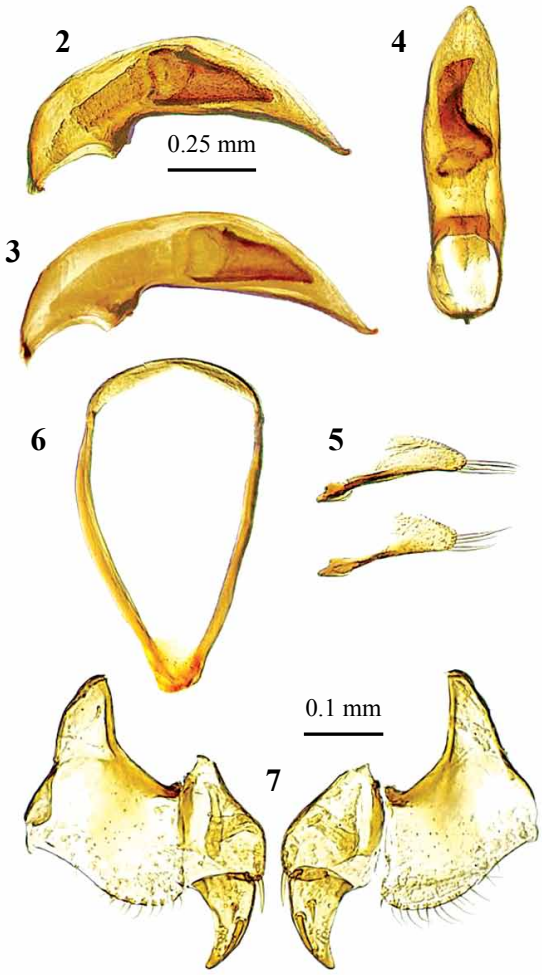
DERIVATIO NOMINIS. The name of the new species refers to its habitat, i.e. the entangled *Erica* spp. bushes, a characteristic plant of the afroalpine environment (Hedberg 1986), particularly abundant in the top part of Mount Sgona.

AFFINITIES AND COMPARATIVE NOTES. The overall morpho-anatomical characters of *T. ericalis* set it clearly apart from the other known *Trechus* from Ethiopia. Its much convex elytrae with marked shoulders strikingly converging towards the almost straight base of the pronotum and the aspect of the aedeagus make it a very characteristic taxon within the Ethiopic fauna. It is well distinguishable from the other known species of the Bale Massif, of which *T. bastianinii* Magrini & Sciaky, 2006 is the species more similar at first view. However, notwithstanding their similar size, *T. ericalis* n.sp. is much different by its reddish-brown colour with green reflections (*T. bastianinii* is brownish-black), and chiefly by the shape of the aedeagus (shorter and completely different, also as regards the endophallic structures).

It is also well distinct from *T. oromiensis* Magrini, Quéinnec & Vigna Taglianti 2012, by many features: its more pronounced convexity, its stouter aspect, the presence of two discal setae on the third interstice (the other has only one) and above all the aspect of the aedeagus: more swollen dorsally and provided of a much bigger copulatory piece of a markedly different shape.

Other similar but well distinguishable Ethiopic taxa are:

- *T. bipartitus* Raffray, 1881, from AbunaYusef Massif, with a different aedeagus and external morphology: a stubbier aspect, clearly cancelled shoulders, elytral striae deeper and all well evident, not only the inner ones.
- *T. aethiopicus* Alluaud, 1918, from the Addis Abeba region (cfr. Jeannel 1928), also with convex elytrae, but well distinct by its bigger size, the pronotum more sinuate, only one discal seta on elytrae,



Figs 2-7 – *Trechus* (*s. str.*) *ericalis* n.sp.: aedeagus in lateral view on acetate (holotype) (2); aedeagus in lateral view on perspex (paratype) (3); aedeagus in ventral view on acetate (holotype) (4); paramera (holotype) (5); IX urite (holotype) (6); female genitalia with gonostyli (paratype) (7).

a thinner and more elongated aedeagus, with a bigger and more evident apical button.

Therefore *T. ericalis* n.sp. is well recognizable among the so far known Ethiopic species; in our opinion it does not represent a group apart, but belongs to the *bipartitus* group.

AKNOWLEDGEMENTS. EQ sincerely thanks his colleague and friend, the botanist C. Reeb of the Natural History Museum of Paris, for her help during the mission on the Bale Massif. AVT wishes to thank the companions of the 1973 expedition to the Ethiopian highlands (C. Consiglio, V. Cottarelli and the late P. Brignoli). We are also indebted with dr Niccolò Falchi for kindly translating the text in English.

SUMMARY

A new species of *Trechus* from the Oromia Province (Ethiopia) is described in the present note. This new taxon shows some peculiar characters, such as a much swollen abdomen of pseudophysiogastric aspect, a feature shared by other high altitude Trechinae, as for instance *Queinnectrechus* Deuve, 1992 from Asia. The integuments are glabrous; the antennae are short; the pronotum is larger than long, with regularly rounded sides and hind angles; the elytrae are short and rounded (pseudophysiogastric) with the first six striae well engraved, on the third of them two discal foveolate setae are well visible. The aedeagus is big and stout, abruptly narrowing at the tip (in lateral view), with a small botton slanting upwards; the copulatory piece is big and well sclerified, triangular, with a more or less sharpened tip. Well recognizable for the "pseudophysiogastric" aspect, *Trechus (Trechus) ericalis* n.sp. belongs to the *bipartitus* group.

RIASSUNTO

Nella presente nota viene descritta una nuova specie di *Trechus* proveniente dalla provincia di Oromia (Etiopia). Questo nuovo taxon presenta alcuni caratteri peculiari, come l'addome assai rigonfio, di aspetto pseudofisiogastrico, comune ad altri trechini di alta quota, come ad esempio *Queinnectrechus* Deuve, 1992 dell'Asia. I tegumenti sono glabri; le antenne sono corte; il pronoto più largo che lungo, con lati regolarmente arrotondati e angoli posteriori del pronoto arrotondati; le elitre sono corte e arrotondate (pseudofisiogastriche) e presentano le prime sei strie evidentemente incise, sulla terza sono presenti due setole discali foveolate ben visibili. L'edeago è grande e robusto, bruscamente ristretto all'apice (in visione laterale) con un piccolo bottone rivolto verso l'alto; la lamella copulatrice è grande e ben sclerificata, di forma triangolare, con apice più o meno appuntito. *Trechus (Trechus) ericalis* n.sp., ben riconoscibile per l'aspetto "pseudofisiogastrico", sembra tuttavia riferibile al gruppo *bipartitus*.

REFERENCES

ALLUAUD, C. 1918. Collections recueillies par M. Maurice de Rothschild dans l'Afrique Orientale. Coléoptères Carabiques: Diagnoses préliminaires des espèces nouvelles. Bulletin du Muséum national d'histoire naturelle, 24: 493-497.

BASILEWSKY, P. 1974. Les Plocamotrechina d'Ethiopie (Col. Carabidae, Trechinae). Revue de Zoologie africaine, 88 (1): 148-158.

BRIGNOLI, P. M., C. CONSIGLIO, V. COTTARELLI & A. VIGNA TAGLIANTI. 1978. General remarks about the first and second zoological expeditions to Ethiopia, organized by the Accademia Nazionale dei Lincei. Zoological researches in Ethiopia (Part 1). Accademia Nazionale dei Lincei, anno CCCLXXV, Roma, 243: 5-26.

DEUVE, T. 1992. Un nouveau genre de Trechinae des montagnes du Sichuan (Coleoptera, Trechidae). Bulletin de la Société entomologique de France, 96: 354.

HEDBERG, O. 1986. The afroalpine flora of Ethiopia. Sinet: Ethiopian Journal Sciences, 9 (suppl.): 105-110.

HILLMANN, J. C. 1986. Conservation in Ethiopian's Bale mountains. Endangered species, 3: 1-4.

HILLMANN, J.C. 1990. The Bale Mountains National Park area, southeast Ethiopia and its management. In B. Messerli & H. Humi (Eds), African mountains and highlands: Problems and perpectives (pp. 277-286). Missouri: Walsworth Press: The African Mountain Association.

JEANNEL, R. 1928. Monographie des Trechinae. III. L'Abeille, 35: 291-344.

JEANNEL, R. 1936. Sur des Trechinae recueillis par M. H. Scott en Abyssinie. Revue française d'Entomologie, 2: 205-212.

JEANNEL, R. 1950. Sur quelques carabiques de la famille des Tréchides recueillis par M. Hugh Scott dans le sud de l'Abyssinie**.** Revue française d'Entomologie, 17: 265-266.

JEANNEL, R. 1954. Les *Trechus* du Simiène récoltés par le Dr. Scott en 1952 (Coleoptera Trechidae). Revue française d'Entomologie, 21: 171-183.

JEANNEL, R. 1960. Un nouveau *Trechus* de l'Abyssinie. Revue française d'Entomologie, 27: 265-266.

MAGRINI, P. & R. SCIAKY. 2006. Cinque nuove specie di *Trechus* dell'Etiopia (Coleoptera, Carabidae). Fragmenta entomologica, Roma, 38 (2): 173-190.

MAGRINI, P., É. QUÉINNEC & A. VIGNA TAGLIANTI. 2012. A new subgenus and two new species of *Trechus* from Ethiopia (Coleoptera, Carabidae). Fragmenta entomologica, Roma, 44 (1): 19-32.

MIEHE, G. & S. MIEHE. 1994. East African bryophytes, XII. Bryophytes from Bale Mountains SE Ethiopia. 1. Phyto-ecological introduction. Fragmenta Floristica et Geobotanica, 39 (1): 165-219.

ORTUÑO, V. M. & F. NOVOA. 2011. A new species of *Trechus* From the Ethiopian Highlands (Coleoptera: Carabidae: Trechinae) and key to the *Trechus* Species of Ethiopia. Annals of the Entomological Society of America, 104 (2): 132-140.

PAWLOWSKY, J. 2001. Le Genre *Trechus* Clairville, 1806 (Coleoptera: Carabidae: Trechini) dans la Collection Éthiopienne du Musée Royal de l'Afrique Centrale. I. Groupe du *T. chokensis*. Elytron, 15: 97-108.

PAWLOWSKY, J. 2003. Preliminary report on Ethiopian species of the genus *Trechus* Clairville, 1806 (Coleoptera: Carabidae). Baltic Journal Coleopterology, 3 (2): 157-160.

RAFFRAY, A. 1885. Note sur la dispersion géographique des Coléoptères en Abyssinie. Annales de la Société entomologique de France, 88 (1): 148-158.

VIGNA TAGLIANTI, A. & P. MAGRINI. 2009. A new subgenus and a new species of *Trechus* from Ethiopia (Coleoptera, Carabidae). Fragmenta entomologica, Roma, 41 (1): 69-76.