

A NEW SUBGENUS AND TWO NEW SPECIES OF *TRECHUS*  
FROM ETHIOPIA  
(Coleoptera, Carabidae)

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The Ethiopian Tableland has been the cradle of genus *Homo*, but its biological importance was great for many other taxa. Among Insects, this is surely the case for the Carabidae of the genus *Trechus* Clairville, 1806: they gave rise to many lineages which survived, confined in these inaccessible mountains with only a few exceptions, like the *Trechus* s. str. Many of those lineages are still unknown to science: in this short note we describe one of them, that bears witness to the ancient kinship between Trechinae and Trechodinae. Furthermore, systematic data concerning two new taxa are given.

**MATERIALS AND METHODS.** Specimens hereby studied are deposited in CVT = A. Vigna Taglianti collection (Roma, Italy), CM = P. Magrini collection (Firenze, Italy), CQ = E. Quéinnec collection (Paris, France), CS = R. Sciaky collection (Milano, Italy), CO = E. Ollivier collection (Bolbec, France).

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

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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 (P. M.) with a Nikon D2X digital camera, mounted on a Nikon Labophot II binocular microscope, with diaphragmed objectives.

### **Trechus (Archeotrechus) n. subgen.**

DIAGNOSIS. A microphthalmic, ferruginous-brown, very small *Trechus* subgenus (fig. 1) distinct from *Trechus* s. str. for having, in the males, only the first article of fore tarsi dilated instead of two (fig. 7) and for the aedeagus with the dorsal opening extending from the root of the basal ostium to the apex (fig. 11). This new subgenus, presently known only from a few spurs of Mt. Batu, Ethiopia, must be compared with the two others that have only the first protarsal article dilated in the male: *Microtrechus* Jeannel, 1927, with a Nearctic distribution and *Minitrechus* Vigna Taglianti & Magrini, 2009, from Mt. Encuolò (Ethiopia). For the first, widespread in North America with several species (endemic in the Appalachians), we refer to Vigna Taglianti & Magrini (2009); the second shows an aedeagus with limited and regular dorsal opening, consistent with *Trechus* s. str. and paramera with three apical setae much distant from each other at the root, whereas in the new subgenus the setae are four with normal spacing at the root. Furthermore, in both the formerly described subgenera, we do not have an almost complete dorsal separation of the lateral walls of the aedeagus, as in *Archeotrechus* n. subgen. The subgeneric systematic position of *Trechus amharicus* Ortuño & Novoa, 2011, also from Ethiopia, whose male shows only one dilated article in the protarsi, should be, in our opinion, reconsidered.

TYPE SPECIES. *Trechus (Archeotrechus) relictus* Magrini, Quéinnec & Vigna Taglianti, 2012, n. sp.

DERIVATIO NOMINIS. The name of the new *Trechus* subgenus derives from two archaic features: almost complete dorsal separation of the aedeagus into two lobes, which brings it close to the Trechodinae and male protarsi with only the first article dilated.

## *Trechus (Archeotrechus) relictus* n. sp.

LOCUS TYPICUS. Ethiopia, Oromia Province, Bale massif, Goba, Mt. Sgona (Mt. Batu), about 3800 m a.s.l.

TYPE SERIES. Holotype: ♂, Ethiopia, Prov. Oromia Prov., Bale massif, Goba, Mt. Sgona (Mt. Batu), about 3800 m a.s.l., 8.XI.1973, A. Vigna Taglianti leg. (CVT). Paratypes 88 ♂♂ ♀♀, same data as holotype: 21 A. Vigna Taglianti leg. (CVT); 4 A. Vigna Taglianti leg. (CM); 10 V. Cottarelli leg. (CVT); 17 P. Brignoli leg. (CVT); 4 C. Consiglio leg. (CVT); 12 ♂♂, 9 ♀♀, Ethiopia, Oromia Prov., Bale massif, Goba, Sanetti plateau, 4138 m, 11.VIII.2011, E. Quéinnec leg. (CQ, CO); 2 ♂♂, 2 ♀♀, Ethiopia, Oromia Prov., Bale massif, Goba, Garba Guracha (Black Lac), 3942 m, 13.VIII.2011, E. Quéinnec leg. (CQ); 5 ♂♂, 2 ♀♀, Ethiopia, Oromia Prov., Bale massif, Goba, Mt. Sgona (Mt. Batu), Sarpa Surach, 3800 m, 13.VIII.2011, E. Quéinnec leg. (CQ, CO).

<i>Trechus relictus</i> n. sp.	L	LA	$\frac{L}{LA}$	PMW	PL	PB	$\frac{PMW}{PL}$	EL	EW	$\frac{EL}{EW}$	EW	PMW	HMW	LE	AN	AN	AN	AN	AN
															1°	2°	3°	4°	11°
Holotype ♂	3,02	1,31	2,30	0,80	0,54	0,61	1,47	1,73	1,28	1,35	1,60	0,61	0,70	0,14	0,12	0,11	0,09	0,16	0,16
min.	2,56	1,18	2,15	0,77	0,51	0,54	1,41	1,44	1,12	1,22	1,45	0,54	0,66	0,12	0,11	0,09	0,08	0,14	0,14
max	3,02	1,31	2,42	0,80	0,54	0,61	1,53	1,73	1,28	1,39	1,62	0,61	0,72	0,14	0,13	0,11	0,09	0,16	0,16
med.	2,89	1,30	2,24	0,78	0,53	0,59	1,47	1,51	1,23	1,31	1,57	0,58	0,69	0,13	0,12	0,10	0,085	0,15	0,15

DESCRIPTION. A micropthalmic *Trechus* of small size, uniform ferruginous brown colour; total length from apex of mandibles to extremity of elytra: 2,56-3,02 mm (average 2,89 mm; holotype 3,02 mm) (fig. 1).

Head big and stout; frontal furrows complete, regular, well marked and deep; eyes moderately convex, small, of greyish-black colour (fig. 2); maximal width at temporal convexity: 0,54-0,61 mm (average 0,58 mm; holotype 0,61 mm). Genae elongate and feebly convex, not pubescent. Head chaetotaxy without notable peculiarities, two supraorbital setae, the foremost of which widely foveolate. Clypeus with 4 setae, fore and hind edges straight. Anterior labrum bilobate and much concave, bearing six marginal setae. Maxillar palpi elongate and glabrous. Right mandible with three small teeth on internal edge (fig. 3). Deep polygonal isodiametric microsculpture on head, lighter and transversal on pronotum. Antennae short and rather slender, moniliform, with little variability in the size of segments (such uniformity can be perceived as a probable pre-evolutive, archaic character), 1,18-1,31 mm long (average 1,30 mm; holotype 1,31 mm), comprised 2,15-2,42 times (average 2,24, holotype 2,30) in total body length (fig. 4).

Pronotum transverse, slightly convex, clearly larger than long, glabrous, with lateral borders regularly rounded and narrowing toward the base, not sinuate before posterior angle. Maximal width: 0,77-0,80 mm

(average 0,78, holotype 0,80 mm); width of the base: 0,54-0,61 mm (average 0,59; holotype 0,61 mm); length along the median line: 0,51-0,54 mm (average 0,53 mm; holotype 0,54mm); ratio maximal width/length: 1,41-1,53 (average 1,47; holotype 1,47). Front angles obtuse, amply rounded, not prominent; hind angles obtuse as well, with blunt apex. Lateral furrows narrow, regular and progressively widening backwards. Basal edge convex, of same width as fore edge; median line well marked, but thin; pronotum base without neat and continuous transversal ridge.

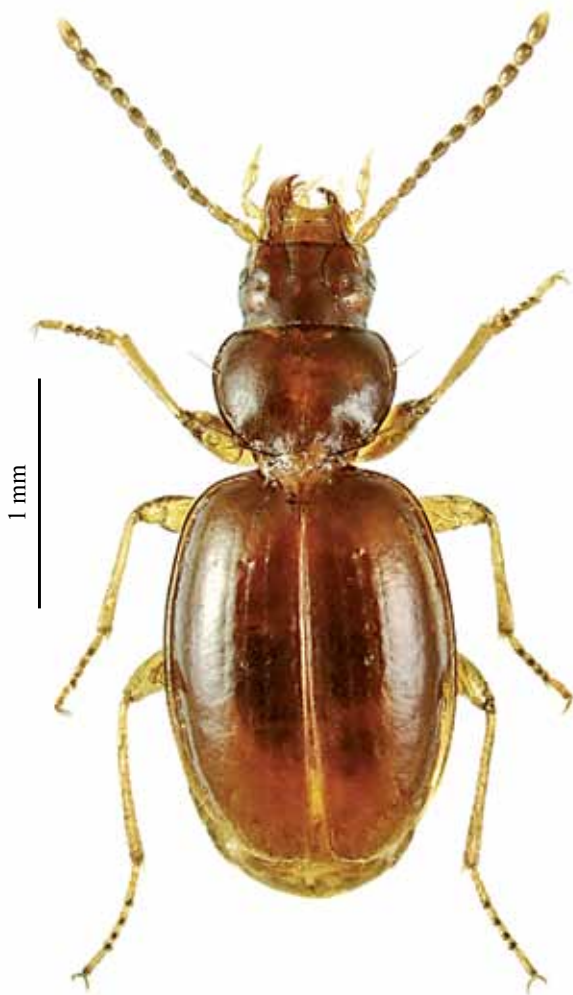
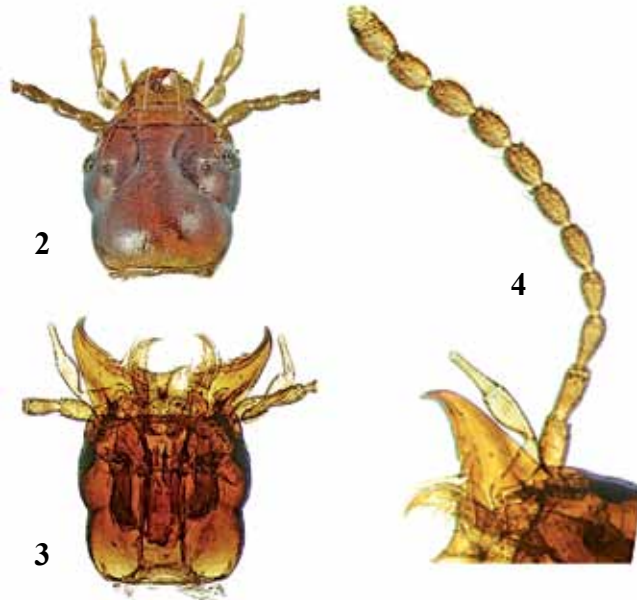


Fig. 1 – *Trechus (Archeotrechus) relictus* n. sp. (holotype ♂): habitus, CVT.

Basal foveae big and flattened, not confluent, shallow and polished. Marginal setae very long, deciduous (only present in few specimens), fore pores at the level of first third, before the point of maximal width, hind pores immediately before the basal angles (fig. 5).

Abdomen roundish, with elytrae convex, especially on the disk, not much elongated, bare. Shoulders widely rounded; basal border of elytrae oblique. Marginal furrow narrow and regular. Elytral striae very thin, the first 4-5 well marked on the disk, intervals flat. Total width 1,12-1,28 mm (average 1,23; holotype 1,28 mm); length from scutellar basis to elytral apex: 1,44-1,73 mm (average 1,51; holotype 1,73). Total length/width ratio between 1,22 and 1,39 (average 1,31; holotype 1,35). Marginal series of umbilicate pores normal: 4+4, in the front group setae regular and equidistant, in the rear disposed in groups of two. Two discal setae on the third stria, the foremost between the third and the fourth humeral seta, the hindermost at about half of elytral length. Apical triangle without noteworthy peculiarities. Width of elytrae/maximal width of pronotum ratio between 1,45 and 1,62 (average 1,57; holotype 1,60) (fig. 6).

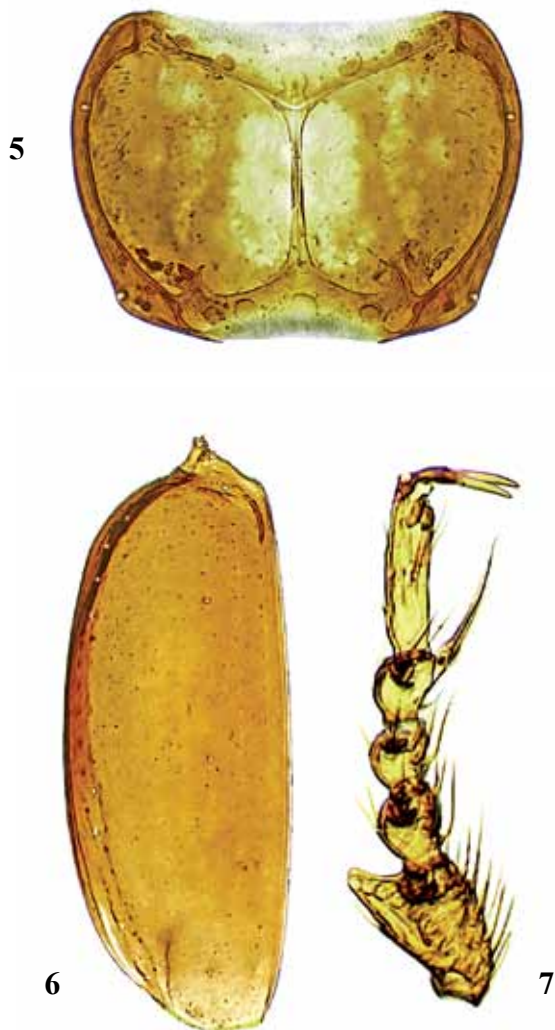
Legs thin, of medium length. Only the first tarsal segment in males



Figs 2-4 – *Trechus (Archeotrechus) relictus* n. sp.: head (paratype) (2); head in euparal with maxillar palps and mandibles pointed out, (paratype) (3); antenna (4).

dilated, with adhesive hairs on the lower face (fig. 7). Fore tibiae sulcate on their whole length. First tarsal segment of hind legs shorter than the subsequent three together.

Aedeagus long and sinuous, 0,66-0,72 mm (average 0,69; holotype 0,70 mm), with basal bulb of medium size and with a broad sagittal wing (figs 8-9). Apical tip, in lateral view, with stout hemispheric button; api-



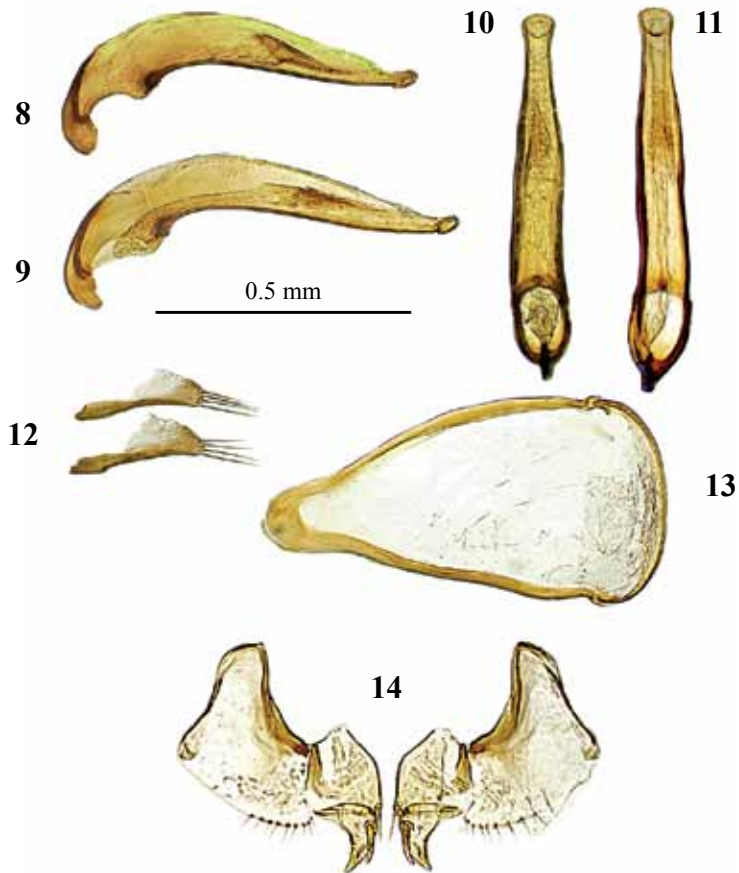
Figs 5-7 – *Trechus (Archeotrechus) relictus* n. sp.: pronotum without setae in euparal (paratype) (5); elytra without setae in euparal (paratype) (6); male protarsus (paratype) (7).

cal tip in ventral view amply rounded, spatulate (fig. 10); dorsal surface with a narrow opening running through whole aedeagus down to the root of basal ostium (fig. 11).

Copulatory piece conical, lanceolate, with acuminate tip, little sclerified, ventrally shaped like an open channel (figs 8-9).

Paramera short and broad, spatulate, bearing four short and stout apical setae not much spaced out at their base (fig. 12).

IX urite subtriangular and stout (fig. 13).



Figs 8-14 – *Trechus (Archeotrechus) relictus* n. sp.: aedeagus in lateral view (holotype) (8); aedeagus in lateral view (paratype) (9); aedeagus in ventral view (holotype) (10); aedeagus in dorsal view (paratype) (11); paramera (holotype) (12); IX urite (holotype) (13); female genital apparatus with gonostyli (paratype) (14).

Female gonostyli with short, stout and curved tips, bearing two big setae on inner edge, of which the nearer to the tip is ensiform: between this seta and the tip there is a third smaller seta, analogous to, but markedly smaller than the one of *Minitrechus* (fig. 14).

DERIVATIO NOMINIS. The name of the new species refers to its character of phylogenetic relict.

ECOLOGICAL NOTES. All specimens were collected under rocks and rotten *Lobelia* sp. leaves in wet areas, above 3800 m in altimontane steppe; two pictures of collecting spots are given (figs 20-21). See also Brignoli et al. 1978.

COMPARATIVE NOTES. The main characters of the new subgenus and of the new species as described and illustrated in the present note easily isolate the new species from related forms (cfr. among others; Jeannele 1928, 1936, 1950, 1954, 1960; Pawlowsky 2001, 2003; Magrini & Sciaky 2006; Vigna Taglianti & Magrini 2009; Ortuño & Novoa 2011).

### **Trechus (s. str.) oromiensis** n. sp.

LOCUS TYPICUS. Ethiopia, Oromia Prov., Bale, South of Goba, about 3200 m a.s.l., 8.XI.1973, A. Vigna Taglianti leg.

TYPE SERIES. Holotype ♂, Ethiopia, Oromia Prov., Bale, South of Goba, about 3200 m a.s.l., 8.XI.1973, A. Vigna Taglianti leg. (CVT). Paratypes: 47 ♂♂ ♀♀. 2 ♂♂ and 2 ♀♀, same data as holotype, (CVT); 1 ♀, same locality and collector as holotype, 3150 m a.s.l., 9.XI.1973, (CVT); 1 ♂, same data as holotype, (CM); 1 ♀, Ethiopia, Oromia Prov., Bale, Mt. Batu 3100-3500 m a.s.l., 8.IV.1976, Löffler leg., (CM); 1 ♀, Ethiopia, Oromia Prov., Bale, Mt. Batu 3100-3500 m a.s.l., 8.IV.1976, Löffler leg., (CS); 15 ♂♂ and 6 ♀♀, Ethiopia, Oromia Prov., Bale, 18 km South of Goba, about 3200 m a.s.l., 13.VIII. 2011, E. Quéinnec leg., (CQ, CO); 5 ♂♂ and 3 ♀♀, Ethiopia, Oromia Prov., Bale, Dinsho, about 3215 m a.s.l., 14.VIII. 2011, E. Quéinnec leg., (CQ, CO); 5 ♂♂ and 5 ♀♀, Ethiopia, Oromia Prov., Bale, Dinsho, Web river, about 3100 m a.s.l., 14.VIII. 2011, E. Quéinnec leg., (CQ, CO).

<i>Trechus oromiensis</i> n. sp.	L	LA	<u>L</u> LA	PMW	PL	PB	<u>PMW</u> PL	EL	EW	<u>EL</u> EW	<u>EW</u> PMW	HMW	LE	AN 1°	AN 2°	AN 3°	AN 4°	AN 11°
Holotype ♂	4,21	2,17	1,93	1,15	0,86	0,86	1,33	2,41	1,73	1,38	1,50	0,80	0,77	0,19	0,16	0,19	0,18	0,23
min.	3,75	1,90	1,82	1,10	0,80	0,80	1,31	2,18	1,57	1,27	1,36	0,73	0,77	0,16	0,14	0,17	0,16	0,22
max	4,40	2,23	2,03	1,28	0,93	0,96	1,44	2,44	1,86	1,44	1,51	0,90	0,83	0,19	0,17	0,20	0,19	0,25
med.	4,11	2,14	1,91	1,20	0,87	0,88	1,37	2,36	1,73	1,35	1,44	0,81	0,80	0,17	0,16	0,19	0,17	0,23



DESCRIPTION. This species has been already reported as new for science by Magrini & Sciaky 2006: 173: it was not described on that occasion because based on only two females, that have been included in the present typical series.

A micropterous, medium sized species: 3,75-4,40 mm (average 4,11 mm; holotype 4,21 mm) of pitchy-brown or ferruginous-brown uniform colour (fig. 15).



Fig. 15 – *Trechus* (s. str.) *oromiensis* n. sp. (holotype ♂): habitus, CVT.

Head of normal size. Polished integuments, with polygonal microsculpture conspicuous on whole body: isodiametric on head and pronotum, slightly transverse on elytrae. Head, pronotum and genae glabrous. Frontal furrows complete, deep, curved and regular; fore edge of clypeus straight, hind edge subconcavous. Eyes big and prominent, convex, longer than the genae, maximal width at temporal convexity: 0,73-0,90 (average 0,81 mm; holotype 0,80 mm). Head chaetotaxy without notable peculiarities, with big, foveolate and close set supraorbital setae. Antennae thin, of medium length, with last article clearly longer than the others. Fore edge of labrum markedly hollow.

Pronotum of medium size, subconvex, wider than long, with slightly rounded lateral borders: maximal width a little before half of its length; sinuature before hind angles barely visible. Maximal width: 1,10-1,28 mm (average 1,20 mm; holotype 1,15 mm); width of the base: 0,80-0,96 mm (average 0,88 mm; holotype 0,86 mm); length along median line: 0,80-0,93 mm (average 0,87 mm; holotype 0,86 mm); maximal width/length ratio: 1,31-1,44 (average 1,37; holotype 1,33). Fore angles blunt and not prominent; hind angles blunt and bevelled but well evident. Lateral furrows narrow and regular. Basal line almost straight; median line deep and well etched; pronotum base without neat and continuous transversal ridge. Basal foveae big and flattened, not confluent, with marked microsculpture and granularity. Fore marginal setae well before half of length, hind marginal setae on tip of hind angles.

Elytrae much convex, glabrous, of medium length and amply rounded at tip. Shoulders rounded; marginal furrow narrow and regular. Only the first three elytral striae well visible, the others progressively fading sideways; intervals flat. Total width: 1,57-1,86 mm (average 1,73 mm; holotype 1,73 mm); length from scutellar basis to elytral apex: 2,18-2,44 mm (average 2,36 mm; holotype 2,41 mm). Total length/width ratio between 1,27 e 1,44 (average 1,35; holotype 1,38). Marginal series of umbilicate pores normal: 4+4. Only one discal seta, the fore one, in normal position near the third humeral. Apical triangle without noteworthy peculiarities. Elytra width/ maximum width of pronotum ratio between 1,36 e 1,51 (average 1,44; holotype 1,50).

Legs reddish, short and stout; the first two tarsal segments of the forelegs in males dilated and hooked, with adhesive hairs on the lower face. Fore tibiae sulcate. First tarsal segment of hind legs shorter than the subsequent two together.

Aedeagus 0,77-0,83 mm long (average 0,80 mm; holotype 0,77 mm)

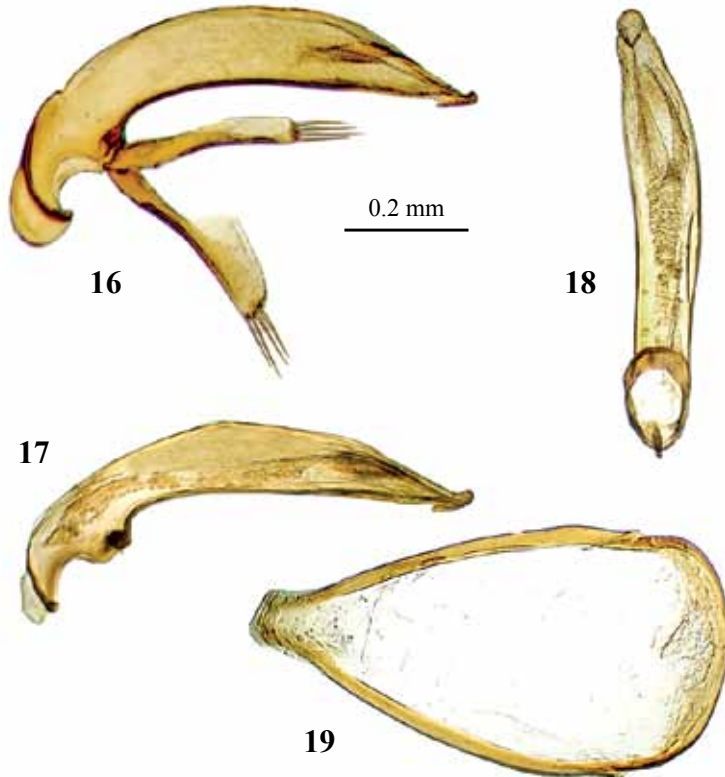
(figs 16-17), stout and bowed; basal bulb medium sized, with a sagittal wing variable in size; apex in lateral view with apical button, thin and subhorizontal. In ventral view, aedeagus bending to the left, with lateral edges linear and regular (fig. 18).

Copulatory piece small, formed by a triangular lamina whose apex is sharp in lateral view, ampler and shaped like a triangular channel, almost closed in the basal part in ventral view (figs 16-18).

Paramera short and stout, each bearing four apical setae (fig. 16).

IX urite subtriangular, stout (fig. 19).

DERIVATIO NOMINIS. The name of the new species comes from the Oromia Province, where the specimens of the typical series come from.



Figs 16-19 – *Trechus (s. str.) oromiensis* n. sp.: aedeagus in lateral view with paramera (holotype) (16); aedeagus in lateral view (paratype) (17); aedeagus in ventral view (paratype) (18); IX urite (paratype) (19).

ECOLOGICAL NOTES. Most specimens were collected under rocks in wet areas, above 3100 m in montane evergreen dry forest (juniper forest). See also Brignoli et al. 1978.

AFFINITIES AND COMPARATIVE NOTES. This new species belongs to *bi-partitus* group cfr. Magrini & Sciaky 2006: 189, in which in our opinion also the species with only one discal elytral seta (sensu novo) should be included, for the following features: glabrous integuments, hind angles of pronotum rounded or blunt, two lateral setae on pronotum, one or two discal elytral setae in normal position, elytrae short and rounded, fore tibiae sulcate, aedeagus stout with well defined apical button. The

20



21



Figs 20-21 – Habitat of *Trechus (Archeotrechus) relictus* n. sp.: Mt. Sgon (Mt. Batu), 3800 m (photo: A. Vigna Taglianti) (20); Sanetti plateau east of Mt. Batu, 4138 m (photo: E. Quéinnec) (21).

species cohabits with the similar *Trechus batuensis* Magrini & Sciaky, 2006, which belongs to the same group, but is easily distinguishable on account of its greater mean size (3,75-4,40 mm, versus 3,48-3,94 mm), only one discal elytral seta instead of two and, above all, for the aedeagus whose copulatory piece is, in lateral view, much smaller, with a much sharper apex and much less expanded basal part; the new species aedeagus shows important differences also in ventral view: a less expanded apex, lateral edges linear instead of sinuous and apex bending to the left instead of straight. The aedeagus of the new species is also similar to the one of *T. patrizii* Jeannel, 1960 and of *T. gallorites* Jeannel, 1936, both from Mt. Chillalo: in these two species the copulatory piece is as sharp as in the new species, but in *Trechus gallorites* the pronotum is much narrower, especially at the base, and there are two discal setae on the elytrae, instead of one; *Trechus patrizii* is more similar, with only one discal seta, but the base of pronotum is less straight and its hind angles are more rounded and less prominent, also the elytrae are different, sinuate before the apex, instead of regularly rounded as in the new species. The presence of only one discal seta on the elytrae draws these two species close to subgen. *Elgonotrechus* Jeannel, 1954 from Mt. Elgon, but in these taxa the only discal seta is not on the third stria but is displaced toward the fifth.

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#### RIASSUNTO

*Un nuovo sottogenere e due nuove specie di Trechus dell'Etiopia (Coleoptera, Carabidae).*

Nella presente nota vengono descritte due nuove specie di *Trechus* provenienti dalla provincia di Oromia (Etiopia). Nella prima parte del lavoro viene descritto *Archeotrechus*, nuovo sottogenere microftalmo di *Trechus*, caratterizzato dalla presenza del solo primo tarsomero dilatato nel maschio e da un edeago con la porzione dorsale separata quasi completamente in due lobi: solo a livello dell'ostio basale è presente un piccolo tratto di connessione sclerificato. A questo sottogenere viene attribuita la nuova specie *Trechus (Archeotrechus) relictus*, del Monte Sgona (Batu) e dintorni, di colore giallo-bruno, piuttosto piatta, con pronoto non sinuato e con angoli anteriori e posteriori smussati; sono presenti due setole discali elitrali nella terza stria. L'edeago è molto allungato, slanciato e con bottone apicale sferico, al suo interno presenta una lamella copulatrice triangolare lanceolata, ad apice acuminato, poco sclerificata e molto semplice, tipica delle specie ancestrali, come ad esempio *Minitrechus* Vigna Taglianti & Magrini, 2009. Gli apici degli stili femmini-

li, corti e incurvati, presentano due grosse setole sul margine interno. Nella seconda parte della nota viene descritto *Trechus* (s. str.) *oromiensis*, nuova specie del Gruppo *bipartitus* (sensu novo), caratterizzato dalla presenza di una sola setola discale elitrale e da un edeago con caratteri distintivi diversi da quelli delle specie note, come evidenziato nella iconografia e nel testo.

#### SUMMARY

Two new species of *Trechus* from the Oromia Province (Ethiopia) are described in the present note. In the first part we describe *Archeotrechus*, a new microptalmic *Trechus*, characterized by the dilation of only the first tarsal segment in males and by the aedeagus with the dorsal part almost completely divided into two lobes: a sclerified connection exists only in the region of the basal ostium. To this subgenus we ascribe the new species *Trechus* (*Archeotrechus*) *relictus*, from the area of Mt. Sgona (Batu), of yellow-brown colour, rather flattened, with non sinuate pronotum and blunt fore and hind angles; two discal setae in the third stria. The aedeagus is much elongated, with a spherical apical button, copulatory piece triangular, lanceolate, with a sharp apex, little sclerified and very simple, typical of ancestral forms, like for instance *Minitrechus* Vigna Taglianti & Magrini, 2009. The female gonostyli, short and curved, bear at the apex two big setae on the inner edge. In the second part of the note we describe *Trechus* (s. str.) *oromiensis*, a new species of *bipartitus* Group (sensu novo), characterized by the presence of only one discal seta on elytra and by peculiar features of the aedeagus.

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