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Bembidiina of Afrotropical Region. 2- *Odontium* subg. *Microserrullula* Netolitzky, 1921 (Coleoptera, Carabidae, Bembidiina)

Abstract: The Afrotropical species of the subgenus *Microserrullula* Netolitzky, 1921, of the genus *Odontium* LeConte, 1848 are here revised. We redescribe the three-known species, *Odontium aegyptiacum* (Dejean, 1831), *O. icterodes* (Alluaud, 1933) and *O. pogonopsis* (Alluaud, 1933), and describe four new species: *Odontium australe* n. sp. (Kenya, Mozambique, Madagascar, South Africa); *Odontium basilewskyi* n. sp. (Democratic Republic of Congo); *Odontium okavangum* n. sp. (Angola, Namibia, Zambia); *Odontium clarkei* n. sp. (Ethiopia). A key for the identification of the African species of the subgenus *Microserrullula* is presented.

Riassunto: *Bembidiina della regione afrotropicale. 2- Odontium subg. Microserrullula* Netolitzky, 1921 (Coleoptera, Carabidae, Bembidiina). Le specie afrotropicali del sottogenere *Microserrullula* Netolitzky, 1921, del genere *Odontium* LeConte, 1848, sono revisionate. Vengono ridescritte le tre specie già conosciute, *Odontium aegyptiacum* (Dejean, 1831), *O. icterodes* (Alluaud, 1933) e *O. pogonopsis* (Alluaud, 1933), e descritte quattro nuove specie: *Odontium australe* n. sp. (Kenya, Mozambique, Madagascar, South Africa); *Odontium basilewskyi* n. sp. (Democratic Republic of Congo); *Odontium okavangum* n. sp. (Angola, Namibia, Zambia); *Odontium clarkei* n. sp. (Ethiopia). Viene inoltre presentata una chiave di identificazione di tutte le specie africane.

Key words: Africa, new taxa, identification key, distribution, *Bembidion*.

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INTRODUCTION

This paper continues the work series on the review of Afrotropical Bembidiina, after Bonavita *et al.* (2016) on *Omotaphus* Netolitzky, 2014.

Netolitzky (1910) described *Serrula* as subg. of *Bembidion* Latreille, 1802 for the species *Bembidion aegyptiacum* Dejean, 1831 (type species), *quadricolle* (Motschulsky, 1844) and *apicale* Ménetriés, 1832, and considered the new subgenus near to the subg. *Pogonidium* Ganglbauer, 1891.

Netolitzky (1921) himself renamed *Serrula* (nomen praeoccupatum) as *Microserrullula*. Then, only Alluaud (1933, as subg. of *Bembidion*) and Schuler (1959, as genus) take up the study of *Microserrullula*, producing a key for species identification, with Schuler also drawing the picture of genitalia of some of the species.

At present we know 11 species (Lorenz, 2005: 217), three of which occur in Afrotropical region. These are reviewed in this paper and four new ones are described for the same area.

Following Maddison (2012), we consider here *Microserrullula* as subgenus in the “*Odontium* series”. In our opinion, however, such “series” should

be considered as a good genus, and not only as a group inside the big genus *Bembidion*.

MATERIALS AND METHODS

We studied a lot of material, from the following museums and private collections.

Museums: The Carnegie Museum of Natural History, Pittsburgh, USA (CMNH); Museum für Naturkunde, Berlin, Germany (MNB); Muséum national d'Histoire naturelle, Paris, France (MNHN); Naturalis Biodiversity Center Leiden, Holland (NBCL); Naturhistorisches Museum Wien, Austria, general collection, included coll. Hauser and coll. ex mus. Vindob (NHMW-V), coll. Netolitzky (NHMW-N), coll. Meyer (NHMW-M); Musée Royal de l'Afrique Centrale, Tervuren, Belgique (MRAC); Natural History Museum, London, Great Britain (NHML); Royal Belgian Institute of Natural Sciences, Bruxelles, Belgique (RBINS); Ditsong National Museum of Natural History, Pretoria, RSA (former Transvaal Museum) (DNMNH).

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Acronyms of measured or derived sizes:

- TB – total body length, from the apex of clypeus to the apex of elytra
- WP – maximum width of pronotum
- LP – length of pronotum, measured along the median line
- BP – width of the base of pronotum, measured between the two hind angles.
- AP – width of pronotum in the anterior part, measured from right to left front angle.
- LWP – length/width ratio of pronotum
- LE – length of elytra, from the base of scutellum to the apex of elytra
- WE – maximum width of elytra
- AL – aedeagus length
- SL – spermatheca length

DIAGNOSIS AND DESCRIPTION OF *MICROSERRULLULA*

Microserrullula is a very characteristic subgenus of *Odontium* LeConte, 1848. The main characteristics are: prominent suborbital ridge, serrulate elytral margin, brush sclerite missing, two flagelliform sclerites of the median lobe of aedeagus more or less long, or very long, parameres bearing two setae.

GENERAL CHARACTERISTICS. Relatively large *Bembidiina* species, from 4.88 mm for *Odontium icterodes* (Alluaud, 1933), to 6.28 mm for *Odontium clarkei* n. sp., with pronotum broad and transverse, and habitus “*Pogonus*-like”. Colour uniform, generally with a yellow apical spot, more or less defined. Microsculpture occurs always on the head and pronotum, with isodiametric sculpticells, and on the entire elytra, with isodiametric to transverse sculpticells.

HEAD. Frontal furrows simple and parallel, so superficial (more than in *Bracteon* Bedel, 1879, where

they are slightly deepened) to result sometimes indistinguishable or almost so; prominent suborbital ridge. Mentum with only one simple central tooth.

THORAX. Pronotum flat, with broad base; furrow between the internal and external fovea more or less impressed; laterobasal carina reduced or missing; the lateral margin presents, at the fore angles, a serrulation similar to the elytral margin, but very reduced, with only 3-7 small setae re-approached; lateral setae at the basal angle and at middle. Metasternal process simple, prominent, not bordered.

ELYTRA. Serrulate elytral margin; humeral margin angled, until the base of the fourth or the fifth elytral stria. Umbilical series: 4 humeral setae + (2+2) sub-apical setae, with seta eo1 often detached from eo2-eo4, as in *Bracteon* (Maddison, 1993). Striae less or more deepened and punctulate, evident to the apex. Two setae, discal and apical, on the third interval, but very near to the stria; in some specimen on the third stria. The basal seta, that is on the first puncture of the first stria, and the first puncture of the sutural stria are positioned on the same transversal line as the base of the scutellum. Eight striae impressed and lightly punctuate, from the base of elytra joining to the ninth stria until the first humeral seta, then touching the other 3 humeral setae and becoming independent, then coming together again at the ninth stria at the first two apical setae, then branching out again until the third and fourth apical seta, where they rejoin the ninth stria before the apex (as in *Bracteon*).

LEGS. In the male, the first protarsomere is slightly widened and elongated, with fore inner tooth; also the second protarsomere is broader, shorter, with a more protruding tooth. Protarsomeres are not widened in the female.

GENITALIA. Male: the sclerites of the median lobe are very similar in all species and quite different from the other *Bembidiina*. A peculiar characteristic is the absence of the brush sclerite, while the main sclerite (S) is always long, straight and stout. Other two sclerites (F1, F2; Fig. 7) occur in all the species, always flagelliform. The first one (F1) is very long, extending from the base to the apical area: it begins from the basal margin, turning in apical area. The second elongated sclerite (F2) begins also in the basal area, could be homologous to the flagellar sheath of Maddison (1993: 257 Fig. 99). F1 and F2 can cross

together in dorsal part of median lobe, sometimes overlapping. *Odontium clarkei* n. sp. presents another flagelliform sclerites (F3; Fig. 7), clearly marked. Parameres left and right with only two setae.

Female: spermathecal duct with multiply coiled, from 2 to 25 spirals; annulus receptaculi missing. The number of coils of the spermathecal duct seems to be related with the length of the first flagellum (F1) of the endophallum.

DISTRIBUTION AND ECOLOGY

Microserrullula shows a wide geographical range in the Palearctic, Afrotropical and Oriental regions, in spite of the rarity of the species, occurring almost entirely in Africa, SE-Europe, S-Asia from W-Asia towards India, Laos and Cambodia.

On the basis of the label indications by the collectors, *Microserrullula* species seem to have adapted to living along the shores of the great rivers, such as Congo, Nile, Zambesi, Firat (Euphrates) and the Tigris. Personal observations (especially in the Mediterranean area) suggest they are very active and fly quickly in case of danger.

SYSTEMATICS NOTES

The diagnostic characters of *Microserrullula* induced different considerations regarding the systematic position and the relatives of this genus, mostly considered in basal position of the whole “genus *Bembidion* s. l.”. According to Schuler (1959) “les espèces de ce genre possèdent à un haut degré la plupart des caractères attribués aux formes les plus primitives des Bembidiini” and again “genre aussi ancien”. Darlington (1959) was the first to consider *Microserrullula*, with some doubts, near to *Odontium*.

Perrault (1981), in his supraspecific classification of Bembidiini, didn't take into consideration the African taxa, and so didn't discuss about *Microserrullula*.

According to Maddison (1993) *Microserrullula* may belong to *Odontium* group, also because “Judging by the apparent uniqueness of these features [possession of serrulate elytral margin; prominent sub-orbital ridge; broad pronotal base; very long flagellum of male genitalia; long multiply coiled spermathecal

duct] within the bembidiines, they are probably derived traits”.

From the taxonomical point of view, *Microserrullula* was differently considered by the authors. According to G. Müller (1918), Netolitzky (1942), Maddison (1993), Krizhanowskij *et al.* (1995) and Marggi *et al.* (2003, 2017) *Microserrullula* is considered subgenus of *Bembidion*, while according to Lorenz (1998, 2005) and Vigna Taglianti (2004) is considered at level of genus. For a more detailed discussion on the use of Bembidiina taxa as generic or subgeneric level see Maddison (1993, 2012), Toledano (2002), Bonavita & Vigna Taglianti (2010).

The recent and illuminating work by Maddison (2012) seems to remove any doubts about the systematic position and the relatives of *Microserrullula*: this genus belongs to *Odontium* complex, where it's the sister group of all other taxa (*Ochthedromus* LeConte, 1848, *Pseudoperyphus* Hatch, 1950, *Odontium*, *Bracteon*).

TAXONOMY

1. *Odontium (Microserrullula) australe* n. sp.

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DBEE4320-65A9-4DDC-BA29-8526A6A3EA22

DIAGNOSIS. Species (Fig. 14) relatively small, pronotum with laterobasal carina absent and latero-hind area, between the internal foveae and the lateral margin, fully smooth; apical elytral spot as a “lunula” in the apical three-quarters, larger and well contrasted. This species occurs in the austral area of Africa.

TYPE LOCALITY. Delagoa Bay [= Maputo Bay], Mozambico.

TYPICAL SERIE. *Mozambique*. Holotypus ♂: “Coll. Mus. Congo, Mozamb.; Delagoa Bay [= Maputo Bay], Col. P. Basilewsky”, with genitals prepared in Euparal on the same pin (MRAC).

Paratypes: “Coll. Mus. Congo, Mozamb.; Delagoa Bay [= Maputo Bay], Col. P. Basilewsky”, 1 ♀ (MRAC); *Kenya* - “KENYA Eastern 6.4.2007 / E of THIKA W of MWINGI / Lgt. Snizek”, 2 ♀♀ (SC); “KENYA / Bushwackers Camp / Athi River Beach / 11-13 II 1977 / J C A van Etten // Museum Leiden / coll. J. van Etten / rec. 1987”, 22 exx. (NBCL, BO, CTVR); *Zambia* -

“Zambia 23.iii.1993, 13°06'03”S/31°47'32”E, South Luangwa NP, Mfuwe Crocodile Farm, 450 m, lux, leg. M. Uhlig”, 1 ♀(MNB); *South Africa* - “S. Afr., Zululand, Mtubatuba, 28.22 S – 32.19 E / 4.4.1974; E-Y: 318, sandy shore washing, leg. Endrödy-Younga”, 4 ♀♀ (2 ♀♀ gen. prep.)(DNMNH); “Rep. South Africa: Pretoria dist., Transvaal, Boekenhouts Kloof, 6 Apr. 1992, 25 31' S, 28 29' E, Robert D. Ward”, 1 ♀!(CMNH); “SÜDAFRIKA – RSA\ Prov.Ost Cape\ Port St. Johns, R61, 10m\ Farm House Lodge\ S 31°36'22.3''E 29°29'06.7''\ leg.A.&A.Puchner 1.XII.2017”, 2 ♂♂, 2 ♀♀ (SC); *Madagascar*: “Madagascar W, Tsiribihina river between Miandrivazo-Antsirataka, 22-24.XI.2005, leg. J. Štátný”, 2 ♂♂, 1 ♀!(BO, BU).

BIBLIOGRAPHIC CITATIONS. Basilewsky (1968 sub *M. aegyptiaca*): “MADAGASCAR SUD. District de Betioky: Tongobory (R. CATALA, 1934)”; we didn't see the specimen from Madagascar, according to Basilewsky “identique à deux spécimens provenant de la Delagoa Bay”.

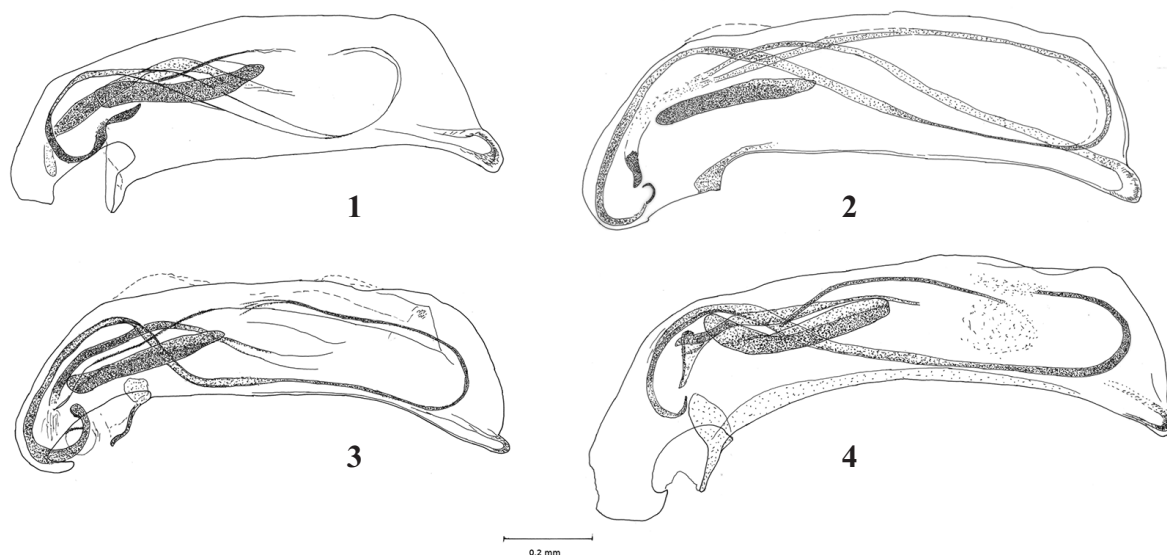
DERIVATIO NOMINIS. The name refers to the known distribution of this species, that occurs in the austral region of Africa, from Kenya to South Africa and Madagascar.

DESCRIPTION OF THE HOLOTYPE. Specimen ♂ (TB 5.37 mm) brown with apical spots, fully reticulated, with isodiametric sculpticells. Palpi and antennae clear, only the last 5-6 antennomeres hardly obscured.

Pronotum (LP 1.20 mm, WP 1.85 mm, LWP 1.54) with sides sinuated before the hind angles, with the base larger than anterior margin; laterobasal carina absent; anterior margin narrow, with sides convergent and angles protruding but rounded; anterior and hind areas, especially in the central area, with longitudinal wrinkles less impressed than in *pogonopsis*; latero-hind area, between the internal fovea and the lateral margin, fully smooth; furrow, between the internal fovea and the hind angle, more or less impressed, parallel to the hind edge of pronotum and not detached from it; hind angles right.

Elytra (LE 3.48 mm, WE 2.20 mm) wide but not elongated, shorter than in *pogonopsis*, parallel almost until the apex; striae and punctuation superficial and less impressed than in *pogonopsis*, with flat interval; apical spot forms a “lunula” in the third-fourth apical, greater and more contrasted than in *pogonopsis*, with the superior limit well defined.

Legs clear; missing the tibia and tarsi of the left posterior leg.



Figs. 1-4. Median lobe of the aedeagus of: 1 - *O. australe*, Mozamb., Delagoa Bay (holotypus); 2 - *O. pogonopsis*, Democratic Republic of Congo, près Bombesa [= Bambesa], Alipago; 3 - *O. icterodes*, Gabon, Kangvé, Ogové; 4 - *O. basilewskyi*, Congo Belge, Libenge, Zambi (holotypus).

Aedeagus (AL 1.13 mm) small (Fig. 1); main sclerite S straight, parallel to the sides; sclerite F1 with the flagellum less evident after the turned; sclerite F2 shorter, visible until the center of the aedeagus; apex proportionally bigger.

DESCRIPTION OF THE PARATYPI AND VARIABILITY OF THE POPULATION. Almost all characters as in the holotypus; specimens brown, bronzed, TB ♀♀ 5.55 mm (5.18-5.85). Palpi and antennae fully clear or, more often, very lightly obscured from fifth antennomere.

Pronotum - LP ♀♀ 1.19 mm (1.10-1.30), WP ♀♀ 1.87 mm (1.73-2.02); LWP ♀♀ 1.56 (1.46-1.60); laterobasal carina always absent; latero-hind area fully smooth; furrow well impressed.

Elytra - LE ♀♀ 3.57 mm (3.35-3.78), WE ♀♀ 2.20 mm (2.01-2.38); basal margin of the elytra ending between the fourth and fifth stria, rarely nearer to the fifth stria. The yellow spots are always well contrasted and well delimited; they occur on the 1/3-1/4 apical, and lunula-shaped.

Genitalia ♀ - (Fig. 8) SL 0.12 mm; spermatheca very simple, with a small bottleneck less evident than in *pogonopsis*, between the anterior and posterior cavity; duct with 4-5 spirals.

DISTRIBUTION. Kenya, Zambia, Mozambique, Madagascar, South Africa.

NOTES. Similar to *pogonopsis*, from which it is distinguishable by the pronotum more sinuated and less wrinkled at margins, by the shorter elytra and the more extended (about apical 1/3-1/4) and well delimited apical spots. In Basilewsky (1968) is mentioned as *aegyptiacum* a specimen from Madagascar (District de Betioky: Tongobory) described as similar to two other specimens from Delagoa Bay (South-Mozambique). He noticed the differences in the sculpture of pronotum and in the coloration of elytra if compared with the specimens from Uganda and Ethiopia. Probably it should refer to *O. australe*.

2. *Odontium (Microserrullula) pogonopsis* (Alluaud, 1933)

Microserrullula pogonopsis Alluaud, 1933: 2

DIAGNOSIS. Species (Fig. 15) of large size (TB ♂♂

5.83 mm (5.61-6.22), ♀♀ 5.87 mm (5.61-6.04), with palpi and antennomeres yellow testaceous, pronotal laterobasal carina reduced, not or scarcely visible and yellow spot in the apical fifth, with the anterior limit not clearly defined.

TYPE LOCALITY. Democratic Republic of Congo, along the Congo river, from Léopoldville [Kinshasa] to Coquilhatville [Mbandaka].

EXAMINED MATERIAL. *Democratic Republic of Congo* - Holotypus: "Moyen-Congo [retro] de Léopoldv., à Coquilhatv., VI-27 / TYPE / Bembid. pogonopsis type Alluaud. Det. 1932", 1 ♂!(MNHN); "Léopoldv., VI.27.", 1 ♂!(MNHN); "MUSÉE DU CONGO, près Bambesa: Alipago - II-1935, J. Leroy", 1 ♂!(MNHN); "Congo Belge, Libenge, Zambi 6.1.1948, R. Cremer -M. Neumann / R. I. Sc. Nat. Belg. , I.G. 16.655 / Institut royal des Sciences naturelles de Belgique, Bruxelles ", 1 ♀ imm.!(RBINS); "MUSÉE DU CONGO, près Bambesa [= Bambesa], Alipago - II-1935, J. Leroy", 2 ♂♂ (gen. prep.), 2 ♀♀ (gen. prep.)(MRAC, BO).

OTHER MATERIAL IN MRAC COLLECTION. *Cameroun* - Cameroun, Yaoundé, 1 ♂, 1 ♀ (MRAC); *Democratic Republic of Congo* - Ubangi, Bambesa, près Alipago, II.1935, J. Leroy, 8 ♂♂ (1 ex. comparé au TYPE pur Alluaud), 17 ♀♀ (MRAC); Ubangi, Dongo, 6.XII.1931, H.J. Brédo, 1 ♀ (MRAC); Eala, VI.1935, J. Gesquière, 4 ♀♀ (MRAC); B. C., Kimpangu Riv, Fulezi 650 m, VII.49, N. Leleup, 1 ♂, 1 ♀ (MRAC); Stanleyville, Yangambi, 5.IX.1952, J. Decelle, 2 ♀♀ (MRAC); Belgian Congo Oriental, Yangambi, 19.VI.1960, 1 ♀ (MRAC); Belgian Congo Oriental, Yangambi, 269.VI.1960, 1 ♂ (MRAC); Tshuapa, Bokuma, IV.1952, R.P. Lootens, 1 ♂, 1 ♀ (MRAC); Tshuapa, Bokuma, 1953, R.P. Lootens, 2 ♂♂, 3 ♀♀ (MRAC).

DESCRIPTION. Specimens brownish, opaque, entirely reticulated with isodiametric sculpticells. Palpi and antennomeres yellow testaceous.

Pronotum - LP ♂♂ 1.26 mm (1.18-1.34), ♀♀ 1.26 mm (1.22-1.32); WP ♂♂ 1.96 mm (1.85-2.09), ♀♀ 1.95 mm (1.90-2.02); LWP ♂♂ 1.54 (1.50-1.57), ♀♀ 1.54 (1.53-1.56); sides slightly sinuated before the hind angles, and the base larger than anterior margin;

fore angles protruding but rounded. Laterobasal carina reduced, not or scarcely visible; furrows more or less impressed, often clearly visible and parallel to the posterior margin of pronotum and more detached from it; hind angles straight or, more rarely, obtuse; fore and hind areas, especially at middle, with longitudinal wrinkles. Microsculpture with isodiametric sculpticells.

Elytra - LE ♂♂ 3.85 mm (3.78-3.96), ♀♀ 3.84 mm (3.72-3.96); WE ♂♂ 2.26 mm (2.20-2.32); ♀♀ 2.32 mm (2.32-2.32); wide and elongated, almost parallel up to the apex; striae and punctuation shallow but clearly impressed, reducing near to apex, with flat interval; sutural stria with 12-14 points; yellow spot in the apical fifth, with the anterior limit not clearly defined.

Legs yellow testaceous.

Genitalia - aedeagus (AL 1.25 mm) (Fig. 2) with a long flagellum and a typical big and long sclerite S in ventral position; the F1 long, turned at the apex until to the base; F2, less visible, connect with the apex; apex thicker and protruding than in *basilewskyi*. Spermatheca (SL 0.13-0.14 mm) (Fig. 9) very simple, with a small bottleneck between the anterior and posterior cavity; the duct with 4-5 spirals.

DISTRIBUTION. This species occurs in Central Africa (Democratic Republic of Congo and Cameroun), along large rivers in tropical forest.

NOTES. Easily recognizable from *O. basilewskyi* n. sp. and *O. icterodes*, sympatric species, in the stouter and enlarged body; elytra parallel almost until to the apex, with striae and punctuation superficial and a yellow spot in the apical fifth with the anterior limit not clearly defined.

3. *Odontium (Microserrullula) icterodes* (Alluaud, 1933)

Microserrullula icterodes Alluaud, 1933

DIAGNOSIS. Species (Fig. 16) of medium-small size, with pronotum transverse and clearly sinuated, with laterobasal carina evident and the base with wrinkles hardly indicated, with elytra relatively shorter and apical spot with indefinite margins.

TYPE LOCALITY. Democratic Republic of Congo, along

the Congo river, from Léopoldville [Kinshasa] to Coquilhatville [Mbandaka].

EXAMINED MATERIAL. *Democratic Republic of Congo* - Holotypus: "de Léopoldv., à Coquilhatv., VI-27 / Bembid. icterodes Alluaud det. 1932, Type / TYPE / TYPE/ cf. Afra, 6, 1933, p. 3 / *Bembidion (Microserrullula) icterodes* Alld., P. Basilewsky vid, 1947 / Institut royal des Sciences naturelles de Belgique, Bruxelles", 1 ♀ imm.!(RBINS); "de Léopoldv., à Coquilhatv., VI-27 / Bembid. icterodes Alluaud det. 1932, cotype", 1 ♂ imm.!(MNHN);

"Gantchou, 19.VI.1927, A. Collart / *Bembidion (Microserrullula) pogonopsis* All. P. Basilewsky det., 1947 / Institut royal des Sciences naturelles de Belgique, Bruxelles", 1 ♂ (gen. prep.)(RBINS); *Gabon* - "Ogové R., A.C. Good / Holland Collection", 1 ♀ without abdomen!(CMNH); "Kangvé, Ogové R., A.C. Good / Holland Collection", 1 ♂ (gen. prep.)(CMNH).

BIBLIOGRAPHIC CITATIONS. Alluaud (1933: 3): "Congo belge, entre Léopoldville et Coquilhatville"; Basilewsky (1948: 12-13 sub *pogonopsis*): "N'Ganchou, ..., en aval de Kwamouth, sur la rive droite du fleuve, ... capturée à quelques reprises dans le Nord du Congo".

REDESCRIPTION OF THE HOLOTYPE ♀. Specimen immature (TB 5.37 mm), yellow with the head brown, fully reticulated, with transverse or isodiametric sculpticells. Palpi and antennae light, with the last antennomeres hardly obscured.

Pronotum (LP 1.08 mm; WP 1.78 mm; LWP 1.64) with sides clearly sinuated before the right hind angles; base hardly larger than anterior margin; laterobasal carina evident and relieved; furrow, between the internal fovea and the lateral margin, well impressed, with the line tightly parallel to the posterior margin of pronotum; anterior margin with sides slightly convergent and angles slightly acute; anterior and posterior margins, especially in the central area, with longitudinal striae weakly impressed. Microsculpture with isodiametric sculpticells.

Elytra (LE 3.48 mm; WE 2.01 mm) not elongated, relatively shorter, with the maximum width in the anterior third; striae and punctuation superficial and slightly impressed, intervals flat; lighter apical spot in the apical fifth-sixth; thorax and abdominal

sternites brown. Microsculpture with transverse or isodiametric sculpticells.

Legs clear.

VARIABILITY OF THE POPULATION. In addition to the type, we saw only four more specimens, including the immature cotype. Specimens of medium size, TB ♂♂ 5.26 mm (5.18-5.37); ♀♀ 5.12 mm (4.88-5.37). The mature specimens, of colour brownish, have an apex slightly lighter, without a well-defined spot.

Pronotum - LP ♂♂ 1.10 mm (1.08-1.13), ♀♀ 1.03 mm (0.98-1.08); WP ♂♂ 1.70 mm (1.68-1.73), ♀♀ 1.67 mm (1.56-1.78); LWP ♂♂ 1.56 (1.49-1.60), ♀♀ 1.61 (1.58-1.64), transverse, more than in the other species, with weak wrinkles at the centre of anterior and posterior margins; furrow, between the internal fovea and the angle of pronotum, well impressed and tightly parallel to the hind edge of pronotum and not detached from it. Microsculpture well defined on the whole pronotum with isodiametric sculpticells. Anterior angles protruding and slightly rounded.

Elytra - LE ♂♂ 3.39 mm (3.35-3.41), ♀♀ 3.29 mm (3.11-3.48); WE ♂♂ 2.17 mm (2.13-2.20); ♀♀ 1.98 mm (1.95-2.01). Elytra shorter with striae superficially punctured and intervals flat or slightly convex; the spots are represented only by an apical area slightly lighter, not yellow.

Aedeagus - AL 1.12 mm (1.10-1.13) (Fig. 3); small; main sclerite S in basal position, straight and slightly oblique; sclerite F1 with the flagellum protruding from the basal margin with a hairpin-like bend, and then, after the bend, becomes less evident up to the center of the aedeagus; sclerite F2 shorter, well visible only in the whole basal half of the aedeagus.

Spermatheca - unknown. The female type is immature, while in the other female the abdomen is missing.

DISTRIBUTION. Democratic Republic of Congo and Gabon.

NOTE. Both Alluaud (1933) and Schuler (1959) described this species as having a pronotal microsculpture more superficial and hardly visible; in the mature specimens we noticed the same development than in the other species of *Microserrullula*.

4. *Odontium (Microserrullula) basilewskyi* n. sp.

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15315D66-034C-4F6A-B579-3FAFEDFADDE4

DIAGNOSIS. Species (Fig. 17) brown, elongate, characterized by strongly convex body and long elytra with maximum width at the anterior third and subparallel sides, narrowing towards the apex. A small yellow spot occur at the elytral apex; legs clear.

TYPE LOCALITY. Zambi, along the Ubangi river, tributary of Congo river, to South of Libenge, in the Democratic Republic of Congo.

TYPICAL SERIES. *Democratic Republic of Congo* - Holotypus ♂: "Congo Belge, Libenge, Zambi 6.1.1948, R. Cremer-M. Neumann / R. I. Sc. Nat. Belg. , I.G. 16.655 / Institut royal des Sciences naturelles de Belgique, Bruxelles"!(RBINS); Paratypes: "Congo Belge, Libenge, Zambi 6.1.1948, R. Cremer-M. Neumann / R. I. Sc. Nat. Belg. , I.G. 16.655 / Institut royal des Sciences naturelles de Belgique, Bruxelles", 7 ♂♂, 5 ♀♀!(RBINS, BO); "Congo Belge, Libenge, Izato 16.XII.1947, R. Cremer -M. Neumann / R. I. Sc. Nat. Belg. , I.G. 16.655 / Institut royal des Sciences naturelles de Belgique, Bruxelles", 1 ♂!(RBINS); "Congo Belge, Libenge, Zambi 6.1.1948, R. Cremer - M. Neumann / COLL. MUS. CONGO, don RBINS, col. P. Basilewsky", 2 ♂♂, 3 ♀♀!(MRAC).

DERIVATIO NOMINIS. We dedicate, with great pleasure, this species to Pierre Basilewsky, the father of the African carabidology.

DESCRIPTION OF THE HOLOTYPE. Specimen ♂ (TB 5.67 mm) brown-reddish, entirely reticulated, with isodiametric sculpticells on the pronotum and isodiametric or slightly transverse sculpticells on the elytra. Palpi and antennomeres yellow testaceous.

Pronotum (LP 1.22 mm; WP 1.85 mm) convex, transverse (LWP 1.51), hardly sinuated before the hind angles, with the base distinctly larger than anterior margin; anterior angles protruding and acute. Laterobasal carina unnoticeable; basal area strongly wrinkled, with striae longitudinal in the middle; furrows shallow, not clearly recognizable; hind angles right; anterior areas with longitudinal wrinkles. Microsculpture with isodiametric sculpticells.

Elytra (LE 3.66 mm; WE 2.13 mm) elongated and narrow; strongly enlarged in the anterior third, where they have their maximum width, gradually narrowing up to the apex. Sutural stria long. Striae and punctuation strongly impressed until the apex. Apical spot short and undefined. Microsculpture with isodiametric or slightly transverse sculpticells.

Legs entirely yellow testaceous.

Aedeagus (AL 1.32 mm) (Fig. 4) with a typical sclerite S in basal position; F1 recurved at the apex and overlapping F2 in dorsal area; apex short and thin.

DESCRIPTION OF THE PARATYPI AND VARIABILITY OF THE POPULATION. Almost all characters as in the holotypus. TB ♂♂ 5.63 mm (5.89-5.65), ♀♀ 5.65 mm (5.43-5.91).

Pronotum - LP ♂♂ 1.23 mm (1.18-1.30), ♀♀ 1.21 mm (1.15-1.25); WP ♂♂ 1.83 mm (1.70-1.92), ♀♀ 1.84 mm (1.75-1.92); LWP ♂♂ 1.49 (1.42-1.55), ♀♀ 1.52 (1.49-1.58); basal furrow of the pronotum sometimes visible, but always shallow; laterobasal carina always unnoticeable.

Elytra - LE ♂♂ 3.64 mm (3.48-3.78), ♀♀ 3.67 mm (3.54-3.90); WE ♂♂ 2.08 mm (1.95-2.13), ♀♀ 2.07 mm (2.01-2.13); sutural stria with 10-12 points; apex always yellow.

Genitalia - aedeagus (AL 1.32 mm; SL 0.12 mm) as in the holotypus. Spermatheca (Fig. 10) very simple, with a little bottleneck between the anterior and posterior cavity; duct with 4-5 spirals.

DISTRIBUTION. The specimens of this species, actually present only in the collection at RBINS, were identified as *pogonopsis*. This new species is known only of Libenge area, along Ubangi river, right tributary of Congo river, that is a boundary between Centrafrican Republic and Democratic Republic of Congo to North, and Republic of Congo and Democratic Republic of Congo to South.

5. *Odontium (Microserrullula) okavangum* n. sp.

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DIAGNOSIS. Species (Fig. 18) of small to medium size, with head and pronotum from red-brownish to brownish, antennae yellow, and elytra red-yellowish to brown; pronotum sinuated, with laterobasal carina hardly indicate, often not visible, with basilateral wrinkles not or hardly indicate.

TYPE LOCALITY. Popa Falls near Bagani, along the Okavango river, Namibia.

TYPICAL SERIES. *Namibia* - Holotypus ♂: "Namibia bor. or., Okavango river, Bagani, Popa Falls, 25.1-6.2.1995, lgt. M. Snizek / cfr. *B. aegyptiacum* det. L. Toledano / *Bembidion aegyptiacum* det. L. Toledano" with genitals prepared in Euparal on the same pin (CTVR); Paratypus: "Namibia bor. or., Okavango river, Bagani, Popa Falls, 25.-6.2.1995, lgt. M. Snizek", 1 ♂, 2 ♀♀ (1 imm.) (1 ♀ gen. prep.)(CTVR); "Namibia bor. or., Okavango river, Bagani, Popa Falls, 25.-6.2.1995, lgt. M. Snizek", 1 ♂ (gen. prep.)(BO); "Namibia bor. or., Okavango river, Bagani, Popa Falls, 25.1-6.2.1995, lgt. M. Snizek", 1 ♀ imm.)(NE); "Namibia Exp.ZMB 1992, East Caprivi: Katima, Mulilo. Lux. 17°29'S/, 24°17'E.3.-8.III.1992, leg. M. Uhlig", 1 ♀!(MNB); *Angola* - "Angola, riv. Cuilo, Cacolo, Alto Cuilo, VI-1954, 3694.3, E. Luna de Carvalho / Musée Royal de l'Afrique centrale Tervuren", 1 ♀!(MRAC); "Angola: riv. Cuilo, Cacolo, / Alto Cuilo VI-1954 / 3694.3 / E. Luna de Carvalho", 1 ♂ (CTVR); *Zambia* - "ZAMBIA, Western 13.1.2010 / 30km NW Sesheke / S20°17.08 E24°08.49 / P. Schüle leg.", 1 ♂ (SC); "D.Sambesi Gebt./ 10.06 / F. Seiner S.G.", 10 exx.!(MNB).

DERIVATIO NOMINIS. The name is referred to the Okavango river, where this species occurs, famous for his beautiful internal delta, flowing into the desert.

DESCRIPTION OF THE HOLOTYPE. Specimen ♂ (TB 5.55 mm) entirely reticulated, with isodiametric sculpticells on head, pronotum and elytra. Antennae and palpi entirely clear; thorax sternite brownish and abdominal sternite reddish or clearer.

Pronotum (LP 1.18 mm, WP 1.78 mm; LWP 1.51) brown reddish, sinuated before of the posterior angles, with the base larger of the anterior margin; laterobasal carina absent or hardly indicate; area latero-posterior, between the internal fovea and the lateral margin, smooth with slight wrinkles hardly indicate; furrow, between the internal fovea and the posterior angle, well impressed, tightly parallel to the hind edge of pronotum and not detached from it; posterior sides slightly obtuse; anterior margin of the

pronotum with sides convergent and angles acute; anterior and posterior margins, especially in the central area, with longitudinal striae hardly indicate (especially posteriorly) or not evident (anteriorly).

Elytra (LE 3.48 mm, WE 2.13 mm) yellow reddish, elongated, with the maximum width in the anterior third; striae and punctuation superficial and slightly impressed, with intervals flat; apex slightly clearer.

Legs yellow.

Genitalia - aedeagus (1.42 mm) (Fig. 5) smaller than in *aegyptiacum*, with the main sclerite S stout, flagellum F1 double at the base and visible up to the apex and F2 short, visible on the main sclerite; apex stout and lightly curved.

DESCRIPTION OF THE PARATYPI AND VARIABILITY OF THE POPULATION. Specimens of small-medium size, TB ♂♂ 5.29 (5.00-5.55) ♀♀ 5.47 mm (5.30-5.61); sometimes distal antennomeres slightly obscured; thorax sternite brownish to reddish, and abdominal sternite clearer, reddish to yellowish.

Pronotum - LP ♂♂ 1.12 mm (1.08-1.18), ♀♀

1.14 mm (1.10-1.15); WP ♂♂ 1.68 mm (1.63-1.78), ♀♀ 1.74 mm (1.70-1.78); LWP ♂♂ 1.50 (1.50-1.51); ♀♀ 1.53 (1.52-1.54), brown reddish to reddish brown; postangular carina absent or, in a female, reduced but visible to high magnification; posterior angles right or slightly obtuse.

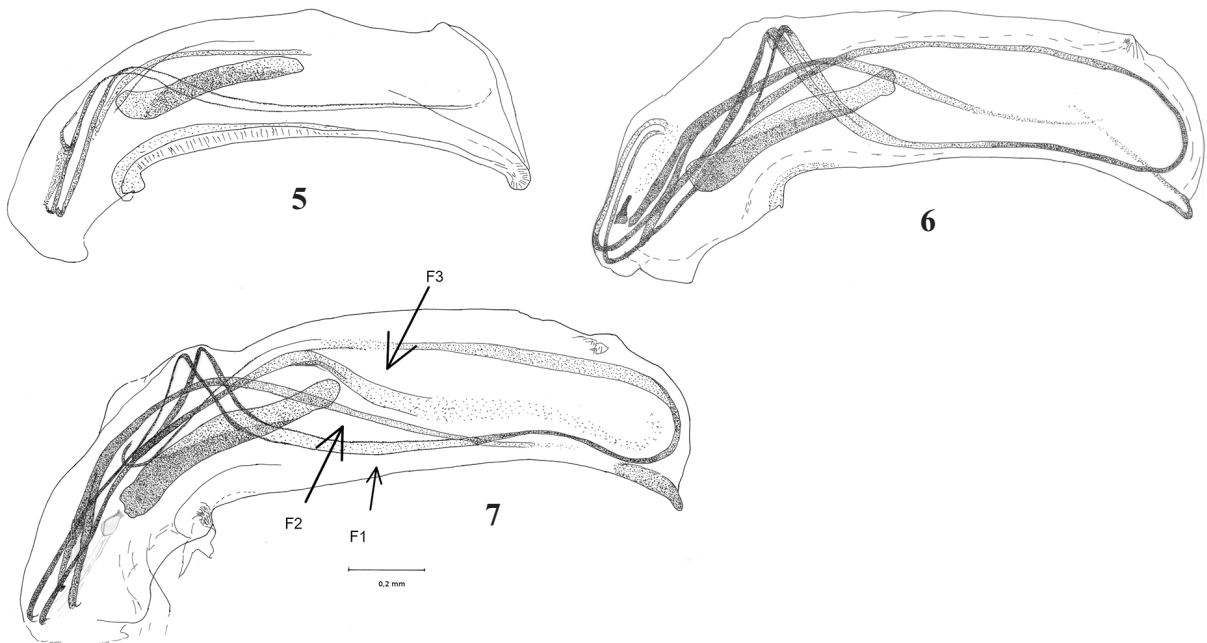
Elytra - LE ♂♂ 3.35 mm (3.17-3.48), ♀♀ 3.54 mm (3.41-3.66), WE ♂♂ 2.03 mm (1.95-2.13), ♀♀ 2.11 mm (2.01-2.20); yellow reddish, sometimes with the first intervals more obscured; brown elytra in the specimens of Angola; apex slightly clearer without a defined spot.

Thorax sternite usually brownish, while abdominal sternite usually yellowish.

Genitalia - aedeagus: 1.39 mm (1.37-1.42); spermatheca (Fig. 11) with 2 cavities and duct with 8-10 spirals.

DISTRIBUTION. Angola, Namibia, Zambia.

COMPARATIVE NOTE. Species very similar to *O. aegyptiacum*, with which was confused and from which is distinguishable especially by the different morphology of the median lobe of aedeagus and the



Figs. 5-7. Median lobe of the aedeagus of: 5 - *O. okavangum*, Namibia bor. or., Okavango river, Bagani, Popa Falls (holotypus); 6 - *O. aegyptiacum*, Egypt, Kitchener; 7 - *O. clarkei*, Ethiopia, Blue Nile Gorge (holotypus); F1, F2, F3 - flagelliform sclerites.

spermatheca. “Kuntzen la cite du Sud-Ouest africain, mais l’identité de ces spécimens devrait être vérifiée” (Basilewsky, 1953): the mention of the species, identified as *aegyptiacum* while occurring in South-West Africa, actually refers to this new species.

6. *Odontium (Microserrullula) aegyptiacum*
(Dejean, 1831)

Bembidium aegyptiacum Dejean, 1831: 90

= *Bembidium senegalense* Dejean, 1831: 92

DIAGNOSIS. Species (Fig. 19) of small-medium size, with head and pronotum red-brownish, antennae yellow, and entirely red-yellowish elytra; pronotum sinuated, with laterobasal carina hardly visible, often not visible, with basilateral wrinkles not or hardly indicate; abdominal sternite in the lateral area yellowish.

TYPE LOCALITY. Dejean (1831) indicates, without clear localities, that the provenance of the typical form is Egypt, and that of *B. senegalense* is Senegal.

EXAMINED MATERIAL. “Schaum – 852 / Coll. Mus. Vindob.”, 1 ex.!(NHMW-V); “Kots 6.59.”, 2 ♀♀!(NHMW-V); “Kots 6”, 1 ♂, 1 ♀!(NHMW-V); “H. E. Andrewes coll. B. M. 1945-97”, 1 ♀!(NHML); *Egypt* - “Egypt / Sharp Coll. 1905-313. / Bembidion aegyptiacum Dej., V. Lutschnik d.”, 1 ♂, 1 imm.!(NHML); “Aegyptus Reitter. / aegyptiacum Dej. Aeg. Luxor / H. E. Andrewes Coll. B.M. 1945-97.”, 1 ♀!(NHML); “Bowering. 63-47* / 2915 / aegyptiacum Dej. Cairo.”, 1 ♂!(NHML); “Goedl 1852. Egypt.”, 1 ♀!(NHMW-V); “Aegypten / Collect. Plason / aegyptiacum det. Netolitzky”, 2 ♂♂!(NHMW-V); “Aegypt. V. M. Duchoň / Collect. Hauser / aegyptiacum det. Netolitzky / B. aegyptiacum Dej.”, 1 ♂!(NHMW-V); “Aegypt. V. M. Duchoň / Collect. Hauser / aegyptiacum det. Netolitzky”, 2 ♂♂!(NHMW-V); “Elephantine Aeg. Reimoser”, 1 ♂, 1 ♀!(NHMW-V); “Luxor Aeg. Reimoser”, 4 ♂♂, 2 ♀♀!(NHMW-V); “Luxor”, 1 ex., 2 ♂♂, 1 ♀!(NHMW-V); “Kitchener J. Aeg. Reimoser”, 7 ♂♂ (2 ♂♂ gen. prep.), 6 ♀♀ (2 ♀♀ gen. prep.)(NHMW-V); “Aegypt. V. M. Duchoň / [illegible] Neto / coll. Netolitzky / aegyptiacum det. Netolitzky / Coll. Netolitzky”, 1 ♀!(NHMW-N); “Aegyptus Luxor / aegyptiacum Dej. / [illegible] / coll. Netolitzky /

aegyptiacum det. Netolitzky”, 1 ♂!(NHMW-N); “Luxor Agypten / coll. Netolitzky / aegyptiacum det. Netolitzky”, 1 ♂!(NHMW-N); “Aegypten, Luxor Slg. W. Meier / coll. Netolitzky / aegyptiacum det. Netolitzky”, 1 ♀!(NHMW-N); “Luxor Aeg. Reitter / coll. Netolitzky / aegyptiacum det. Netolitzky”, 1 ♂ (senza addome)!(NHMW-N); “Assuan Nil, Nil-Ufer 25.- I / Assuan Bänninger / coll. Netolitzky / aegyptiacum det. Netolitzky”, 1 ♂!(NHMW-N); “Aegypt. V. M. Duchoň / Luxor V. M. Duchon. / coll. Paul Meyer / aegyptiacum Dej. det. P. Meyer / Acqu.-Nr. 1951-23 / Coll. P. Meyer”, 1 ♂!(NHMW-M); “Lüxor Ägypten / aus Sammlg. E. Buchka-Frkf. / coll. Paul Meyer / aegyptiacum Dej. det. P. Meyer / Acqu.-Nr. 1951-23”, 1 ♀!(NHMW-M); “Luxor / Aegypt. V. M. Duchoň / coll. Paul Meyer / aegyptiacum Dej. det. P. Meyer / Acqu.-Nr. 1951-23”, 1 ♀!(NHMW-M); “Luxor V. M. Duchon / coll. Paul Meyer / aegyptiacum Dej. det. P. Meyer / Acqu.-Nr. 1951-23”, 1 ♀!(NHMW-M); “Nil / collectio Paganetti / Coll. Mus. Vindob. / aegyptiacum Dej. det. P. Meyer / Inserenda”, 2 ♀♀(NHMW-V); “Alexandria Aegyptus / collectio Paganetti / Coll. Mus. Vindob. / 4”, 1 ♂, 1 ♀!(NHMW-V); “Aegyptus Reitter / Coll. Hampe / Coll. Mus. Vindob. / Pogonidium aegyptiacum Dej. det. Breit”, 1 ♀!(NHMW-V); “Helwan 94 Egy. Dr. Fényes B./ Coll. Hampe / Coll. Mus. Vindob.”, 1 ♀!(NHMW-V); *Sudan* - “Kodroko, 8.IV.13, (W.T.R.L., Bureau Ec. Ent.), N° 5021, H. H. D. King”, 1 ♀!(NHML); “British Sudan, H.H. King (Pres. By Imp. Bur. Ent. Brit. Mus. 1923-541)”, 1 ♂!(NHML); “E. Africa, Sudan, Merowé, 5.ii.1947. B.M. 1947-147. / Pres. By B. J. Lewis 22.iv.1947.”, 1 ex.!(NHML); “Sudan 16.10.1962, W. Alfa distr., 2nd Catarakt, [leg.] S. Panelius / Mus. Zool. Helsinki, Loan No. C219 / Coll. Mus. Tervuren, Coll. P. Basilewsky”, 1 ♀!(MRAC); “Wadihalfa”, 1 ♂, 1 ♀!(NHMW-V); *Sudan*, Khartoum, X.1967, leg. Dr. P. Štys, 1 ♀!(KM); *Ethiopia* - “Éthiopie Mérid., Nanoropus, bords du Rodolphe, 565 m / Muséum de Paris, Mission de l’Omo, C. Arambourg, P.-A. Chappuis, & R. Jeannel, 1932-33 / Coll. Mus. Congo, Col. P. Basilewsky”, 1 ♂!(MRAC); *Kenya* - “Kenya bor. occ., Lodwar, 20.12.95, ing. Snizek lgt.”, 1 ♂!(CTVR); “Kenya bor. occ., Lodwar, 20.12.95, ing. Snizek lgt.”, 3 ♀♀!(FA); “Kenya bor. occ., Lodwar, 20.12.95, ing. Snizek lgt.”, 1 ♀!(MO); “Kenya bor. occ., lake Turkana, Kalekol

env., 17.12.95, Lgt. M. Snizek", 1 ♂, 2 ♀♀(FA); Kenya bor. occ., lake Turkana, Kalekol env., 17.XII.1995, leg. M. Snizek, 1 ♂!(WR); "KENYA / Lodwar / Turkwell River / 4 VIII 1978 / J C A van Etten // Museum Leiden / coll. J. van Etten / rec. 1987", 3 exx (NBCL); *Uganda* - "Uganda: Turkana Prov., D. R. Buxton / L. Rudolf Rift Val., Expedition 1934., B.M. 1935-267 / *Bembidion aegyptiacum* Dej. v. *senegalense* Dej.", 1 ♂!(NHML); *Senegal* - "Senegal (Thomson coll. 77-15 k) / *B senegalense* Dej. Senegal", 1 ♀!(NHML).

OTHER MATERIAL IN MRAC COLLECTION. *Sudan* - C.I.P.P.A.S., Dogo, lumière, (Macina) Soudan Fr, 2 X 50, G.Remaudière, 1 ♀ (MRAC); *Sudan*, 16.10.1962, W. Halfa distr. 2nd catarakt, S. Panerius / Mus. Zool. Helsinki lo.C219, 1 ♀ (MRAC); *Sudan*, Wadi Haifa, 10.IV.1964, J. Kaisila / Mus. Zool. Helsinki lo.C219, 1 ♀ (MRAC); *Ethiopia* - Ethiopie mérid., Nanoropus, Bords du Rodolphe 565 m / Muséum de Paris, Mission de l'Omo C. Arambourg, P.A. Chappuis & R. Jeannel 1932-33, 1 ♂ (MRAC); *Burkina Faso* - Dyoko-Iunda, 10.VIII.1921, excrement humain, Lt. Gesquière, 1 ♂ (MRAC); *Uganda* - Uganda, Turkana Prov., D.R. Buxton / L. Rudolf Rift Val. Expedition 1934, B.M. 1935-267, 1 ♂ 1 ♀ (MRAC).

BIBLIOGRAPHIC CITATIONS. Dejean (1831: 91-92): "Égypte" and (sub *senegalense*) "Sénégal"; Alluaud (1933: 3 sub var. *senegalense*): "Sénégal et de Gao sur les bords du Niger"; Schatzmayr (1936): "Rod El Farag, Tura, Matarie, Marg, Mazguna (F); Heluan, Luxor (S); Delta (A); Barrage! Assiut! U. Halfa!"; Alluaud (1939: 2 sub *Bembidion* (*Microserrullula*)): "Nanoropus, extrémité boréale du lac Rodolphe, 565 m"; Basilewsky (1953: 1553): "Dogo [Central African Republic], à la lumière, 2-5-VIII, 9-X-1950; deux exemplaires"; Kaszab (1959: 284): "Assuan, Isl. Kitchener, 26.X.1957"; Basilewsky (1968: 516): *Uganda* and *Ethiopia*; Abdel-Dayem (1998: 184): "very common in upper Egypt on banks of the river Nile and on shores of the Lake Nasser...in the Nile Delta and in lower Egypt, and is rare along the sea coast, whereas only one record is thus far known From Sinai".

DESCRIPTION. Small to medium sized species, TB ♂♂ 5.52 mm (5.24-6.16), ♀♀ 5.75 mm (5.18-6.22), entirely reticulated, with sculpticells isodiametric on

pronotum and elytra. Palpi and antennae entirely yellow.

Pronotum - LP ♂♂ 1.20 mm (1.08-1.37), ♀♀ 1.21 mm (1.08-1.30); WP ♂♂ 1.78 mm (1.58-2.02), ♀♀ 1.85 mm (1.70-1.99); LWP ♂♂ 1.49 (1.32-1.57), ♀♀ 1.54 (1.46-1.68); from dark brown to reddish brown, sinuated before the posterior angles; base wider than anterior margin; laterobasal carina hardly indicate, often not visible; latero-posterior area, between the internal fovea and the lateral margin, smooth or with slight wrinkles hardly indicate; furrow, between the internal fovea and the angle of pronotum, well impressed and tightly parallel to the hind edge of pronotum and not detached from it; posterior sides right or slightly obtuse; anterior margin of the pronotum with sides convergent and angles slightly acute; anterior and posterior margins, especially in the central area, with longitudinal striations hardly indicate or not evident.

Elytra - LE ♂♂ 3.62 mm (3.41-3.90), ♀♀ 3.72 mm (3.41-3.96); WE ♂♂ 2.24 mm (2.01-2.44); ♀♀ 2.29 mm (2.13-2.44); red-yellowish, shorter, with parallel sides; striae and punctuation clear and superficial, with intervals flat; apex sometimes clearer; thorax sternite usually brownish, while abdominal sternite usually yellowish at sides.

Legs - clear.

Genitalia - aedeagus: AL 1.69 mm (1.63-1.80) (Fig. 6), bigger, with a big and long main sclerite (S) obliquely positioned in the basal area, F1 double and turned at the base, with a very long flagellum turning in the apical part and coming back to the base, above the main sclerite S; F2 double at the base; apex short and thin. Spermatheca: (Fig. 12) LS 0.17 mm, with a bottleneck between the anterior cavity, larger and curved, and the posterior cavity; duct with about 30 spirals.

DISTRIBUTION. Mali, Burkina Faso, Senegal, Central African Republic, Egypt, Sudan, Uganda, Ethiopia, Kenya.

NOTE. Dejean (1831) described *senegalense*, on specimens from Senegal; Alluaud (1933) distinguish it by bigger size and punctures of elytra more spaced from one another, while Schuler (1959) by the punctures stronger and less (serrata). We consider

these characters included in the variability of the species.

7. *Odontium (Microserrullula) clarkei* n. sp.

urn:lsid:zoobank.org:act:

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DIAGNOSIS. Species (Fig. 20) of great size, the bigger of the subgenus, with wide elytra, very similar to *pogonopsis*; elytra with striae and punctuation shallow and intervals flat; yellow spot of elytra reduced, present in the apical fifth.

TYPE LOCALITY. Blue Nile Gorge, 1100 m, in Ethiopia.

TYPICAL SERIES. *Ethiopia* - Holotypus ♂: "Blue Nile Gorge, 1100 m, 10.XI.1971 / Coll. Mus. Tervuren, Ethiopie, R.O.S. Clarke / Musée Royal de l'Afrique centrale Tervuren", with genitals prepared in Euparal on the same pin (MRAC); Paratypi: "Blue Nile Gorge, 1100 m, 10.XI.1971 / Coll. Mus. Tervuren, Ethiopie, R.O.S. Clarke / Musée Royal de l'Afrique centrale Tervuren", 1 ♂ (gen. prep.), 2 ♀♀ (gen. prep.)(MRAC, BO).

DERIVATIO NOMINIS. We dedicated, with great pleasure, this species to †R.O.S. Clarke, that collected all known specimens.

DESCRIPTION OF THE HOLOTYPE. Specimen ♂ (TB 5.85 mm) of large size, brown, entirely reticulated. Palpi and antennomeres yellow testaceous.

Pronotum (LP 1.34 mm, WP 1.90 mm, LWP 1.41) wide with sides sinuated before the hind angles; the base larger than anterior margin; laterobasal carina reduced but clearly visible; basal area almost without wrinkles; furrow well impressed, parallel to the hind margin and detached from it; hind angles straight; anterior margin less narrow with angles protruding and rounded; fore and hind areas, especially in the middle, with longitudinal wrinkles. The lateral margins, next to the anterior angles, serrulated, as in the elytral margin, with 3 very small setae.

Elytra (LE 3.78 mm, WE 2.32 mm) wide with parallel sides; striae and punctuation superficial and intervals flat; yellow spot occurs at the elytral apex, with the anterior limit not clearly defined.

Legs yellow testaceous.

Aedeagus big (AL 1.80 mm) (Fig. 7), with a big and long main sclerite (S) obliquely positioned in basal area and F1 with a very long flagellum that turned until to the base; apex thin, short and weakly curved.

DESCRIPTION OF THE PARATYPI AND VARIABILITY OF THE POPULATION. Almost all characters as in the holotypus. TB ♂♂ 5.95 mm (5.85-6.04), ♀♀ 6.22 mm (6.16-6.28). Antennae lightly obscured from fourth antennomeres or almost not obscured.

Pronotum - LP ♂♂ 1.33 mm (1.32-1.34), ♀♀ 1.38 mm (1.37-1.39); WP ♂♂ 1.94 mm (1.90-1.99), ♀♀ 2.03 (2.02-2.04); LWP ♂♂ 1.46 (1.41-1.51), ♀♀ 1.47 (1.45-1.49). The lateral margin, near to the anterior angles, serrulated with 3-4 setae. Basal margin of the elytra ending between the fourth and fifth stria, sometimes nearer to the fifth stria.

Elytra - LE ♂♂ 3.81 mm (3.78-3.84), ♀♀ 3.96 mm (3.90-4.02); WE ♂♂ 2.38 mm (2.32-2.44), ♀♀ 2.47 mm (2.44-2.50); sutural stria with 12-14 points; yellow apex, with the anterior limit not clearly defined.

Genitalia - aedeagus (AL 1.80 mm, SL 0.19 mm); spermatheca (Fig. 13) very simple, with rounded margins and a little bottleneck between the anterior and posterior cavity; the duct is very long with 25-30 spirals.

DISTRIBUTION. Species known only from the type locality, in Ethiopia, along the Blue Nile.

CATALOGUS OF THE AFRICAN SPECIES
OF *MICROSERRULLULA*

Odontium (Microserrullula) australe Bonavita & Vigna Taglianti, 2021

Odontium (Microserrullula) icterodes (Alluaud, 1933)

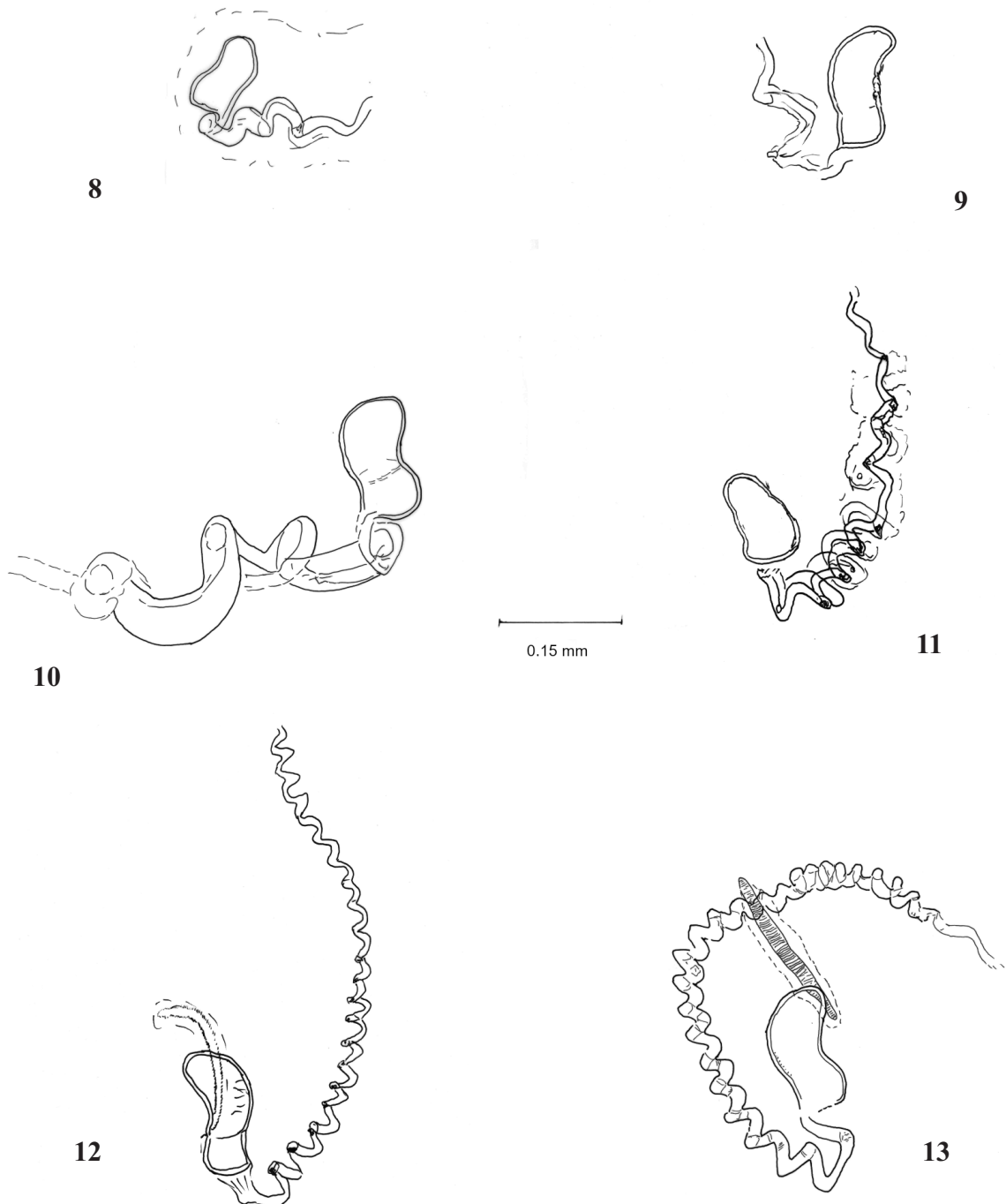
Odontium (Microserrullula) basilewskyi Bonavita & Vigna Taglianti, 2021

Odontium (Microserrullula) pogonopsis (Alluaud, 1933)

Odontium (Microserrullula) okavangum Bonavita & Vigna Taglianti, 2021

Odontium (Microserrullula) aegyptiacum (Dejean, 1831)

Odontium (Microserrullula) clarkei Bonavita & Vigna Taglianti, 2021



Figs. 8-13. Spermathecae of: 8 - *O. australe*, South Africa, Zululand, Mtubatuba; 9 - *O. pogonopsis*, Democratic Republic of Congo, près Bombesa [= Bambesa], Alipago; 10 - *O. basilewskyi*, Congo Belge, Libenge, Zambi; 11 - *O. okavangum*, Namibia bor. or., Okavango river, Bagani, Popa Falls; 12 - *O. aegyptiacum*, Egypte, Kitchener; 13 - *O. clarkei*, Ethiopia, Blue Nile Gorge.



14



15



16



17

Figs. 14-17. Habitus of: 14 - *O. australe*, Kenya, Bushwackers Camp, Athi River Beach; 15 - *O. pogonopsis*, Democratic Republic of Congo, près Bombesa [= Bambesa], Alipago; 16 - *O. icterodes*, Democratic Republic of Congo, Gantchou; 17 - *O. basilewskyi*, Congo Belge, Libenge, Zambi.



Figs. 18-20. Habitus of: 18 - *O. okavangum*, Angola, riv. Cuilo, Cacolo, Alto Cuilo; 19 - *O. aegyptiacum*, Sudan, Wadi Hatta; 20 - *O. clarkei*, Ethiopia, Blue Nile Gorge.

IDENTIFICATION KEY

- 1 bicolor species, with pronotum brownish and elytra entirely reddish or yellow-reddish with apex clearer; abdominal sternites clearer, yellowish; laterobasal carina often not visible or at least hardly visible.....2
- unicolor species, with pronotum and elytra brown with apex clearer; abdominal sternites brownish3
- 2 median lobe of aedeagus bigger, with a very long flagellum and the apex shorter and thinner (Fig. 6); L ♂♂ 5.24-6.16 mm, ♀♀ 5.18-6.22 mm; North to Equator: Mali, Burkina Faso, Senegal, Central African Republic, Egypt, Sudan, Uganda, Ethiopia, Kenya.....*aegyptiacum* (Dejean, 1831)
- median lobe of aedeagus smaller, with a flagellum clearly shorter and the apex with a small lip (Fig. 5); L ♂♂ 5.00-5.55 mm, ♀♀ 5.30-5.61 mm; South to Equator: Angola, Namibia, Zambia*okavangum* n. sp.
- 3 pronotum not or lightly wrinkled; pronotal furrow, between the internal fovea and the hind angle, more or less impressed; elytra less elongated and punctures more superficial.....4
- area, between the internal fovea and the lateral margin of pronotum, more strongly wrinkled; pronotal furrow, between the internal fovea and the hind angle, superficial and not clearly visible; laterobasal carina unnoticeable; elytra narrowed and strongly elongated with striae and punctures strongly impressed; apical spot smaller, occurs only at the far apex; L ♂♂ 5.65-5.89 mm, ♀♀ 5.43-5.91 mm; Democratic Republic of Congo....*basilewskyi* n. sp.
- 4 species smaller (5.18-5.85 mm); sides of pronotum clearly sinuated; elytra not elongated, proportionally shorter with punctures superficial; latero-hind area, between the internal fovea and the lateral margin, entirely smooth or with weakly wrinkled; furrow, between the internal fovea and the hind angle, superficial and more or less impressed5
- species bigger (5.61-6.28 mm); sides of pronotum sinuated; elytra wide; latero-hind area, between the internal fovea and the lateral margin, less or more wrinkled; furrow, between the internal fovea and the hind angle, well or strongly impressed6
- 5 pronotum entirely smooth; laterobasal carina not distinguishable; apical spot as a lunula of big size, with superior limits clearly delimited; L ♂ 5.37 mm, ♀♀ 5.18-5.85 mm; Kenya, Mozambique, Madagascar, South Africa*australe* n. sp.
- pronotum with longitudinal striole weakly impressed; laterobasal carina clearly evident and relieved; apical spot clearer, in the fifth-sixth apical; L ♂♂ 5.18-5.37 mm; ♀♀ 4.88-5.37; Democratic Republic of Congo, Gabon.....*icterodes* (Alluaud, 1933)
- 6 pronotal laterobasal carina reduced but clearly visible; latero-hind area wrinkled; anterior angles protruding and less rounded than in *pogonopsis*; anterior and hind margins, especially in the central area, with distinct longitudinal striole. Elytra wide with parallel sides; apical spot occurs in the apical fifth only near the sides, with the superior limit not clearly defined; L ♂♂ 5.85-6.04, ♀♀ 6.16-6.28; Ethiopia*clarkei* n. sp.
- pronotal laterobasal carina strongly reduced, visible only at high magnifier; latero-hind area lightly wrinkled; anterior margin narrower, with sides more convergent. Elytra wide; apical spot as a lunula of big size, with the superior limit not clearly delimited; L ♂♂ 5.61-6.22 mm, ♀♀ 5.61-6.04 mm; Democratic Republic of Congo, Cameroun.....*pogonopsis* (Alluaud, 1933)

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REFERENCES

- ABDEL-DAYEM MAHMOUD S., 1998 - The Egyptian species of *Bembidion* Latreille, 1802 (Coleoptera, Carabidae). Bulletin of the Entomological Society of Egypt, 76: 181-198.
- ALLUAUD C., 1933 - I. Bembidiinae d'Afrique et de Madagascar. 1. Revision des *Bembidion* africains du sous-genre *Microserrullula* Netol. 1921 (*Serrula* Netol. 1910). *Afra*, 6: 2-9.
- ALLUAUD C., 1939 - Coleoptera. XII. Carabidae: Bembidiinae, Pogoninae, Cymbionotinae, Chlaeniinae, Pterostichinae, Graphipterinae, Anthiinae, Cyclosominae. Mission Scientifique de L'Omo, V (42): 1-26, 1 tav.
- BASILEWSKY P., 1948 - Contributions à l'étude dea Coléoptères Carabidae du Congo Belge. I. Etude des Carabiques recuillis par M. A. Collart. Bulletin du Musée Royal d'Histoire Naturelle de Belgique - Mededeelingen van het Koninklijk Natuurhistorisch Museum van België, 24(5):1-48.
- BASILEWSKY P., 1953 - Contribution à l'étude de la zone d'inondation du Niger (mission G. Remaudière, 1950). VI. Coléoptères Carabidae. Bulletin del'Institut Français de l'Afrique Noire, 15(3): 1552-1560. (Dakar).
- BASILEWSKY P., 1968 - Contributions a l'etude des coleopteres carabiques de la region Malgache. Les Bembidiinae de Madagascar et des iles voisines. Annales de la Société Entomologique de France (N.S.), 4(3): 515-548.
- BONAVITA P., VIGNA TAGLIANTI A., 2010 - *Ocydromus* subg. *Nepha* Motschulsky, 1864: revisione tassonomica, filogenesi e biogeografia (Coleoptera Carabidae). *Memorie Società Entomologica Italiana*, 89: 7-180.
- BONAVITA P., TOLEDANO L., MADDISON D.R., VIGNA TAGLIANTI A., 2016 - Bembidiina of the Afrotropical region: *Bembidion* subgenus *Omotaphus* Netolitzky, 1914 (Coleoptera, Carabidae, Bembidiini). *Entomologische Blätter und Coleoptera*, 112(1): 67-106.
- DARLINGTON P.J. Jr., 1959 - The *Bembidion* and *Trechus* (Col. Carabidae) of the Malay Archipelago. *Pacific Insects*, 1: 331-345.
- DEJEAN P.F.M.A., 1831 - Species général des coléoptères, de la collection de M. le Comte Dejean. Tome cinquième. Paris: Méquignon-Marvis, viii + 883 pp.
- KASZAB Z., 1959 - Ergebnisse der zoologischen Aufsammlungen des Ungarischen Naturwissenschaftlichen Museums in Ägypten im Jahre 1957. 5. Coleoptera. *Annales historico-naturales Musei nationalis hungarici*, 51: 283-291.
- KRYZHANOVSKIY O.L., BELOUSOV I.A., KABAK I.I., KATAEV B.M., MAKAROV K.V., SHILENKOV V.G., 1995 - A checklist of the Ground-Beetles of Russia and Adjacent Lands (Insecta, Coleoptera, Carabidae). *Pensoft Publishers, Series Faunistica N.3*, Sofia - Moscow: 271 pp.
- LORENZ W., 1998 - Systematic list of extant ground beetles of the world (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). *Tutzing*, iv + 503 pp.
- LORENZ W., 2005 - Systematic list of extant ground beetles of the world. Second edition. *Tutzing*, iv + 530 pp.
- MADDISON D.R., 1993 - Systematics of the Holarctic beetle subgenus *Bracteon* and related *Bembidion* (Coleoptera: Carabidae). *Bulletin of the Museum of Comparative Zoology*, 153(3): 141-299.
- MADDISON D.R., 2012 - Phylogeny of *Bembidion* and related ground beetles (Coleoptera: Carabidae: Trechinae: Bembidiini: Bembidiina). *Molecular Phylogenetics and Evolution*, 63: 533-576.
- MARGGI W.A., HUBER C., MÜLLER-MOTZFELD G., HARTMANN M., 2003 - Bembidiina, pp. 241-273. In LÖBL I. & SMETANA A. (Eds.), *Catalogue of Palaearctic Coleoptera*, Vol. 1. Apollo Books, Stenstrup, 819 pp.
- MARGGI W., TOLEDANO L., NERI P., 2017 - Bembidiina: - In: LÖBL, I. & LÖBL, D. (Eds): *Catalogue of Palaearctic Coleoptera*. Volume I. Archostemata - Myxophaga - Adephaga. Second edition. Brill, Leiden: 294-342.
- MÜLLER G., 1918 - Bestimmungstabelle der Bembidion-Arten Europas und des Mittelmeergebietes. *Koleopterologische Rundschau*, 7: 26-117.
- NETOLITZKY F., 1910 - Bemerkungen zur Systematik in der Gattung *Bembidion* Latr. *Wiener Entomologische Zeitung*, 29: 209-228.
- NETOLITZKY F., 1921 - Catalogus systematicus specierum palaearcticarum generis *Bembidion* Latr. *Archiv für Naturgeschichte (A)*, 87: 183-229.
- NETOLITZKY F., 1942 - Bestimmungs-Tabellen europäischer Käfer (9. Stück). II. Fam. Carabidae. Subfam. Bembidiinae. 66. Gattung: *Bembidion* Latr. Bestimmungstabelle der *Bembidion*-Arten des paläarktischen Gebietes. *Koleopterologische Rundschau*, 28: 69-124.
- PERRAULT G.G., 1981 - Études sur la Tribu des Bembidiini (Coleoptera, Carabidae). I. - Notes sur la classification supraspécifique. *Nouvelle Revue d'Entomologie*, 11(3): 237-250.
- SCHATZMAYR A., 1936 - Risultati scientifici della spedizione entomologica d. S.A.S. il Principe Alessandro della Torre e Tasso in Egitto e nella penisola del Sinai. XII. Catalogo ragionato dei Carabidi finora noti d'Egitto e del Sinai. *Pubblicazioni del Museo Entomologico "Pietro Rossi"* - Duino, 1, 114 pp.
- SCHULER L., 1959 - Le genre *Microserrullula* Netolitzky (Bembidiini Jeannel, Col. Trechidae). Les formes multispines. *Revue Française d'Entomologie*, 26(2): 96-105

- TOLEDANO L., 2002 - Nomenclatorial revision of the supraspecific taxa of Bembidiini s.str. of South America described by Jeannel (1962) and related taxa with some descriptions of the fauna of South America (Coleoptera: Carabidae). *Koleopterologische Rundschau*, 72: 1-14.
- VIGNA TAGLIANTI A., 2004 - Fauna Europaea: Carabidae. In: AUDISIO P. (Ed.), *Fauna Europaea: Coleoptera 2, Beetles*. Fauna Europaea version 1.1, available at <http://www.faunaeur.org> [accessed September 2009 as version 1.3 of April 19th 2007].