

**CONTRIBUTIONS TO THE KNOWLEDGE OF THE GENUS *SCAURUS*
FABRICIUS, 1775 (COLEOPTERA, TENEBRIONIDAE) WITH DESCRIPTION
OF NEW SPECIES FROM QATAR (*SCAURUS QATARICUS* N. SP.)
AND FROM CYPRUS (*SCAURUS NIELSENI* N. SP.)**

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Abstract: We describe two darkling beetle species new to science, found, respectively, in Qatar and Cyprus. The presence of *Scaurus puncticolis* in Qatar was indicated for the first time in 2013, but a more detailed morphological examination of the individual has shown considerable differences between the Qatar material and the close species *Scaurus puncticolis* Solier, 1838. The Qatar specimen is here assigned to a new species, *Scaurus qataricus* n. sp. Also based on morphological differences, material from Cyprus hitherto confused with *Scaurus puncticolis syriacus* Reitter, 1914 (*species composita*) is here described as another new species, *Scaurus nielseni* n. sp. Additionally, we elevate to the rank of valid species three presumptive subspecies of *Scaurus puncticolis* Solier: *Scaurus syriacus* Reitter, 1914 **stat. nov.**, from Iraq, *Scaurus rugicollis* Reiche 1854 (= *Scaurus puncticolis rugicollis* Reitter, 1914), from Israel, and *Scaurus dlabolai* Kaszab **stat. nov.**, from Turkey. Examination of the ovipositor and aedeagus suggests sexual incompatibility, but breeding and molecular analyses would be necessary to confirm this. Our study highlights the importance of examining the ovipositor of females to correctly identify different species of the genus *Scaurus* that could not be distinguished by only examining the male aedeagus. Considering our results, the *Scaurus puncticolis* group seems to be a supra-specific conglomerate of sympatric and allopatric species rather than a geographic parasymphatric widely distributed species composed of different subspecies as previously believed by different authors. Finally, a key to the species of the *Scaurus puncticolis* group is provided.

Key words: Coleoptera, Tenebrionidae, Scaurini, *Scaurus*, female genitalia, new species, Middle East, Qatar, Cyprus.

Aportación al conocimiento del género *Scaurus* Fabricius, 1775 (Coleoptera, Tenebrionidae), con descripción de especies nuevas de Qatar (*Scaurus qataricus* n. sp.) y Chipre (*Scaurus nielseni* n. sp.)

Resumen: Se describen dos especies nuevas de la familia Tenebrionidae, encontradas respectivamente en Qatar y Chipre. La presencia de *Scaurus puncticolis* en Qatar fue señalada por primera vez en 2013, pero un examen morfológico más detallado ha revelado la existencia de diferencias considerables entre el material de Qatar y la especie próxima *Scaurus puncticolis* Solier, 1838. Este nuevo examen ha permitido descubrir una especie nueva, *Scaurus qataricus* n. sp., de Qatar. Igualmente, y basándonos en las diferencias morfológicas entre el ovipositor y el edeago del *Scaurus* de Chipre, se ha detectado otra especie nueva, hasta el momento confundida con *Scaurus puncticolis syriacus* Reitter, 1914 (*species composita*): *Scaurus nielseni* n. sp., de Chipre. Ambas especies se describen e ilustran. En este estudio también se elevan a rango de especies válidas tres presuntas subspecies de *Scaurus puncticolis* Solier: *Scaurus syriacus* Reitter, 1914 **stat. nov.**, de Iraq, *Scaurus rugicollis* Reiche 1854 (= *Scaurus puncticolis rugicollis* Reitter, 1914), de Israel, y *Scaurus dlabolai* Kaszab **stat. nov.**, de Turquía. Un detallado examen del ovipositor y del edeago de estos insectos demuestra la existencia de significativas diferencias morfológicas externas y genitales entre las especies, y se dan figuras y una clave para identificarlas y separarlas de *Scaurus puncticolis* Solier, 1838. Considerando nuestros resultados, el grupo de *Scaurus puncticolis* parece ser un conglomerado supra-específico de especies simpátricas y alopátricas en vez de una sola especie parasimpátrica de gran distribución geográfica compuesta de diferentes subspecies, como venía tratándose el grupo por por diferentes autores, en ausencia de estudios adecuados de los genitales, incluido el ovipositor de las hembras.

Palabras clave: Coleoptera, Tenebrionidae, Scaurini, *Scaurus*, genitalia femenina, especies nuevas, Oriente Medio, Qatar, Chipre.

Taxonomy / Taxonomía: *Scaurus qataricus* n. sp., *Scaurus nielseni* n. sp., *Scaurus syriacus* Reitter, 1914 **stat. nov.**, *Scaurus dlabolai* (Kaszab, 1959) **stat. nov.**

Introduction

The genus *Scaurus* Fabricius, 1775 belongs to the tribe Scaurini Billberg, 1820, revised by Solier (1838), Reitter (1914), Koch (1935, 1958), Peyerimhoff (1948), Español (1954, 1960), Antoine (1953, 1954), Kocher (1958, 1964), Reymond (1956 a, 1956 b) and Labrique (1992, 1995 a, 1995 b, 1995 c, 2002, 2004, 2005, 2007, 2009). *Scaurus* species are distributed through the Mediterranean region in North Africa (Peyerimhoff, 1948), Iberian Peninsula (Español, 1960), Balearic Islands (Español, 1954), South France (Paulian, 1946), Corse (Portevin, 1934), Italy, Sardinia and Sicily (Aliquo *et al.*, 2007, 2010), Malta, Cyprus (Kaszab, 1982), Turkey (Kaszab, 1959), the Middle East and Sudan (Lillig, 1995, Lillig & Bremer, 2002).

The tribe is recorded from the Mediterranean region. Only two Mediterranean genera *Scaurus* F. and *Cephalostenus* Solier constitute the tribe Scaurini. They are recognized by lack of wings, the keeled eye, conical maxillary palp and hairless antennae with a lengthened last segment and a ridged thorax base (Reitter, 1914).

Since the descriptions of Allard (1882), systematic taxonomic studies concerning the whole of darkling beetles of Iraq not exist.

The genus *Scaurus* Fabricius, 1775, the works of Solier (1838) and Reitter (1914), have been exhaustively revised by Peyerimhoff (1948) and Labrique (doctoral thesis, 1999). The species *Scaurus puncticollis* Solier, 1838, described from Egypt, is after these revisions, currently considered as a widely distributed complex of subspecies (Löbl & Smetana, 2008), the subspecies *puncticollis* Solier, 1838. f. typ. from Egypt (Koch, 1935), Sudan (Lillig, 1995, Lillig & Bremer, 2002), Israel and Saudi Arabia (Kaszab 1982) and the Sinai Peninsula (Lillig, 2003); the subspecies *getula* Peyerimhoff, 1946, from Morocco (Antoine, 1953 and 1954 ; Kocher, 1958 and 1964 ; Reymond, 1956 a and 1956 b), Algeria, Tunisia, Libya (Peyerimhoff, 1948); the subspecies *dlabolai* Kaszab, 1959 from Turkey and the subspecies *syriacus* Reitter, 1914, from Syria, Turkey, Cyprus, and from Arax valley of Armenia (Richter, 1945). Recently *Scaurus puncticollis* have been cited from Iran: from Fars and Bushehr in the middle southern parts of Iran (Taravati & Ferrer, 2007), representing the most eastern distribution record for the members of this genus.

During the present study comparative examination of ulterior material, consisting in specimens from Syrie and Cyprus, evidenciate conspicuous morphologic differences indicating that the population of Cyprus is a species new to science and that *Scaurus syriacus* is an own species, not a geographical race of *Scaurus puncticollis* from Egypt. We describe hereby the new *Scaurus* from Cyprus under the name *Scaurus nielseni* n. sp. We have examined *Scaurus* specimens from Egypt, Turkey, Israel, Iran, Iraq and bordering regions that were preserved in diverse collections, to evaluate the taxonomic status of the examined taxa. The types of the new species of Cyprus are deposited in the Swedish Museum of Natural History, the holotype of the new species *Scaurus qataricus* is deposited in the collection of the Ministry of the Environment, in Doha, Qatar.

Ecology.

The biology of species belonging to the genus *Scaurus* is practically unknown. Most species are xerophilous and lapidicolous and seems to be crepuscular, frequently itinerant.

Some species are myrmecophilous (*Scaurus punctatus* F. in Madrid and *Scaurus striatus* F., *Personal obs.* of JF in Rom, Italy, July, 2013), other, simulating *rigor mortis* when disturbed (*Personal obs.* of JF). A matter of future investigation is to explain the presence of *Scaurus* in anthills being tolerated by ants. Some species are troglophilous (Antoine, 1953), living in the entrance of caves or to shelters sub-rock.

Acronyms and Abbreviations

The examined specimens belonging to the genus *Scaurus* are preserved in the following institutions and private collections:

CJF: Collection Julio Ferrer, Haninge, Sweden.

CJAA: Collection Jonas A. Andersson, Tollarp, Sweden.

CJN: Collection Jörgen Nielsen, Vällingby, Sweden.

CML: Collection Martin Lillig, Saarbrücken, Germany.

CRR: Collection Rolf Röber, Vällingby, Sweden.

IRIPP: Iranian Research Institute of Plant Protection, Teheran, Iran .

MOE: Collection of the Ministry of the Environment (MOE), Doha, Qatar.

NHRS: Naturhistoriska riskmseet (SMNH), Stockholm, Sweden.

MNHN: Muséum national d'Histoire naturelle, Paris, France.

NHMB: Naturhistorisches Museum, Basel, Switzerland.

Material and method

The studied material is principally, preserved in the collection of the Swedish Museum of Natural History, Stockholm, Sweden (NHES), in the collection Martin Lillig, Saarbrücken, Germany and in the collection of the senior author (CJF), in Haninge, Sweden, and in the collections of MOE in Qatar. All cited specimens preserved in the Swedish Museum were identified (*in litt.*) by Adrian Schuster. The identification (*in litt.*) of the Egyptian and Iranian specimens assigned by Taravati & Ferrer (2007) to *Scaurus puncticollis* were controlled, after examination of lectotype designated by Harold Labrique and housed Museum National of Natural History (Paris).

The material from Turkey and from Israel was primarily identified by Martin Lillig, specialist of Tenebrionidae from Europe, the Middle East and the Sahelian region of Africa. The method to establish the rang of the studied taxa is based in the critical scrutiny of the morphological differences observed in the morphologic characters, but focusing the disparity of the internal features, indicating in the sexual organs of respective sexes. The observed differences support the decision to elevate presumptive subspecies to supra specific rang. This taxonomic decision is supported even so by the sympatric geographic occurrence of some of the examined taxa, a circumstance excluding their treatment as geographical vicariates or "races". Historically, the decision to elevate all previous varieties to sub specific level was taken after the exigencies posed by the Code International of Zoological Nomenclature (CINZ).

Examen of the female genitalia

The male copulatory organ currently named aedeagus, is since many years ago, generally figured with practically all descriptions of new species and used for separation of closely related taxa. Otherwise, the female organ, especially the ovipositor, is in general, neglected by the great majority of authors and for this reason the female copulation organ remains unknown for the great part of genera and species of Coleoptera.

In the Family Tenebrionidae the use of the female genital organ has been in the past successfully used by Doyen and

Tschinkel (1982), who presented their new classification of the under families, tribes and sub tribes, by examining the features of female sexual organs among other morphological characters. Other authors (Castro Tovar & Ferrer, 2012; Ferrer, 2012a, 2012b, 2013) provided evidences of the specific validity of several presumptive synonyms in other genera of Tenebrionidae, previously arbitrary rejected by some authors after superficial examination.

Despite of these facts, several authors avoid to represent female genitalia with modern revisions and description of new species. In combination with the rest of morphological characters we consider the ovipositor of the different populations of *Scaurus puncticollis* Solier *sensu lat.* and relatives examined under the present study, as a possible discriminatory organ to separate taxa previously treated as geographical races or synonymies.

Results

Specimens assignable to *Scaurus puncticollis* Solier, 1838 from Egypt and to *Scaurus puncticollis syriacus* Reitter, 1914 from Iraq and unclassifiable *Scaurus* from Cyprus were compared with respective type material and found to be three different species. The types of *Scaurus macricollis* Allard 1882, according Peyerimhoff (1948), unfortunately tender by immature, were no found in the Museum d'Histoire Naturelle, Paris. Moreover, the presumptive synonymy established by him, is not based in genital comparative examination of aedeagus, extracted from specimens from Iraq, but only in external morphologic characters. In other hands, Peyerimhoff (1948) figure the aedeagus dorsally, overlooking important diagnostic characters, as the position of the endophalus and the ventral opening of the paramers (fig. 16-22). As results of this circumstance, *Scaurus macricollis* described after two males, from "Mesopotamie", without precise locality, and compared with specimens from Egypt, was considered by subsequent authors after Allard (1882), as a simple variation of *Scaurus puncticollis* Solier, which is a widely distributed species. However, Löbl & Smetana (2008) revalidated. *Scaurus macricollis* was treated as subspecies from Iran, Iraq and Turkey of *Scaurus puncticollis* Solier by Reitter (1914), Gebien (1937) and Peyerimhoff (key, 1948). Labrique in Löbl et Smetana (2008: 17), after a profound study of more than 20 000 specimens examined under Labriques (1999) Doctoral Thesis, conserve the treatment as subspecies of the taxa integrating the *Scaurus puncticollis* group. However, the genitalia never were presented and the study is only based in external morphology. Morphological extern characters are unsuffisant to separe simpling species (Mayr, 1973). Generally, morphologically, nearly indistinguishable "biological races" or subspecies are today accepted as simbling species in basis of genital differences (Mayr, 1973).

We consider *Scaurus macricollis* Allard as a valid species, after examen of specimens determined (*in litt.*) by Labrique, after type comparison. However, we consider *S. macricollis* a different species, not a geographical subspecies of *S. puncticollis*.

Scaurus puncticollis (Solier, 1838)

Fig. 1, 9, 16, 23, 29, 36-37, 45.

Scaurus puncticollis Solier, 1838 : 172 - 173; Reitter, 1914: 374; Koch, 1935: 52 (key), 53-54; Peyerimhoff, 1948: 161, fig 3: 109, 186; Lillig, 1995: 52.

NON *Scaurus puncticollis* Kaszab, 1959: 73; 1997: 134; 1997: 211, photo 177; Mas-Peinado *et al.* 2013. (= *Scaurus qataricus* n. sp.).

MATERIAL EXAMINED: Lectotype and paralectotype, Solier, 1838 (coll. Marseul, MNHN, Paris), H. Labrique det.; Egypt, Luxor, A. Odelcalchi leg. (2 specimens *cum typo comp.*, H. Labrique det. CJF); Luxor, Morz/*puncticoll.*/Samml. A. Schuster (2, NMB); Le Caire, W. Mnes leg. (2, NMB); Alexandria, Gassner/*puncticoll.* (NMB); Alexandria (4, NMB); Alexandria San Stephano, *puncticollis*/A. L. Montadon leg. (2, NMB); Egypt, Pyramide XV, Korb, Berlin (2, NMB).

Scaurus puncticollis was described by Solier (1838) after an unknown number of specimens from Egypt, without precise locality.

Two syntype specimens were found by Labrique (2007) in the collection Marseul. One female, has been designed as the lectotype by Labrique (2007). Both specimens are probably conspecific, but they are slightly different: the paralectotype presenting a reticulate sculpture of pronotum and nearly inconspicuous elytral rows. It is a larger specimen, but it is not a male, as believe Solier.

Two specimens from Luxor, A. Odelcalchi leg. were examined by Harold Labrique and found conspecific with the lectotype. Obviously agree with the original description presenting same habitus with strongly punctured pronotum and costate elytra; the punctures are subfoveate, oblong, slightly margined (fig. 36-37) without reticulation; elytra with rows of incised and conspicuously traceable punctures

We consider hazardous to do a genital extraction of the ovipositor of the lectotype and emphasizing the necessity to perform this operation dissecting another conspecific specimen to avoid irreparable damage of the types. For this reason we examined a female from Luxor (NMB), exhibiting exposed ovipositor to illustrate the female genitalia.

According Taravati & Ferrer (2007) (fig. 2) *Scaurus puncticollis* seems to be widely distributed from Egypt to the middle Southern regions of Iran It may also be present around Orumiye Lake (Dr. H. Labrique, *pers. comm.*). Labrique (*per. commun. in litt.* 2014) consider that the typonominal form lives only in Egypt, Libya and Sudan. In Middle-East (Iraq, Iran lives the subspecies *macricollis*. Recently, a *Scaurus* species assigned to *S. puncticollis* has been found in Qatar (Mas-Peinado *et al.* 2013. Further research was needed to clarify the distribution limits of *Scaurus puncticollis* in Iran and to verify the identity of this species in Qatar, because the characters figured by the authors cannot support satisfactory their determination. A single male specimen of a species referred to *Scaurus puncticollis* was figured by Kaszab (1997, fig. 177). The pronotal punctures of the species recently found in Qatar are simple, slightly oblong and more superficial and denser incised, not foveate, irregular and deeply and sparsely sculpted as in *S. puncticollis*. The aedeagus of the Qatar's specimens is shorter, the phallobase is more robust and with sub parallel at sides, the proportion or ratio between the paramers and the phallobase is different. The parameral piece of *Scaurus puncticollis*, from Alexandria is 1/4 shorter than the combinate length of paramers and phallobase; in *Scaurus syriacus* from Iraq the ratio is 1/3.6; in the *Scaurus sp.* of Qatar, the ratio is 1/4.2 times. Most of the characters given by Mas-Peinado *et al.* (2013) are congeneric and the femoral teeth are different. The male specimen from Saudi Arabia (Ryadh) figured by Kaszab (1982), belongs very probably to

the new species *Scaurus qataricus*. The genus *Scaurus* was accurately revised by Harold Labrique (1999) in a Doctoral Thesis, but this work is unfortunately unpublished and hardly accessible. Additionally the genitalia of all species (or presumptive subspecies) is not examined.

We agree in all essential points with Labriques results, but after genital examen we find no reason to conserve the subspecific status and separate hereby the nominal form formed by Egyptian populations, from the subsequent taxa described or treated as varieties or subspecies by Reitter (1914), Peyerimhoff (1948) and Labrique in Löbl & Smetana (2008).

***Scaurus macricollis* (Allard, 1882)**

Fig. 6, 14, 21, 27, 35, 43, 46.

Scaurus macricollis Allard, 1882: 37; *Scaurus puncticollis* var. *macricollis* Holdhaus, 1920: 44; Peyerimhoff, 1948: 176, 186.

REPOSITORY OF TYPE: Muséum national d'Histoire naturelle, MNHN (Paris).

LOCI TYPICA: Mesopotamia and Egypt.

MATERIAL EXAMINED: Iraq, Ergil, D. Hawez leg. *Scaurus macricollis* Allard Labrique det. (4 specimens, males and females CJF).

Peyerimhoff (1948) was unable to locate the types of Allard in the Museum of Paris (MNHN), but after Reitter (1914), He treated this species as a variety of *S. puncticollis*, separated by larger size, pronotum as long as broad, with base nearly as broad as the anterior board, elongate and smaller elytra, with stronger punctures in the intervals between costae. Peyerimhoff (1948) emphasizes the difficulties posed studying this form, dues to the tender character of the types, according the description. Labrique (1999) found the lost syntypes of this species in the Muséum of Paris (MNHN) and consider *S. macricollis* as the race of *S. puncticollis* inhabiting the Valley of Tigris and Euphrates, from the coast to high altitude (Shiraz, Ispahan).

DIAGNOSIS: The head exhibits proportionally long antennae, with very long apical antennomere, blunt end-segment of maxillary palp and strongly toothed femur. Males are generally larger and more robust than females and are distinguished by stronger claviform, dentate profemur, and longer anterior legs.

The description in Latin by Allard (1882) agrees with Reitter's concise diagnose and emphasized the following characters:

Long.: 14-16 mm.

Black, oval elongate, head constricted with anterior zone punctured, the punctures becoming rugose backwards; prothorax a little longer than width, sinuate at base, anterior and posterior angles rounded, base margined, moderately constricted. Tegument strongly punctured dorsally, the punctures slightly oblong, sparsely at middle of disc and becoming confluent laterally. Elytra with punctured striae, finely granulated, with conspicuous costa, the first obsolescent on the anterior third, the second and third costae marked up to the base. Costae subcrenulate. Abdomen densely punctured, anal sternite, tarsi and antennae reddish. Antenna thin and elongate. We consider the populations from Northern Iraq as the Mesopotamian species described under the name *Scaurus macricollis* by Allard (1882) and after examen, We reestablished hereby it to the original specific rang as a valid spe-

cies with conspicuous morphologic and genital differences, ignored by precedent authors. Both taxa differ from the Egyptian *Scaurus puncticollis* by pronotum conspicuously superficially sculpted, not foveate, slightly margined fovea and short, robust, subparallel aedeagus, with phallobase not constricted at sides. The aedeagus of Iraq populations is constantly triangular, rounded apically and margined laterally, not sub parallel rounded apically as *puncticollis* (fig. 14 cf 9).

***Scaurus syriacus* (Reitter, 1914), stat. nov.**

Fig. 2, 9, 16, 24, 32, 42, 47.

Scaurus puncticollis var. *syriacus* Reitter, 1914: 374; Peyerimhoff, 1948: 185; Lillig, 2003: 53. ssp. *syriacus* Reitter Gebien, 1937: 193 793.

MATERIAL EXAMINED: Three syntypes, Iraq, Bagdad/syriacus/Rtt det./COTYPUS/samml. Adr. Schuster (NHMB); Syrien, without precise locality or collector, 1 specimen, NHRS).

REMARKS: The term Cotype is rejected by the International Code of Zoological Nomenclature as an unnecessary synonym of Syntype. Syria and Cyprus are the type localities of *S. syriacus*. However, the locality "Syria" Reitter (1914) is ambiguous, because at this time the Republic of Iraq not exists and Syria today is another land. Reitter (1914) cite "Syria", without specify "Bagdad" (labeled locality of the three syntypes) because Bagdad is situated in the Mesopotamian province of Syria and was under long time an English protectorate.

Reitter describe this *Scaurus* from Syria and Cyprus, as a variety of the widely distributed *S. puncticollis* from Egypt, differing from the nominal form by shorter elytra, covered of finer punctures and dull tegument. Wherever, the ovipositor and aedeagus evidentiate conspicuous differences between both species from Syria and with the population inhabiting Cyprus, which is another undescribed new species. We elevate hereby the species *Scaurus syriacus* Reitter **stat. nov.** from Iraq to specific level and we consider necessary the designation of a Lectotype to support the separation of the specimens belonging to other sympatric or para sympatric *Scaurus* species, cohabiting in Iraq, as *S. macricollis* Allard and another species of *Scaurus* from Cyprus, which is conspicuously different and new to science.

REMARKS: We think important include herein a *comm. pers. in litt.* 2014 by Harold Labrique, concerning te validity of *Scaurus nielsenii* n. sp.

Designation of Lectotype of *Scaurus puncticollis* var. *syriacus* Reitter, 1914

(= *Scaurus syriacus* Reitter, 1914, stat. nov.). Present designation:

We designate Lectotype the specimen male and two paralectotypes females, (three syntypes, carrying identical labels) of this species from Iraq, (old Southern Syria). preserved in the collection G. Frey, owned by the Naturhistorisches Museum, Basel (NHMB).

Labrique (*Personal comm. in litt.* to JF 2014) inform that a Lectotype and paralectotype were *designed in litt.* By Him, in the Hungarian Museum of Natural History, Budapest. Unfortunately, this lectotype designation never had been published and otherwise the 20 syntypes of Reitter in Budapest are both *S. syriacus* and *S. nielsenii* (Cyprus).

***Scaurus nielsenii* n. sp.**

Fig. 5, 13, 20, 27, 31, 38, 50.

Scaurus puncticollis Solier var. *syriacus* Reitter, 1914: *partim*, specimens from Cyprus; *Scaurus puncticollis* Solier Freude, 1952: 121. Gheorgiou, 1977; Alziar, 1985; Grimm, 1991: 24; Lillig, 2003: 53. (*nec Scaurus puncticollis* Solier, 1838).

MATERIAL EXAMINED: Cyprus, Agya Napa, III.1986, J. Nielsen leg. 3 specimens, Holotype and Paratypes: same data and collector as the holotype (2 specimens, CJF, SMNH); Cyprus: Famagusta, 26.V.1963, J. Nielsen leg. (1, CJF). Agya Napa, 2.V.2002, J. Nielsen leg. 4 in CJAA; idem, 21, 22, 22.VII.1984, R. Röber leg. (2, CRR); idem, Cap Greco, 23.VI.1984, R. Röber leg. (2, CJF); Fig Tree Bay 16-20.VI.1989, R. Röber leg. (2, NHRS); idem (2, NHMB).

DESCRIPTION: Size: Long.: 15.5-18.9 mm; width (at elytra) 7.3-8.6 mm.

Very similar in shape to *Scaurus syriacus* Reitter, but separated by different sculpture of pronotum, consisting in irregular, more superficial and laterally strigose, confluent, longitudinal rides. The head exhibits proportionally long antennae, with very long apical joint, blunt end-segment of maxillary palp and toothed femur. Males are generally bigger and more robust than females and are distinguished by stronger claviform, dentate profemur, and longer anterior legs.

Body black, dull, oval elongate; head constricted anteriorly, subquadrate, the lateral contour of the tempora early as broad as the maximum width of the genae before eyes (head conspicuously broader basally in *S. puncticollis*); covered of contiguous, rounded to a little elongate punctures becoming rugose backwards and granose at vertex. Antennae svelte, elongate and long, surpassing the level of the humeri in both sexes, without diagnostic characters.

Prothorax as long as width, sinuate at base; anterior and posterior angles rounded; base entirely margined, moderately constricted. Tegument finely but conspicuously punctured dorsally, the punctures oblong, small and somewhat confluent at middle of disc and becoming strigose, stronger and confluent laterally. Elytra with punctured striae, finely granulated, with conspicuous costa, the first obsolescent on the anterior third, the second and third costae marked up to the base. Costae subrenulate. Abdomen densely punctured, anal (sternite), tarsi and antennae reddish.

Aedeagus: fig. 13, 20.

Ovipositor similar in shape to congeners, but different comparing the ratio between the respective length, shape, separation and disposition of the coxites (fig. 27).

ETYMOLOGY: named after the Swedish collector Jörgen Nielsen, Vällingby, Stockholm.

DISTRIBUTION: highly probably endemic from Cyprus.

***Scaurus rugicollis* Reitter, 1914 stat. nov.**

Fig. 3, 11, 18, 32, 40, 47.

Scaurus rugicollis Reiche, 1854: 447, *nomen nudum* *nec Scaurus rugicollis* Reiche et Saulcy, 1857: 232, *nomen nudum* (erroneously misinterpreted as synonym of *Scaurus barbarus* Solier, 1838).

Scaurus puncticollis var. *rugicollis* Reitter, 1914: 374; Koch, 1935: 52 (key), 53-54; Peyerimhoff, 1948:186; Lillig and Pavlicek, 2003: 53.

MATERIAL EXAMINED: The types of *Scaurus rugicollis* Reiche et Saulcy, carrying the manuscript label "Palestine" (ink of

China) are preserved in the Muséum of Paris (MNHN) and were examined by Peyerimhoff. (1948); a female specimen labeled as "puncticollis" from "Syrien", without other data, is preserved in the Swedish Museum of Natural History, indicating the sympatric character of this species. Israel: Haifa, beach, 11.IV.1992, T. Pavlicek, coll. Martin Lillig (2 specimens); Mount Karmel, beach, 6.X.1993, T. Pavlicek, leg.. Martin Lillig, det. (CML 2 specimens).

REMARKS: *Scaurus rugicollis* Reiche et Saulcy 1854, was never described and additionally the name was assigned to *Scaurus barbarus* Solier, an error signaled by Peyerimhoff (1948). Following the name was a *nomen nudum*. Reitter (1914) revalid this name with hesitation: « ?var. » as a form close to *S. puncticollis*, inhabiting Haifa and other regions. This invalid status was automatically elevated to subspecific rang according the rules of the ICZN by Gebien (1937).

As already commented the locality "Syria" from the specimen preserved in the Museum of Stockholm (NRMS) is ambiguous. The hitherto known geographical circumscription of this species seems to be limited to Israel. In the Peninsula of Sinai. The specimens presenting *facies* of *S. puncticollis* but presenting strongly confluent granular and rugose pronotum (fig. 40), would be assigned to *Scaurus rugicollis* Reitter. The species was wrongly invalidated as synonym of *S. barbarus* Solier, 1838 by Reiche and Saulcy (1857) and later, degraded as possible variety of *S. puncticollis* by Reitter, 1914. Peyerimhoff (1948) correct the misinterpretation of Reiche and Saulcy (1857), considering *rugicollis* as an aberration of *S. puncticollis*, presenting strongly rugose pronotum, sparsely and conspicuously granulose, strigose and strongly confluent; the elytra with granose and punctate intervals between costae, inhabiting Palestina.

The shape of the aedeagus, ovipositor and external morphology of this species evidentiate conspicuous differences with *Scaurus puncticollis* from Egypt and with other *Scaurus* inhabiting the actual Syrie, as *Scaurus syriacus* Reitter, 1914 **stat. nov.** and *S. carinatus*, from Egypt. The sympatric character with *S. syriacus* not permit the treatment as subspecies and the morphological external and genital differences are almost conspicuous to consider both taxa as synonyms. All cites from Palestine, Sinai Peninsula and Israel of *Scaurus puncticollis* Solier highly probably must to be referred to *S. rugicollis*.

Dimensions: Long.: 12.9 mm to 18,9 mm – maximum of width (at elytra): 5,7 to 8,1 mm.

Very similar in shape to *Scaurus syriacus* Reitter, but separated by different sculpture of pronotum, consisting in irregular, oblong and laterally stronger, strigose, confluent, longitudinal rides. The head exhibits proportionally long antennae, with very long apical joint, blunt end-segment of maxillary palp and toothed femur. The male is normally bigger and more robust than females and are distinguished by stronger claviform, dentate profemur, and longer anterior legs.

Body black, dull, oval elongate; head constricted anteriorly, subquadrate, the lateral contour of the tempora nearly as broad as the maximum width of the genae before eyes (head conspicuously broader basally in *S. puncticollis*); tegument covered of contiguous, rounded to a little elongate punctures, becoming rugose backwards and granulose at vertex. Antennae svelte, elongate and long, surpassing the level of the humeri in both sexes, without diagnostic characters.

Prothorax as long as width, sinuate at base, anterior and posterior angles rounded; base entirely margined, moderately constricted; finely but conspicuously punctured dorsally, the punctures oblong, small and somewhat confluent at middle of disc and becoming strigose, stronger and confluent laterally. Elytra with four finely punctured regular striae, the first coinciding with the sutural costa, dull and without secondary punctures; with conspicuous costa, the sutural obsolete on the anterior third, the second and third costae traceable up to the base; all costae subcrenulate; replied elytral zone with four rows of punctures, and two rows of punctures a little more elevate, near the board of the epipleura. Abdomen densely but not confluent punctured; III-V ventral sternites strongly impressed laterally.

Aedeagus: apparently, the differences of size between the male copulatory organs of *S. rugicollis* and *S. syriacus* (fig. 11 cf 10) could be interpreted as results of the different size of the specimens, but the different proportions (ratio) between the respective length of the parameral piece and the phallobase, as well as the different shape of the profil structure and the conformation of the median lobe (endophallus), which is subquadrate, respectively rounded, indicate a different basic structure.

Ovipositor: The respective length of the coxites is conspicuously shorter in *S. rugicollis* (fig. 23 cf 25).

***Scaurus dlabolai* Kaszab stat. nov.**

Fig. 15, 22, 26, 32-33, 39, 49.

Scaurus puncticollis dlabolai Kaszab, 1959: 79-80.

MATERIAL EXAMINED: Turkey: Cuculeva Delta, Harbis, Gökum and Aydin leg. 10.V.2003, leg., Martin Lillig det. Two specimens, male and female (CML).

Described as an Anatolian subspecies of *Scaurus puncticollis* Solier by Kaszab (1959), after a single specimen from Turkey, Karatas (HMNH).

REMARKS: The sex of the single holotype is not given and the genitalia never figured, after the original description.

The material of Tenebrionidae from Turkey accessed under many years seems to indicate a rare oriental geographic distribution of this *Scaurus*, because the species never was collected under several European expeditions to Turkey (Ferrer and Soldati, 1999). The size of the holotype is 12 mm. long and 6 mm. width. Kaszab (1959) describe this subspecies as a "kleine lokal form" of *Scaurus puncticollis*. Our female specimen is much larger; 18.56 mm long., 7.74 mm. width and the male is smaller: 13.67 long., 6.04 mm. width. So the size of this species is variable, as in many other species of this genus.

***Scaurus qataricus* n. sp. (Ferrer)**

Fig. 7, 15, 22, 34, 41, 51.

= *Scaurus puncticollis* Solier Kaszab, 1961; 1982, 199, 210, 211, photo 177. Mas Peinado *et al.* 2013, *nec* Solier, 1838: 172. *Scaurus* n. sp. Ferrer, 2014: 23-24.

MATERIAL EXAMINED: Holotype, male: Qatar: 9.2 Km NE of Al Kiranah (250659N-51110879E) 20.IV.2012. (preserved in MOE collection, Doha, Qatar), found with two specimens reduced to fragments.

DIMENSIONS: Long.: 13.2 mm.; maximum of width at elytra: 5.3 mm.

Body black, with buccal appendages brown with a reddish tint; moderately shiny, elytra dull, glabrous, except the labrum presenting short, straight golden hair. Head elongate, a little longer than broad; epistome truncate, depressed anteriorly at each side and reclined from the level of the antennae to the labrum; lateral genal zones rounded before eyes and forming with the lateral contour of the head a conspicuous angle. Eyes feebly reniform in dorsal view, reniform on lateral profile; well separated at front by a distance of about 4 times the diameter of an eye, measured dorsally, excavate in a concavity strongly incised by subfrontal, preocular and suborbital sulcus.

The frontal ridge reaching the level antennae and the tempora backwards. Front convex, transversally depressed before epistome and elevate between eyes; tempora rounded and conspicuously protruding from the collar zone. Tegument strongly rugose, deeply covered of irregular, confluent rugosities.

Antenna slender reaching the base of pronotum; 3th antennomere three times longer than broad; the following 4th to 8th, a little longer than broad; 8th to 10th increasing in length; apical antennomere acuminate and long, about 3.5 times longer than broad.

Pronotum subpentagonal, a little protruding anteriorly, at middle; sides regularly curved; just a little constricted from middle to base; anterior angles conspicuously right, but appearing obtusely rounded from dorsal view, the sides entirely and finely margined, but the lateral margin only visible from side; posterior angles obtuse; base conspicuously and finely margined, truncate; Tegument sculpted as the head with confluent irregular foveate punctures.

Foramen narrowed and strongly microgranulose. Elytra dull, perfectly oval, shoulders completely rounded, the maximum of width at middle; carinate, presenting seven conspicuously carinate, equidistant costal elevations: the sutural costae fused, reaching the scutellum, the first discal interrupted before base, the second discal and the lateral complete; tegument alutaceous, finely and irregularly sculpted presenting a double sculpture, consisting in extremely fine sparse microgranules and broader, very superficial, round punctures, forming vestigial rows.

Ventral side shiny; strongly punctured. Mentum subpentagonal with a conspicuous excavation (fovea) at middle; Gular sulcus separating the cephalic zone, strongly incised and perfectly separated from the extremely globose gular zone.

Legs slender, Femora subclavate; profemora dentate; protibia regularly curved, tarsi without diagnostic characters. Mesotibia subright; metatibias moderately curved.

Aedeagus similar in acuminate shape to congeners, but different comparing the ratio between the respective length of the paramers and the phallobase (fig. 15 and 22).

HABITAT: Xerophilous, desertic, lapidicolous (fig. 8). The specimen was found in a habitat characterized by having open soil with disperse bushes and some small *Acacia* trees and an elevation of 50 m (fig. 8). The specimen was collected on 20 April 2012 in the municipality of Al Rayyan, at 9.2 km NE of Al-Kiranah, Qatar (25.06594°N, 51.10879°E)

REMARKS: The strong sculpture of this new species indicate, as in other congeners, a great adaptation to dried habitat, with temperatures reaching the lethal point (45 C degrees). The dorsal punctures and rows permits this insect to optimize the

thermic adaptation, retaining in the deeply incised irregularities of the tegument of pronotum humidity, inclusive water retaining particles of earth, forming a terrose protection against lethal temperatures. Moreover, the peculiar costal elevation additionally provide a constant protection, similar to the adaptation of xerophilous plants in deserts (Cactacea), presenting longitudinal intervals separated by raised costae projecting an "own shadow", if the insect run under the sun. Comparatively, *Scaurus puncticollis* inhabiting in littoral zones, present a much more sparsely reduced sculpture of pronotum, with well separate smaller punctures and moderate costal elevations, as response to a more comfortable climate. The vital buccal appendages (fovea and gular sulcus) of *Scaurus* species retain water, running directly in the mouth when the insect adopt the characteristic position "upp and down". Very conspicuous and interesting is the special adaptation of legs and genitalia to procreation. The clavate femora with femoral tooth, combined with long, curvate protibia in both sexes (fig. 29-35), probably permit a favorable position *in copula* of males *versus* females, retaining each other. In other cases strongly femoral features are offensive weapon for males in competition, and perhaps against some predators.

ETYMOLOGY: Latin, species found in Qatar.

REMARKS: According Labrique (*comm. pers. in litt.* 2014) the femoral thoot and aedeagus of this *Scaurus* seems support the decision to describe a new species in basis of a single male specimen and some rest. In other hands the Saudi Arabian population of *Scaurus* treated as "*incertae sedis*" in Labrique (1999) highly probably belongs to *Scaurus qataricus*.

***Scaurus carinatus* Solier, 1838**

Fig. 44.

MATERIAL EXAMINED: Two Syntypes specimens of this species are preserved in the collection Etienne Marseul (Muséum national d'Histoire naturelle, Paris, MNHN). Labrique (2007) designed both specimens as respective lectotype and paralectotype of *Scaurus carinatus* Solier, describing original labels and designation. According Labrique (2007) *Scaurus carinatus* Solier inhabit the littoral coast of Egypt, from Sinai to the oriental region of Cyrenaica in the actual Libya (ssp. *vicinoides* Schuster, 1935). JF have compared *in situ* the types of Solier with specimens preserved in the Swedish Museum of Natural History, determined by Adrian Schuster and Harold Labrique (*in litt.*). The presence of this group of species in Qatar is highly improbable.

Key of the species of *Scaurus puncticollis* group:

1. Sculpture of pronotum simple, consisting in small, rounded and well separate punctures, without micro granulation, the punctures separated by a distance on average equivalent to more or less the diameter of a puncture; spaces between the punctures flat, without microgranules (fig. 36-37).....*puncticollis* Solier
- Sculpture of pronotum double, consisting in foveate punctures carrying a microgranule, each puncture strongly incised, with deep, finely margined semicircles, consisting in oblong, separate microgranular punctures or without microgranules, but in this case forming irregular and more or less confluent rugosities (fig. 38-43) 2

2. Sculpture of pronotum punctured, forming rounded to elongate, deep foveate punctures, carrying microgranules at middle (fig. 38 and 40)..... 3
- Sculpture of pronotum punctured, forming irregular contiguous or confluent, rounded to elongate, deep rugosities, without microgranules at middle (fig. 39 and 41-43).... 4
3. Sculpture of pronotum sparse to confluent and rugose, forming a little, open fovea U-shaped carrying a little microgranule at middle (fig. 38)*nielseni* n. sp.
- Sculpture of pronotum strongly incised, consisting in deep, isolate, irregularly confluent punctures and unpunctured zones, each puncture oblong or oval in shape, the U inverted (open basally), carrying a microgranule at middle (fig. 40)*rugicollis* Reiche
4. Sculpture of pronotum double, consisting in large, rounded, confluent fovea discally and isolate smaller punctures at sides and basally (fig. 43); elytra strongly foveate and microgranulate (fig. 46).....*macricollis* Allard
- Sculpture of pronotum simple, homogeneous and contiguous or more or less confluent, rugosely punctured or rugosely foveate (fig. 41-42) 5
5. Sculpture of pronotum rugose-punctured, not microgranular at middle of the punctures, forming strongly incised and, sulcate by deeply ribs, carrying 3-4 punctures and confluent, forming conspicuous longitudinal rugosities (fig.42)*syriacus* (Reitter)
- Sculpture of pronotum rugose-foveated, more superficial, forming a conspicuous, irregular sculpture, like confluent, craters arranged in longitudinal rugosities (fig 39 and 41) 6
6. Genal zones subparallel, forming with the lateral contour of the eye a continuous line. Sculpture of pronotum with confluent rugosities, oval to round in shape, forming very irregular sculpture (fig. 39); sculpture of elytra strongly granular and irregular, without lines of punctures traceable between costal elevations. (fig. 49); elytral width more than 1.3 times the width of pronotum; elytral granulation conspicuously indicated. Phallobase long in relation to the length of the paramers (fig. 15, 22)*dlabolai* Kaszab
- Genal zones rounded, forming with the lateral contour of the eye an obtuse angle; sculpture of pronotum very similar to the precedent species; elytral width about 1.2 times the width of pronotum; sculpture of elytra simple, without granular and irregular structure, with very fine and superficial punctures, hardly traceable between costal elevations (fig. 51): Phallobase shorter (fig. 15, 22)*qataricus*. n. sp.

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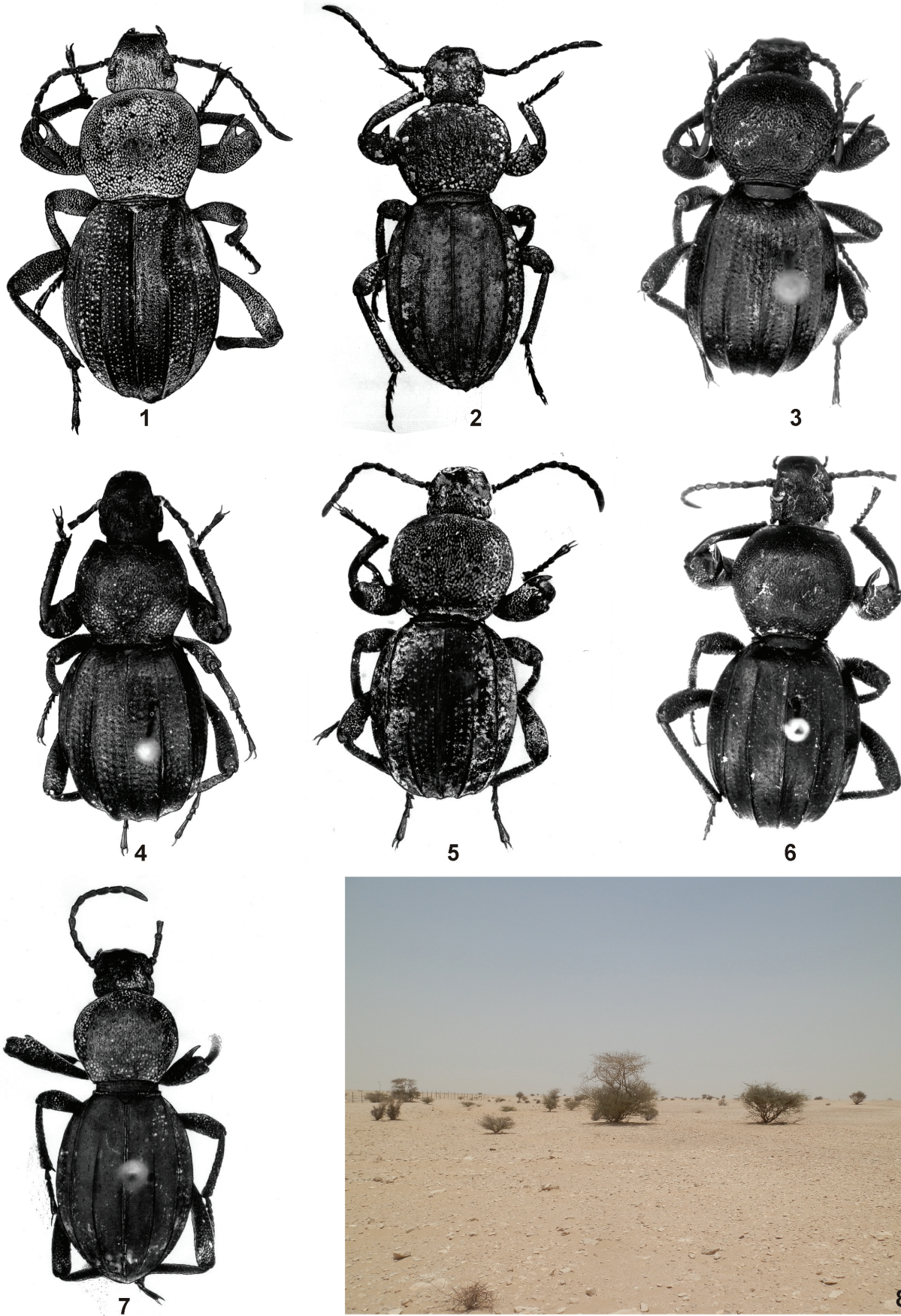
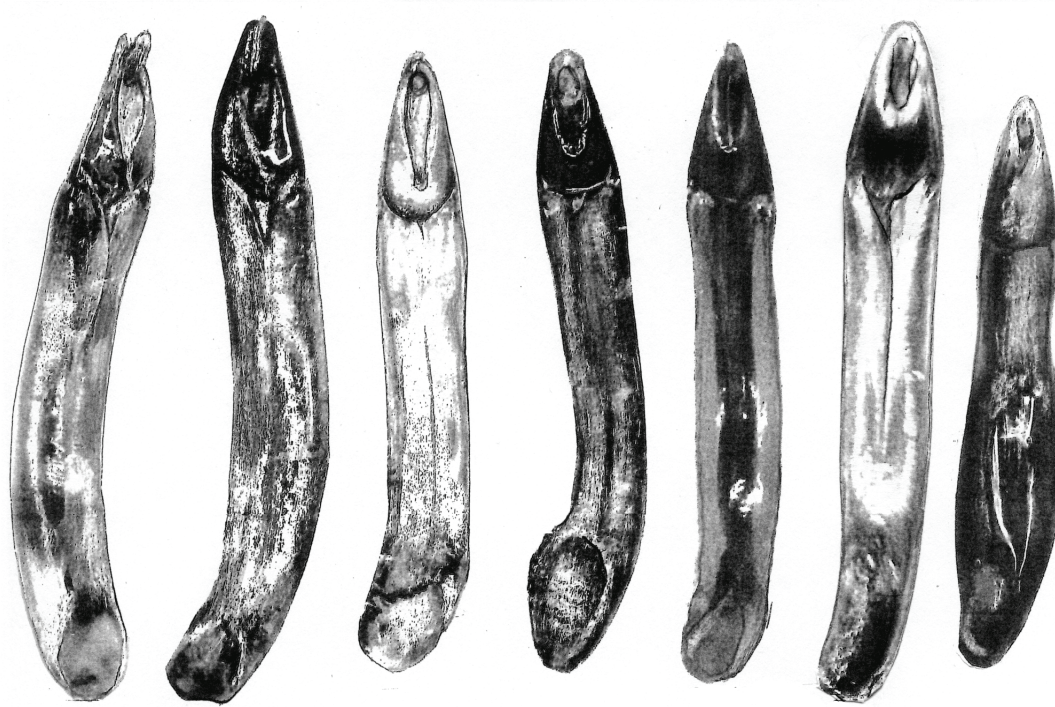


Fig. 1-7: habitus of *Scaurus*: 1. *puncticollis*; 2. *syriacus*; 3. *rugicollis*; 4. *dlabolai*; 5. *nielseni* n. sp.; 6. *macricollis*; 7. *qataricus* n. sp.
 Fig. 8. Habitat of *Scaurus qataricus* n. sp. in Al-Kirannah, Qatar. Foto Aurora M. Castilla.



9 10 11 12 13 14 15



16 17 18 19 20 21 22

Fig. 9-15: Aedeagus of *Scaurus*: 9. *puncticollis*; 10. *syriacus*; 11. *rugicollis*; 12. *dlabolai*; 13. *nielseni* n. sp.; 14. *macricollis*; 15. *qataricus* n. sp. **Fig. 16-22:** Aedeagus in lateral view of *Scaurus*: 16. *puncticollis*; 17. *syriacus*; 18. *rugicollis*; 19. *dlabolai*; 20. *nielseni* n. sp.; 21. *macricollis*; 22. *qataricus* n. sp.

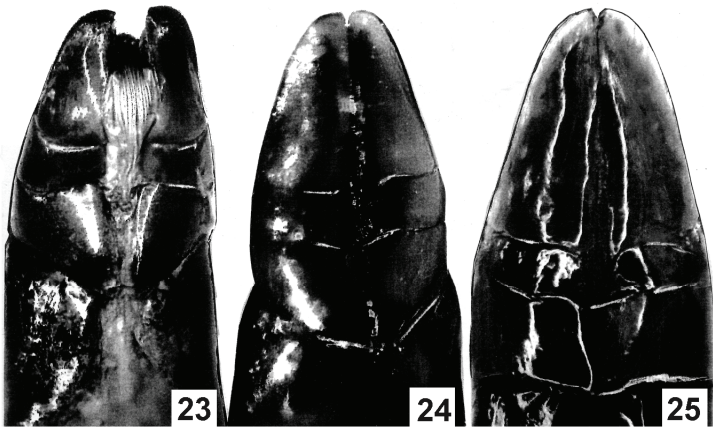


Fig. 23-28: Ovipositors of *Scaurus*: 23. *puncticollis*; 24. *syriacus*; 25. *rugicollis*; 26. *dlabolai*; 27. *nielsenii* n. sp.; 28: urosternites of *S. syriacus* (a) and *S. nielsenii* (b) (from Agya Napa, Cyprus.)

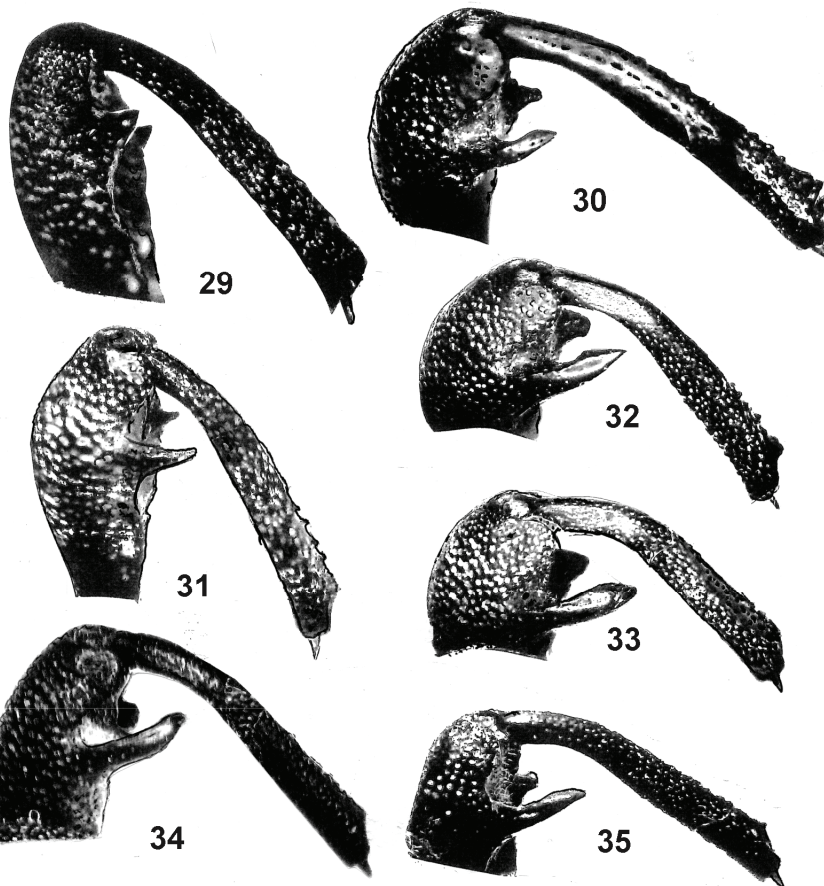
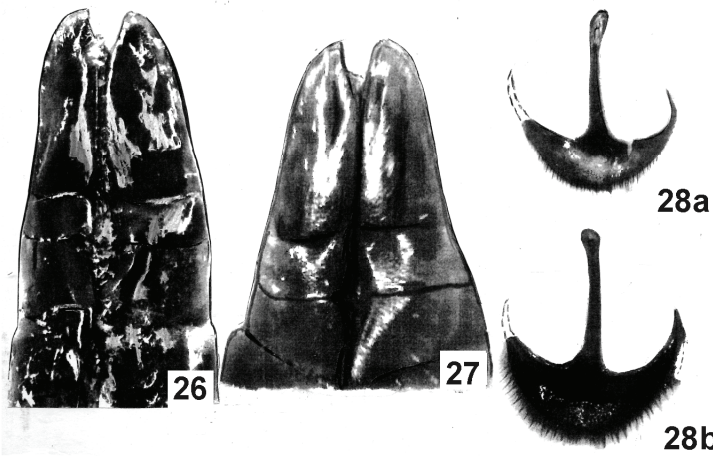


Fig. 29-35 : Protibia of *Scaurus*: 29. *puncticollis*; 30. *syriacus*; 31. *nielsenii* n. sp.; 32. *rugicollis*; 33. *dlabolai*; 34. *qataricus* n. sp.; 35. *macricollis*.

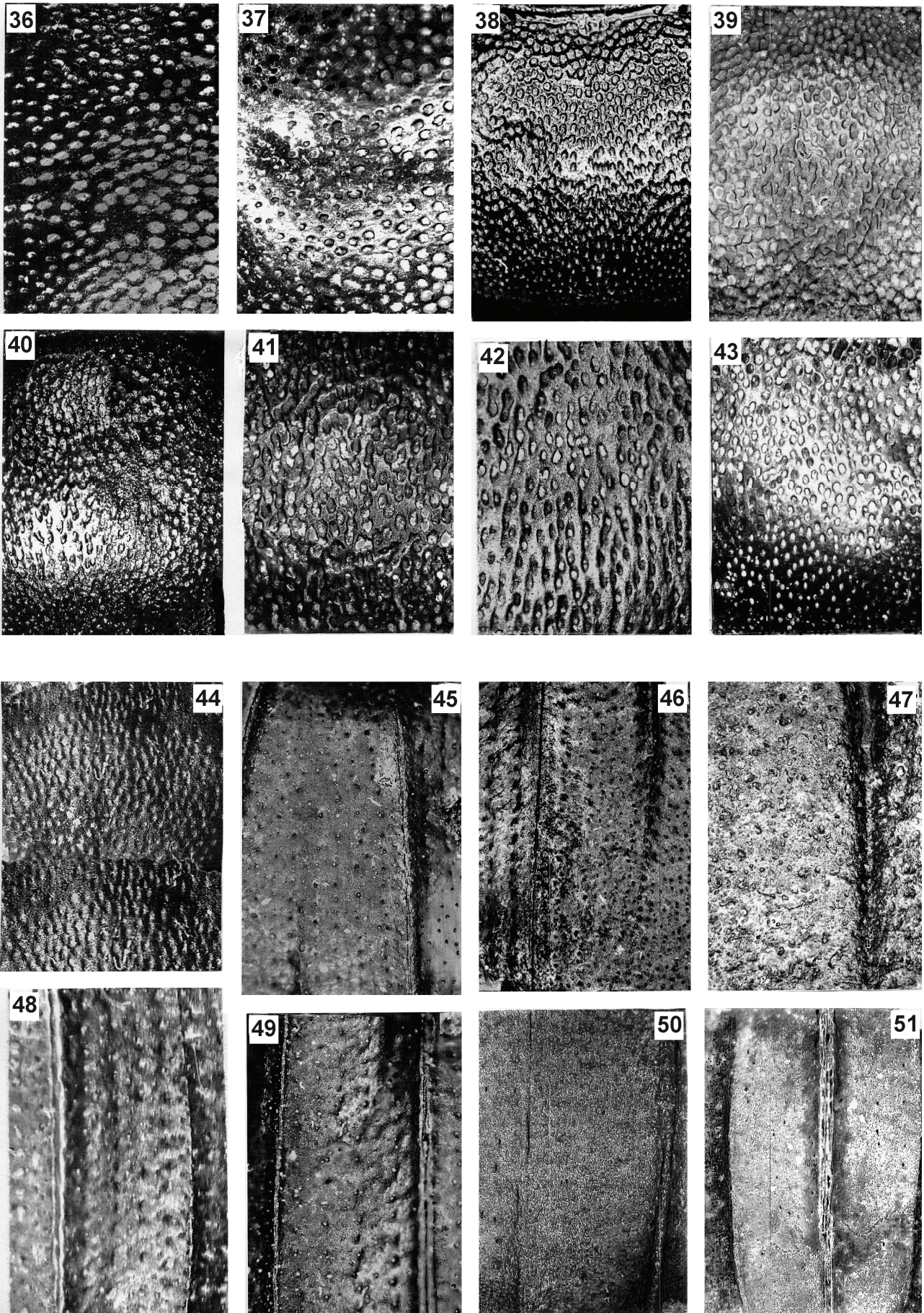


Fig. 36-44: Pronotum sculpture of *Scaurus*: 36. *puncticollis* (covered of earth particles); 37. *puncticollis* (cleaned); 38. *nielseni* n. sp.; 39. *dlabolai*; 40. *rugicollis*; 41. *qataricus* n. sp.; 42. *syriacus*; 43. *macricollis*; 44. *carinatus*. **Fig. 45-51 :** Elytral sculpture of *Scaurus*: 45. *puncticollis*; 46. *macricollis*; 47. *syriacus*; 48. *rugicollis*; 49. *dlabolai*; 50. *nielseni* n. sp.; 51. *qataricus* n. sp.