

Spider beetles (Coleoptera, Ptinidae) from the Socotra Archipelago

Xavier Bellés

Abstract: The present paper reports the results of the first general study of the Ptinidae (Coleoptera) from the Socotra Archipelago. Five species are recorded. Two of them are new to science (*Sphaericus hirsutus* n. sp. and *Mezium erinaceus* n. sp.) and were found on Socotra Island. They are related to the species of *Sphaericus* and *Mezium* that are distributed in the Mediterranean area and on the Atlantic islands, especially the Canary Archipelago. There is another endemic species, *Silisoptinus inermicollis* Bellés, 2005, recently described from Socotra Island and related to its congener *Silisoptinus singularicollis* (Pic, 1917), known from Zanzibar. A fourth species, *Dignomus mesopotamicus* (Pic, 1849), recorded from Socotra and Abd al-Kuri islands, is widely distributed over the adjacent continental regions of Arabia and Mesopotamia. Finally, a possibly new species of *Ptinus*, related with its South Palearctic congeners, is recorded from Socotra Island.

الخنافس العنكبوية (غمديات الأجنحة: الخنافس العنكبوية) في أرخبيل سقطرى

زافيير بيليس

خلاصة: تقدم هذه الورقة العلمية نتائج أول دراسة عامة حول عائلة الخنافس العنكبوية في أرخبيل سقطرى. تم تسجيل خمسة أنواع. يمثل النوعين *Sphaericus hirsutus* و *Mezium erinaceus* أنواع جديدة توصف لأول مرة، حيث تم العثور عليهما في جزيرة سقطرى. وهما مرتبطتان بأنواع أخرى من الجنس *Sphaericus* و *Mezium* المنتشرة في منطقة حوض البحر الأبيض المتوسط وجزر المحيط الأطلسي، خاصة أرخبيل جزر الكناري. وهناك أيضا نوع متوطن (*Silisoptinus inermicollis*) تم وصفه حديثا من جزيرة سقطرى والذي تربطه صلة قري بالنوع *Silisoptinus singularicollis* المعروف في زنجبار. أما النوع الرابع *Dignomus mesopotamicus* المسجل في جزيرتي سقطرى وعبد الكوري، فهو واسع الانتشار في المناطق القارية المجاورة من شبه الجزيرة العربية ومنطقة ما بين النهرين. وأخيرا، سجل نوع يمكن أن يكون جديداً من الجنس *Ptinus* من جزيرة سقطرى، والذي يرتبط بنظرائه في المنطقة القطبية القديمة

INTRODUCTION

The Socotra Archipelago lies in the Western Indian Ocean, at the entrance of the Gulf of Aden, and is composed of the main island of Socotra, some 3600 km², and three much smaller adjacent islands, namely Samha, Darsa and Abd al-Kuri. Socotra Island is located approximately 400 km south of the Arabian Peninsula and 250 km east of the Somali Cape Guardafui, on the Horn of Africa. This location, and its palaeogeographic history (FLEITMANN et al. 2004) makes this Archi-

Author's address:

Xavier Bellés, Institut de Biologia Evolutiva (CSIC-UPF), CMIMA, Passeig Marítim de la Barceloneta 37, 08003 Barcelona, Spain, e-mail: xavier.belles@ibe.upf-csic.es

pelago a centre of biological diversity of paramount importance, with many endemic species of animals and plants (DI MICCO DI SANTO & ZANDRI 2004). The present report aims to contribute to our knowledge of this biological diversity by studying the samples of Ptinidae (Coleoptera) from the Socotra Archipelago that have become available to the author.

The Ptinidae, or spider beetles, are included in the superfamily Bostrichoidea within the sub-order Polyphaga (CROWSON 1967, 1981), which also includes the families Bostrichidae, Lyctidae and Anobiidae. The Anobiidae are the closest relatives of the Ptinidae, and a number of authors consider that they should both be considered as a single family (see, for example, LAWRENCE & NEWTON 1995). Worldwide about 80 genera and some 800 species of spider beetles are known, and they are distributed throughout the major regions of the world, although they are especially abundant in the drier parts of the subtropical and temperate zones. Ptinidae are mainly scavengers, and many species feed equally readily on more or less dried plant or animal materials. Many species are associated with the nests or excrement of other animal species, while others are found in dead or decaying wood, leaf litter or among other plant debris.

Given that many species of spider beetles prefer semi-desert and arid areas, they should be well represented in the coastal plains of an island like Socotra. However, little is known about the spider beetle fauna of the Socotra Archipelago. The only previous reference is the description of the species *Silisoptinus inermicollis* Bellés, 2005, recently discovered at "Calanthia" (Qalaansiyah?) on Socotra Island (BELLÉS 2005). Data on spider beetles are equally sparse in the adjacent continental areas, namely the Arabian Peninsula and the Horn of Africa. At most two dozen species, mainly belonging to the genus *Ptinus* Linnaeus, 1766, are known from these areas (PIC 1912). The present contribution helps to cover this gap in our knowledge of this interesting beetle family in the still more interesting Socotra Archipelago.

MATERIALS AND METHODS

Most of the specimens studied here were collected by H. Pohl and A. van Harten during two fieldtrips to the Socotra Archipelago in February 1999 and October 2000. They were deposited in the Hessisches Landesmuseum, Darmstadt, Germany, and were sent to me by Robert Güsten of that Museum. An additional number of specimens were collected by V. Bejček and K. St'astný during two fieldtrips carried out in February-March 2000 and March-April 2001, within the framework of the Socotra Project which was included in the international development aid given by the Czech Republic to the Republic of Yemen; these specimens were sent to me by Petr Zahradník (Forestry and Game Management Research Institute, Jiloviste-Strnady, Prague, Czech Republic). Some of the specimens collected by H. Pohl and A. van Harten will be deposited in the Natural History Collection of Yemen, once the museum is established. In the meantime, these specimens will remain at the HMLD. Some specimens are also in the collections of Petr Zahradník and Xavier Bellés. Type specimens and other reference specimens from the Pic collection that were needed during study of the Socotran samples were loaned by the Muséum national d'Histoire naturelle, Paris.

The Socotran specimens were collected manually, by pitfall traps, attracted to light, or by using Malaise traps. They were collected at ten localities on Socotra Island and one on Abd al-Kuri Island. Most of these localities are shown on a map of the Socotra Archipelago published by HAAS et al. (2004). Identification to species level was based on the external morphology and on features of the male genitalia, which were dissected in all species where males were available, following the standard methods.

Abbreviations:

HLMD	Hessisches Landesmuseum Darmstadt
MNHN	Muséum national d'Histoire naturelle, Paris
NHCY	Natural History Collection of Yemen
PZ	Private collection Petr Zahradník
XB	Private collection Xavier Bellés

SPECIES ACCOUNT

Ptinus sp.

Specimen examined: Socotra Island: 1 ♀, Deksam Plateau, 12°32'N 53°59'E, 1020 m, Schwarzlicht, 22-24 Feb. 1999, H. Pohl, HLMD-Col-1285.

The single female specimen studied belongs to the genus *Ptinus* and is morphologically similar (especially in the elytral shape and pubescence) to *Ptinus (Bruchoptinus) palliatus* Perris, 1847, which is distributed over Southern Europe (Pic 1912). The specimen from Socotra could possibly belong to a new, related species, but without a male a full characterization cannot be made.

Dignomus mesopotamicus (Pic, 1894)

Figs 1-3

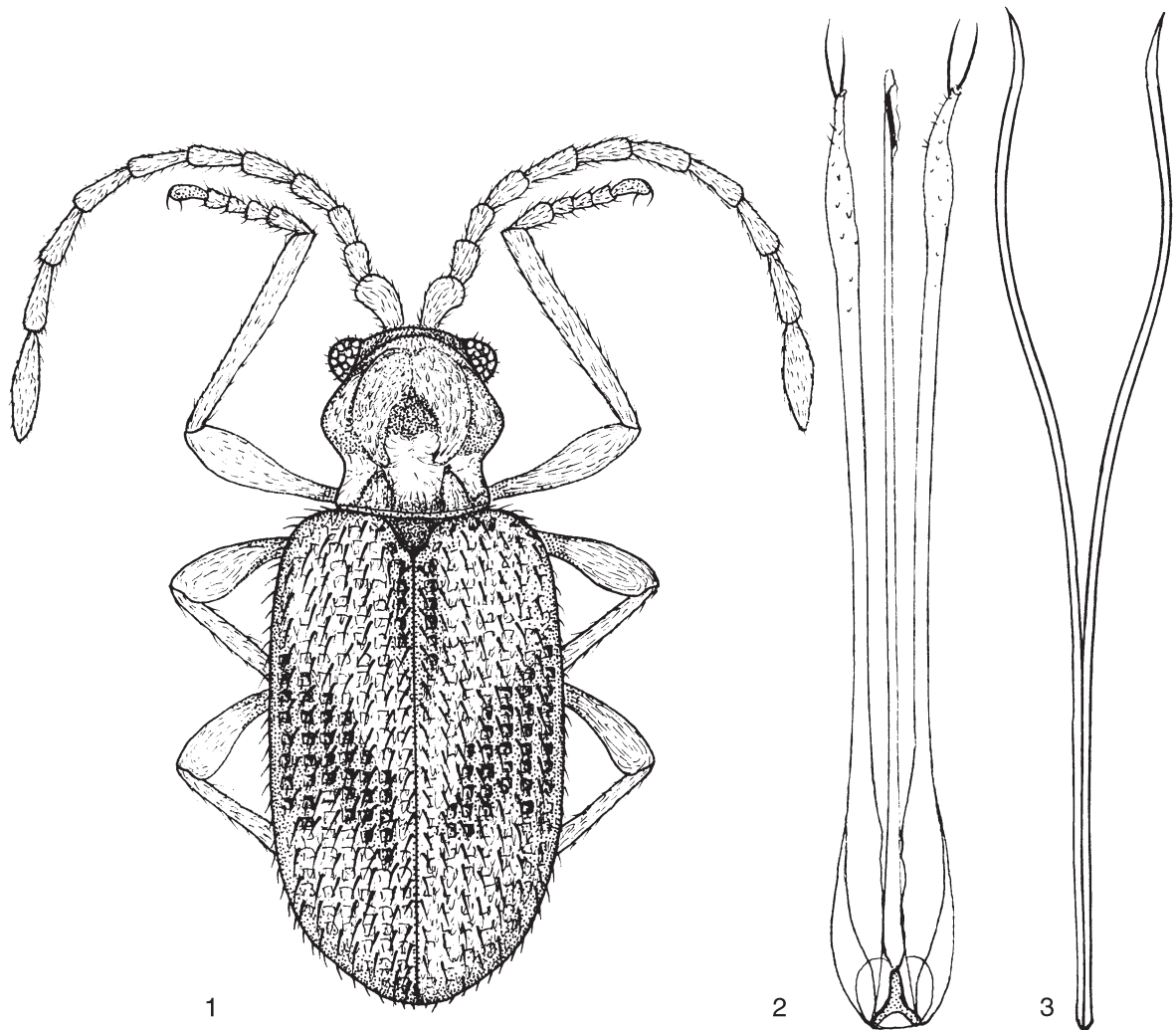
Ptinus pulverulentus v. *mesopotamicus* Pic, 1894. — L'Échange 113: 66.

Ptinus (Pseudeutaphrus) pulverulentus v. *mesopotamicus*. — Pic 1912; *Coleopterorum Catalogus* 41: 31.

Dignomus mesopotamicus. — Borowski 2002; *Annals of the Warsaw Agricultural University, Forest and Wood Technology* 52: 35-40.

Specimens examined: Yemen, Socotra Island: 20, Noged, Farmihin, close to the beach, 0 m, 12°24'41"N 54°13'35"E, 24-25 Oct. 2000, H. Pohl, HLMD-Col-1292; 6, Noged, Farmihin, Sterch, Wadi, 12°24'26"N 54°08'40"E, 24 Oct. 2000, T. van Harten, HLMD-Col-1293; 5, Diksam, 12°31.401'N 53°57.205'E, 26-27 Oct. 2000, T. van Harten / H. Pohl, HLMD-Col-1294; 21, Homhil, spring with *Ficus*, 12°34'15"N 54°18'32"E, light trap, 29 Oct. 2000, H. Pohl, HLMD-Col-1295; 6, Wadi Danegan, 12°36'59"N 54°03'48"E, 90 m, 30 Oct. 2000, T. van Harten, HLMD-Col-1290; 2, Deksam Plateau, 12°32'N 53°59'E, 1020 m, Schwarzlicht, 22-24 Feb. 1999, H. Pohl, HLMD-Col-1288; 1, Deksam Plateau, wetlands of little creek, 12°32'N 53°59'E, 1020 m, Malaise trap, 22-24 Feb. 1999, H. Pohl, HLMD-Col-1289; 1, Halle, coastal road close to the shore, 12°36'N 54°21'E, granite/sandstone, Malaise trap, 4-7 Feb. 1999, H. Pohl, HLMD-Col-1286; 1, Goeeh, 12°32'25"N 54°10'22"E, 240 m, 23 Oct. 2000, T. van Harten, HLMD-Col-1291; 1, Calanthia [Qualaansiyah?], 29-30 Mar. 2001, V. Bejček & K. St'astný, PZ; 2, Noged, 27 Feb.-1 Mar. 2000, V. Bejček & K. St'astný, PZ; 1, Shoab, 10 Mar. 2000, V. Bejček & K. St'astný, PZ; 3, Wadi Faar, 1 Apr. 2001, V. Bejček & K. St'astný, PZ; 2, Zerik, 25-27 Mar. 2001, V. Bejček & K. St'astný, PZ, XB.. — Yemen, Abd al-Kuri Island: 1, anchorage place, 12°11'N 53°14'E, Malaise trap, 17-18 Feb. 1999, H. Pohl, HLMD-Col-1287, NHCY, XB. — Yemen, mainland: 2, Perim, hiver 1891, Dr. Jousseume, MNHN; 1, Aden, Ch. Alluaud 1892, MNHN; 2, Aden. F. Ancey, MNHN; 2, Aden Arab II, MNHN; 1, Aden, MNHN; 1, Aden, coll. Argod, 1831, MNHN; 1, "Mesopotam Milligen/type v. *mesopotamicus*" [type ♂ of *Ptinus pulverulentus* var. *mesopotamicus* Pic, 1894, MNHN; 2, "Arabia"].

Description: Male (Fig. 1) length 1.9-3.1 mm; robust, parallel-sided; cuticle brownish-piceous; head clothed with short, golden-yellow, recumbent hairs, directed towards the front; antennae slender, slightly longer than the body length; pronotum with two discal protuberances projecting towards base, and a deep excavation in the middle; basal third with a transverse groove mostly covered by a cushion of dense, golden-yellow tomentum, and with two symmetrical subtriangular processes that connect with the discal protuberances; elytra parallel-sided; punctures slightly broader than the intervals; pubescence of three types: 1st) long, yellowish hairs, erect and placed on the intervals, 2nd) short, yellowish hairs, recumbent and placed in the punctures, and 3rd) recumbent and dense short pale hairs more or less covering the surface, depending on the specimen; the pattern shown in Fig. 1 is quite common, but the extent of these recumbent pale hairs varies from relatively scarce, covering strictly the basal and apical parts of the elytra, to very abundant, covering the entire elytra; aedeagus with the median lobe extremely thin and long (Fig.

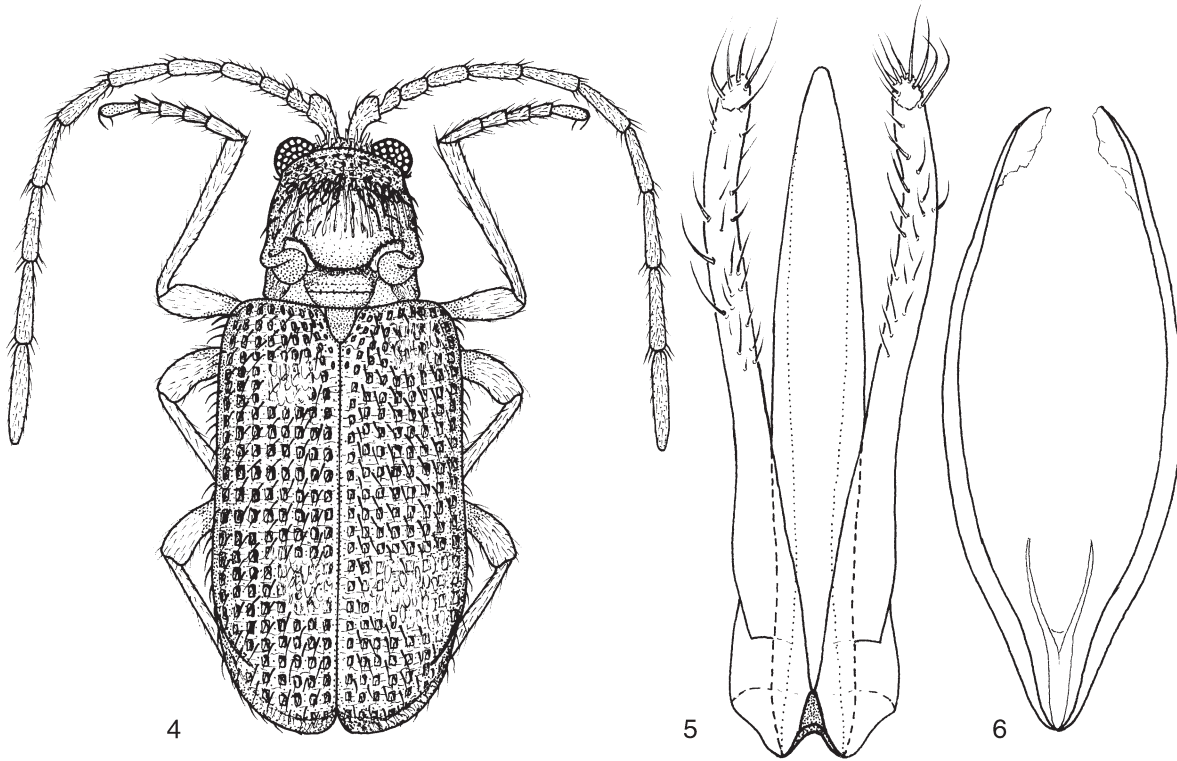


Figs 1-3: *Dignomus mesopotamicus* (Pic, 1894). 1: Habitus of a male specimen from Wadi Danegan, Socotra Island; 2: Aedeagus; 3: Male genital segment.

2), as long as the abdominal length of the specimen; parameres as long as median lobe, also very thin, and slightly broadened at apex which has two long setae; male genital segment very slender and formed by two simple branches (Fig. 3).

Female externally similar to male, although with the elytra slightly more convex and the antennae more robust.

Comments: This species belongs to the “*D. pulverulentus* group” defined by BELLÉS (1996) which includes the species *D. pulverulentus* (Boieldieu, 1854), *D. fairmairei* (Pic, 1895), *D. ruspolii* (Pic, 1898), *D. tewfiki* (Pic, 1930), *D. robustus* (Pic, 1941), *D. erythreus* (Pic, 1941) and *D. klapperichi* (Pic, 1956), which are distributed on both sides of the Red Sea, reaching the Iranian plateau in the east (BELLÉS 1996). One of the most typical features of this group is the long and slender aedeagus, and *D. mesopotamicus* exhibits an extreme example of this (Fig. 2). The large series of specimens available from Socotra enables to define the limits of variation in this species, which are quite broad, especially as regards the size (from 1.9 to 3.1 mm) and the elytral pubescence (see description). The most common pattern of the elytral pubescence among the Socotran



Figs 4-6: *Silisoptinus inermicollis* Bellés, 2005. 4: Habitus of the holotype male, collected at Calanthia (Qualaansiyah?), Socotra Island; 5: Aedeagus; 6: Male genital segment.

D. mesopotamicus is shown in Fig. 1, which is similar to that shown by the holotype of *Ptinus pulverulentus mesopotamicus*. The status of *P. mesopotamicus* as a species distinct from *D. pulverulentus* was proposed by BOROWSKI (2002).

Distribution: This species is known from Arabia and Mesopotamia (PIC 1912), including the Socotra Archipelago (BOROWSKI 2002 and present paper). Most of the Arabian specimens are from the locality of Aden. The only Mesopotamian record is that of the type of *P. pulverulentus mesopotamicus*. *Dignomus mesopotamicus* seems quite common on the island of Socotra, given the high number of specimens available compared with the other Socotran Ptinidae studied here. The species is also present on Abd al-Kuri, the westernmost island of the Socotra Archipelago.

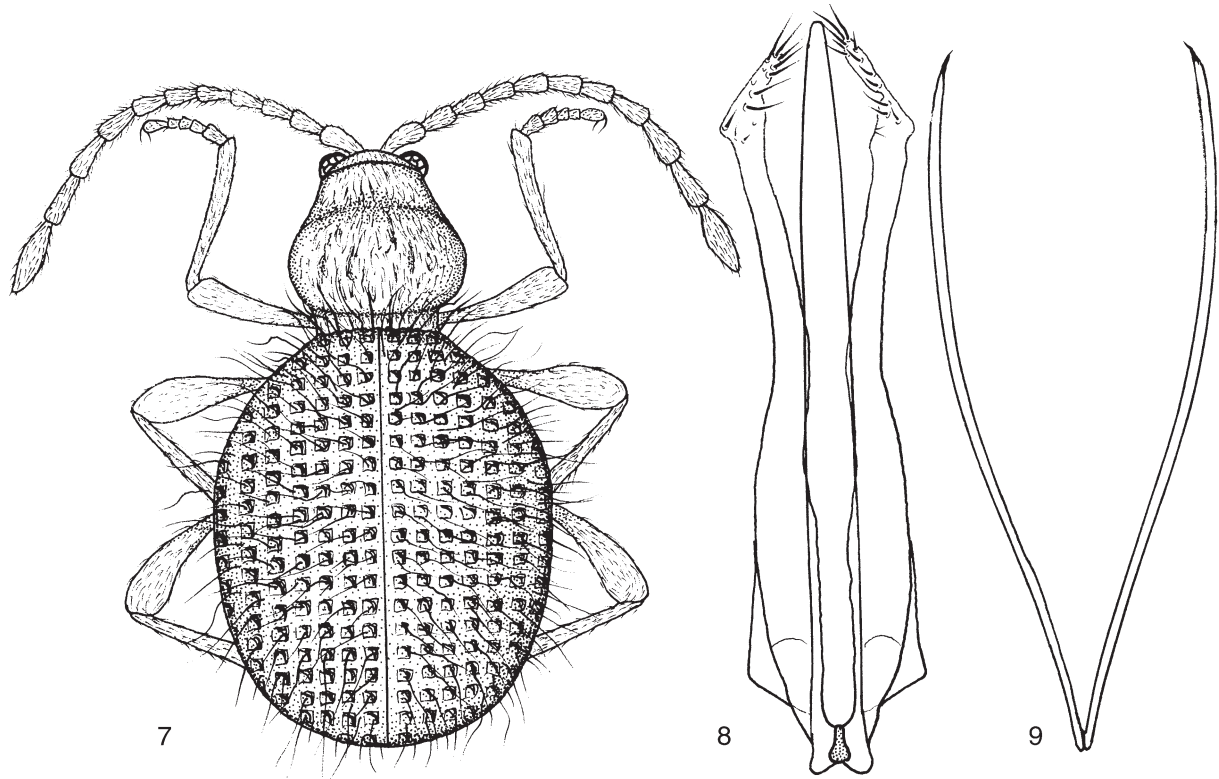
Silisoptinus inermicollis Bellés, 2005

Figs 4-6

Silisoptinus inermicollis Bellés, 2005. — Elytron 19: 77-82.

Specimen examined: Yemen, Socotra Island: ♂ holotype, Calanthia [Qualaansiyah?], 29-30 Mar. 2001, V. Bejček & K. St'astný, XB.

Description: Male (Fig. 4) length 3.3 mm; robust, parallel sided; cuticle brownish-piceous; head densely clothed with fine, short, brownish-yellow, recumbent hairs, and with a number of scattered whitish hairs, erect, projecting towards the front; antennae very slender, slightly longer than body length, pronotum with the disc deeply excavated in posterior third, the disc convex and with a number of longitudinal superficial grooves, basal third with a deep transverse groove and with a small subcircular structure at each end, which is very sclerotised and has a dense patch of yellowish tomentum on upper part; prosternal process as long as the diameter of the corresponding coxae; metasternal disc simple, only slightly depressed near base; elytra parallel-sided; punctures



Figs 7-9: *Sphaericus hirsutus* n. sp. 7: Habitus of the holotype male, collected at Wadi Danegan, Socotra Island; 8: Aedeagus; 9: Male genital segment.

slightly narrower than the intervals; pubescence of three types: 1st) long, brownish hairs, erect and placed on the intervals, 2nd) short, brownish-yellow hairs, recumbent and placed in the punctures, and 3rd) recumbent and dense short pale hairs scattered over anterior third and behind disc (Fig. 4); abdomen with five ventrites, with all the sutures well impressed, disc of third ventrite with a slight, triangular depression; aedeagus with median lobe as long as length of parameres, and pointed at apex; parameres subcylindrical at apex (Fig. 5); male genital segment formed by two simple branches (Fig. 6).

Female unknown.

Comments: Among other details, *S. inermicollis* can be readily distinguished from *S. singularicollis*, the other species of the genus, known from Zanzibar (PIC 1917, BELLÉS 1988), by having a very different pronotum and aedeagal morphology (BELLÉS 2005).

Distribution: *Silisoptinus inermicollis* is endemic to Socotra Island and is only known from the type locality, "Calanthia", which possibly refers to Wadi Qualaansiyah.

Sphaericus (Sphaericus) hirsutus n. sp.

Figs 7-9

Holotype ♂, Yemen, Socotra Island, Wadi Danegan, 12°36'59"N 54°03'48"E, 90 m, Barber traps, 28-30 Oct. 2000, T. van Harten & H. Pohl, HLMD-Col-1296-HT. — Paratype: 1 ♂, same data as the holotype, XB.

Diagnosis: The new species is easily distinguished from all other known *Sphaericus* s. str. by the serially punctuated and pubescent elytra.

Description: Male (Fig. 7) length 1.4-1.7 mm; broadly oval; cuticle brownish-red; head clothed with short, recumbent, golden hairs; eyes moderately convex, round, space between anten-

nal fossae narrow and acute; antennae 11-segmented, relatively long (more than two-thirds of body length) and slender, with all segments subcylindrical; pronotum disc evenly convex, transverse, sides feebly arcuate, maximum breadth near base; covered with flat, obovate, recumbent yellowish scales, which are easily abraded; legs slender; tarsi 5-segmented; elytra broadly oval, sides regularly rounded, maximum breadth at middle; surface shining, with longitudinal series of square punctures somewhat larger than intervals; pubescence consisting of long and sinuous whitish hairs inserted on the intervals and punctures; scutellum hidden from above; aedeagus (Figs. 8) symmetrical, with the median lobe robust, in dorsal view slightly longer than parameres; parameres elongate and sinuous, forming an obtuse angle at apex, which is slightly pubescent; male genital segment formed by two simple branches (Fig. 9).

Female unknown.

Comments: The 11-segmented antennae, the 5-segmented male tarsi and the slender parameres of the aedeagus allow *S. hirsutus* n. sp. to be placed in the subgenus *Sphaericus* Wollaston, 1854 (see BELLÉS 1994). Among the species of *Sphaericus* s. str., *S. gibbicollis* Wollaston, 1862, from the Canary Islands (BELLÉS 1994), has a pronotal shape similar to that of *S. hirsutus* n. sp. However, the serially punctuated and pubescent elytra of *S. hirsutus* n. sp. distinguish it not only from *S. gibbicollis* but from any other *Sphaericus* s. str. In addition, the parameres forming an obtuse angle at apex is also exclusive to the new species (see BELLÉS 1994).

Distribution: Only known from the type locality.

Etymology: From the Latin *hirsutus* (hairy), referring to the characteristic elytral pubescence.

Meziium erinaceus n. sp.

Figs 10-12

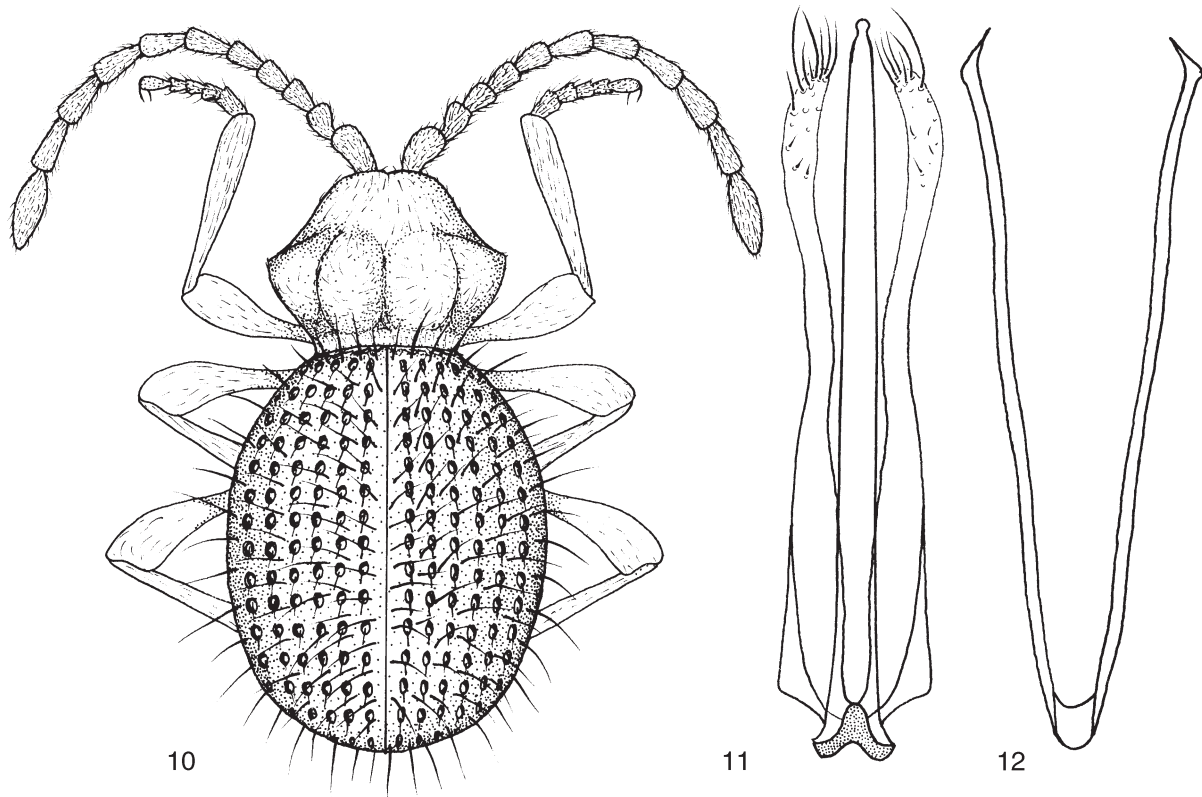
Holotype ♂, Yemen, Socotra Island, Diksam, 12°31.401'N 53°57.205'E, 26-27 Oct. 2000, A. van Harten, HLMD-Col-1297-HT. — Paratypes: 4 (both sexes), Goeeh, 12°32'25"N 54°10'22"E, 240 m, 23 Oct. 2000, T. van Harten / H. Pohl, HLMD-Col-1298-PT, NHCY, XB.

Diagnosis: Within the genus *Meziium* Curtis, 1828, the new species can be reliably separated from all other species by the serially punctuated and pubescent elytra.

Description: Male (Fig. 10) length 1.8-2.1 mm; oval, with elytra strongly convex; cuticle shining and dark brown to nearly black; head and antennae densely clothed with recumbent to suberect, golden-testaceous scales and hairs; eyes convex and nearly round; antennae almost as long as the body length, segments subcylindrical and increasing in length towards apex; pronotum somewhat transverse, with four protuberances, two on the disc and two on the sides; densely clothed like the head; elytra with longitudinal series of subcircular punctures somewhat narrower than the intervals; pubescence consisting of a narrow basal collar of sparse golden-testaceous scales and hairs; short recumbent brown hairs on the punctures and long erect nearly black hairs on the intervals; legs and abdominal ventrites clothed like the head and antennae; aedeagus with the median lobe slightly longer than length of parameres, and forming a subspherical process at apex; parameres subcylindrical at apex (Fig. 11); male genital segment formed by two simple branches (Fig. 12).

Female externally similar to male.

Comments: The simple model of the male genital segment relates *M. erinaceus* n. sp. to the species of *Meziium* that are distributed in the Mediterranean area, including North Africa and the Canary Islands: *M. sulcatum* (Fabricius, 1781), *M. affine* Boieldieu, 1856, *M. americanum* (Laporte de Castelnau, 1840), *M. giganteum* Escalera, 1914 and *M. horridum* Harald Lindberg, 1951 (see BELLÉS 1985). However, the serially punctuated and pubescent elytra of *M. erinaceus* n. sp. enables it to be clearly distinguished from all these species. The narrow and sinuous parameres of the aedeagus, and the sparse pubescence of the basal collar of the elytra, are further characters typical of the new species (see BELLÉS 1985).



Figs 10-12: *Meziium erinaceus* n. sp. 10: Habitus of the holotype male, collected at Diksam, Socotra Island; 11: Aedeagus; 12: Male genital segment.

Distribution: Only known from the localities of the type and paratypes.

Etyymology: From *Erinaceus*, the Latin name for hedgehog. The name refers to the characteristic elytral pubescence of the new species.

DISCUSSION

Study of the Ptinidae specimens collected in the Socotra Archipelago has given a total of five species, three of them most likely endemic (*Silisoptinus inermicollis*, *Sphaericus hirsutus* n. sp. and *Meziium erinaceus* n. sp.), one widely distributed over the adjacent continental regions of Arabia and Mesopotamia (*Dignomus mesopotamicus*), and a species of *Ptinus* related to its South Palaearctic congeners which is possibly new and endemic. Of these species, *Dignomus mesopotamicus* is by far the commonest species and is recorded not only from Socotra Island but also from Abd al-Kuri. Socotran populations of this *Dignomus* species are morphologically very similar to those of the adjacent continental regions. This suggests that colonisers could have reached the Socotra Archipelago from continental areas in relatively recent times, perhaps from Africa and using Abd al-Kuri as a stepping stone.

Silisoptinus inermicollis and *Silisoptinus singularicollis*, the later known from Zanzibar (PIC 1917, BELLÉS 1988), are considerably divergent in morphology (BELLÉS 2005). These circumstances suggest that both may derive from a North-East African ancestor, and may have originated through vicariance after the continental area containing Socotra separated from Africa some 36

million years ago, at approximately the same time as the rifting that formed the Gulf of Aden, while the archipelago itself detached from Africa some 6 million years ago (see BEYDOUN & BICHAN 1970, FLEITMANN et al. 2004).

The case of *Mezium erinaceus* and *Sphaericus hirsutus* is very interesting from a biogeographic point of view. These species are related with the species of *Mezium* and *Sphaericus* distributed over the Mediterranean area, especially with the species of the Canary Islands where an endemic *Mezium* (BELLÉS 1985) and no less than eleven endemic *Sphaericus* (BELLÉS 1994) are known. This contrasts with the poor and rather trivial fauna of *Sphaericus* and *Mezium* known from North Africa (including both Saharan and Sub-Saharan areas), which consists of half a dozen circummediterranean or sub-cosmopolitan species, most of them synanthropic (BELLÉS 1985, 1994).

The endemic species of *Sphaericus* and *Mezium* with a disjunct occurrence on islands at the opposite sides of North Africa may be the relict distribution of a formerly much wider occurrence of these genera in the north of continental Africa. North African ancestors of presentday *Sphaericus* and *Mezium* might have populated the Saharan area prior to the Holocene desiccation that triggered the shift from a tropical to a desert ecosystem (KRÖPELIN et al. 2008). If this is the case, the formation of the Sahara desert might have played a role in this vicariance event, not only in the sense of North-South, as is usually recognized (see, for example, DOUADI et al. 2003), but also in the sense of West-East.

Alternatively, the future possibility of discovering new endemic *Sphaericus* and *Mezium* species in North Africa that are related to the Canaries and Socotra species cannot be ruled out. They would connect the extreme populations of the Canaries and Socotra, explaining the origin of the insular species by simpler and relatively recent dispersion processes. To take a striking example, the relatively recent and quite unexpected finding of a Dragon tree population in Western Morocco (*Dracaena draco ajgal*) was found to connect the apparently disjunct distribution of Dragon trees in the Canary Archipelago and other Atlantic islands (*Dracaena draco*, *Dracaena tamaranae*) and in Socotra (*Dracaena cinnabari*) (see BENABID & CUZIN 1997).

Although present knowledge of the ptinid fauna of the Socotra Archipelago suggests that it is peculiar and has a certain variety of origins, it seems clear that the data available on species diversity is still very incomplete. Indeed, the number of indigenous ptinid species on other, better-studied islands of the West Indian Ocean is clearly higher. For example, 13 species are known from La Réunion (2512 km²), 24 from Mauritius (1865 km²), 3 from Mahé (155 km²), 3 from Rodriguez (107 km²) and 3 from Silhouette (26 km²) (see BELLÉS 1991). This suggests that a greater species diversity should be expected on Socotra, an island with an area of 3600 km² and with a considerable richness of habitats (DI MICCO DE SANTO & ZANDRI 2004). It is hoped that new scientific fieldwork in the Socotra Archipelago will contribute towards a more complete knowledge of this interesting beetle family.

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REFERENCES

- BELLÉS, X. 1985. Sistemática, filogenia y biogeografía de la subfamilia Gibbiinae (Coleoptera, Ptinidae). *Treballs del Museu de Zoologia* 3: 1-94.
- BELLÉS, X. 1988. El género *Silisoptinus* Pic, 1917 (Coleoptera, Ptinidae). *Miscelánea Zoológica* 12: 371-374.
- BELLÉS, X. 1991. Insectes Coléoptères Ptinidae. *Faune de Madagascar* 77: 1-122.
- BELLÉS, X. 1994. El género *Sphaericus* Wollaston, 1854 (Coleoptera: Ptinidae). *Boletín de la Asociación Española de Entomología* 18: 61-79.
- BELLÉS, X. 1996. El género *Dignomus* Wollaston (Coleoptera, Ptinidae). *Bolletí de la Societat d'Història Natural de Balears* 39: 209-228.
- BELLÉS, X. 2005. A synopsis of the genus *Silisoptinus* Pic, 1917 (Coleoptera, Ptinidae), with the description of a new species from Socotra Island. *Elytron* 19: 77-82.
- BENABID, A. & CUZIN, F. 1997. Dragon tree (*Dracaena draco* subsp. *ajgal* Benabid et Cuzin) populations in Morocco: Taxonomical, biogeographical and phytosociological values. *Comptes Rendus de l'Académie des Sciences Serie III Sciences de la Vie* 320 (3): 267-277.
- BEYDOUN, Z.R. & BICHAN, H.R. 1970. The geology of Socotra Island, Gulf of Aden. *Quarterly Journal of the Geological Society of London* 125: 413-446.
- BOIELDIEU, A. 1854. [Note]. *Annales de la Société Entomologique de France* 3 (2), *Bulletin*: 77-85.
- BOIELDIEU, A. 1856. Monographie des Ptiniores. *Annales de la Société Entomologique de France* 3 (4): 285-315, 487-504, 629-686.
- BOROWSKI, J. 2002. A world catalogue of the genus *Dignomus* Wollaston. *Annals of the Warsaw Agricultural University, Forest and Wood Technology* 52: 35-40.
- CROWSON, R.A. 1967. *The natural classification of the families of Coleoptera*. 214 pp. Hampton; E.W. Classey.
- CROWSON, R.A. 1981. *The biology of the Coleoptera*. 802 pp. London; Academic Press.
- DI MICCO DE SANTO, T. & ZANDRI, E. 2004. Main features of the Socotra Archipelago and ongoing conservation efforts. *Fauna of Arabia* 20: 9-26.
- DOUADY, C.J., CATZEFELIS, F., RAMAN, J., SPRINGER, M.S. & STANHOPE, M.J. 2003. The Sahara as a vicariant agent, and the role of Miocene climatic events, in the diversification of the mammalian order Macroscelidea (elephant shrews). *Proceedings of the National Academy of Sciences, USA* 100 (14): 8325-8330.
- FLEITMANN, D., MATTER, A., BURNS, S.J., AL-SUBBARY, A. & AL-AOWAH, M.A. 2004. Geology and Quaternary climate history of Socotra. *Fauna of Arabia* 20: 27-43.
- HAAS, F., POHL, H. & WRANIK, W. 2004. Dermaptera of the Socotra Archipelago, with the description of a new species. *Fauna of Arabia* 20: 409-419.
- KRÖPELIN, S., VERSCHUREN, D., LÉZINE, A.M., EGGERMONT, H., COCQUYT, C., FRANCUS, P., CAZET, J.P., FAGOT, M., RUMES, B., RUSSELL, J.M., DARIUS, F., CONLEY, D.J., SCHUSTER, M., VON SUCHODOLETZ, H. & ENGSTROM, D. R. 2008. Climate-driven ecosystem succession in the Sahara: The past 6000 years. *Science* 320:765-768.
- LAWRENCE, J.F. & NEWTON, A.F. 1995. Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names). In: *Biology, Phylogeny, and Classification of Coleoptera*. PAKALUK, J. & SLIPINSKI, A. (eds.): 779-1006.
- PIC, M. 1894. Descriptions et notes entomologiques. *L'Échange* 113: 66.
- PIC, M. 1912. Ptinidae. *Coleopterorum Catalogus* 41: 1-46. W. Junk, Berlin.
- PIC, M. 1917. Descriptions abrégées diverses. *Mélanges Exotico-entomologiques* 24: 2-24.

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