

# WESTERN PALAEARCTIC *TRACHYSCELIS* LATREILLE, 1809 (COLEOPTERA: TENEBRIONIDAE: TRACHYSCELINI)

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**Abstract.**— A review of supralittoral species of the genus *Trachyscelis* in the Western Palaearctic and Afrotropical regions with new data on distribution and morphology of five Palaearctic species is given. The new smallest eyeless and wingless species *T. shokhini* sp. nov. is described from Agadir (Morocco) and the new species *T. kochi* sp. nov. with reduced tarsomeres and eyes is described from Socotra Island (Yemen). The latter species is similar to *T. subcoecus* Koch, 1960, from which it differs by different number of ommatidia, different tarsal formula, different shape of clypeus and different body size. *Trachyscelis leoi* Lo Cascio & Grita, 2011 and *T. litoralis* Soldati, 2009 are found on Socotra Island for the first time, *T. tenuestriatus* Fairmaire, 1886 is new record for Iran. Catalogue of the tribe Trachyscelini of the world with 20 species of 3 genera is given. The key to eight Western Palaearctic and Afrotropical species of *Trachyscelis* is given.



**Key words.**— Coleoptera, Tenebrionidae, Trachyscelini, catalogue, *Trachyscelis*, Morocco, Yemen, Western Palaearctic region, new species, taxonomy, distribution

## INTRODUCTION

Trachyscelini Blanchard, 1845 is relatively small tribe of the subfamily Diaperinae Latreille, 1802 within the family Tenebrionidae and it was formerly comprised of three genera – *Trachyscelis* Latreille, 1809, *Macrotrachyscelis* Pic, 1925 and *Histiæa* Fairmaire, 1892 (Gebien 1939). The latter genus, however, was transferred by Koch (1953) to the tribe Opatrini Brullé, 1832. Recently, Masumoto *et al.* (2012) described the new genus *Taiwanotrachyscelis* Masumoto, Akita & Lee, 2012 so the tribe presently again includes three genera.

The genus *Trachyscelis* was erected by Latreille (1809) for *Trachyscelis aphodioides* Latreille, 1809 (by monotypy). Melsheimer (1846) described *T. flavipes* Melsheimer, 1846 from North America which

recently was synonymised by Steiner (2004) with *T. aphodioides*. Later Fairmaire (1886) described *T. tenuestriatus* from Djibouti. Champion (1893, 1894) added four species: *T. ciliaris* Champion, 1893, *T. laevis* Champion, 1893 (both from Australia), *T. pallens* Champion, 1893, the endemic species from Sri Lanka, and *T. chinensis* Champion, 1894 from Chinese Namo Island. At the same time Lewis (1894) described *T. sabuleti* from Japan. Carter (1906) added further Australian species *T. nigra*. Later Pic (1923) described *T. subopacus* from Egypt and Koch (1935) described *T. aphodioides lopadusae* from Italian Lampedusa Island. Both these taxa, however, were synonymised by Schatzmayr (1949) with *T. aphodioides*. Similarly, *Hybosorus hopei* Costa, 1844, for long time overlooked species from Italy, was synonymised with *T. aphodioides* too (Nardi 2010). Lea (1929) added

another species *T. howensis* Lea, 1929, a species endemic to Lord Howe Island (Australia). Much later Koch (1953, 1960) described *T. esquivelei* Koch, 1953 from Mozambique and *T. subcoecus* Koch, 1960 from Somalia respectively. Kulzer (1957) added the only Micronesian representative *T. suturalis* Kulzer, 1957 and Kaszab (1975) added *T. orissae* Kaszab, 1975, the only known species from India. Finally, quite recently two new species were described by Soldati (2009) and Lo Cascio and Grita (2011) – *T. litoralis* Soldati, 2009 from Qatar and *T. leoi* Lo Cascio et Grita, 2011 from Yemen Samha Island (Socotra Archipelago). This paper brings description of new species recently found in Morocco and in Socotra Island.

While *Macrotrachyscelis* and *Taiwanotrachyscelis* are strictly confined to limited area of eastern Africa and south-east Asia respectively (see also the catalogue below), the genus *Trachyscelis* on the other hand is cosmopolitan (e.g. Aalbu *et al.* 2002, Steiner 2004, Matthews and Bouchard 2008).

Members of the genus *Trachyscelis* are psammophilous and fossorial beetles with strong modifications for digging in sand, possessing compact form, flattened protibia and spinose meso- and metatibiae (Koch 1953, Matthews and Bouchard 2008). They occur on coastal dunes. Adults can be found hidden in sand between roots of dune plants (Purchart, pers. observ.) with which the larvae are supposed to be associated (Doyen *et al.* 1990). According to Schneider and Kinzelbach (1994) both, adults and larvae of *T. tenuestriatus*, feed on decaying algae. The same authors also found that this species hibernates in larval stage. Adults of *Trachyscelis* can often be found together with other representatives of the genus – *T. subcoecus*, *T. esquivelei* or with another psammophilous species *Freyula psammarina* Koch, 1959 (Koch 1960; Purchart 2014).

In February 2015 entomologists from Rostov Branch of Russian Entomological Society (A. E. Abramov, M. V. Nabozhenko and I. V. Shokhin) conducted field studies in Souss-Massa-Drâa Region of Morocco. As a result a new species of the genus *Trachyscelis* was collected. This smallest eyeless and wingless representative of the genus with reduced tarsomeres (tarsal formula 1-4-3) was found in dunes between Atlantic coast and left bank of Souss River and is described in this paper. Besides, as a result of biodiversity research on Socotra Island (e.g., Purchart 2012, Purchart and Nabozhenko 2012), a species new to science and further two species of this genus were recorded as new for the island and are reported below. New data about morphology, taxonomy, bionomics and distribution of the genus and catalogue of the tribe *Trachyscelini* are given below as well. This work continues our revisions of the Western Palaearctic genera of Tenebrionidae (Chigray, Nabozhenko 2016, Nabozhenko *et al.* 2016 etc.).

## MATERIAL AND METHODS

Stated lengths and widths represent the maximum values of the measured parts. Body length is the distance from the clypeus to the elytral apex with head in its natural position. Width of the elytra is the combined maximum width of both elytra.

Label data are given verbatim for type material. For nontype material the data are arranged as follows: name of locality, coordinates, altitude, collection date, collector name. Name of each locality was kept as stated on locality labels. For more information on localities from Socotra Island see Bezděk *et al.* (2012).

All specimens of the species described as new bear one printed red label: 'Holotype [Paratype], *Name of species* sp. nov., det. M. Nabozhenko & L. Purchart 2016'.

The study is based on the examination of adult beetles from the following institutes, museums and private collections:

NMPC – National Museum in Prague, Czech Republic (Jiří Hájek);

ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (Mark Volkovitsh);

CN – private collection of Maxim Nabozhenko, Rostov-on-Don, Russia;

LPCB – private collection of Luboš Purchart, Brno, Czech Republic;

BMNH – The Natural History Museum, London, United Kingdom (Maxwell V.L. Barclay);

MZUF – Museo di Storia Naturale, Università di Firenze, Florence, Italy (Luca Bartolozzi);

CBGP – Centre de Biologie pour la Gestion des Populations, Montferrier-sur-Lez, France (Laurent Soldati).

Scanning electron microscopy was made with the SEM EVO-40 XVP (LEO 1430VP).

## REVIEW OF WESTERN PALAEARCTIC SPECIES

*Trachyscelis aphodioides* Latreille, 1809  
(Figs. 1, 2)

**Notes.** Synonymy and distribution of this species are well known after many authors and particularly recent work of Nardi (2010). However, some information in Nardi's paper is probably erroneous and not supported by collected material. Especially the distribution of the species in the eastern part of its range needs corrections. Also records of the species in Kazakhstan are obviously erroneous. Based on the study of the largest collection (for Caspian region) deposited in

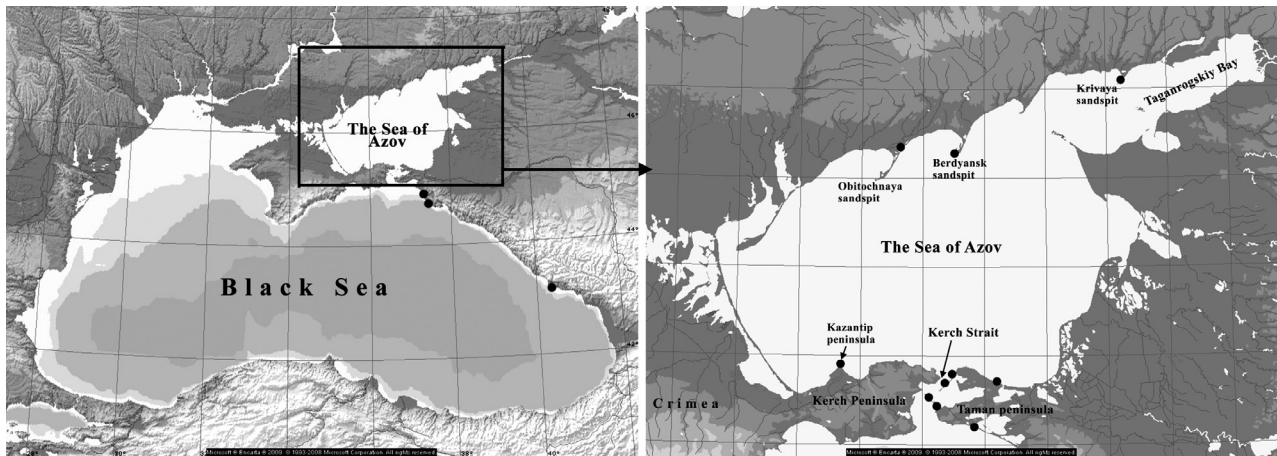


Figure 1. Distribution of *Trachyscelis aphodioides* in the eastern part of range in the Western Palaearctic.

the Zoological Institute (St. Petersburg) and material of current expeditions we can confirm with confidence that *T. aphodioides* is not distributed around the Caspian Sea and in Kazakhstan (Abdurakhmanov and Nabozhenko 2014). Eastern border of distribution is Caucasian coast of Black Sea (Abkhazia: Pitsunda; Russia, Krasnodar Region: Utrish, Anapa and Blagoveshchenskaya), the Kerch Strait (Chushka sandspit, Tuzla sandspit and island) and coasts of the Sea of Azov (Abdurakhmanov and Nabozhenko 2011, Nabozhenko *et al.* 2012, Putschkov *et al.* 2013). Distribution of this psammohalobiontic species on sand coasts of the Sea of Azov is limited by necessary conditions and salinity of the sea and sand supralittoral zone. The northernmost population of *T. aphodioides* on western coasts of the sea is known from Krivaya sandspit (Fig. 1) of Taganrog Bay, where salinity does not decrease under 7‰ even during periods of desalination (Shokhin *et al.* 2006). Absence of *T. aphodioides* on sandspits of eastern coast of Taganrog Bay (Beglit-skaya, Chumburskaya, Pavlo-Ochakovskaya sandspits) is due to lower salinity of water and supralittoral zone: from 3‰ (in periods of desalination) to 7‰ (in periods of salination). The species is distributed on eastern coast of the Sea of Azov only on northern part of Taman Peninsula and limited by Kuban' River delta. *Trachyscelis aphodioides* was not found on eastern coast of the sea because of absence of necessary sand dunes (mainly shell beaches or *Phragmites australis* thicket) and large coastal abrasion.

***Trachyscelis tenuistriatus* Fairmaire, 1886**

**Material.** 4 spec. (NMPC): “S Iran: Ziarat, 23 km NNW Bila'i, 14–15.v.1977”, “Loc. no. 330, Exped., Nat. Mus. Praha”.

New record for Iran.

***Trachyscelis leoi* Lo Cascio et Grita, 2011**  
(Fig. 3)

**Type material.** *Trachyscelis leoi*: Holotype (sex unknown) (MZUF): “SAMHA I., Socotra Archipel., 27.II.09, P. Lo Cascio & F. Grita” [white, printed], “HOLOTYPUS, *Trachyscelis leoi*, Lo Cascio & Grita, det. 2011” [red, handwritten], «„La Specola“ Firenze, Coleoptera Coll., 14788» [white, printed].

**Additional material examined.** 6 specimens: “YEMEN, SOQOTRA ISLAND: Bizidig, *Avicennia marina* mangrove, 12°18.6'N, 53°48.2'E, 6 m, 13.vi.2012, 6 spec., SOCOTRA expedition 2012, J. J. Niedobová & L. Purchart leg.” (NMPC, LPCB, CN).

New record for Socotra Island.

***Trachyscelis litoralis* Soldati, 2009**  
(Fig. 4)

**Type material.** *Trachyscelis litoralis*: Holotype: ♂ (CBGP): “QATAR, [Madinat al Shamal], Al Ghariyah, 09-III-2003, C. COCQUEMPOT leg. [white, printed]”, “Seashore mainly under dead dolphin, N – 26°04'51.2”, E – 51°21'26.7” [white, printed], “*Trachyscelis litoralis* m. n. sp., Soldati det. 2007, HOLOTYPE ♂” [red, printed], “CBGP\_INRA\_COL\_001551\_0101” [white, printed]; Paratype: 1 unsexed (CBGP): “QATAR, [Madinat al Shamal], Al Ghariyah, 09-III-2003, C. COCQUEMPOT leg.” [white, printed], “Seashore mainly under dead dolphin, N – 26°04'51.2”, E – 51°21'26.7” [white, printed], “*Trachyscelis litoralis* m. n. sp., Soldati det. 2007, PARATYPE” [red, printed], “CBGP\_INRA\_COL\_001552\_0101” [white, printed]; Paratype: 1 unsexed (CBGP): “QATAR, [Al Khor], Al Khor area, 18-IV-2004, M. MARTINEZ leg.” [white, printed], “West side of Ras al Matbakhah, (Mangrove) N – 25°40.858', E – 051°33.258' [white, printed],

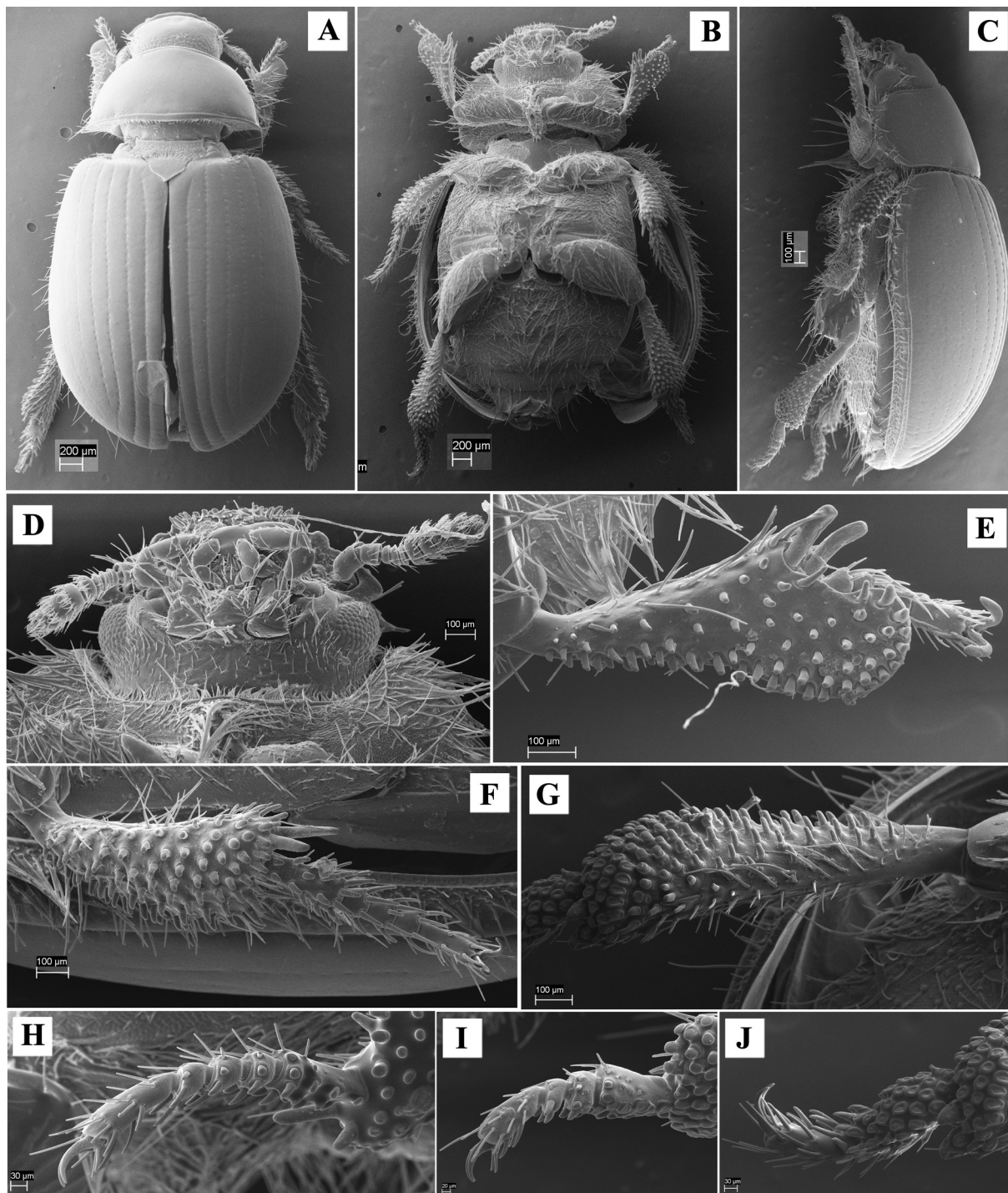


Figure 2. *Trachyscelis aphodioides*. A – habitus, dorsal view, B – habitus, ventral view, C – habitus, lateral view, D – vertex, E – protibia, F – mesotibia, G – metatibia, H – protarsi, I – mesotarsi, J – metatarsi.

*“Trachyscelis litoralis* m. n. sp., Soldati det. 2007, PARATYPE” [red, printed], “CBGP\_INRA\_COL\_001553\_0101” [white, printed].

**Additional material examined.** (34 specimens) YEMEN, Socotra Island: Halla area, Arher, freshwater

spring in sand dune, N 12°33'00”, E 54°27'36”, 5 m, 9-10. + 15.vi.2012, 27 spec., SOCOTRA expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (LPCB, CN, BMNH); same data, 6 spec., J. Hájek leg. (NMPC); Khayrha Mts.,

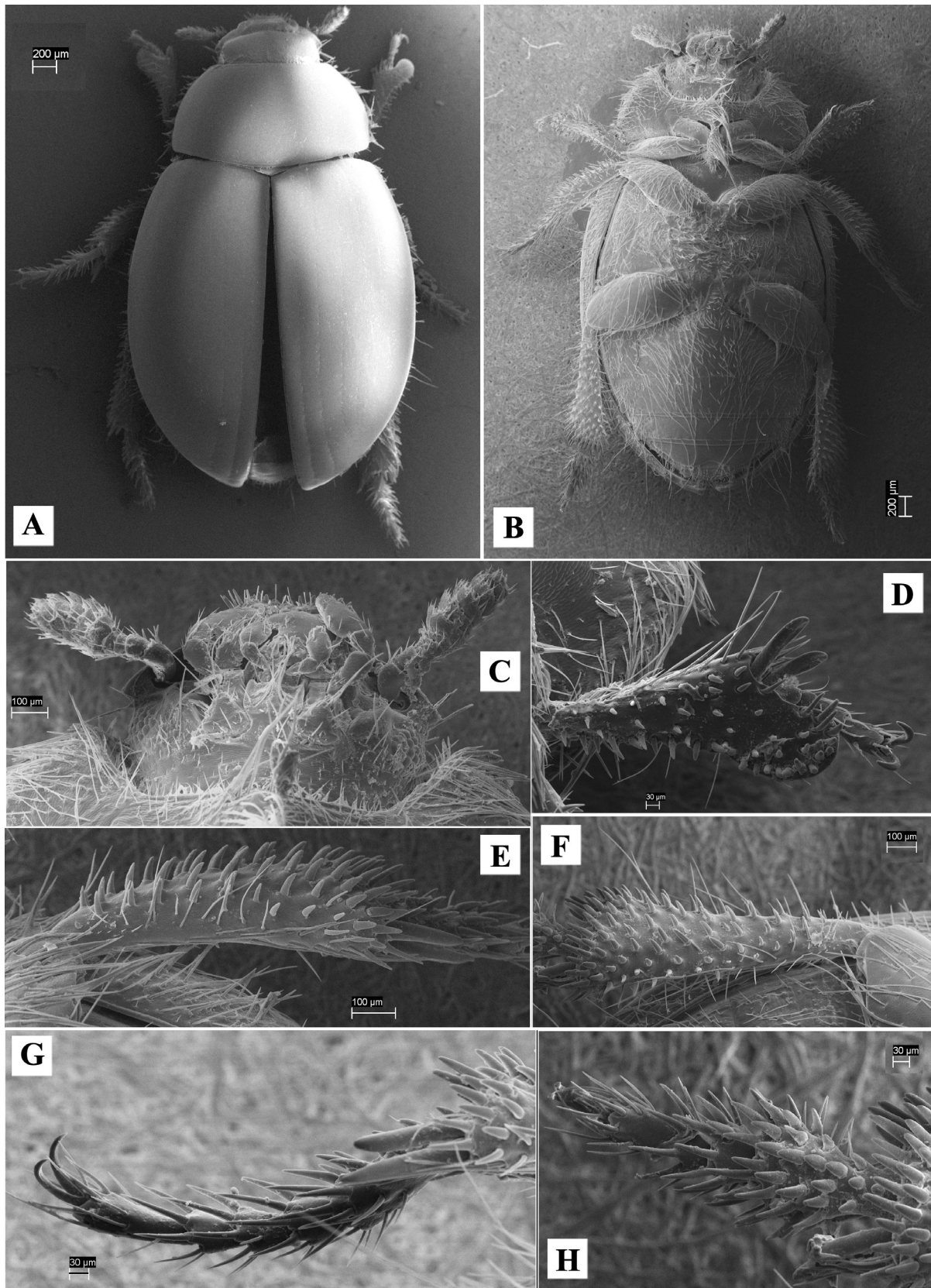


Figure 3. *Trachyscelis leoi*. A – habitus, dorsal view, B – habitus, ventral view, C – vertex, D – protibia, E – mesotibia, F – metatibia, G – mesotarsi, H – metatarsi.



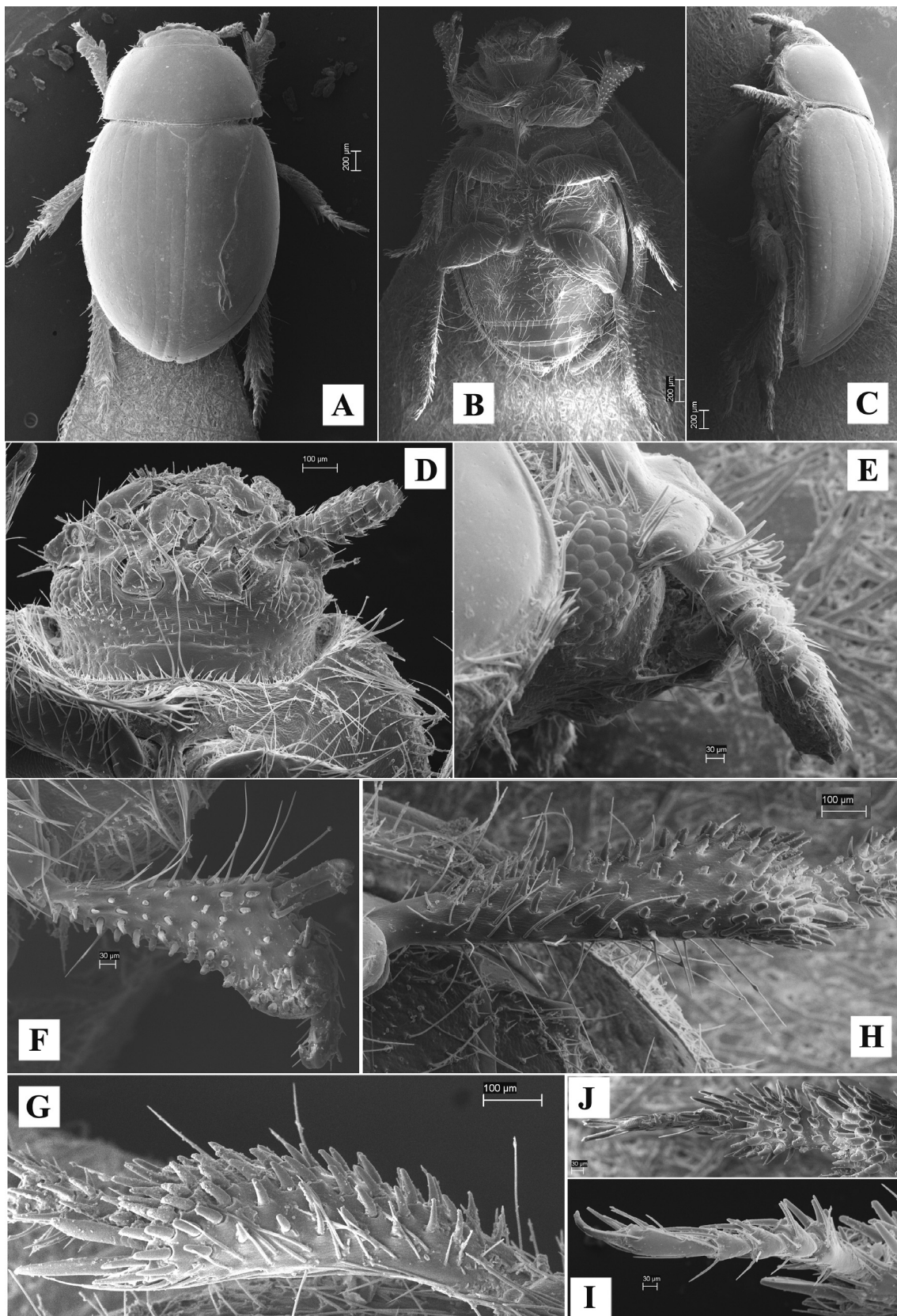


Figure 4. *Trachyscelis litoralis*. A – habitus, dorsal view, B – habitus, ventral view, C – habitus, lateral view, D – vertex, E – head, lateral view, F – protibia, G – mesotibia, H – metatibia, I – mesotarsi, J – metatarsi.

N slopes, Qalansiyah env., N 12°38'50" E 53°27'45", 85-592 m, 9-10.xii.2003, 1 spec., D. Král leg. (NMPC).

New record for Socotra Island and Yemen.

**Variability.** When studying types kindly provided by L. Soldati, we found that paratype specimen from Al Khor area differs from the holotype and the second paratype with lateral clypeal teeth not projecting forward more than median part of anterior edge, with protarsi approx. as long as outer apical lobe of protibiae (much longer in the holotype and the second paratype) and finally with frontoclypeal suture much deeper than in the holotype and the second paratype.

**Notes.** This species was described from Qatar and Iran (Iranian specimens were not included in the type series) (Soldati 2009).

### *Trachyscelis esquiveli* Koch, 1953

**Material examined.** Four unsexed specimens: MADAGASCAR: Ansibe, Vieu, x.1963 (NMPC).

### *Trachyscelis subcoecus* Koch, 1960

**Type material examined.** Paratypes: 7 (sex is not determined) specimens (BMNH): "Paratype" [rounded, white, yellow bordered, printed], "Obbia, SOMALIA, Mudugh, VIII.1958, C. KOCH", "Brit. Mus., 1959-430" [white, printed]; Paratypes: 3 (sex is not determined) (BMNH): "El Cabobe, SOMALIA, Mudugh, VIII.1958, C. KOCH" [white, printed], "Brit. Mus., 1960-185" [white, printed], "PARATYPE, *Trachyscelis subcoecus*, KOCH" [pink, printed].

## NEW SPECIES

### *Trachyscelis kochi* sp. nov.

(Fig. 5)

**Type material.** (37 spec.). Holotype (sex is not determined; NMPC), labelled: "YEMEN, Soqatra Island: ca. 3 km NE of Shuab, *Avicennia marina* mangrove, sand dunes, 12°34.1'N, 53°23.9'E, 3 m, 20.-21.vi.2012" [white, printed], "SOCOTRA expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg." [white, printed]. Paratypes (sex is not determined; 10 LPCB, 2 CN, 2 ZIN, 2 BMNH, 1 CBGP): same data as holotype; (1 NMPC): "YEMEN, Socotra Island, Halla area, Arher, freshwater spring in sand dune, N 12°33'00", E 54°27'36", 5 m, 9-10. + 15.vi.2012" [white, printed], "SOCOTRA expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg." [white, printed]; (2 NMPC): "YEMEN, Socotra Island, Noked plain (sand

dunes), Sharet Halma vill. env., 12°21.9' N, 54°05.3' E, 20 m, Jiří Hájek leg., 10-11.xi.2010" [white, printed]; (2 NMPC): "Yemen, Soqatra Is., BA'A vill. env., 5.xii.2003, N 12°32'19", E 54°10'41", 234 m [GPS], leg. P. Kabátek", "YEMEN – SOQOTRA, 2003, Expedition, Jan Farkač, Petr Kabátek & David Král"; (2 NMPC): same as previous but David Král lgt.; (Must be 8 NMPC, 2 LPCB, 2 CN): "Yemen, Soqatra Is., 2003, 5-6/xii., NOGED plain (sand dunes), 11 m, N12°21'09", E54°01'47" [GPS], David Král lgt.", "YEMEN – SOQOTRA, 2003, Expedition; Jan Farkač, Petr Kabátek & David Král".

**Description.** Body length 2.7–3.6 mm, width 1.7–2.4 mm. Body globose, pale brown, shiny. Dorsal side with very fine and sparse punctation only near pronotal and head margins and in striae.

Head widest at genal level. Eyes very small, presented by only 10 ommatidia. Head laterally with some long and some very short setae above eyes. Labrum with strong erected spine-shaped setae. Anterior margin of frontoclypeus weakly rounded in middle and weakly sinuated laterally, without projected processes. Surface of clypeus covered with rounded tubercles. Lateral margin of head between gena and clypeus with emargination and deep furrow dorsally, which divides frontoclypeus from frons. Punctation of frons very fine and sparse, surface of frontoclypeus with tubercles. Mouthparts including submentum not immersed in epicranium. Mentum with elevated longitudinal ridge. Apical maxillar palpomer strongly elongate, 2.4 times as long as wide, with circular line of short setae near apex; apical weakly convex platform of the palpomer with very short dense obtuse sensilla distinctly bordered by furrow from remaining surface. Apical labial palpomer also with circular line of setae near apex; apical platform not convex, with very short dense obtuse sensilla. Surface of vertex around laryngeal emargination with 3 lines of short and sparse setae and also with several long sensilla (not clustered) on lateral margins of laryngeal emargination. Submentum with 4 very long setae. Antennae 10-segmented, with dorsoventrally flattened 5-segmented club; antennomeres 3–5 very short, flattened baso-apically, with sporadic setae; antennomeres 6–10 with circular marginal line of long bent setae; antennomere 10 much smaller than antennomeres 6–9.

Pronotum strongly transverse (2.25 times as wide as long), widest behind middle, 1.8 times as wide as head. Lateral margins of pronotum moderately regularly rounded. Angles of pronotum not expressed. Disc strongly convex in transverse direction, margins of disc narrowly beaded. Pronotal surface with very fine and sparse punctation only near lateral margins. Prothoracic hypomera with dense pubescence of long hairs in outer half. Prosternum with dense brush of very long hairs in middle. Prosternal process convex, with very long and dense hairs.

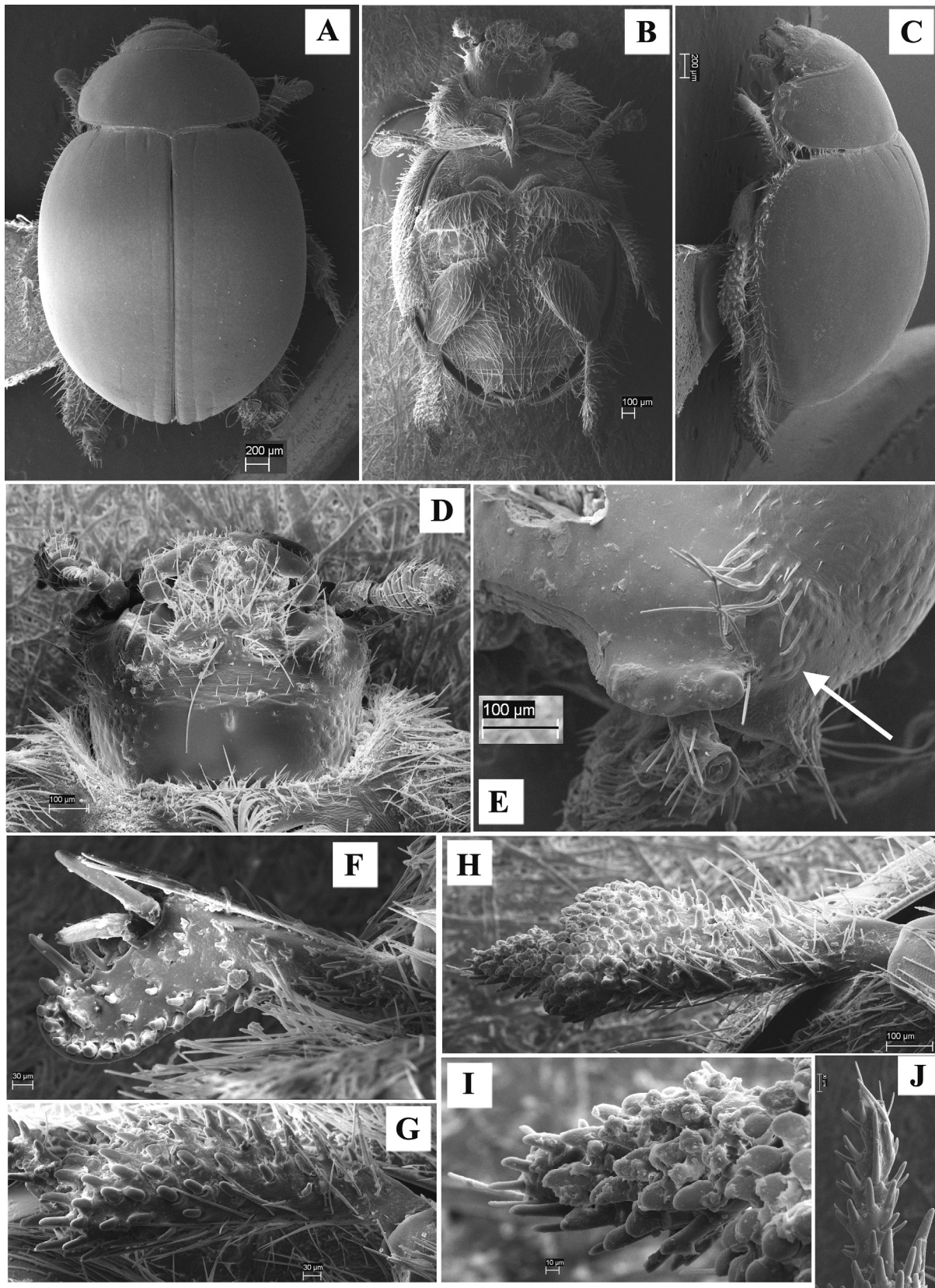


Figure 5. *Trachyscelis kochi* sp. nov. A – habitus, dorsal view, B – habitus, ventral view, C – habitus, lateral view, D – vertex, E – head, lateral view, F – protibia, G – mesotibia, H – metatibia, I – metatarsi, J – mesotarsi.



Elytra with subequal length and width (only 1.03 times as long as wide), widest at middle, 2.64 times as wide as head, 1.45 times as wide and 3.4 times as long as pronotum. First stria complete, second stria expressed only apically and basally, third one visible only at elytral base, other striae absent. First interval of each elytron not keel-shaped on apex, only slightly convex. Pseudepipleura with furrow, separating them from elytra and with dense pubescence of both long and short hairs.

Wingless.

Ventral side. Mesoventrite without pubescence in middle and with moderately dense pubescence laterally. Mesepimera and metepisterna with dense pubescence. Metaventrite with dense pubescence of long hairs and with longitudinal furrow in middle. Abdominal ventrites with long, backward directed hairs; apical margin of ventrite 5 weakly sinuated.

Legs. Lower part of protibiae with line of strong spines on outer margin – 4 transverse lines with longer and acute spines in basal half and 5 transverse lines of long erected spines on protibial lamina. Inner margin of protibial lamina with 3 very long spines with unequal length. Spurs long, flattened, narrowly rounded on apex. Inner margin of protibiae with long hairs. Mesotibiae with monomorphic strong acute apically directed spines. Metatibiae with long erected setae and dense monomorphic strong spines; spines longer and acute in basal half and shorter and obtuse in apical part (often abraded or even erased). Protarsi only with 4 tarsomeres (tarsal formula 4-5-4). Mesotarsomeres with long setae upside and with long and acute spines underneath. Metatarsomeres with setae upside and with the same strong rounded spines as on metatibiae. Ratio of tibial/tarsal length of middle and hind legs 1.87 and 2.7 accordingly.

**Etymology.** The species is named in honour of Charles Koch (1904–1970), the famous African coleopterologist.

**Differential diagnosis.** Due to the low number of ommatidia *T. kochi* sp. nov. belongs, together with *T. shokhini* sp. nov. and *T. subcoecus* Koch, 1960, to the group of species with strongly reduced (10 ommatidia in *T. kochi* sp. nov. and 6–7 ommatidia in *T. subcoecus*) or completely absent eyes (no ommatidia present in *T. shokhini* sp. nov.). The group is also characterised by reduction of tarsomeres with tarsal formula 4-5-4 in *T. kochi* sp. nov., 2-4-3 in *T. subcoecus* and finally 1-4-3 in *T. shokhini* sp. nov. The rest of *Trachyscelis* species have normally developed eyes and tarsal formula 5-5-4. Besides characters stated above, *T. kochi* sp. nov. differs from *T. shokhini* sp. nov. also by larger body size (see descriptions). From *T. subcoecus* it can be distinguished also by weakly rounded anterior clypeal margin and tuberculate surface of clypeus while in *T. subcoecus* the anterior margin of

clypeus is straight or weakly emarginated and clypeal surface is more or less wrinkled, not tuberculate. Finally, body length of *T. kochi* sp. nov. ranges between 2.7–3.6 mm while in *T. subcoecus* it ranges between 2.3–2.5 mm.

*Trachyscelis shokhini* sp. nov.  
(Figs. 6–8)

**Type material.** Holotype (sex is not determined; will be deposited in ZIN), labelled: “Morocco, Souss-Massa-Drâa Region, Ait Melloul near Agadir, 30°18'23.2"N / 09°30'30.1"W, 27.02.2015 leg. I.V. Shokhin, M.V. Nabozhenko”. Paratypes (sex is not determined; 2 ZIN, 1 CN, 1 LPCB, 1 NMPC): same data as holotype.

**Description.** Body small (length 2–2.35 mm, width 1.37–1.42; length of holotype 2.3 mm, width 1.39 mm), globose, yellow, shine. Dorsal side glabrous, almost without punctation, only with very fine and sparse punctures on head and lateral sides of pronotum.

Head widest at genal level. Eyes absent (sporadic ommatidia also absent). Head laterally only with 10 long and some very short setae instead of eyes. Labrum with strong erected spine-shaped setae. Anterior margin of frontoclypeus widely weakly sinuated in middle, with two deep emarginations and processed angles laterally. Surface of frontoclypeus with very sparse and fine punctation. Lateral margin of head between genae and frontoclypeus with emargination and deep furrow dorsally, which separate frontoclypeus from frons. Punctation of head and frontoclypeus very sparse (distance between punctures 7 or more times as long as puncture diameter) and very fine, punctures very small, with short basiconic and trichoid sensillae. Mouthparts, including submentum, deeply depressed in epicranium. Mentum without keel or bulge, with several moderately long setae. Apical maxillar palpomere oval, 1.6 times as long as wide, with circular line of short setae near apex and very short dense obtuse sensilla apically; apex not separated by furrow from other part of palpomere. Apical labial palpomere also with circular line of setae, with rounded apex and same sensilla as on apical maxillar palpomere. Surface of vertex around laryngeal emargination with 2 lines of very short and sparse setae and cluster of moderately long sensillae on lateral margins of laryngeal emargination. Antennae 10-segmented, with 5-segmented dorsoventrally flattened club; antennomeres 3–5 very short, flattened baso-apically, with sporadic setae; antennomeres 6–10 with circular marginal line of long bent setae and groups of short straight basiconic sensilla located on tubercles on flattened apical platform of antennomeres; antennomere 10 much smaller than antennomeres 6–9.

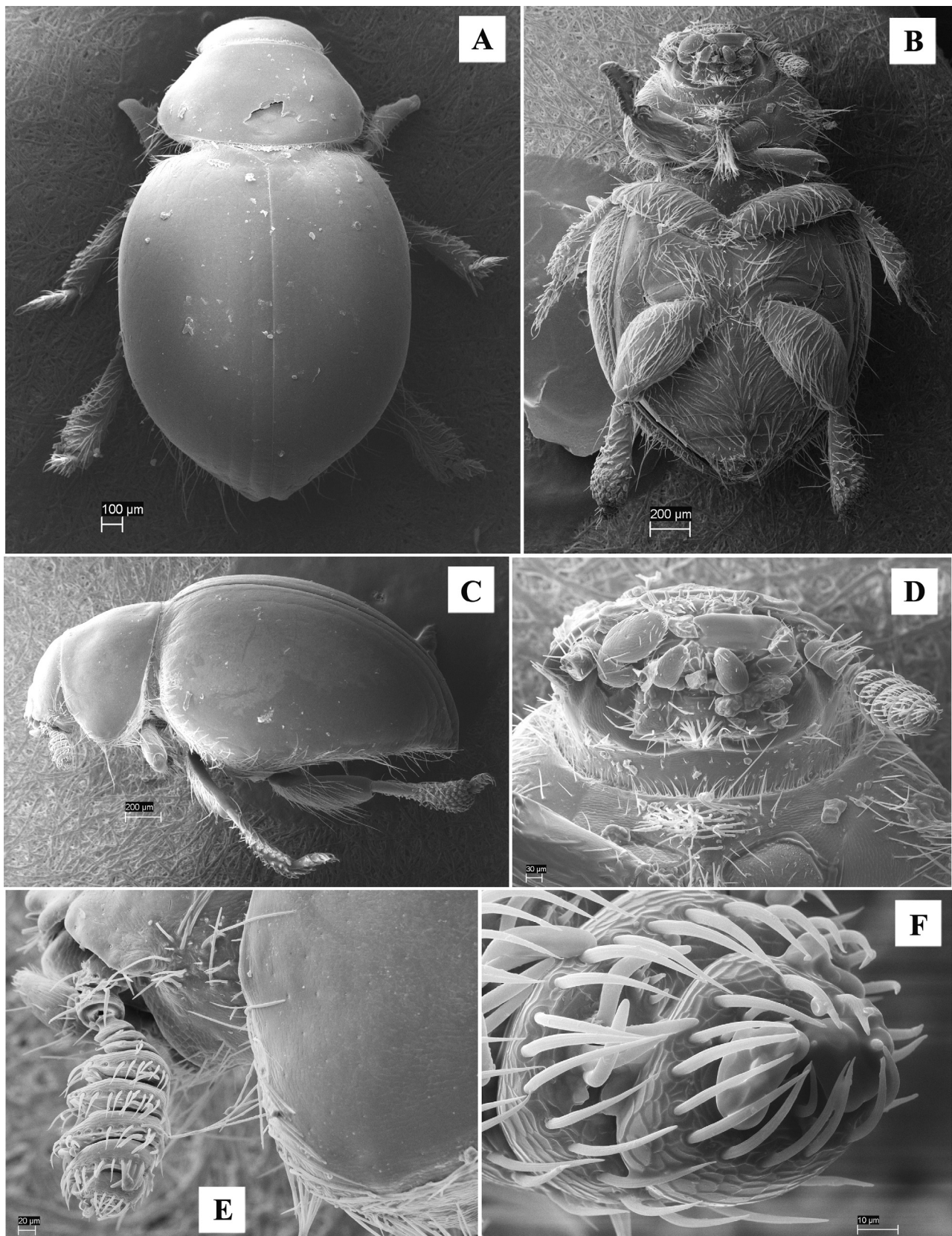


Figure 6. *Trachyscelis shokhini* sp. nov. A – habitus, dorsal view, B – habitus, ventral view, C – habitus, lateral view, D – vertex, E – head laterally, F – apex of antenna.

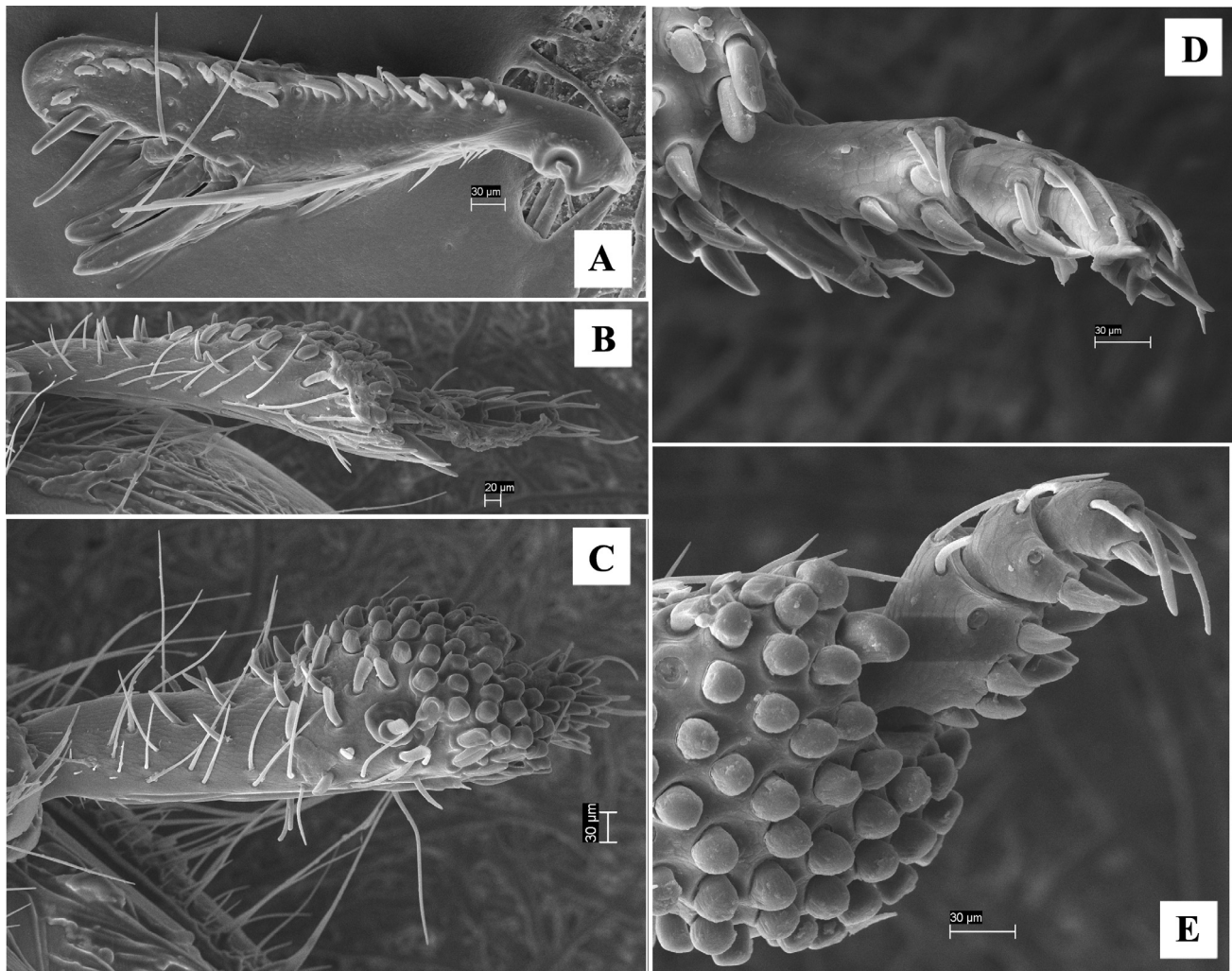


Figure 7. *Trachyscelis shokhini* sp. nov. A – protibia, B – mesotibia, C – metatibia, D – mesotarsi (tarsomere 4 is broken), E – metatarsi.

Pronotum transverse (2.14 times as wide as long), bell-shaped, widest behind middle, 1.6 times as wide as head. Lateral margins of pronotum strongly rounded in basal half and weakly emarginated in anterior half. Angles of pronotum not expressed. Disc strongly convex in lateral view, margins of pronotum not beaded. Pronotum with sporadic setae laterally and with very fine and sparse punctation near lateral margins. Prothoracic hypomera with dense pubescence of long hairs in outer half. Prosternum with dense brush of very long hairs. Prosternal process convex, with very long and dense erected hairs.

Elytra widely oval (1.14 times as long as wide), widest at middle, 2.25 times as wide as head, 1.4 times as wide and 3.4 times as long as pronotum. Elytral striae 1–3 indicated only near apex. First interstria of each elytron keel-shaped apically (elytral apex with 2 obtuse processes in dorsal view). Furrow or carina between

elytra and epipleura absent. Pseudepipleura with dense pubescence of long hairs.

Wingless.

Ventral side. Mesoventrite not pubescent in middle, with sparse short pubescence laterally. Mesepimera and metepisterna with sparse short hairs. Metaventrite with dense pubescence of long hairs and longitudinal furrow in middle. Abdominal ventrites with long, backward directed hairs. Apical margin of ventrite 5 straight, not sinuated.

Legs. Lower part of protibiae with line of strong spines on outer margin and 3 thinner spines in middle of protibial lamina; other lower surface without spines. Inner margin of protibial lamina with 2 very long spines with unequal length. Spurs long, flattened, with rounded apices. Inner margin of protibia with long hairs. Mesotibiae with long setae and 3 types of spines: thin and acute basally directed spines (presented only in

basal half of mesotibiae); wide flattened rounded, apically directed spines (presented only in apical half); thick strong acute spines near apex. Metatibiae with long erected setae and 3 types of spines: thin and acute, basally directed spines (presented only in basal half); wide flattened rounded erected spines (presented only in apical half); very thick and short rounded spines in apical third. Protarsomeres 1–4 absent (reduced), mesotarsi with 4, metatarsi with 3 tarsomeres (tarsal formula 1-4-3). Meso- and metatarsomeres with long setae upside and strong acute spines underneath. Ratio of tibial/tarsal length of middle and hind legs accordingly 1.28 and 3.17.

**Etymology.** Species named in honour of our colleague Igor Shokhin (Institute of Aride zones, Rostov-on-Don).

**Collection circumstances.** The new species was found in sand dunes at depth 10–30 cm under *Tamarix* sp.

**Differential diagnosis.** Due to the reduction of tarsomeres and eyes the new species is similar to *T. subcoecus*, which is distributed in northwest of Indian Ocean coast and *T. kochi* sp. nov. an endemic species to the Island of Socotra (Yemen). Other known *Trachyscelis* species have more or less expressed eyes and normally developed tarsomeres (Figs. 2–4). The new species also differs from other *Trachyscelis* by the presence of 3 morphologically different types of spines on meso- and metatibia. Among Western Palaearctic *Trachyscelis* only *T. litoralis* has different morphological types of only metatibial spines (Figs. 4H, G). Other studied *Trachyscelis* species have a monomorphic meso- and metatibial spines (Figs. 2F–G, 3E–H). Further differences are given in the key.

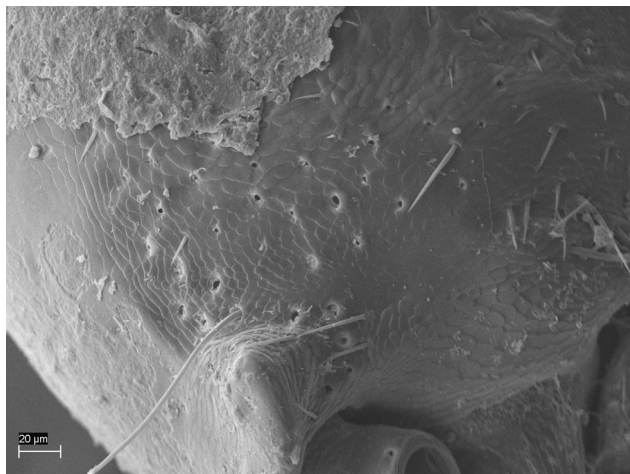


Figure 8. *Trachyscelis shokhini* sp. nov. head, lateral view (eyeless), setation is removed.

### Key to the Western Palaearctic and Afrotropical species of the genus *Trachyscelis*

- 1(2). Eyeless. Mentum without elevated ridge. Tarsal formula 1-4-3 . . . . . *T. shokhini* sp. nov.
- 2(1). Eyes reduced or not. Mentum with elevated ridge. Tarsal formula different.
- 3(6). Eyes reduced, hardly visible, consist of 5–6 to 10 small light ommatidia. Tarsi reduced. Tarsal formula 4-5-4 or 2-4-3.
- 4(5). Tarsal formula 4-5-4. Frontoclypeus with weakly rounded anterior margin and tuberculate surface. Body length 2.7–3.6 mm . . . . . *T. kochi* sp. nov.
- 5(4). Tarsal formula 2-4-3. Frontoclypeus with straight or weakly emarginated anterior margin and more or less wrinkled (not tuberculate) surface. Body length 2.3–2.5 mm . . . *T. subcoecus*
- 6(3). Eyes well developed, possess 30–70 ommatidia. Tarsal formula 5-5-4.
- 7(10). Anterior margin of frontoclypeus with distinctly projecting lateral teeth. Eyes with less than 50 ommatidia, usually possess about 40 ommatidia.
- 8(9). Metatibiae with two types of spines: a) flattened apical spines; b) not flattened, acute (often obliterated) spines. Elytral striae 1–3 regularly punctate, not interrupted; striae 4 interrupted; striae 5–8 extremely weakly indicated, without punctures . . . . . *T. litoralis*
- 9(8). Metatibiae with only one type of acute spines. Elytral striae almost not visible; stria 1 very shallow, interrupted, with row of irregularly placed punctures; stria 2 indicated by irregularly placed punctures; striae 3–8 almost not visible, very slightly indicated, interrupted, without punctures . . . . . *T. leoi*
- 10(7). Anterior margin of frontoclypeus distinctly emarginated laterally but without projecting lateral teeth. Eyes with about 30 or more than 60 ommatidia.
- 11(12). Clypeus strongly transversally carinate. Elytral striae deep, with coarse punctures. Eyes with more than 60 ommatidia . . . . . *T. aphodioides*
- 12(11). Clypeus slightly transversally carinate, almost flat. Elytral striae shallow, with fine punctures.
- 13(14). Frons densely punctate, without central impression. All eight elytral striae distinct, striae 6–8 very fine. First inner stria reaching the apex of elytra. Eyes with more than 60 ommatidia . . . . . *T. tenuestriatus*
- 14(13). Frons with shallow but distinct central impression, without punctures. Striae 1–5 distinct (three first with arranged punctures), striae 6–8 not visible. First inner stria not reaching the apex of elytra. Eyes with about 30 ommatidia . . . . . *T. esquiveli*

## Overview of keys and differential diagnosis for species of the genus *Trachyscelis*

Carter (1906) – dif. diagnosis for *T. nigra* and *T. ciliaris*;

Champion (1893) – dif. diagnosis *T. ciliaris* × *T. aphodioides*; *T. laevis* × *T. ciliaris* and *T. aphodioides*; *T. pallens* × *T. aphodioides*;

Champion (1894) – dif. diagnosis *T. chinensis* × *T. laevis*;

Fairmaire (1886) – dif. diagnosis *T. aphodioides* and *T. tenuestriatus*;

Kaszab (1975) – dif. diagnosis for *T. orissae* and *T. pallens*;

Koch (1953) – dif. diagnosis for *Macrotrachyscelis* and *Trachyscelis*;

Koch (1960) – dif. diagnosis for *T. subcoecus* × *T. howensis*, *T. aphodioides*, *T. tenuestriatus*, *T. esquivei*, *T. chinensis*, *T. sabuleti*, *T. pallens*, *T. nigra*, *T. laevis*, *T. ciliaris* and *T. flavipes*;

Lea (1926) – dif. diagnosis for *T. howensis*, *T. niger* and *T. laevis*;

Lewis (1894) – dif. diagnosis *T. sabuleti* × *T. tenuestriatus*;

Lo Cascio and Grita (2011) – dif. diagnosis and key for west Palaearctic species *T. leoi*, *T. subcoecus*, *T. aphodioides*, *T. tenuestriatus*, *T. esquivei*;

Reitter (1904) – key for *T. aphodioides* and *T. sabuleti*;

Soldati (2009) – dif. diagnosis *T. litoralis* × *T. tenuestriatus*, *T. aphodioides*.

## CATALOGUE OF THE TRIBE TRACHYSCELINI

The following species list is based on: Ando & Yamasako (2013), Ardoin (1969), Champion (1893, 1894), Gebien (1939), Johnson (1989), Jung (2009), Kaszab (1975, 1979, 1982), Koch (1953, 1960), Kulzer (1957), Lillig & Bremer (2002), Lo Cascio & Grita (2011), Löbl *et al.* (2008), Masumoto (2003, 2006), Masumoto *et al.* (2012), Masumoto & Lee (2004), Matthews & Bouchard (2008), Nardi (2010), Novák (2014), Soldati (2009), Steiner (2004), Waitzbauer *et al.* (2004), Schawaller (2010).

### *Macrotrachyscelis* Pic, 1925

1. *Macrotrachyscelis rufus* Pic, 1925 — eastern Africa, Madagascar

### *Taiwanotrachyscelis* Masumoto, Akita et Lee, 2012

1. *Taiwanotrachyscelis chengi* Masumoto, Akita et Lee, 2012 — Taiwan

2. *Taiwanotrachyscelis sanguinosus* Ando et Yamasako, 2013 — Sulawesi

## *Trachyscelis* Latreille, 1809

1. *Trachyscelis aphodioides* Latreille, 1809 — cosmopolitan\*  
= *T. subopacus* Pic, 1923 (Schatzmayr 1949: 28).  
= *T. a. lopadusae* Koch, 1935 (Schatzmayr 1949: 28).  
= *T. flavipes* Melsheimer, 1846 (Steiner 2004: 335).  
= *Hybosorus hopei* Costa, 1844 (Nardi 2010: 60).
2. *Trachyscelis chinensis* Champion, 1894 — China (Namo Is.), Japan (Ryukyu Is.), Taiwan
3. *Trachyscelis ciliaris* Champion, 1893 — E. Wallaby Is. and W. Australia
4. *Trachyscelis esquivei* Koch, 1953 — Madagascar, Mozambique, Kenya, Somalia
5. *Trachyscelis howensis* Lea, 1929 — Australia (Lord Howe Is.)
6. *Trachyscelis kochi* sp. nov. — Yemen (Socotra Is.)
7. *Trachyscelis laevis* Champion, 1893 — Sulawesi, Adele Is. and W. Australia
8. *Trachyscelis leoi* Lo Cascio et Grita, 2011 — Yemen: Samha Is, Socotra Is. – new record
9. *Trachyscelis litoralis* Soldati, 2009 — Qatar, Iran, Yemen: Socotra Is. – new record
10. *Trachyscelis nigra* Carter, 1906 — SE Australia
11. *Trachyscelis orissae* Kaszab, 1975 — India (Konark – Odisha State)
12. *Trachyscelis pallens* Champion, 1893 — Sri Lanka
13. *Trachyscelis sabuleti* Lewis, 1894 — Japan, South Korea (Jeju Is.)
14. *Trachyscelis shokhini* sp. nov. — Morocco
15. *Trachyscelis subcoecus* Koch, 1960 — Somalia
16. *Trachyscelis suturalis* Kulzer, 1957 — Micronesia (Kiribati and Palau Is.)
17. *Trachyscelis tenuestriatus* Fairmaire, 1886 — Jordan, Saudi Arabia, Egypt (Sinai), Yemen (incl. Perim Isl.), Oman, Iran (new record); Afrotropical Region (e.g. Sudan, Djibouti).

## ACKNOWLEDGEMENTS

Authors are very much obliged to Igor Shokhin (Institute of arid zones of the Russian Academy of Sciences) for the material from coasts of the Sea of Azov and help in collection of Tenebrionidae in Morocco. They also want to thank Jiří Hájek (NMPC), Maxwell V. Barclay (BMNH), Laurent Soldati (CBGP), Luca Bartolozzi (MZUF), G.S. Medvedev and M.G. Volkovich (Zoological Institute of Russian Academy of Sciences) for the provided material and K.D. Dvadenko

\* — For detailed information about wide distribution of *T. aphodioides* see Nardi (2010) and this paper.



(Institute of arid zones of the Russian Academy of Sciences) for work with SEM. The study was partly supported by the Russian state research project no. 01201363187 and the Russian Foundation for Basic Research (grant 15-04-02971a).

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Received: May 31, 2016

Accepted: April 1, 2017