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## A new species of silverfish of the genus *Sceletolepisma* Wygodzinsky, 1955 (Zygentoma: Lepismatidae) from Oman

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**Abstract.** A new species *Sceletolepisma omanicum* sp. n. from the Sultanate of Oman in West Asia on the southeastern coast of the Arabian Peninsula is described and illustrated. The species is related to similar species *S. maroccanum* (Mendes, 1980), *S. picturatum* (Wygodzinsky, 1955), *S. weberi* (Escherich, 1905) and *S. kervillei* (Silvestri, 1911) from Africa, Syria, Iran and Oman, differing in body length, number of bristle combs on thoracic sterna, chaetotaxy of urosternites and the shape of tergite X. Prosternum of *S. omanicum* sp. n. with 4 + 4 distal; urosternite I without, urosternites III–VIII with 1 + 1 sublateral and II–VI with one medial bristle combs.

**Key words:** new taxon, Lepismatidae, *Sceletolepisma*, distribution, Arabian Peninsula.

### Новый вид щетинохвосток рода *Sceletolepisma* Wygodzinsky, 1955 (Zygentoma: Lepismatidae) из Омана

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**Резюме.** Даны описание и иллюстрации нового вида *Sceletolepisma omanicum* sp. n. из Султаната Оман. Вид близок к *S. maroccanum* (Mendes, 1980), *S. picturatum* (Wygodzinsky, 1955), *S. weberi* (Escherich, 1905) и *S. kervillei* (Silvestri, 1911) из Африки, Сирии, Ирана и Омана, от которых отличается размерами тела, хетотаксией грудных и брюшных стернитов, формой десятого тергита брюшка.

**Ключевые слова:** новый таксон, Lepismatidae, *Sceletolepisma*, распространение, Аравийский полуостров.

## Introduction

The silverfish family Lepismatidae includes six subfamilies, about 40 genera and more than 300 described species [Mendes, 1991; Smith, 2017], with the subfamily Ctenolepismatinae comprising 21 genera and about 195 species [Molero-Baltanás et al., 2024]. The species of the subfamily Ctenolepismatinae are characterised by the pectinate macrochaetae and the thoracic sterna as large plates attached only at their anterior margins. These plates largely cover the inner anterior margins of coxae of all legs [Smith, 2017].

About 123 species (68%) in Ctenolepismatinae belong to two close genera *Ctenolepisma* Escherich, 1905 and *Sceletolepisma* Wygodzinsky, 1955 [Wygodzinsky, 1955; Irish, 1987; Smith, 2018; Molero-Baltanás et al., 2024]. In Oman, the fauna of *Ctenolepisma* and *Sceletolepisma* is poorly studied, with four widespread species recorded: *C. ciliatum* (Dufour, 1831), *C. mauritanicum* (Lucas, 1846), *S. wahrmani* (Wygodzinsky, 1952), *S. michaelsoni* (Escherich, 1905), and one species known from the Middle East (Syria, Iran, Oman), *S. kervillei* (Silvestri, 1911) [Irish, 1991].

## Material and methods

Silverfish were stored in 70% ethanol. The holotype (male) and one paratype (female) were dissected and

mounted in Berlese fluid on glass microscope slides. The drawings were made using a microscope and a drawing tool. The type specimens of the new species are deposited in the collection of the All-Russian Institution of Plant Protection (Pushkin, St Petersburg, Russia).

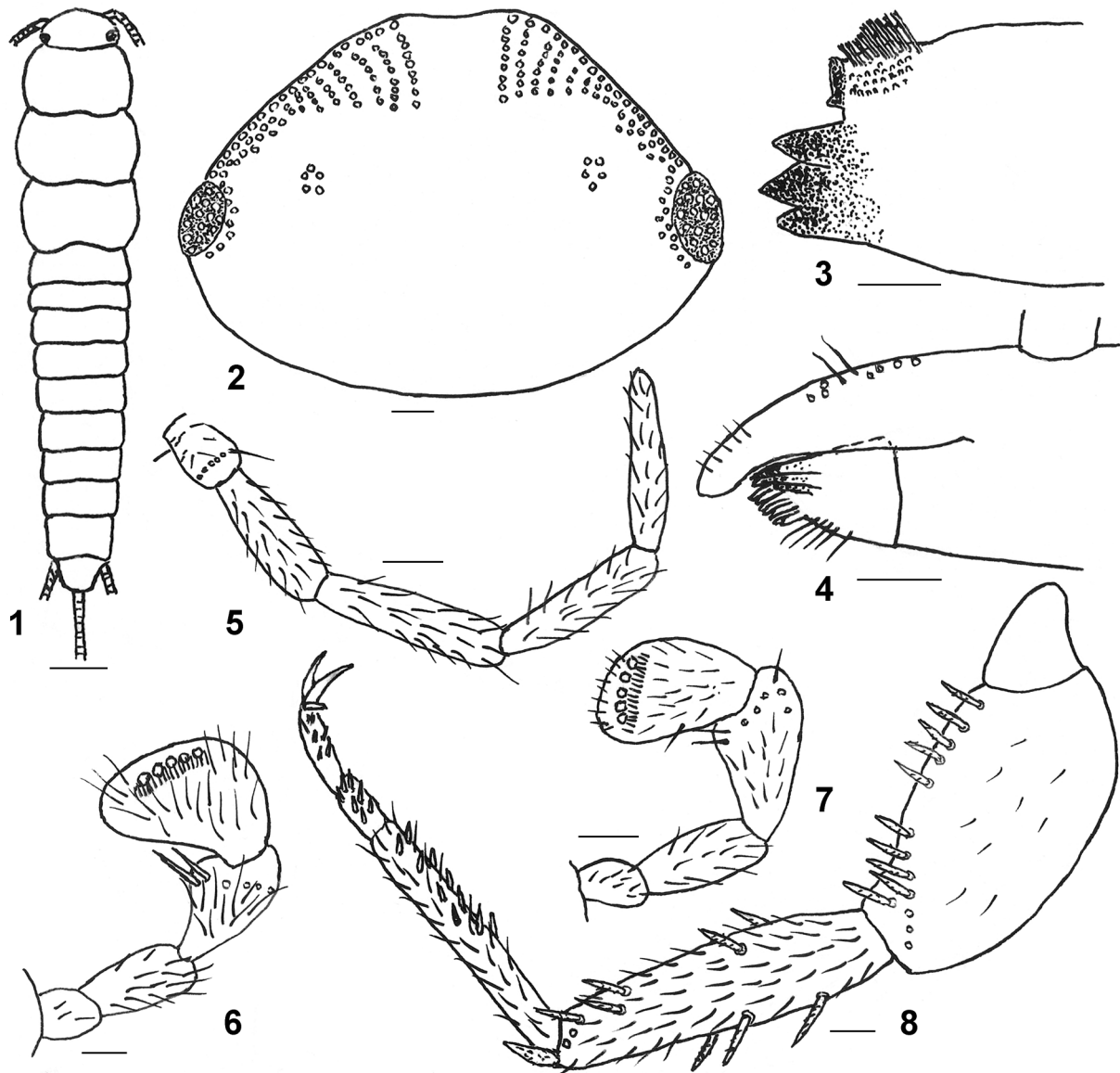
**Order Zygentoma Börner, 1904**  
**Family Lepismatidae Latreille, 1802**  
**Subfamily Ctenolepismatinae Mendes, 1991**  
**Genus *Sceletolepisma* Wygodzinsky, 1955**  
**sensu Irish, 1987**

Type species *Lepisma lineatum* Fabricius, 1775.

*Sceletolepisma omanicum* sp. n.  
(Figs 1–22)

**Material.** Holotype, ♂: Oman, near Matrah, 23°37'N / 58°34'E, 949 m, under stones, 6.03.2024 (V.G. Kaplin). Paratype: 1♀, the same data as in the holotype.

**Description.** Medium-sized silverfish. Body noticeably elongate, with thorax slightly wider than abdominal segment I. Body length (including head): 10 mm in male, 9 mm in female; body width 2.1 and 2.3 mm, respectively. Ratio of head length to whole body length about 0.07 in male and female, that of thorax to whole body about 0.37 in male and 0.34 in female, abdomen to whole body about 0.56 and 0.59, respectively. Width of head 1.5 mm in male and 1.4 mm in female, width of thorax 2.1 and 2.3 mm, width of abdomen 1.9 and 2.1 mm, width of urotergite X 1.2 and 1.3 mm, respectively. Head 2–2.3 times as wide as long. Eyes black, well-



Figs 1–8. *Scetelelepisma omanicum* sp. n., habitus and details of structure.

1–6, 8 – male, holotype; 7 – female, paratype. 1 – general view (from dorsal side); 2 – head capsule (compound eyes, frons, vertex); 3 – distal part of mandible; 4 – distal part of maxilla (galea and lacinia); 5 – maxillary palp; 6–7 – labial palp; 8 – hind leg (tarsus, tibia, femur and trochanter). Scale bars 0.1 mm.

Рис. 1–8. *Scetelelepisma omanicum* sp. n., габитус и детали строения.

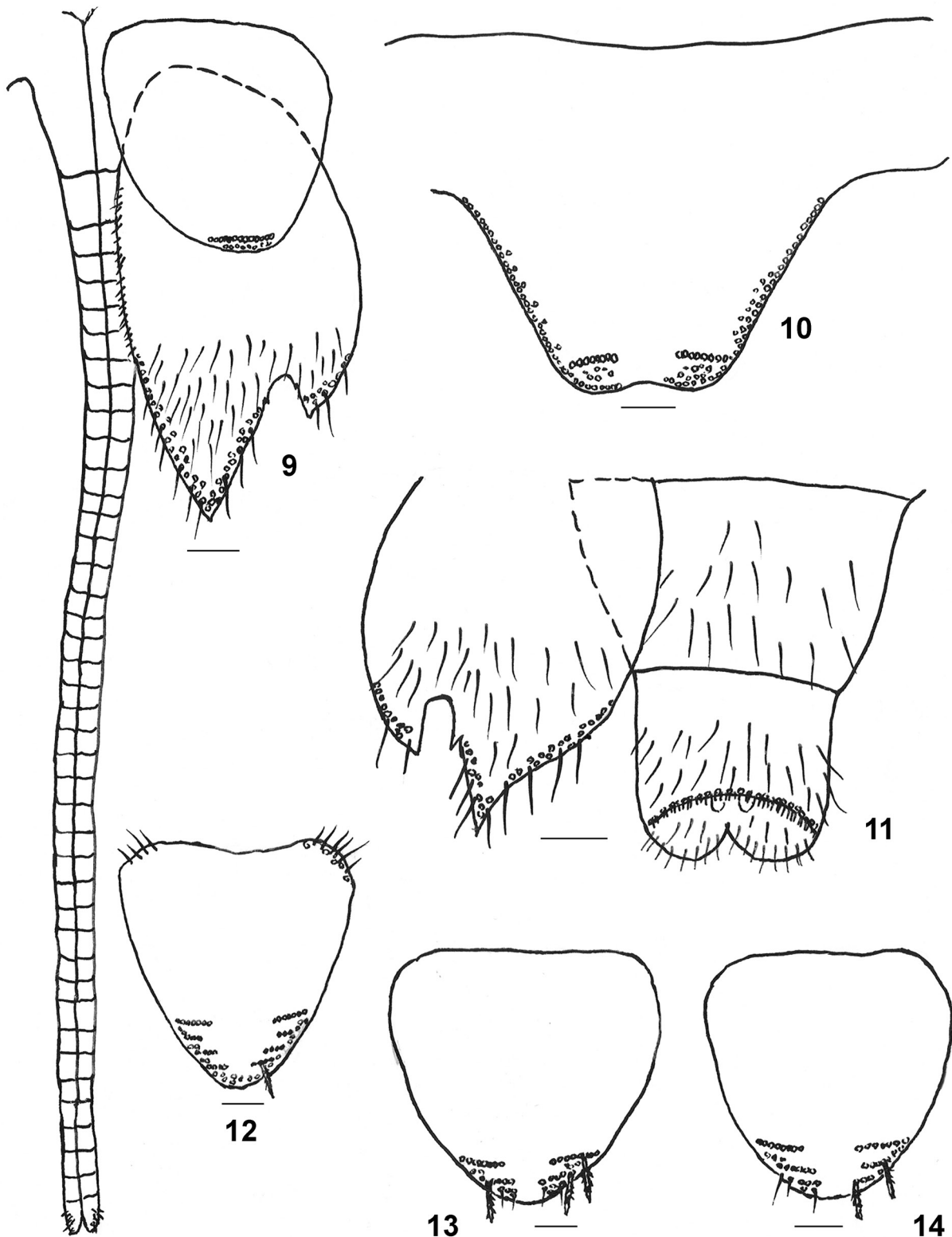
1–6, 8 – самец, голотип; 7 – самка, паратип. 1 – общий вид сверху; 2 – головная капсула (сложные глаза, лоб, вершина головы); 3 – дистальная часть верхней челюсти; 4 – дистальная часть нижней челюсти (галеа и лациния); 5 – нижнечелюстной щупик; 6–7 – нижнегубной щупик; 8 – задняя нога (лапка, голень, бедро и вертлуг). Масштабные линейки 0.1 мм.

developed; eye diameter about 0.18–0.2 mm (Figs 1, 2). Antennae, cerci and median dorsal appendage damaged. Maximum length of preserved part of antenna 6 mm, cerci 5.5 mm. Ratio of scapus length to width about 1.4, all flagellomeres of antennae with one transverse row of simple bristles (Fig. 22).

General colour of thorax (in ethanol) whitish, the abdomen is yellowish with brownish-reddish pigment. Scales on upper side of body brownish-dark gray, on lower side light brown. Scales were not found on flagellum of antennae and terminal filaments.

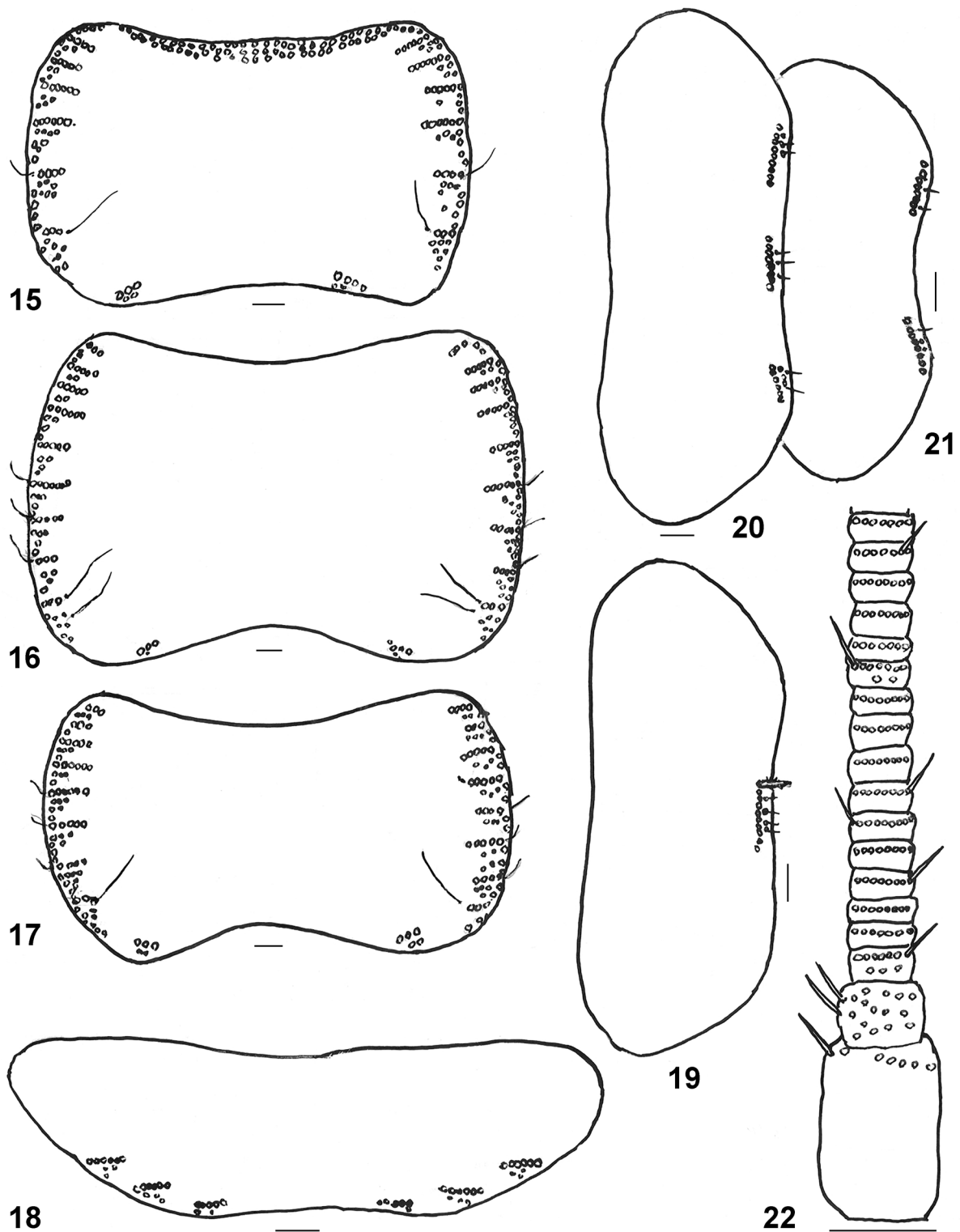
Macrochaetae pectinate, bifid apically, with their large number on the forehead opposite the bases of antennae, also two tufts of macrochaetae on the sides of the clypeus, as well as labrum of variable shape, rounded and suboval.

Mandible with well-developed molar and incisor areas, with 5 strong chitinized teeth: 2 smaller and 3 larger ones, of which 2 sharp and 1 wide (Fig. 3). Main part of mandible with numerous relatively long bifid apically colourless setae. Near incisor area of mandible there is also a lateral row including about 14 smooth, shorter, light brown and bifid apically chaetae. Maxilla without peculiar characters; lacinia with 3 strong teeth (2 large and 1 smaller), 7 lamellate processes and a row of 5 simple chaetae; galea laterally with about 5–6 small and 8–10 longer chaetae in male and in female (Fig. 4). Apical palpomere of maxillary palp about 1.02 in male and 1.12 in female times as long as its penultimate palpomere (Fig. 5). Labium broad; postmentum with a row of relatively large, smooth chaetae. Labial palp well-developed;



Figs 9–14. *Sceletolepisma omanicum* sp. n., details of structure.  
 9–10 – female, paratype; 11–14 – male, holotype. 9 – urocoxites VIII and IX with ovipositor; 10 – urotergite X; 11 – urocoxite IX with penis; 12 – prosternum; 13 – mesosternum; 14 – metasternum. Scale bars 0.1 mm.

Рис. 9–14. *Sceletolepisma omanicum* sp. n., детали строения.  
 9–10 – самка, паратип; 11–14 – самец, голотип. 9 – урококситы VIII и IX с яйцекладом; 10 – уротергит X; 11 – урококсит IX с penisом; 12 – простернум; 13 – мезостернум; 14 – метастернум. Масштабные линейки 0.1 мм.



Figs 15–22. *Sceletolepisma omanicum* sp. n., details of structure.  
 15–21 – male, holotype; 22 – female, paratype. 15 – pronotum; 16 – mesonotum; 17 – metanotum; 18 – urotergite III; 19 – urosternite II; 20 – urosternite VI; 21 – urosternite VII; 22 – antenna (scapus, pedicellum and flagellomeres). Scale bars 0.1 mm.

Рис. 15–22. *Sceletolepisma omanicum* sp. n., детали строения.

15–21 – самец, голотип; 22 – самка, паратип. 15 – переднеспинка; 16 – среднеспинка; 17 – заднеспинка; 18 – уротергит III; 19 – уростернит II; 20 – уростернит VI; 21 – уростернит VII; 22 – усик (основной членик, ножка и членики жгутика). Масштабные линейки 0.1 мм.

Table 1. Ratios of length to width of main leg segments in *Scetelelepisma omanicum* sp. n.  
Таблица 1. Отношения длины к ширине основных сегментов ноги у *Scetelelepisma omanicum* sp. n.

Segments Сегменты	Legs Ноги					
	fore / передняя		middle / средняя		hind / задняя	
	male / самец	female / самка	male / самец	female / самка	male / самец	female / самка
Tarsus / Лапка	8.7	9.6	9.0	10.9	12.5	13.0
Tibia / Голень	3.2	3.6	3.8	3.7	4.4	4.3
Femur / Бедро	2.4	2.6	2.4	2.8	2.5	2.5
Coxa / Тазик	2.1	2.0	1.8	2.0	1.9	1.8

Table 2. Numbers of pectinate macrochaetae on the main leg segments of *Scetelelepisma omanicum* sp. n.  
Таблица 2. Количество оперенных макрохет на основных сегментах ноги *Scetelelepisma omanicum* sp. n.

Segments Сегменты		Legs Ноги					
		fore / передняя		middle / средняя		hind / задняя	
		male / самец	female / самка	male / самец	female / самка	male / самец	female / самка
Tarsomeres Членики лапки	1	8–10	8	5	11	11	10
	2	5	6	3	5	5	7
	3	2	3	0	4	1	5
Tibia / Голень		11–12	9	9	11	11	10
Femur / Бедро		7	6	7	10	7–8	10
Coxa / Тазик		0	0	0	0	0	0

Table 3. Number of macrochaetae per bristle comb in male and female of *Scetelelepisma omanicum* sp. n.  
Таблица 3. Количество макрохет в щетинковом гребне у самца и самки *Scetelelepisma omanicum* sp. n.

Segment Сегмент	Urotergite Уротергит			Urosternite Уростернит	
	lateral латеральный	sublateral сублатеральный	submedial субмедиальный	sublateral сублатеральный	medial медиальный
I	7	–	–	–	–
II	7–8	5–6	5–6	–	13
III	8	6	6	11–12	11
IV	7–9	6	6	11–12	9–10
V	8–9	6	6	11–12	9
VI	8–9	6	6–7	12–13	9
VII	9–10	6–7	6–8	12–13	–
VIII	10	6–8	–	12–13	–
IX	–	–	–	–	–
X	8	8	–	–	–

apical palpomere oval, with 5 papillae in one row, ratio of its length to width approximately 0.8–0.9 in male and 1.3–1.4 in female (Figs 6, 7).

Legs fairly long, running. Hind legs about 1.2 times as long as fore and 1.3 times as middle legs in male and in female (Fig. 8). Ratios of length to width in leg segments as in Table 1. Coxae and femora covered with scales. Middle and hind femora and coxae most widened. Ratio of length of first tarsomere of hind tarsus to total length of hind tarsus about 0.64 in male and 0.67 in female. Pretarsus with lateral claws relatively long, slightly curved. Fore, middle and hind tarsus 1.2 times as long as respective tibia in male and 1.3 times in female. First tarsomere, tibia and femur with 5–12 well developed pectinate macrochaetae (Table 2).

Prosternum subtriangular (Fig. 12). Mesosternum (Fig. 13) and metasternum (Fig. 14) semioval, rounded apically. Pro-, meso- and metasternum almost reaching apex of coxae of fore, middle and hind legs, respectively. Ratio of length to width of thoracic sterna about 1.01–1.02, 0.92–1 and 0.87–0.88, respectively. Distal parts

of all thoracic sterna with bristle combs: they located in about 0.27 of prosternum, 0.22 of mesosternum and 0.16 of metasternum length in male, and respectively 0.32, 0.17 and 0.12 length in female. Distal part of prosternum with 4 + 4 bristle combs, that of mesosternum with 3 + 3 combs, preapical part of metasternum with 2 + 2 combs in male and in female, including 3–9, 3–8 and 8–11 large pectinate macrochaetae, respectively. All thoracic sterna with hyaline scales.

Anterior margin of pronotum with interrupted chaetal collar. Lateral margins of pronotum with 6 + 6, mesonotum with 9–10 + 9–10 and metanotum with 8 + 8 bristle combs in male and female, including 3–6, less often 2, long, pectinate, apically bifurcate macrochaetae and with open trichobothrial areas with 1, less often 2 thin, very long trichobothria in lateral combs (Figs 15–17). Posterior trichobothrial areas associated with posterior combs on all thoracic nota. Posterior margins of pro-, meso- and metanotum with 1 + 1 sublateral bristle combs including 3, less often 4 pectinate macrochaetae.

Table 4. Main morphological differences between *Sceletolepisma omanicum* sp. n., *S. kervillei*, *S. maroccanum*, *S. picturatum* and *S. weberi* [Silvestri, 1911; Wygodzinsky, 1955; Mendes, 1980; Irish, 1991].

Таблица 4. Основные морфологические различия между *Sceletolepisma omanicum* sp. n., *S. kervillei*, *S. maroccanum*, *S. picturatum* и *S. weberi* [Silvestri, 1911; Wygodzinsky, 1955; Mendes, 1980; Irish, 1991].

Species Виды	Distribution Распространение	Body length, mm Длина тела, мм	Bristle combs on urosternites / Щетинковые гребни на брюшных стернитах		Number of bristle combs on thoracic sternites / Количество щетинковых гребней на грудных стернитах		Trapezium of tergite X Трапеция X тергита брюшка		
			sublateral сублатеральные	medial медиальные	prosternum переднегрудной стернит	meso- and metasternum среде- и заднегрудной стерниты	ratio of its anterior to posterior width / отношение ширины его переднего и заднего оснований	ratio of length to width of anterior base / отношение длины тергита к ширине его переднего основания	ratio of length to width of posterior base / отношение длины тергита к ширине его заднего основания
<i>S. omanicum</i> sp. n.	Oman Оман	9–10	III–VIII	II–VI	4 + 4	3 + 3, 2 + 2	2.5	0.5	1.3
<i>S. kervillei</i>	Syria, Iran, Oman Сирия, Иран, Оман	8	III–VIII	II–VI	?	?	?	?	?
<i>S. maroccanum</i>	Mogocso Марокко	6.2	III–VIII	II–VI	2 + 2	2 + 2	2.2	0.3	0.7
<i>S. picturatum</i>	South Africa Южная Африка	12	III–VIII	II–VII	3 + 3	2 + 2	1.9	0.8	1.6
<i>S. weberi</i>	South Africa Южная Африка	11	III–VIII	II–VI	1 + 1	1 + 1	1.8	0.7	1.2

Numbers of macrochaetae in abdominal bristle combs as in Table 3. Urotergite IX without bristle combs. Urotergite X trapezoidal (Fig. 10). Ratio width of anterior to posterior bases of its trapezium about 2.5, length to width of anterior and posterior bases 0.5 and 1.3, respectively. Urotergites I and X with 1 + 1 lateral, VIII with 2 + 2 lateral and sublateral and II–VII with 3 + 3 lateral, sublateral and submedial bristle combs (Fig. 18), including 6–10, less often 5 pectinate macrochaetae (Table 3), respectively. Abdominal segments with one pair of broken styli (urostyli) on urocoxites IX. Urosternite I without bristle combs. Urosternites III–VIII with 1 + 1 sublateral and II–VI with one medial bristle combs of 9–13 pectinate macrochaetae (Figs 19–21).

Penis typical for the genus *Sceletolepisma*. Male parameres absent (Fig. 11). Ovipositor long, about 3.3 mm with 42–44 divisions, its apex surpassing the tip of the inner process of coxite IX by about 2 times its length. Ratio lengths of ovipositor to body about 0.37 (Fig. 9).

**Comparison.** *Sceletolepisma omanicum* sp. n. is the species of the genus *Sceletolepisma* with 1 + 1 bristle combs on urotergite I, 3 + 3 bristle combs on urotergites II–VII, 2 + 2 on urotergite VIII; urosternite I without bristle combs, urosternites III–VIII with 1 + 1 sublateral and II–VI with one medial bristle combs; apical palpomere of labial palps with five sensory papillae in one row; in both sexes of the new species one pairs of styli on urocoxites IX. The indicated morphological features are characteristic of a few related species of this genus from North

Africa (*S. maroccanum* (Mendes, 1980)), South Africa (*S. picturatum* (Wygodzinsky, 1955), *S. weberi* (Escherich, 1905)), from Syria, Iran and Oman (*S. kervillei* (Silvestri, 1911)) [Silvestri, 1911; Wygodzinsky, 1955; Mendes, 1980; Irish, 1987, 1991]. The main differences between these species (body length, number of bristle combs on thoracic sterna, chaetotaxy of urosternites, the shape of tergite X) are given in Table 4.

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