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Sacarum nemkovi gen. et sp.n. (Aranei: Nesticidae), from the steppe Cisurals, Russia

Sacarum nemkovi gen. et sp.n. (Aranei: Nesticidae) из степного Приуралья, Россия

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КЛЮЧЕВЫЕ СЛОВА: Araneae, новый род, новый вид, степная зона.

ABSTRACT. Based on two females, a new monotype genus *Sacarum* gen.n., with the type species *S. nemkovi* sp.n., is described from Orenburg Area, Russia. The new genus differs from all the nesticid genera in having unserrated ventral setae of the tarsi IV.

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РЕЗЮМЕ. Новый монотипный род нестицид *Sacarum* gen.n., с типовым видом *S. nemkovi* sp.n., описан из Оренбургской области по двум самкам. Новый род отличается от всех родов нестицид незазубренными вентральными щетинками лапок IV.

Introduction

Nesticidae is a small family of spiders with 280 described species in 16 genera [WSC, 2022]. The majority of nesticids from temperate regions are medium-sized, long-legged and mainly restricted to cave-like habitats. In contrast, the nesticids from (sub)tropical regions are characterized by a smaller size and shorter legs; they frequently occur outside caves in forest litter, on grass and under stones [Lehtinen, Saaristo, 1980].

According to F. Ballarin (pers. comm.), the 'short-legged' nesticid complex represents a paraphyletic group and includes the genus *Nesticella* Lehtinen et Saaristo, 1980 from the tribe Nesticellini and three genera outside this tribe, *Hamus* Ballarin et Li, 2015, *Nescina* Ballarin et Li, 2015 and *Wraios* Ballarin et Li, 2015, which were described from south-east Asia [Ballarin, Li, 2015].

In the western Palaearctic, the 'short-legged' nesticids are represented by two introduced species: *Eidmannella pallida* (Emerton, 1875) and *Nesticella mogera* (Yaginuma, 1972) [Nentwig *et al*., 2022]. In Europe, *E. pallida* is a typical indoor dweller [Nentwig *et al*., 2022]; yet, it was recorded as a troglophile species [Mammola *et al*., 2018]. *N. mogera* is represented by introduced populations in Europe and the Urals. In temperate areas of Europe, it is a true synanthropic (=eusynanthropic) species [Esyunin *et al*., 2019]; naturalized populations of this species are only known from South Europe (Ballarin, pers. comm.) and the Caucasus [Marusik, Guseinov, 2003].

At the moment, three nesticid species have been reported from the Urals [Esyunin, Efimik, 1995, 1998; Esyunin *et al*., 2019], of which one, *Aituaria pontica* (Spassky, 1932), is known from the cis-Ural steppe zone [Esyunin, 2017]. During the past decade numerous materials have been collected from various localities of the steppe zone of Orenburg Area. A new nesticid-like species belonging to an undescribed genus has been found in this material. The aim of the present work is to diagnose and describe these new species and genus.

Material & Methods

The holotype and paratype of new species are deposited in the Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU; curator K.G. Mikhailov).

Stacks of colour images were manually generated using an Olympus OMD EM-10 digital camera with a Panasonic Lumix H-H025 25 mm f/1.7 lens mounted on a Zeiss microscope. Digital images were prepared using Photoshop CS6 image stacking software.

The terminology of the epigyne morphology follows that by Ribera *et al*. [2014]. The sequence of leg segment measurements is as follows: total length (femur, patella, tibia, metatarsus, tarsus). The leg formula is given from longest to shortest leg. All measurements are given in millimeters.

Abbreviations used in the text: ALE — anterior lateral eye, AME — anterior median eye, PLE — posterior lateral eye, PME — posterior median eye; Tm — metatarsal trichobothrium position.

Table. Diagnostic characters of *Sacarum* gen.n. and related nesticid genera.
Таблица. Диагностические признаки *Sacarum* gen.n. и близких родов нестицид.

Characters	Genera			
	***Sacarum* gen.n.**	***Hamus***	***Nesticina***	***Nesticella***
Total length	2.4	2.0-2.2	1.4-1.6	2.0-3.4
Carapace L/W	1.16	1.15-1.21	1.12-1.24	1.0 (type*)
Carapace colouration	brown or grayish yellow	yellow	pale yellow	yellow or pale yellow
Cephalic part	slightly raised	slightly raised	strongly raised	slightly raised
Thoracic part	strongly raised	not modified	not modified	not modified
Eyes	AME>ALE=PME =PLE	ALE>PME=PLE> AME	ALE=PLE> PME>AME	ALE>PLE=PME>AME
Cheliceral teeth promarginal retromarginal	 3 2	 3 multiple tiny denticles	 6 2 tiny denticle	 3 multiple tiny denticles
Leg formula	I, IV, II, III	I, IV, II, III	I, IV, II, III	I, IV, II, III
Femur I/Carapace length	0.9	1.3-1.4	1.0	1.7 (type*)
Tm I	0.6	0.4	0.5	0.4-0.5
Pedipalpal claw	absent	long pectinate	long	present
Abdomen coloration	grey	yellow to grey	yellowish, usually with four darker marks	yellowish or greyish, with pairs of dark spots
Abdomen setae	long	long	long	long
Habitat	?steppe litter	forest litter, rarely cave	forest litter	forest litter, under stones. cave

* Lin with the co-authors [Lin *et al*., 2016] proposed five species-groups in the genus *Nesticella*, based on male palpal and epigynal morphology and preliminary results of molecular analysis. Therefore, in the present table only morphological characters of the type species, *Nesticella nepalensis* (Hubert, 1973) [Hubert, 1973], are given.

***Sacarum* gen.n**.

Type species: *Sacarum nemkovi* sp.n.

DIAGNOSIS. The habitus, leg spination and the epigynal conformation of the new species are evidence of its belonging to a new genus in the family Nesticidae. Yet, the new genus differs from all the known nesticid genera in having unserrated ventral setae of the tarsi IV.

In the body and legs sizes, colouration, etc. (see Table), the new genus belongs to the so-called 'short-legged' nesticids. However, its Tm I = 0.6 is typical of the tribe Nesticini [Lehtinen, Saaristo, 1980]. The new genus also differs from the closely related genera, viz. *Hamus* Ballarin et Li, 2015, *Nescina* Ballarin et Li, 2015 and *Nesticella* Lehtinen et Saaristo, 1980, in a modification of the thoracic part of carapace, in the armament of the posterior edge of cheliceral groove and in the absence of a claw on pedipalp (Table).

ETYMOLOGY. The generic epithet is derived from the Latin name of ancient nomadic people Scythians (or Scyths) — *Sacarum*, who used to live primarily in the steppe regions of Eurasia known as Scythia. The gender is masculine in gender.

DESCRIPTION. Small spiders: total length 2.4. Carapace almost round (length/wide proportion 1.16; Fig. 1), brownish or greyish yellow. Fovea indistinct. Eyes in two rows (Figs 1, 3): anterior row straight (in frontal view), posterior row strongly procurved. Median eyes are round, lateral eyes — oval. Eyes formula: AME>ALE=PME=PLE. Chelicera with three promarginal and two retromarginal teeth. Labium rebordered with a swelling (Fig. 5, 9). Pedipalp without a claw (Fig. 11). Legs and pedipalp uniformly yellow. Leg formula: IV, I, II, III. Tm I = 0.6. Abdomen with four spots and sparse long setae that sit on a small knob (Figs 1, 2). Anterior and posterior spinnerets conical, almost equal in size. Colulus well-developed.

Epigyne convex, with a posterior sclerotized plate and median septum (Figs 4, 6). The anterior and posterior edges are sclerotized. Vulva simple. Vulval pockets absent.

DISTRIBUTION. The steppe cis-Urals (Fig. 12).

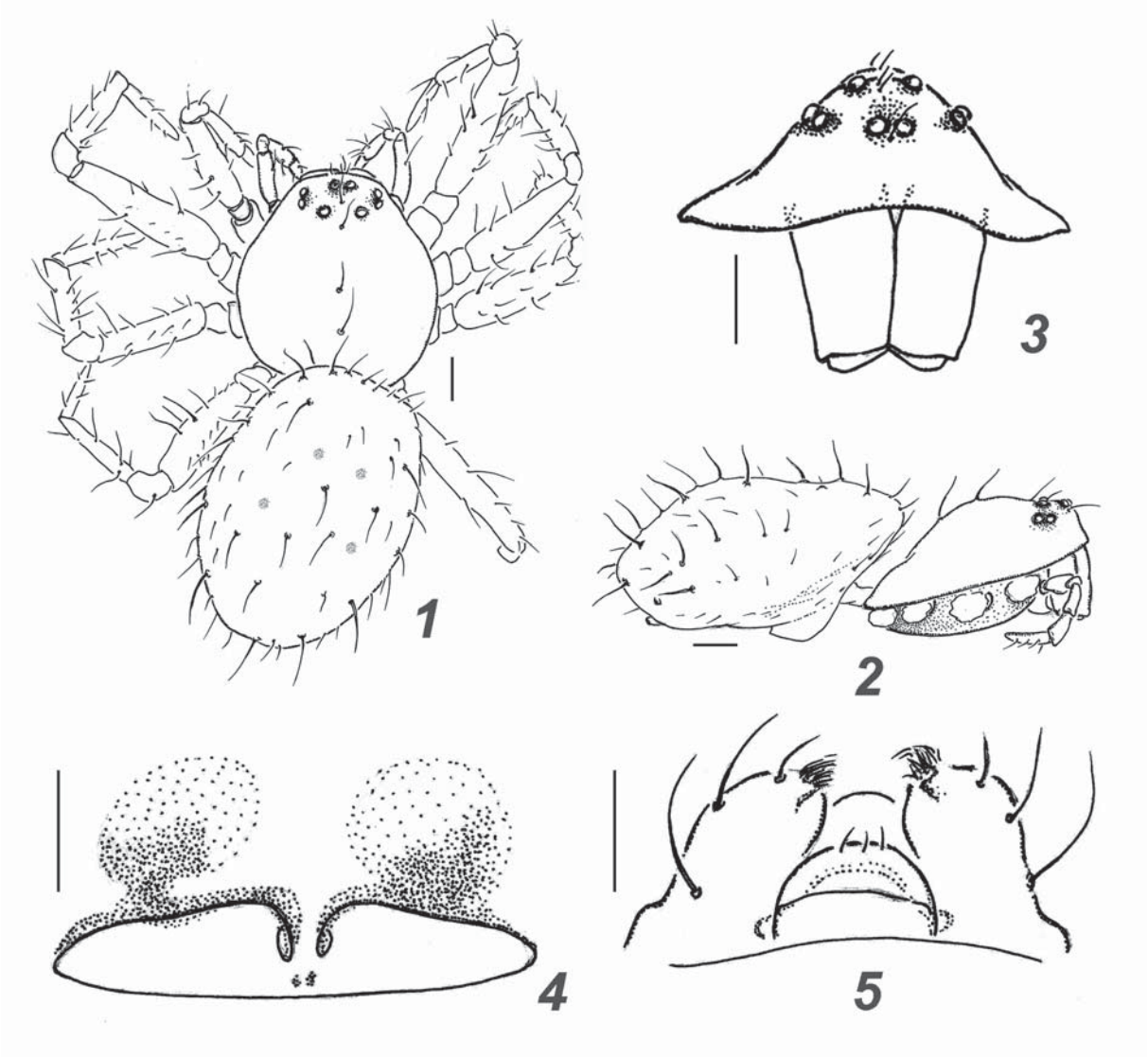
Sacarum nemkovi **sp.n**.
Figs 1–11.

TYPES. Holotype ♀ (ZMMU), Russia, Orenburg Area, Belyaevka District, the 'Burtinskaya Steppe' division of Orenburg Reserve (51°22′N, 55°59′E), steppe, VIII.2016, V.A. Nemkov. Paratype ♀ (ZMMU), Russia, Orenburg Area, Svetlyi District, the 'Ashchisayskaya Steppe' division of Orenburg Reserve (50°57′38″N, 61°12′44″E), steppe with *Festuca* and other herbs, pitfall traps, 22–27.IX.2015, S.S. Sokolova.

ETYMOLOGY. This species is named after the Uralian entomologist Viktor A. Nemkov who collected the holotype.

DIAGNOSIS. As of the genus (see above).

DESCRIPTION. Holotype ♀. Total length 2,42. Cephalothorax 1.02 long, 0.88 wide with smooth teguments. Leg measurements: I: 3.19 (0.92, 0.29, 0.77, 0.69, 0.52); II: 2.91 (0.85, 0.29, 0.70, 0.62, 0.45); III: 2.48 (0.71, 0.25, 0.56, 0.57, 0.39); IV: 3.46 (1.01, 0.29, 0.91, 0.77, 0.48).



Figs 1–5. *Sacarum nemkovi* gen. et sp. n.: 1, 2 — habit, dorsal and lateral views; 3 — carapace, frontal view; 4 — epigyne, ventral view; 5 — labium and maxillae, ventral view. Scale bars: 0.1 mm.

Рис. 1–5. *Sacarum nemkovi* gen. et sp.n.: 1, 2 — внешний вид, сверху и сбоку; 3 — карапакс, спереди; 4 — эпигина, снизу; 5 — нижняя губа и максиллы, снизу. Шкала: 0.,1 мм.

Cephalothorax with a slight median elevation (Fig. 2); brown with indistinct greyish radial stripes; head with three rows of bristles: one in the middle and two between PMEs and PLEs. Chelicerae brown. Labium brown, with a distal-apical light brown swelling; endites light brown, with white apexes (Fig. 9). Sternum dark brown, smooth. Pedipalp and legs greyish yellow. Abdomen dark grey, dorsum with narrow, transverse light grey stripes, sides with longitudinal stripes, venter monochromously black. Book-lung covers yellow.

Epigyne convex (Figs 4, 6), with a posterior sclerotized plate (*PP*) and median septum (*MS*; Fig. 7). The anterior and posterior edges sclerotized (Fig. 4). Copulatory orifices on the sides of the septum, close to each other (*CO*; Fig. 7).

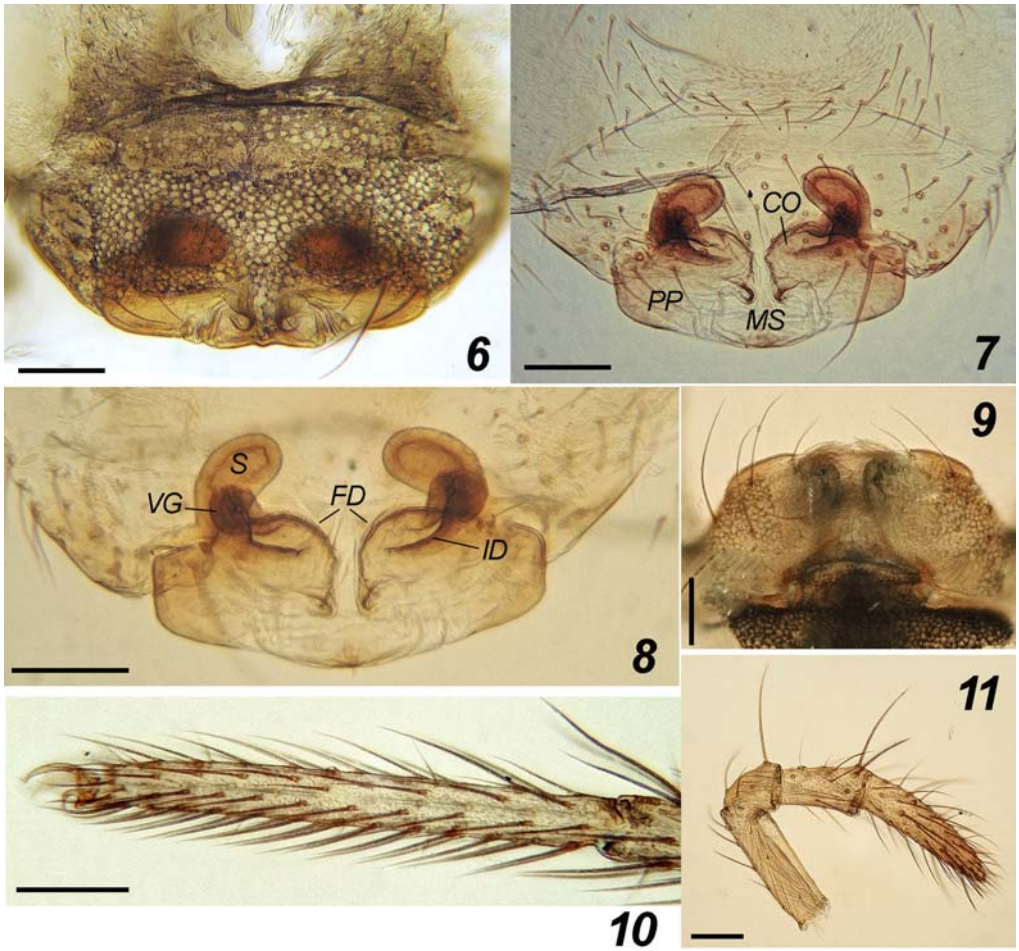
Vulva quite simple (Figs 7, 8), consisting of two oval spermathecae (*S*), short thick insemination ducts (*ID*) and long thin fertilization ducts (*FD*). Vulval pockets absent. The base of spermateca with a vulval gland (*VG*).

Paratype female. Cephalothorax 1.08 long, 0.93 wide. Abdomen damaged. Eye measurements: AME 0.06; ALE=PLE=PME 0.07; AME–AME 0.01; AME–ALE 0.08; PME–PME 0.10; PME–PLE 0.07; AME–PME 0.08; ALE–PLE 0.00. Clypeus height 2.5 times diameter of AME; 0.15 high. Leg measurements: I: 3.30 (0.98, 1.08, 0.70, 0.55); II: 2.84 (0.83, 0.92, 0.63, 0.46); III: 2.52 (0.73, 0.84, 0.56, 0.39); IV: 3.29 (0.98, 1.13, 0.73, 0.45).

Cephalothorax greyish yellow, with indistinct greyish radial stripes. Chelicerae greyish yellow, with 3(4) promarginal and 2 retromarginal teeth. Endites grey-yellow. Sternum black, with numerous small yellow specks. Pedipalp yellow. Legs uniformly greyish yellow. Abdomen grey, without a colour pattern.

Male unknown.

DISTRIBUTION. Only the type localities (Fig. 12).



Figs 6–11. *Sacarum nemkovi* sp.n.: 6 — intact epigyne, posterior-ventral view; 7, 8 — macerated endogyne, ventral and dorsal view; 9 — labium and maxillae, ventral view; 10 — tarsus IV, lateral view; 11 — pedipalpe, lateral view. Abbreviations: *CO* — copulatory orifice; *FD* — fertilization duct, *ID* — insemination duct; *MS* — median septum; *PP* — posterior plate; *S* — spermatheca; *VG* — vulval gland. Scale bars: 0.1 mm.

Рис. 6–11. *Sacarum nemkovi* sp.n.: 6 — не обработанная эпигина, сзади и снизу; 7, 8 — мацерированная эндогина, снизу и сверху; 9 — нижняя губа и максиллы, снизу; 10 — лапка IV, сбоку; 11 — педипальпа, сбоку. Сокращения: *CO* — вводное отверстие; *FD* — оплодотворительный проток, *ID* — осеменительный проток; *MS* — срединный септум; *PP* — задняя платинка; *S* — сперматека; *VG* — вагинальная железа. Шкала: 0,1 мм.

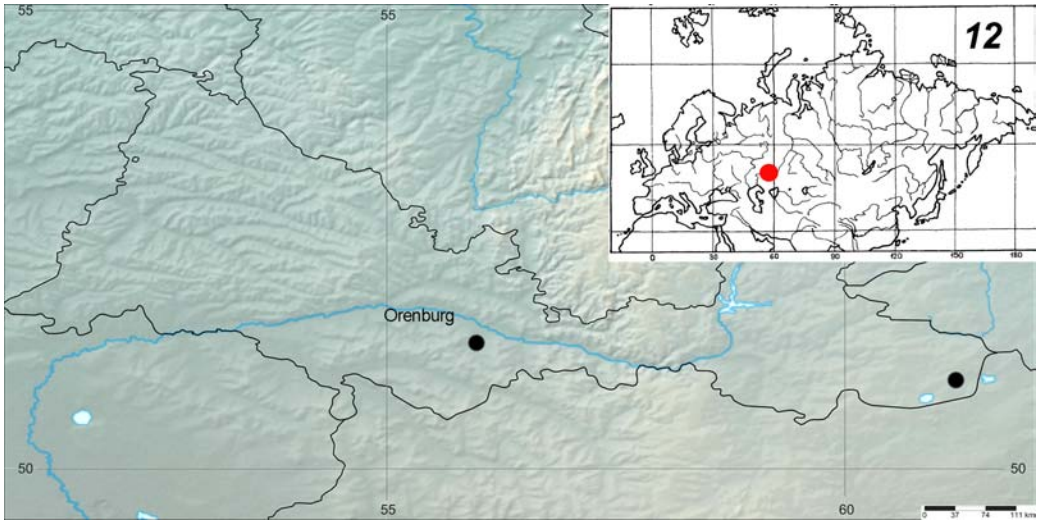


Fig. 12. Collecting localities of *Sacarum nemkovi* sp.n.

Рис. 12. Места сборов *Sacarum nemkovi* sp.n.

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