

Genus	Vol. 22(4): 645-651	Wrocław, 27 XII 2011
-------	---------------------	----------------------

Eremulus spinosus, a new species of oribatid mite from Vietnam
(Acari: Oribatida: Eremulidae)

SERGEY G. ERMILOV¹ & ALEXANDER E. ANICHKIN²

¹Laboratory of Entomology, Center of Independent Examinations–NN, Gagarin 97, 603107 Nizhniy Novgorod, Russia; e-mail: ermilovacari@yandex.ru (corresponding author)

²Institute of Ecological and Evolutionary Problems, Russian Academy of Sciences, Lenin 33, 119071 Moscow, Russia; Joint Russian-Vietnamese Research and Technological Center, Southern Branch, Dstr. 10, Str. 3/2, 3, Ho Chi Minh City, Vietnam

ABSTRACT. A new species, *Eremulus spinosus* sp. n., is described from dark loamy soil of *Lagerstroemia* forest of Cat Tien National Park (southern Vietnam). A new species is similar in spindle-form sensilli to *Eremulus jyotsnai* SARKAR, 1991 from India, but it differs from latter by the some morphological feature of sensilli, morphology of notogastral setae and epimeral setae *lc*. An identification key to Vietnamese species of *Eremulus* is presented.

Key words: acarology, taxonomy, oribatid mite, new species, Eremulidae, *Eremulus*, Cat Tien National Park, Vietnam.

INTRODUCTION

Eremulidae is a family of oribatid mites, which comprises 7 genera and 45 species (SUBÍAS 2004, online version 2010). *Eremulus* is the largest genus of Eremulidae that was proposed by BERLESE (1908) with *Eremulus flagellifer* BERLESE, 1908 as the type species. Currently, the genus comprises 34 species, which are cosmopolitan in distribution.

The oribatid fauna of Vietnam has been poorly studied, and only two identified species and one genus of this family have been recorded in Vietnam, *Eremulus avenifer* BERLESE, 1913 and *E. truncatus* HAMMER, 1971 (BALOGH & MAHUNKA 1967; GOLOSOVA 1983; KRIVOLUTSKIY *et al.* 1997).

In the course of faunistic studies of oribatid mites of Cat Tien National Park (southern Vietnam) we have found a new species (third species in fauna of Vietnam) from the genus *Eremulus*, that is described below.

MATERIAL AND METHODS

Collection localities and habitats of a new species are characterized in the "Material examined" section.

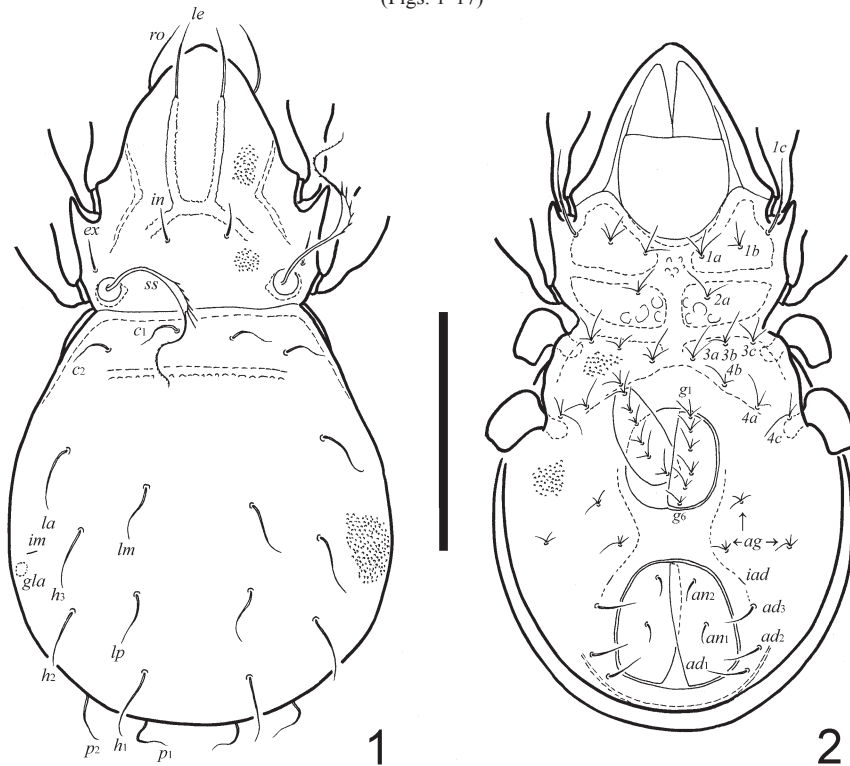
Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. All the body measurements are presented in micrometers. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate, to avoid discrepancies caused by different degrees of notogastral distortion. Notogastral width refers to the maximum width in dorsal aspect. Lengths of body setae were measured in lateral aspect. Some specimens were dissected for detailed study of the gnathosoma and legs.

Formulae of leg setation are given in parentheses according to the sequence trochanter–femur–genu–tibia–tarsus (famulus included). Formulae of leg solenidia are given in square brackets according to the sequence genu–tibia–tarsus.

DESCRIPTION OF NEW SPECIES

Eremulus spinosus sp. n.

(Figs. 1-17)



1, 2. *Eremulus spinosus* sp. n., adult: 1 – dorsal view, legs partly removed; 2 – ventral view, legs partly removed, setae of gnathosoma and palps removed, two pairs of tubercles (Sa, Sp) on epimeral region not shown. Scale bar 100 μ m

DIAGNOSIS

New species is characterized by the small size of body, 282-315 × 157-166; body surface granulate; costulae narrow; transcostula present; sensilli spindle-form, with long stalk, well-developed oblong head, having five–six strongly spines, and long, setiform distal part, having 11-13 small spines unilaterally; eleven or ten pairs of notogastral setae setiform, with short flagellate tips; six pairs of genital and three pairs of aggenital setae stellate; two pairs of anal and three pairs of adanal setae setiform; epimeral setae *lc* setiform, all the others stellate; lyrifissures *iad* inverse apoanal; hypostomal setae *h* stellate, *a* and *m* setiform.

DESCRIPTION

Measurements – Body length 298 (holotype), 282-315 (mean 294, eight paratypes); body width 166 (holotype), 157-166 (mean 165, eight paratypes).

Integument – Body yellow-brown to brown. Body and legs covered by secretion granules (diameter up to 2 µm). Epimeral region with some foveolae.

Prodorsum (Figs. 1, 3-6) – Rostrum rounded in dorsal view. Costulae long and narrow. Transcostula present (sometimes very poorly developed). Rostral and lamellar setae 36-41, setiform. Rostral setae slightly barbed (visible under high magnification), inserted laterally on prodorsum, lamellar setae smooth, inserted dorsally on prodorsum, located on tubercles on the tips of costulae. Interlamellar setae 16-20, setiform, slightly barbed (visible under high magnification). Exobothridial setae 16-20, setiform, smooth. Sensilli 80-92, spindle-form, with long stalk (28-32), well-developed oblong head (20-24), having five–six strongly spines, and long, setiform distal part (32-36), having 11-13 small spines unilaterally.

Notogaster (Figs. 1, 7) – Dorsosejugal suture straight. One pair of humeral slightly developed cristae (visible in dorso-lateral view) present. Eleven or ten pairs of notogastral setae (*p*₃ present or sometimes absent). All setae setiform, with short flagellate tips; *c* and *la* 24-32 shorter than others (41-53). Opisthosomal gland opening and lyrifissures developed in typical arrangement for the genus.

Table 1. Leg setation and solenidia of *Eremulus spinosus* sp. n.*

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	v'	d, (l), bv'', v''	(l), v', σ	(l), (v), φ ₁ , φ ₂	(ft), (tc), (it), (p), (u), (a), s, (pv), (v), (pl), e, ω ₁ , ω ₂
II	v'	d, (l), bv'', v''	(l), v', σ	(l), (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv), l'', ω ₁ , ω ₂
III	l', v'	d, l', ev'	l', σ	l', (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv)
IV	v'	d, l', ev'	d, l'	d, l', (v), φ	ft'', (tc), (p), (u), (a), s, (pv)

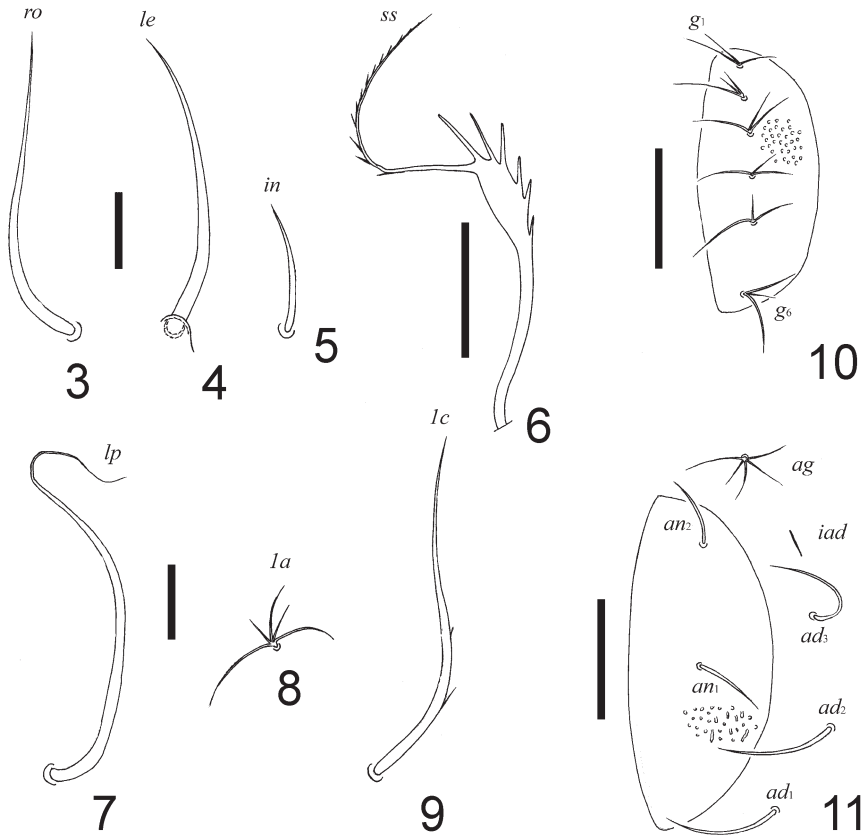
*Roman letters refer to normal setae, *e* to famulus, Greek letters to solenidia. Single prime (') marks setae on anterior and double prime (') setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.

Anogenital region (Figs. 2, 10-11) – Six pairs of genital (g_1 – g_6) and three pairs of aggenital (ag) setae stellate. Two pairs of anal (an_1 , an_2 , 16-18) and three pairs of adanal (ad_1 – ad_3 , 20-24) setae setiform, smooth. Lyrifissures iad inverse apoanal.

Epimeral region (Fig. 2, 8-9) – The shape of the apodemes and epimeral borders typical for the genus. Epimeral setal formula 3-1-3-3. Setae lc long (36-41), setiform, with two small barbs; all the others stellate.

Gnathosoma (Figs. 12-14) – Subcapitulum longer than wide: 69-77 × 45-49. Hypostomal setae h stellate, a (20-24) and m (28-32) setiform, slightly barbed. Adoral setae absent. Palp (length 45-53) with setation 0-2-1-3-8(+1 ω). Chelicera (length 57-65) chelate-dentate. Cheliceral setae long (both 20), setiform, barbed.

Legs (Figs. 15-17) – Legs with one simple claw. Formulae of leg setation and solenidia: I (1-5-3-4-20) [1-2-2], II (1-5-3-4-16) [1-1-2], III (2-3-1-4-15) [1-1-0], IV (1-3-2-4-12) [0-1-0]; homology of setae and solenidia indicated in Table 1. Se-



3-11. *Eremulus spinosus* sp. n., adult: 3 – rostral seta; 4 – lamellar seta; 5 – interlamellar seta; 6 – sensillus; 7 – notogastral seta lp ; 8 – epimeral seta la ; 9 – epimeral seta lc ; 10 – genital plate, left; 11 – anal plate, left. Scale bar (6, 10-11) 20 μ m, scale bar (3-5, 7-9) 10 μ m

tae slightly barbed (except smooth *p*). Famulus short, setiform. Solenidia ω_2 on tarsi I and ϕ_1 on tibiae I setiform; ω_2 almost straight, ϕ_1 strongly curved. Other solenidia thickened, blunt-ended. Solenidia σ on all genua slightly dilated distally and curved in proximal parts.

MATERIAL EXAMINED

Holotype and eight paratypes were obtained from the southern Vietnam, 11°25' N, 107°25' E, 149 m above sea level, in dark loamy soil of *Lagerstroemia* forest, February–March 2009, collected by A.E. Anichkin.

TYPE DEPOSITION

The holotype is deposited in the collection of Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia. Paratypes are deposited in the collection of Siberian Zoological Museum, Novosibirsk, Russia.

ETYMOLOGY

The specific name “*spinus*” refers to the spines of sensilli.

DISTRIBUTION

At present, this species is only known from Cat Tien National Park of southern Vietnam.

REMARKS

The identification of the species of the genus *Eremulus* is complicated, however *Eremulus spinus* sp. n. is clearly distinguishable from the other species of this genus by the specific morphology of sensilli. The overwhelming majority of species of this genus have setiform or setiform with thickened long proximal part sensilli. A new species is similar in spindle-form sensilli to *Eremulus jyotsnai* SARKAR, 1991 from India (see SARKAR 1991), but it differs from latter by the long, setiform distal parts of sensilli (short in *E. jyotsnai*), sensilli with strongly spines (with small barbs in *E. jyotsnai*), setiform notogastral setae (lanceolate in *E. jyotsnai*) and setiform epimeral setae *1c* (stellate in *E. jyotsnai*).

KEY TO VIETNAMESE SPECIES OF GENUS *EREMULUS*

1. Sensilli spindle-form *Eremulus spinus* sp. n.
- . Sensilli setiform, with thickened proximal parts 2.
2. Interlamellar setae long, with thin tips *Eremulus truncatus* HAMMER
- . Interlamellar setae shorter, without thin tips *Eremulus avenifer* BERLESE

ACKNOWLEDGEMENTS

We gratefully acknowledge Prof. Dr. Roy A. NORTON (State University of New York, College of Environmental Science and Forestry, Syracuse, USA), Dr. Umukusum SHTANCHAEVA (Caspian Institute of Biological Resources, Makhachkala, Russia), Prof.

Dr. Luis SUBÍAS (Universidad Complutense de Madrid, Madrid, Spain), Edit HORVÁTH (Hungarian National History Museum, Hungary) and Kerstin FRANKE (Senckenberg Museum für Naturkunde Görlitz, Germany) for help with collecting literature. We thank the staff of Cat Tien National Park for supporting during the fieldwork.

REFERENCES

- BALOGH, J., MAHUNKA, S., 1967. New Oribatids (Acari) from Vietnam. *Acta zool. acad. sci. hung.*, **13** (1-2): 39-74.
- BERLESE, A., 1908. Elenco di generi e specie nuovi di Acari. *Redia*, **5**: 1-15.
- , 1913. Acari nuovi. Manipoli VII–VIII. *Redia*, **9**: 77-111.
- GOLOSOVA, L. D., 1983. Some notes about oribatid mites of Vietnam. *Ecology and fauna of animals, Tyumen*, 41-51.
- HAMMER, M., 1971. On some oribatids from Viti Levu, The Fiji Islands. *Det Kongelige Danske Videnskabernes Selskab Biologiske Skrifter*, **16** (6): 1-60.
- KRIVOLUTSKIY, D.A., VU, Q.M., PHAN, T.V., 1997. The oribatid mites of Vietnam. In: *The biological diversity and modern status of tropical ecosystems in Vietnam, Tropical medicine*. Publisher: The Russian-Vietnamese tropical centre, Hanoi, Vietnam, pp. 152-166.
- SARKAR, S. 1991. Taxonomy of oribatid mites from the soils of Tripura. I. Two new species of *Allonothrus* and *Eremulus*. In: VEERESH, G.K., RAJAGOPAL, D. and VIRAKTAMAH, C.A. (eds.): *Advances in management and conservation of soil fauna*. Oxford and IBH Publishing, New Delhi, Bombay, Calcutta, pp. 727-731.
- SUBÍAS, L.S., 2004. Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes: Oribatida) del mundo (excepto fósiles). *Graellsia*, **60** (número extraordinario): 3–305. Online version accessed in July 2010. 557 pp.; <http://www.ucm.es/info/zoo/Artropodos/Catalogo.pdf>.