

TWO SPECIES OF ORIBATID MITES OF THE GENUS *BANKSINOMA* (ACARI: ORIBATIDA: BANKSINOMIDAE) FROM MONGOLIA

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ABSTRACT. The present work deals with two species of oribatid mites of the genus *Banksinoma* Oudemans, 1930 from Mongolia. A new species, *Banksinoma orbiculata* sp. n. is described from the steppe habitats in Eastern Mongolia. In addition, supplementary description of a little known species, *Banksinoma exobothridialis* Bayartogtokh, 1997, collected from the nest of the ant species, *Formica rufa*, located in the mountain steppe and temperate taiga forest habitats in Central Mongolia is given. Data on ecology and distribution of each species of oribatids are given.

KEY WORDS: Acari, Oribatida, *Banksinoma*, new species, Mongolia

INTRODUCTION

The oribatid mite genus *Banksinoma* was proposed by Oudemans (1930) with *Notaspis castaneus* Hermann, 1844 as the type species. The diagnostic characters of the genus are considered to be following: lamellar costulae short, strongly converging toward anterior direction; 10 or 11 pairs of notogastral setae; tip of rostrum narrowed and mostly pointed; legs monodactylous.

Members of this genus are known primarily from dry to moist soils and forest litter in Holarctic and Neotropical regions. *Banksinoma* is one of the small genera of oribatid mites, which includes more than 20 species known, of which only four species have been recorded in Mongolia previously, namely *Banksinoma lanceolata* (Michael, 1885), *B. insignis* Balogh et Mahunka, 1965, *B. longisetosa* Bayartogtokh et Aoki, 1998 and *B. exobothridialis* Bayartogtokh, 1997. Representatives of this genus seem to be relatively rare. The known species have been found mostly in the northern hemisphere, and only a few of them were recorded in southern hemisphere. According to present data the only species, *B. lanceolata*, is widely distributed throughout the Holarctic region. Most other species seem to be distributed only in restricted areas or are known only from the type localities.

The study of oribatid mite biodiversity in Mongolia is the subject of ongoing research as part of the biodiversity assessment in various habitats of the country. The present paper deals with a description of one new species, and a supplementary description of a known species of *Banksinoma*.

The morphological terminology used in this paper is based on that (with a few modifications) generally developed by F. Grandjean (see for references Travé and Vachon, 1975). Body length is

measured in lateral view, from the tip of the rostrum to the posterior edge of the notogaster. Notogastral width refers to the maximum width in dorsal aspect. All measurements are given in micrometers, and the average measurement values are given in parentheses after the range. The line drawings were made with the aid of a camera lucida attached to a compound microscope.

Banksinoma orbiculata sp. n.

Fig. 1.

Diagnosis. Medium in size; body yellowish to yellowish-brown in color, covered with thin cerotegument; rostrum triangular, its tip pointed; lamellar costulae short, narrow, same width throughout its length, strongly converging toward anterior direction; translamellar region bearing a number of conical tubercles in three rows; rostral, lamellar and interlamellar setae thin, smooth, setae *le* about 1.5 times as long as *ro* and *in*; sensilli short, smooth, with mostly club-shaped, rarely distally pointed head; exobothridial region finely tuberculated; notogaster nearly round, notogastral setae medium long, thin, smooth except for relatively thick and distally barbed setae *c*₁.

Measurements. Body length: 372–403 (393) µm; width of notogaster 248–258 (253) µm.

Description. *Integument.* Body yellowish to yellowish-brown in color. Surface of body and leg segments with thin granular cerotegument and distinctly tuberculated on lateral part of prodorsum and notogaster.

Prodorsum. Rostrum triangular, its tip pointed. Rostral setae (*ro*) moderately long, smooth, inserted dorsally close together and extending well beyond tip of rostrum. Lamellar costulae short,

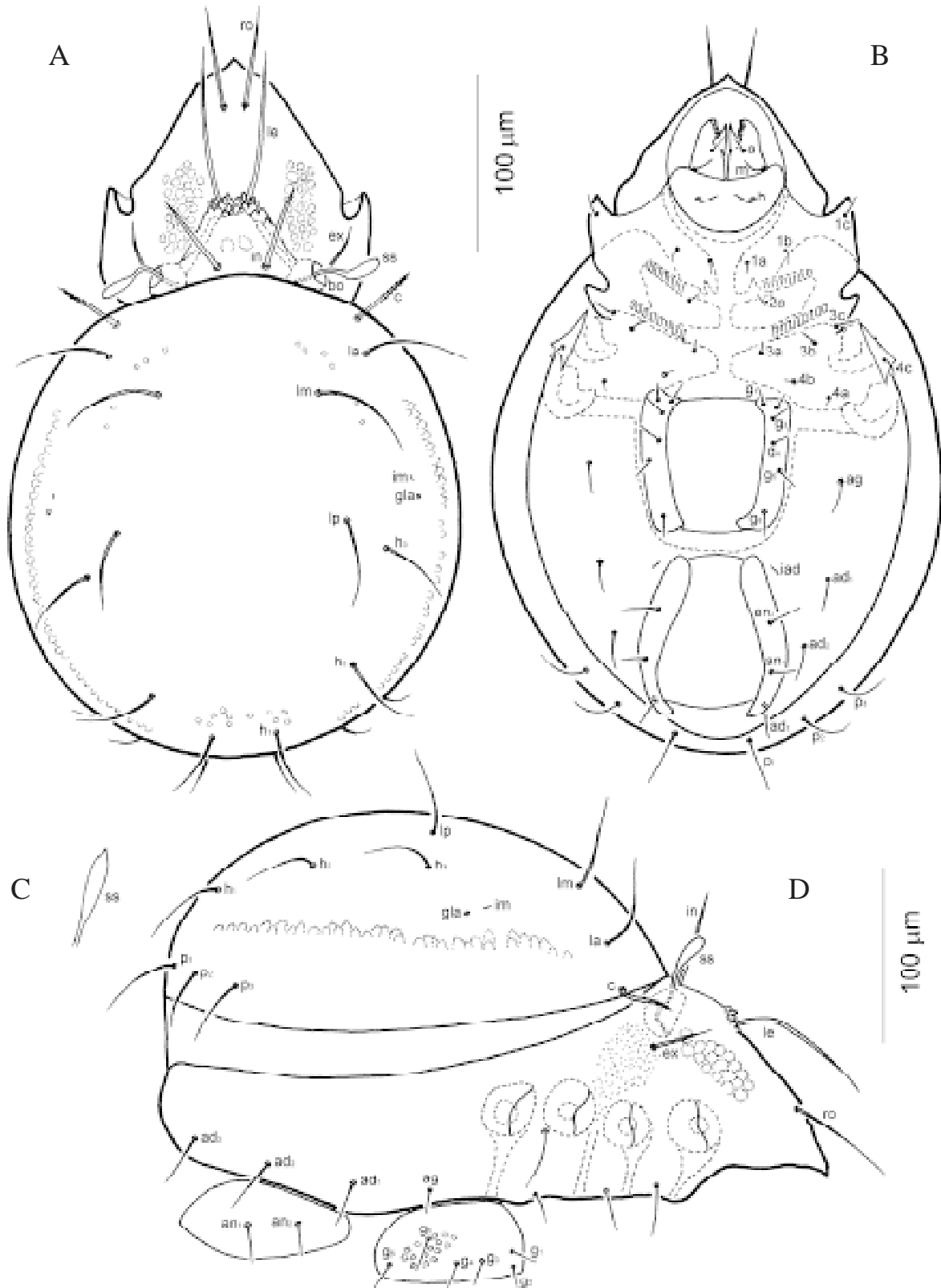


Fig. 1. *Banksinoma orbiculata* sp. n.: A — dorsal view, B — ventral view; C — variation of sensillus, D — lateral view.

narrow, same width throughout its length, strongly converging toward anterior direction. Translamellar region bearing a number of conical tubercles in three rows. Lamellar setae (*le*) about 1.5 times as

long as *ro*, thin, smooth. Interlamellar setae nearly as long as *ro*, but slightly thicker than latter. Exobothridial setae (*ex*) about half as long as *in*, thin, smooth. Bothridia (*bo*) directed anterolaterad, its

posterior part concealed under anterior margin of notogaster (in dorsal view). Sensilli (*ss*) short, smooth, with mostly club-shaped, rarely distally pointed head. Exobothridial region and lateral part of prodorsum finely tuberculated (Fig. 1A, C, D).

Notogaster. Nearly round, slightly longer than width, dorsosejugal suture broadly rounded; humeral projections indistinct. Ten pairs of medium long notogastral setae; *c*₁ distally barbed, relatively thicker, but shorter than other thin, smooth setae. Lyrifissures *im* and opistosomal gland opening (*gla*) small in size, other lyrifissures not evident (Fig. 1B, C).

Gnathosoma. Infracapitular mentum conspicuously wider than long, without noticeable micro-tubercles. Hypostomal setae *a*, *m* and *h* medium long, thin, smooth (Fig. 2B). Chelicerae relatively large, fixed and movable digits with few blunt teeth; palp normal for genus.

Epimeral region. Apodemes *apo.2* and *apo.sj* well developed, obliquely oriented; other apodemes poorly developed. Epimeral setae short, smooth; setal formula: 3–1–3–3. Custodium well developed, but short and slightly projected anteriorly; discidium well developed, projected distally (Fig. 1B).

Ano-genital region. Anal and genital apertures large, situated close to each other. Genital plates with six pairs of medium long, thin, smooth setae. Aggenital setae slightly longer than genital setae, thin, smooth. Anal aperture widened posteriorly, anal and adanal setae equal in size. Adanal lyrifissure (*iad*) well developed, located adjacent to the anterolateral margins of anal plates (Fig. 1B).

Legs. Tarsi monodactylous; femora of all legs and trochanters of all legs with large porose areas. Setation of legs typical for genus.

Type material. Holotype (female): Basin of the Lake Ganga Nuur, District Dariganga, Province Sukhbaatar, 45° 16' N, 113° 59' E, 1310 m. a.s.l., litter and organic debris accumulated under bushes, 02 June 2003; 38 paratypes (22 females and 16 males): same data as holotype, Coll. B. Bayartogtokh.

Type depository. The holotype and 30 paratypes (alcohol preserved) are deposited in the collection of the Department of Zoology, National University of Mongolia, Ulaanbaatar; four paratypes in the collection of the Zoological Museum, Moscow Lomonosov State University, Moscow, and four paratypes in the collection of the Zoological Museum, Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia.

Ecology. The present species is an inhabitant of the litter and organic debris accumulated under bushes, *Amygdalis* sp., growing in the basin of a small lake in the steppe zone with sandy soils, and mostly prefer mesoxeric habitat.

Distribution. Known only from the type localities.

Remarks. The species, *Banksinoma orbiculata* sp. n. is easily distinguishable from other species of the genus *Banksinoma* by the round shape of notogaster; smooth prodorsal setae and sensilli; relatively narrow, strongly converged lamellar costulae, and the presence of three rows of conical tubercles on the interlamellar region. In the presence of conical tubercles on the interlamellar region, the new species is similar with *B. spinifera* described by Hammer (1952) from North America, *B. akhtyamovi* described by Rjabinin and Pankov (1993) from the Russian Far East and Mongolian species, *B. exobothridialis*, described by Bayartogtokh (1997).

However, the new species differs from *B. spinifera* in the different shape of rostrum and costulae, and relatively large size of notogastral setae *c*₁.

Banksinoma orbiculata sp. n. is distinguished from *B. akhtyamovi* by the relatively short and smooth prodorsal setae, and smooth sensilli.

The species from Mongolia, *B. exobothridialis*, can be differentiated from the new species in the elongated shape of notogaster; relatively long stalk and fusiform head of sensilli, and much wider costulae.

Etymology. The specific epithet «*orbiculata*» refers to the round shape of notogaster.

Banksinoma exobothridialis
Bayartogtokh, 1997

Fig. 2.

Banksinoma exobothridialis Bayartogtokh, 1997, p. 118, fig. 2.

Diagnosis. Medium in size; body yellowish to yellowish-brown in color, covered with thin cerotegument; rostrum triangular, its tip pointed; lamellar costulae short, wide, slightly widened anteriorly, converging toward anterior direction; translamellar region bearing a number of conical tubercles in two rows; rostral, lamellar and interlamellar setae thin, but finely barbed, setae *le* about 1.5 times as long as *ro* and *in*; sensilli medium in length, with distally pointed fusiform head; exobothridial region finely tuberculated; notogaster oval, narrowed posteriorly; notogastral setae moderately long, thin, smooth except for relatively thick and sparsely barbed setae *c*₁.

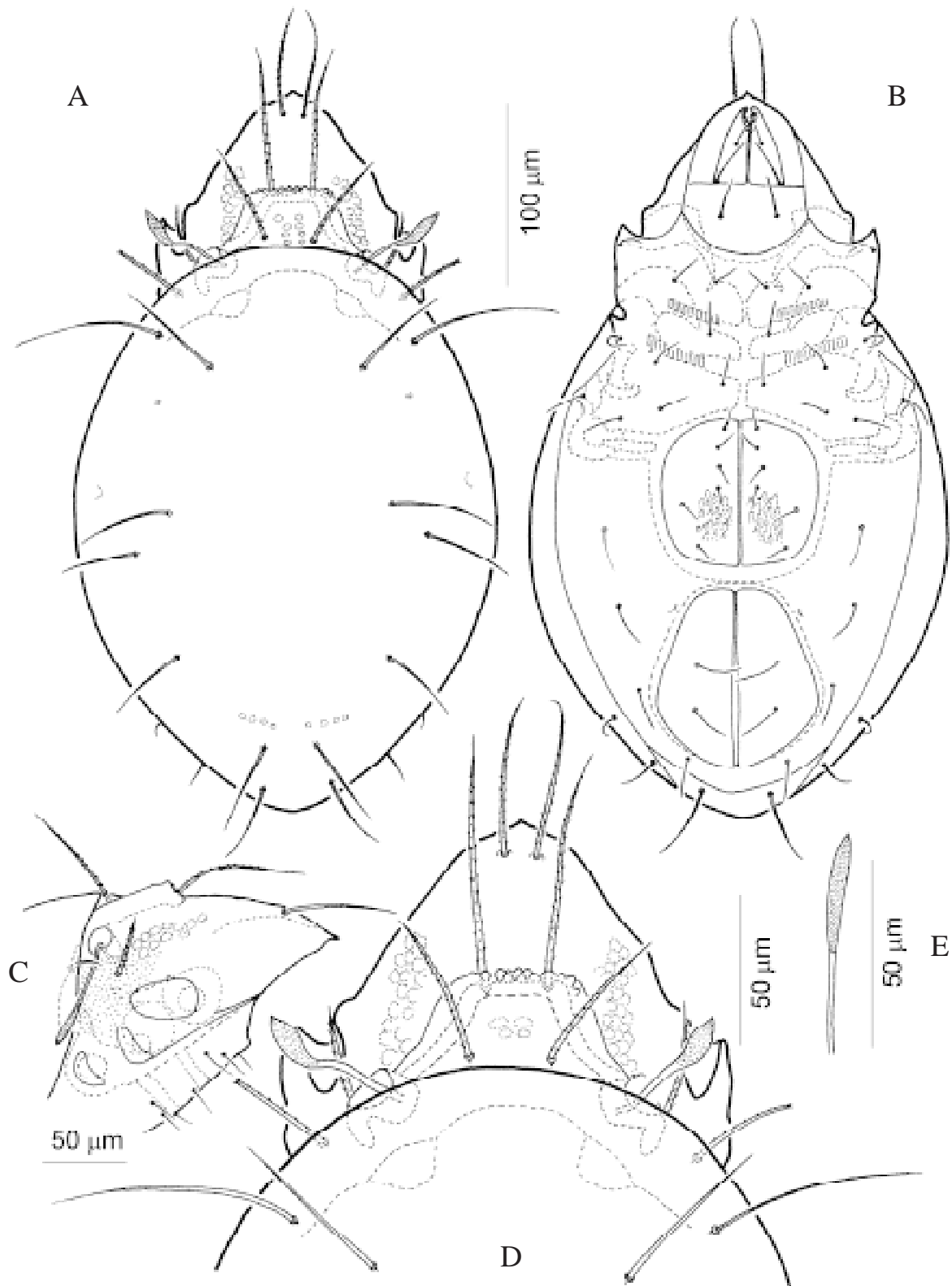


Fig. 2. *Banksinoma exobothridialis* Bayartogtokh, 1997: A — dorsal view, B — ventral view; C — proterosoma (lateral view), D — prodorsum and anterior part of notogaster, E — variation of sensillus.

Measurements. Body length: 392–402 (395) μm ; width of notogaster 225–238 (233) μm .

Description. *Integument.* Body yellowish to yellowish-brown in color. Surface of body and leg

segments with thin granular cerotegument and distinctly tuberculated on exobothridial region, lateral part of prodorsum and notogaster.

Prodorsum. Rostrum triangular, its tip pointed. Rostral setae (*ro*) moderately long, finely barbed, inserted dorsally close together and extending well beyond tip of rostrum. Lamellar costulae short, but rather wide, slightly widened anteriorly, converging toward anterior direction. Translamellar region bearing a number of conical tubercles in two rows. Lamellar setae (*le*) slightly thicker and about 1.5 times as long as *ro*, finely barbed. Interlamellar setae nearly as long as *ro*, with fine barbs. Exobothridial setae (*ex*) about 1.5 times shorter than *in*, finely barbed. Bothridia (*bo*) directed anterolaterad, its posterior half concealed under anterior margin of notogaster (in dorsal view). Sensilli (*ss*) medium in length, with distally pointed fusiform head. Exobothridial region and lateral part of prodorsum distinctly tuberculated (Fig. 2A, C, D).

Notogaster. Oval in shape, about 1.3 times as long as wide, dorsosejugal suture broadly rounded; humeral projections poorly developed. Ten pairs of moderately long notogastral setae; *c*₁ sparsely barbed, relatively thicker, but shorter than other thin, smooth setae; setae *p*₂ and *p*₃ shortest. Lyrifissures and opisthosomal gland opening not evident (Fig. 2A, D).

Gnathosoma. Infracapitular mentum conspicuously wider than long, without noticeable microtubercles. Hypostomal setae thin, smooth; setae *a* relatively shorter than moderately long *m* and *h* (Fig. 2B). Chelicerae relatively large, fixed and movable digits with few blunt teeth; palp normal for genus.

Epimeral region. Apodemes *apo.2* and *apo.sj* well developed, obliquely oriented; other apodemes poorly developed. Epimeral setae medium long, smooth; setal formula: 3–1–3–3. Custodium short, slightly projected anteriorly; discidium well developed, projected distally (Fig. 2B).

Ano-genital region. Anal and genital apertures large, situated close to each other. Genital plates with six pairs of medium long, thin, smooth setae. Aggenital setae slightly longer than genital setae, also thin, smooth. Anal aperture widened posteriorly, anal and adanal setae equal in size. Adanal lyrifissure (*iad*) well developed, located adjacent to the anterolateral margins of anal plates (Fig. 2B).

Legs. Tarsi monodactylous; femora of all legs and trochanters of all legs with large porose areas. Setation of legs typical for genus.

Material examined. Four specimens (two females and two males): Khonin Nuga area, District Mandal, Province Selenge, 49° 20' N, 107° 40' E, elevation 1610 m. a.s.l., nest of ant species, *Formica rufa*, in mountain steppe and cool temperate taiga forest habitats, 26 July 2004, Coll. B. Bayartogtokh.

Ecology. This is a xerophilous species that has been most often recorded previously in the soils of the steppe zone in Central Mongolia, but has been recently found in the above ground nest materials of ants in mountain-steppe and cool temperate taiga forests, mostly consisted of larch trees.

Distribution. The range of this species involves the central and northern parts of Mongolia.

Remarks. In the original description, all prodorsal and notogastral setae *c*₁ have been illustrated as smooth, but in the studied specimens here, I revealed that they are actually finely barbed. In addition, the specimens studied here are relatively larger than the type specimens. Except for this features, the character states of the examined specimens accord well with those of the type specimens.

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