

## **ZERCON BOTHNICUS, A NEW SPECIES OF ZERCONIDAE (ACARI: MESOSTIGMATA) FROM FINLAND**

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ABSTRACT: *Zercon bothnicus* sp.n., a new species of Zerconidae, is described and illustrated. Eight specimens were collected among grass roots on a seashore dune, Gulf of Bothnia, Finland.

Key words: Mesostigmata, *Zercon*, new species, Finland

### **INTRODUCTION**

The soil fauna of Finland has been under intensive faunistic research in the recent years, thanks to the ‘PUTTE-Project’ (Research Program of Deficiently Known and Threatened Forest Species; Juslén et al. 2008). An intensive sampling was carried out covering 15 habitat types and 10 sampling areas around the country (Huhta et al. 2010). In addition, the funding enabled a re-investigation of a large material collected and partly identified by Pekka T. Lehtinen in the 1980’s, now deposited at the Zoological Museum of Turku University. As a result, several previously unknown species of Mesostigmata have been identified and described (Karg and Huhta 2009, 2012; Huhta and Karg 2010). In this paper we describe one more species, found only in a single locality, seashore dune on the western coast of Finland.

### **MATERIAL AND METHODS**

The animals were collected on a seashore dune by sieving *Festuca* roots and extracting in Berlese funnels. Specimens were cleared with lactic acid for preliminary identification, stored in ethanol, mounted in Heinz PVC and examined using light microscopy; drawings were made with the aid of a drawing tube. Type specimens are deposited on slides. The terminology of setae follows Lindquist and Evans (1965), with modifications for the caudal region as given by Lindquist and Moraza (1998). The system of notation for dermal glands and lyrifissures is based on Athias-Henriot (1969) and Johnston and Moraza (1991). The epistome typology follows Ujvári (2011).

### **DESCRIPTION AND TAXONOMY**

#### *Zercon bothnicus* sp. n.

Figs 1–7

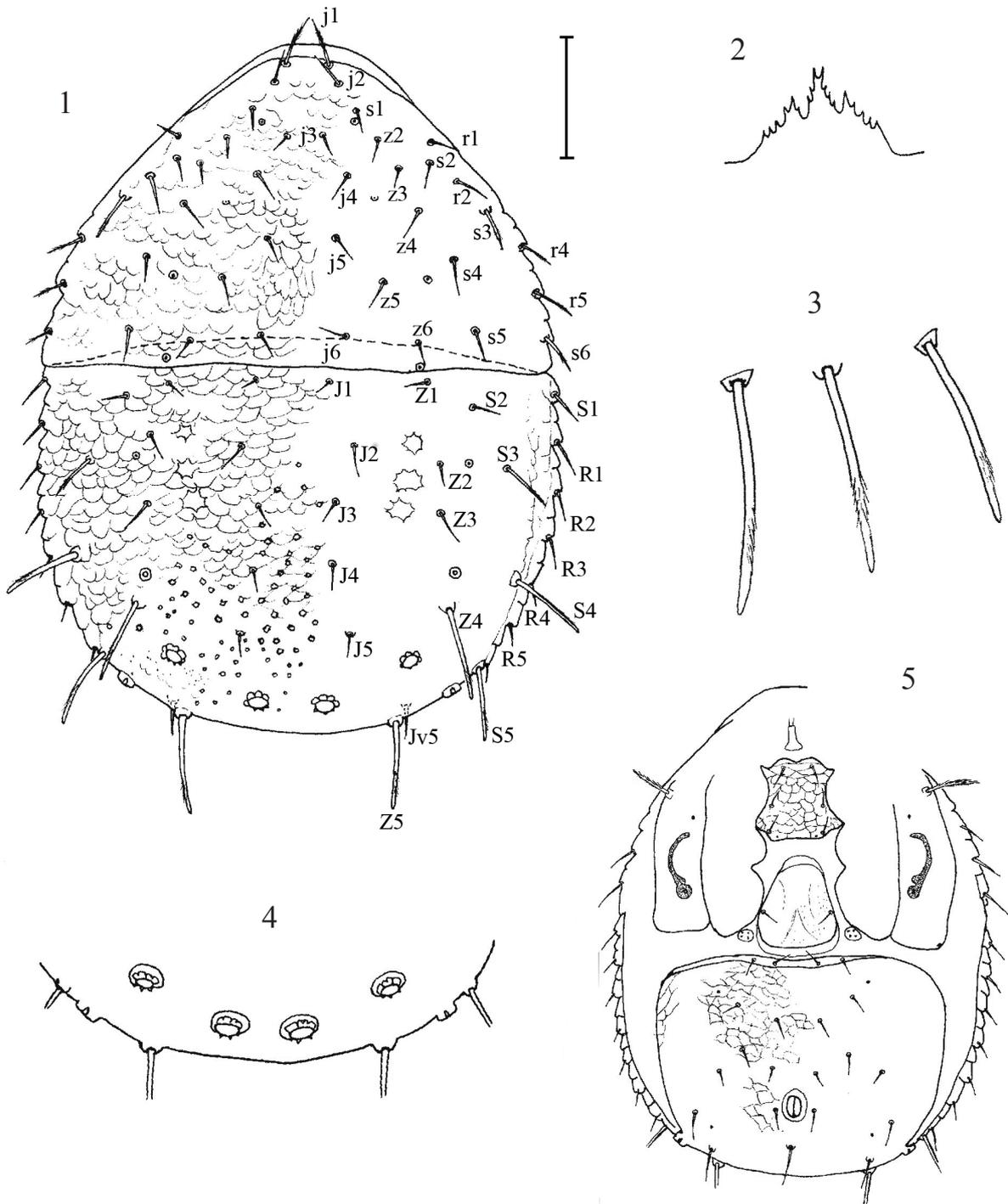
**Diagnosis.** Anterior margin of ventrianal shield with two pairs of setae, Zv1 present. Podono-

tal setae s1 present. Opisthonotal setae J1–5, Z1–3, and S2 short and smooth. Setae S3 twice as long as S2. Setae Z4–5 and S4–5 long, distally pilose, with rounded-pointed hyaline tips. Marginal setae distally barbed. Setae Z5 and Jv5 situated near each other. Pores gdZ2 (Po2) situated near line connecting Z2 and S3, gdZ3 (Po3) on line or somewhat lateral to the line connecting Z3–4. Dorsal cavities of general size with undulate margins. Anterior surface of opisthonotum covered by tile-like pattern, posterocentral surface with large pits.

**Description.** Female (Figs 1–5). Length of idiosoma: 520 µm (500–530 µm), width: 400 µm (390–410 µm) ( $n = 6$ ).

Dorsal side (Fig. 1). Podonotum with 21 pairs of setae (j1–6, z2–6, s1–6, r1–2 and r4–5 inserted dorsally, r3 inserted ventrally, on peritremal shields). Setae j1 pilose, s3, r4–5 and s6 apically barbed, other j, z, and s setae smooth, needle-like. The shield covered by irregular and scale-like ornamentation. Pores gdj2 (po1) situated on line connecting s1 and j3; gdj4 (po2) below line connecting j4 and z4 (not fully developed in all specimens), gds4 (po3) below line connecting z5 and s4.

Opisthonotum with 21 pairs of setae (J1–5, Z1–5, S1–5, R1–6). Setae J1–5, Z1–2, and S2 short, smooth and needle-like, not reaching bases of the following setae. Setae Z3 1.4 times longer than Z2, finely barbed. Setae S3 twice as long as S2, distally pilose, not reaching margins of idiosoma. Setae Z4–5 and S4–5 similar in appearance, elongate, distally pilose, with rounded-pointed hyaline tips (Fig. 3). Marginal setae distally barbed, gradually shortening posteriorly. The size of setae and the distances between their insertions as in Table 1. Pores gdz6 (Po1) situated anterior or anteromedial to Z1; gdZ2 (Po2) positioned near

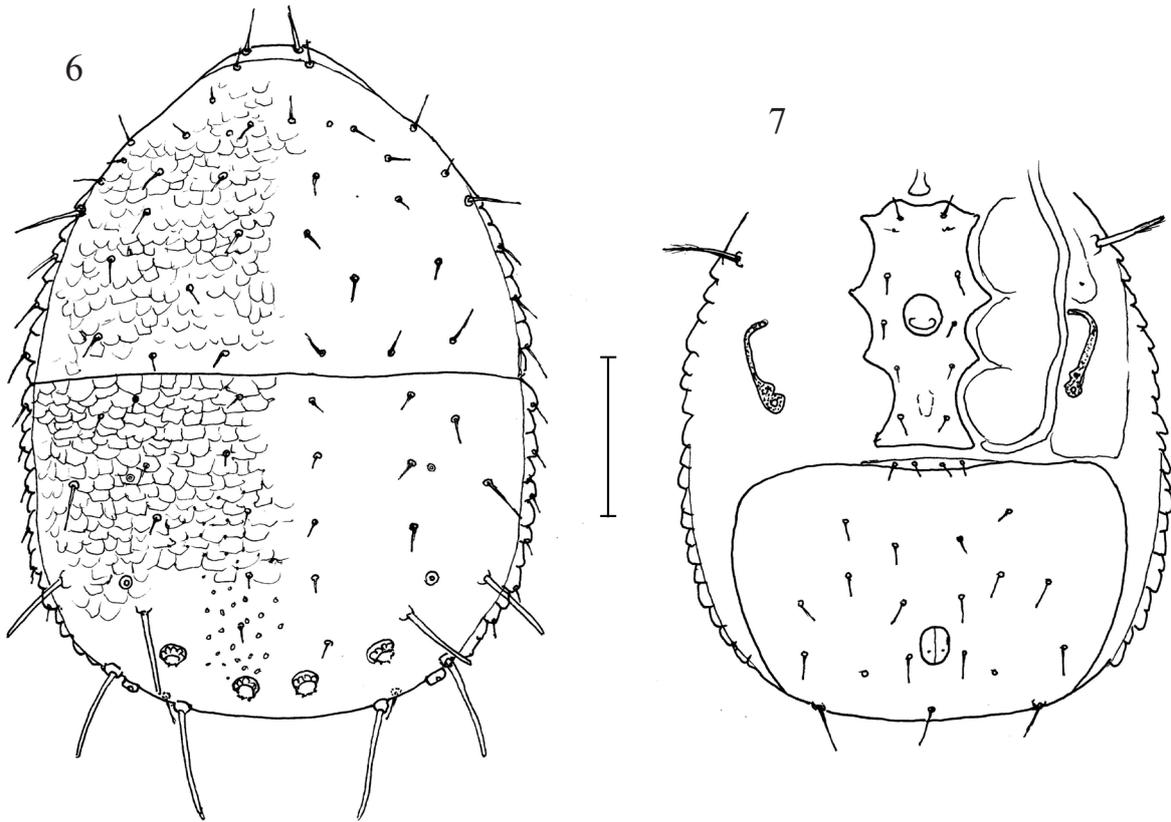


Figs 1–5. *Zercon bothnicus* sp. n. female (holotype): 1 — dorsal view (scale bar = 100  $\mu$ m), 2 — epistome, 3 — setae Z5, Z4 and S5, 4 — posterior part of opisthonotum, 5 — ventral view.

line connecting Z2 and S3; gdZ3 (Po3) on line or somewhat lateral to the line connecting Z3 and Z4; gdS5 (Po4) on line connecting S5 and Z5, closer to S5. Anterior and lateral surface of opisthonotum covered by tile-like pattern. Medial and posterior surface covered by large alveolar pits and fine reticulation. Dorsal cavities of general size, uniform, rose-like, with undulate anterior margins and axes parallel to that of the body (Fig.

4). The size of opisthonotal setae and the distances between their insertions as in Table 1.

Ventral side (Fig. 5). Chaetotaxy, poroidotaxy, and shape of ventral shields typical for the genus. Peritremes bent. Peritremal setae r3 elongate, distally pilose. Sternal shield well sclerotized, 95  $\mu$ m long and 72  $\mu$ m wide at level of setae st2, with straight posterior margin and reticulate ornamentation. Glands gv2 with four openings, on



Figs 6–7. *Zercon bothnicus* sp. n. male (paratypes): 6 — dorsal view, 7 — ventral view. Scale bar = 100  $\mu$ m.

well-developed adgenital platelets. Anterior margin of ventrianal shield with two pairs of setae. Preanal and adanal setae short, smooth, and needle-like, postanal seta prolonged, smooth. Setae JV5 similar in appearance to postanal seta, situated near insertions of setae Z5. Anal valves with euanal setae. Ventrianal shield covered by squamous pattern.

Epistome (Fig. 2) typical for the genus *Zercon*, of *Zercon*-type.

Male (Figs 6–7). Length of idiosoma: 410–420  $\mu$ m; width: 310–320  $\mu$ m ( $n = 2$ ). Dorsal chaetotaxy, poroidotaxy and sculptural pattern basically similar to that of the female, except that pilosity of short setae less expressed. Pores gdZ3 (Po3) somewhat lateral to the line connecting Z3 and Z4. Sternigenital shield with five pairs of setae. Anal valves with euanal setae. The size of opisthotal setae and the distances between their insertions as in Table 1.

**Type localities and material.** All specimens hitherto known were found in the same sample, collected on 7 June 2010 in Lohtaja, coast of the Gulf of Bothnia (64°00'N, 23°23'E), by sieving roots of *Festuca rubra* on a seashore dune (leg. R. Penttinen). Holotype and 2 paratypes (fe-

males) are deposited at the Zoological Museum, University of Turku, other paratypes at the Zoological Museum, University of Helsinki, Finland (2 males and 1 female), and the Hungarian Natural History Museum, Budapest, Hungary (2 females).

**Taxonomy.** The species belongs to the group of Zerconidae possessing full complement of dorsal setae, short and needle-like J-setae, pointed opisthomarginal setae, robust chelicerae and glands Po2 in position gdZ2. Five species, *Z. bothnicus* n. sp., *Z. lindrothi* Lindquist & Johnston, 1985 (*Z. colligans sensu* Sellnick 1944), *Z. italicus* Sellnick, 1944, *Z. zelawaiensis* Sellnick, 1944 and *Z. acanticus* Błaszak, 1978, share the combination of characters: punctate opisthotal ornamentation and glands Po3 on line connecting setae Z3 and Z4. Distinguishing characters of these species are summarized in Table 2.

**Etymology.** The name *Z. bothnicus* comes from the only record of the species from shore of the Bothnian Gulf.

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Table 1.  
Length of opisthonotal setae and distance between their bases in  
*Zercon bothnicus* sp.n. (values in  $\mu\text{m}$ , as mean)

Female					
J1	13	Z1	17	S1	27
J1–J2	52	Z1–Z2	51	S1–S2	63
J2	23	Z2	19	S2	21
J2–J3	46	Z2–Z3	44	S2–S3	54
J3	19	Z3	26	S3	39
J3–J4	47	Z3–Z4	73	S3–S4	79
J4	19	Z4	68	S4	60
J4–J5	51	Z4–Z5	93	S4–5	74
J5	18	Z5	71	S5	60
Male					
J1	15	Z1	15	S1	20
J1–J2	38	Z1–Z2	45	S1–S2	50
J2	13	Z2	13	S2	20
J2–J3	40	Z2–Z3	35	S2–S3	45
J3	13	Z3	18	S3	33
J3–J4	35	Z3–Z4	55	S3–S4	60
J4	13	Z4	63	S4	50
J4–J5	38	Z4–Z5	63	S4–5	60
J5	13	Z5	68	S5	60

Table 2.  
Distinguishing characters of *Z. bothnicus* sp. n., *Z. lindrothi* Lundqvist and Johnston, 1985, *Z. italicus* Sellnick, 1944, *Z. zelawaiensis* Sellnick, 1944 and *Z. acanticus* Błazszak, 1978.

	<i>Z. bothnicus</i> sp. n.	<i>Z. lindrothi</i>	<i>Z. italicus</i>	<i>Z. zelawaiensis</i>	<i>Z. acanticus</i>
Ornamentation on opisthonothum	Large pits	Large pits	Large pits	Tips postero-laterally only	Small spots
Setae Z3	Short, needle-like	Short, needle-like	Elongate, apically pilose	Short, needle-like	Elongate, apically pilose
Setae S3	Not reaching body margins	Short, needle-like	Not reaching body margins	Reach beyond body marings	Reach beyond body marings
Setae S4	Elongate, rounded hyaline tips	Short, needle-like	Elongate, lanceolate hyaline tips	Elongate, rounded hyaline tips	Elongate, rounded hyaline tips
Insertion of setae Jv5	Near insertion of Z5	Near or slightly lateral to Z5	Near insertion of Z5	Lateral to Z5	Lateral to Z5

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