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On the Peruvian *Erigone palustris* Millidge, 1991, with notes on the *psychrophila*-species group (Arachnida: Araneae)

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Abstract: The Peruvian high-altitude spider species *Erigone palustris* Millidge, 1991, a member of the *psychrophila*-species group, is redescribed and illustrated. This species is very similar to the northern European hypoarcto-boreal *E. svenssoni* Holm, 1975, different only in a few minor details of the male palp. A list of the *psychrophila*-species group is presented and its biogeography is discussed.

Keywords: Taxonomy - Erigoninae - species group - distribution.

INTRODUCTION

At present the *Erigone psychrophila* species group (*sensu* Crosby & Bishop, 1928) includes at least 23 species (see Table 1) which mainly occur in the Northern Hemisphere, mostly in the tundra, boreal and montane regions of the Holarctic. Only two species, *E. clavipalpis* Millidge, 1991 and *E. palustris* Millidge, 1991, live in the Southern Hemisphere, in the highlands of the Peruvian Cordilleras (Millidge, 1991). Four conspicuous species in this group share a characteristically long and sabre-shaped process on the ventral surface of the male palpal tibia (SP in Figs 5, 7): *E. svenssoni* Holm, 1975, known from northern Europe, *E. hydrophytae* Ivie & Barrows, 1935 and *E. uintana* Chamberlin & Ivie, 1935, described from Florida and Uta, U.S.A., respectively, and *E. palustris* Millidge, 1991, from Peru.

Quite unexpectedly, a male labeled as *E. svenssoni* was recently found in the spider collection of the Muséum d'histoire naturelle de Genève, Switzerland. This species is known to occur in the taiga and tundra belts of northern Europe, however the specimen examined was collected in the highlands of the Cordilleras of Peru. Such a disjunction would be so unusual that I decided to carefully check if the identification of that male is correct, since at first glance it truly looked like representing the northern European species.

MATERIAL AND METHODS

This paper is based on spider material kept in the Muséum d'histoire naturelle de Genève, Switzerland (MHNG) and in the personal collection of Andrei Tanasevitch,

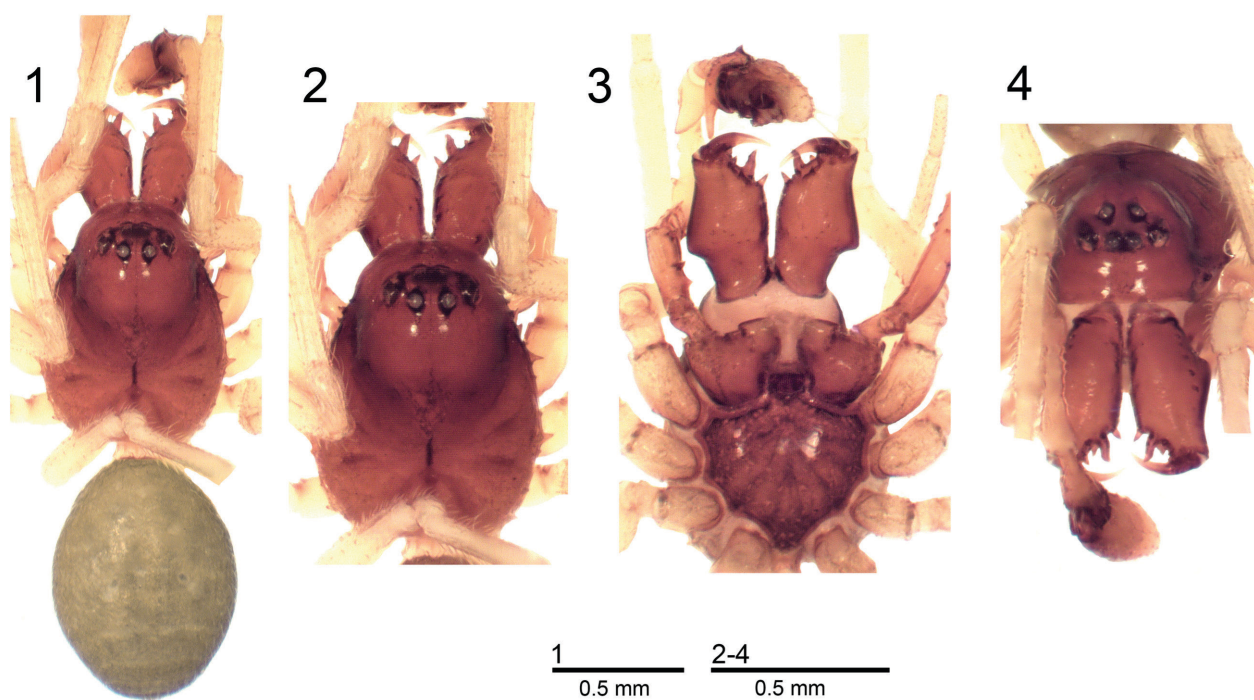
Moscow (CAT). Specimens preserved in 70% ethanol were studied using a MBS-9 stereomicroscope. A Levenhuk C-800 digital camera was used for taking photos. Leg chaetotaxy is presented in a formula, e.g., 2.2.2.1, which refers to the number of dorsal spines on tibiae I-IV. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm. Scale lines in the figures correspond to 0.1 mm unless indicated otherwise. Figure numbers are given above the corresponding scale lines, the length they represent is given below them. The terminology of copulatory organs mainly follows that of Merrett (1963) and that of authors mentioned in the abbreviations below.

Abbreviations

a.s.l.	above sea level
DSA	distal suprategular apophysis <i>sensu</i> Hormiga (1994)
E	embolus
EM	embolic membrane <i>sensu</i> Tanasevitch (2017), not <i>sensu</i> Hormiga (1994, 2000)
EP	embolus proper <i>sensu</i> Saaristo (1971)
MRA	median radical apophysis (= median tooth <i>sensu</i> Crosby & Bishop, 1928)
MRT	mesal radical tooth (= mesal tooth <i>sensu</i> Crosby & Bishop, 1928)
PN	posterior notch of radix
PRA	posterior radical apophysis (= posterior tooth <i>sensu</i> Crosby & Bishop, 1928)
SP	sabre-shaped process
TmI	position of trichobothrium on metatarsus I.

Table 1. Composition and distribution of the *Erigone psychrophila*-species group.

	Species	Zoogeographical regions		
		Palearctic	Nearctic	Neotropics (only known from Peru)
1	<i>E. aletris</i> Crosby & Bishop, 1928	+	+	
2	<i>E. angela</i> Chamberlin & Ivie, 1939		+	
3	<i>E. clavipalpis</i> Millidge, 1991			+
4	<i>E. cristatopalpus</i> Simon, 1884	+	+	
5	<i>E. denticulata</i> Chamberlin & Ivie, 1939		+	
6	<i>E. dentosa</i> O. Pickard-Cambridge, 1894	+	+	
7	<i>E. ephala</i> Crosby & Bishop, 1928		+	
8	<i>E. hydrophytae</i> Ivie & Barrows, 1935		+	
9	<i>E. hypenema</i> Crosby & Bishop, 1928		+	
10	<i>E. koshiensis</i> Oi, 1960	+		
11	<i>E. malvari</i> Barrion & Litsinger, 1995	+		
12	<i>E. ostiaria</i> Crosby & Bishop, 1928		+	
13	<i>E. palustris</i> Millidge, 1991			+
14	<i>E. paradiscicola</i> Crosby & Bishop, 1928		+	
15	<i>E. psychrophila</i> Thorell, 1871	+	+	
16	<i>E. reducta</i> Schenkel, 1950		+	
17	<i>E. svenssoni</i> Holm, 1975	+		
18	<i>E. tenuimana</i> Simon, 1884	+		
19	<i>E. tirolensis</i> L. Koch, 1872	+	+	
20	<i>E. uintana</i> Chamberlin & Ivie, 1935		+	
21	<i>E. whitneyana</i> Chamberlin & Ivie, 1935		+	
22	<i>E. whymeri</i> O. Pickard-Cambridge, 1877		+	
23	<i>E. zheduoshanensis</i> Song & Li, 2008	+		
Total species:		10	16	2

Figs 1-4. Photographs of a male of *Erigone palustris* Millidge, 1991 deposited in the MHNG. (1) Habitus, dorsal view. (2-4) Prosoma, dorsal, ventral and frontal views, respectively.

TAXONOMY

Erigone palustris Millidge, 1991

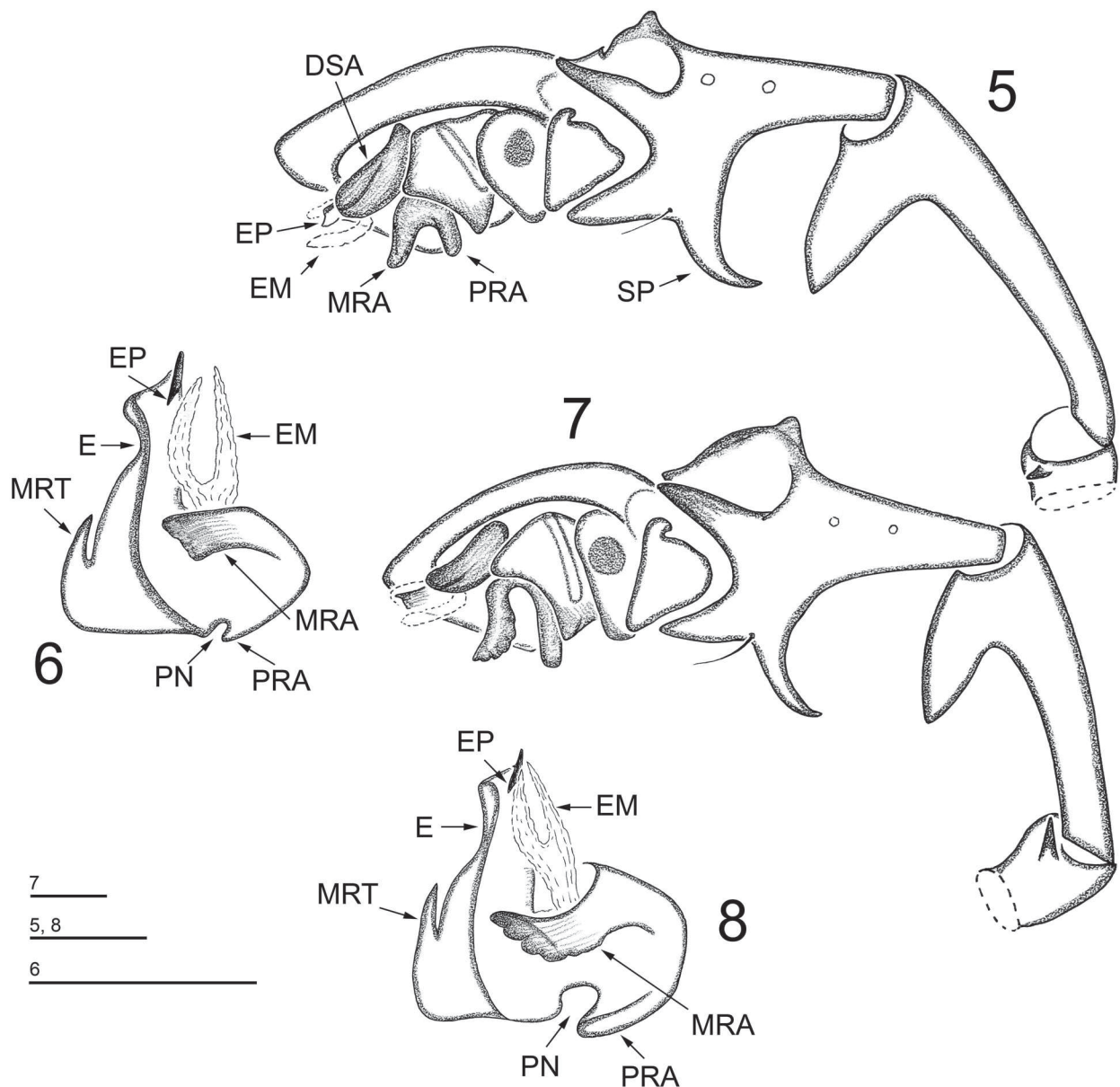
Figs 1-6

Material: MHNG; 1 male, labeled as *Erigone svenssoni* Holm; PERU, Junin Department, La Oroya, Pachacayo, 3700-3750 m ü NN (= a.s.l.); 22.XII.1978; leg. and det. S. Heimer.

Comparative material examined: *Erigone svenssoni* Holm, 1975: MHNG (collection of S. Heimer); 1 male (see Figs 7-8), 2 females; SWEDEN, Swedish Lapland, Stordalen, mire; 14.-23.VI.1979; leg. Å. Holm. – CAT; 1 male, 6 females; RUSSIA, environs of Vorkuta, near

Vorgashor, sedge fen on lake bank; 5.XI.1983; leg. A. Tanasevitch. – CAT; 2 males, 1 female, same locality; 4.IX.1984; leg. A. Tanasevitch.

Description: *Male.* Total length 1.88. Carapace (Figs 1-2, 4) 0.90 long, 0.68 wide, reddish brown, its cephalic part arched. Lateral edges of carapace with irregular sharp teeth of different sizes. Chelicerae 0.50 long, retrolateral-frontal side with a row of small teeth, mastidion absent. Promargin of cheliceral groove with one small and two large teeth, retromargin with two small teeth. Legs yellow. Leg I 2.24 long (0.62 + 0.23 + 0.54 + 0.47 + 0.38), IV, 2.24 long (0.62 + 0.23 + 0.56 + 0.48 + 0.35). Chaetotaxy 2.2.2.1, spines about as long



Figs 5-8. Details of the left palp of a male of *Erigone palustris* Millidge, 1991 (5-6) and of a *E. svenssoni* Holm, 1975 male from Swedish Lapland (7-8) deposited in the MHNG. (5, 7) Palp, retrolateral view. (6, 8) Embolic division, mesal (= prolateral) view.

as diameter of corresponding leg segment. Metatarsus IV without trichobothrium. TmI 0.42. Palp (Figs 5-6): Patella long and slender, with a large, conical ventro-apical apophysis. Tibia elongated, with an anterior concavity typical for the *psychrophila*-species group, and with a characteristic ventral sabre-shaped process. Distal suprategular apophysis elongated, rounded distally, strongly sclerotized. Embolic division typical for the group: mesal radical tooth conical, pointed; median radical apophysis not expanded distally; embolic membrane bipartite, transparent. Posterior notch of radix very small, resulting in a short posterior radical apophysis. Abdomen 1.00 long, 0.68 wide, pale grey.

Distribution: The species is known only from the highlands of the Peruvian Cordilleras at 2530-3850 m a.s.l. (Millidge, 1991).

Remarks: The spider collection of the MHNG has a male labeled as *Erigone svenssoni* Holm, 1975, which has been collected by Stefan Heimer (Dresden) in the highlands of the Peruvian Cordilleras in 1979. In 1991 A.F. Millidge described *E. palustris* on the basis of several males and females from high altitudes (2530-3850 m a.s.l.) from the same mountain region of Peru (Millidge, 1991). In the diagnosis of this species Millidge did not mention that it belongs to the *psychrophila*-species group, and only compared it with a few *Erigone* species known from South America. On the other hand, Heimer was not far from the truth, having identified the male he collected in Peru as the Swedish Laplandic *E. svenssoni*. *Erigone svenssoni* was originally described from Sweden (Holm, 1975) and later also recorded from the northern part of the Russian Plain [Karelia (Byzova *et al.*, 1986)], from the Polar Urals (Esyunin *et al.*, 1995), and from the Bolshezemelskaya tundra (Tanasevitch & Koponen, 2007). Both species belong to the *psychrophila*-species group, and are really very similar to each other. The male from high-altitudes of Peru, belonging to *E. palustris*, differs from that of the northern European hypoarcto-boreal *E. svenssoni* by a few details of the embolic division, i.e. the shorter median radical apophysis with a more or less even apical edge (see MRA in Figs 6, 8), the smaller posterior notch of the radix, and the smaller posterior radical apophysis (see PN and PRA in Figs 6, 8). The epigynes of both species are rather different in the shape of the posterior median plate (triangular in *E. svenssoni* vs trapezium-shape in *E. palustris*) and of the receptacles [much large in the European species (Holm, 1975: fig. 8; cf. Millidge, 1991: fig. 551)].

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