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A new littoral interstitial species of the genus *Isotomodes* (Collembola, Isotomidae) from Italy

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The genus *Isotomodes* Linnaniemi, 1907 can be easily recognized among Isotomidae because of its remarkable morphology and chaetotaxy of the last abdominal segments (Gama, 1963; Potapov, 2001); it comprises 34 worldwide species (Bellinger *et al.* 2014, Potapov 2001, Arbea 2006, Abrantes & Mendonça 2007, Thibaud 2008) mainly distributed in Europe (especially in Mediterranean region) and America, and only a few from est Asia and Oceania (Bellinger *et al.* 2014). The genus *Isotomodes* appears well represented in interstitial sandy habitat, especially in supralittoral and inland biotopes, as reported by Thibaud & Christian (1997) and Thibaud (2007). The littoral fauna of Collembola along the Italian peninsula has been poorly studied (Dallai *et al.* 2010), so we decided to fill this gap beginning with a collecting design along the Thirrenian coast of Tuscany. As preliminary result, herein we describe a new species of *Isotomodes* that had been collected in the sand dune in front of the Regional Park of S. Rossore (Tuscany).

The material was collected on the sand dune in the Park of S.Rossore (Tuscany, central Italy) using a corer (volume 500 ml). Several soil samples were collected and the mesofauna was recovered by means of Berlese funnels. Sorting and recovering of the species through a stereoscopic microscope. Specimens of *Isotomodes tyrrhenicus* **sp. nov.** were mounted on slides both in lactic acid and Marc Andrè fluid; we described the new species following the terminology as proposed by Gama (1963), Potapov (2001) and Fjellberg (1999). For scanning electron microscopy, specimens preserved in 80% ethanol were completely dehydrated in absolute ethanol, critical-point dried in a Balzer CPD 030 apparatus and coated with gold in a Balzer MED 010 sputter coater. Observations were performed with a Philips XL20 scanning electron microscope.

Abbreviations used in the text: Th.—thoracic tergum, Abd.—abdominal tergum, Ant.—antennal segment, PAO—postantennal sense organ, VT—ventral tube.

Isotomodes tyrrhenicus sp. nov.

Figs 1–3, Tab. 1

Type locality. Specimens of the new species were collected in the littoral sand dune of the regional park of S. Rossore (Tuscany) (43°47'12.5''N, 10°16'09.7'').

Type material. Holotype (female) and 10 paratypes (7 females and 3 males). All types deposited in the Collembola collection of the Department of Life Sciences, University of Siena.

Description. Length of holotype and paratypes about 0.6-0.7 mm. Eyes and body pigment absent, cuticle granulation fine and regularly distributed. Antennae longer than the cephalic diagonal (A/d = 1.2). Ant. I with 12 setae, one dorsal microseta and two ventral sensilla of different length (Fig. 1A); Ant. II with 14 setae, three basal microsetae and one ventral sensillum (Fig. 1A). Ant. III with 20-23 setae; Ant. III sensory organ formed by two globular sensilla placed in two cuticular pits, two curved and subcylindrical guard sensilla and one ventrolateral thinner sensillum (Fig. 1A). Ant. IV with about 15 subcylindrical dorsal sensilla and several ordinary setae (Fig. 1A, 3B); subapical organite and microsensillum present (Fig. 1B). Basomedial field (submentum) with 4 +4 setae, basolateral field (mentum) with 5 setae (Fig. 1F). Labial palp with four papillae (A, B, D, E) with 1, 2, 2, 2 guard setae respectively. Lateral process of labial palp thicker, similar to basal papilla with a blunt roundish apex (Fig. 1H). Labrum with 3/4,4,4 setae (Fig. 3C). PAO elliptical, slightly narrower than the base of the antenna with six posterior setae (Fig. 1C, 3E). Tibiotarsi I, II and III with 21, 21 and 21–22 acuminate setae respectively (Fig. 2E). Claw without internal teeth, empodium lanceolate half as long as the claw. Head with 5+5 setae along the ventral line (Fig. 2C); thoracic sternites I, II and III with 2, 2 and 4 setae (Fig. 2C)

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them longer than the others), 2 long dorsal macrosetae and 1 +1 microsensilla. Chaetotaxy of abdominal segment VI consists of some spine-like and slightly barbulate setae (P_0, P_1, P_3, P_4) while the others are long, thin and smooth setae (P_2, P_5 and P_6).

Remarks. The new species is closely related to *Isotomodes alavensis* Simón, Luciáñez, Ruiz & Martin, 1994 from which it can be separated by the different number of setae on the ventral tube (4+4 in *I. alavensis* against 5+5 in *I. thyrrenicus* **sp. nov.**). Further differences are in the type of setae on the VI abdominal tergites (P_4 spine-like and slightly barbulate in *I. thyrrenicus* **sp. nov.**, ordinary seta in *I. alavensis*); moreover *I. thyrrenicus* **sp. nov.** has P_{12} on Abd. IV while it is absent in *I. alavensis*. Others 5 species of *Isotomodes* have 5+5 distal setae on the ventral tube as *I. thyrrenicus* **sp. nov.** but they can be distinguished by the different chaetotaxy of dens (Tab. 1): *I. thyrrenicus* **sp. nov.** (dens anterior setae= 4; posterior= 2), *I. gisini* Gama, 1963 (ant.= 2; post.= 2), *I. maroccanus* Stach, 1947 (ant.= 1; post.= 2), *I. productus* (Axelson, 1906) (ant.= 1; post.= 2), *I. sexsetosus* Gama, 1963 (ant.= 6; post.=2) and *I. sotoensis* Simon et al 1994 (ant.= 5; post.=2).

Etymology. The name of the new species refers to the Tyrrhenian Sea that is just in front of the beach in which it was found.

TABLE 1. Characters comparison between *I. thyrrenicus* **sp. nov.** and some closely related species. *SSLM=smooth spin like macroseta, BSLM=barbulated spin like macrosetae; **a=spiniform slightly barbulate; b=ordinary setae.

Species	number of laterodistal setae on VT	number of setae on posterior margin of PAO	number of anterior setae on dens	presence/ absence of p12 seta on Abd. IV	presence/absence and shape of macroseta on Abd. V*	Shape of P setae on Abd. VI**
I. thyrrenicus **sp. nov.**	5+5	6	4	present	1+1 SSLM	a=P_0,P_1,P_3,P_4; b=P_2,P_5,P_6
I. alavensis	4+4	6-7	4	absent	1+1 SSLM	a=P_0,P_1,P_3; b=P_2,P_4,P_5,P_6
I. gisini	5+5	5	2	absent	0+0	b=P_0,P_1,P_2,P_3,P_4,P_5,P_6
I. marroccanus	5+5	6	1	present	0+0	b=P_0,P_1,P_2,P_3,P_4,P_5,P_6
I. productus	5+5	7	1	present	1+1 SSLM	b=P_0,P_1,P_2,P_3,P_4,P_5,P_6
I. sexsetosus	5+5	6	6	absent	0+0	b=P_0,P_1,P_2,P_3,P_4,P_5,P_6
I. sotoensis	5+5	6-7	5	absent	1+1 BSLM	a=P_1,P_3; b P_0,P_2,P_4,P_5,P_6

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