

Rare and little known Collembola species from Hungary

D. WINKLER¹, M. KORDA² and GY. TRASER³

Abstract. Two species, *Pseudosinella bohemica* Rusek, 1979 and *Folsomides marchicus* (Frenzel, 1941) are recorded from Hungary, the latter species for the first time. An illustrated morphological description of the two species is presented.

Keywords. *Pseudosinella bohemica*, *Folsomides marchicus*, Entomobryidae, Isotomidae, soil fauna, first record.

INTRODUCTION

During investigations of the soil fauna diversity of different habitat types in Hungary, we found two rare and little known collembolan species; *Pseudosinella bohemica* Rusek, 1979 and, as new to the Hungarian fauna, *Folsomides marchicus* (Frenzel, 1941). Since the publication of the checklist of the Hungarian collembolan fauna (Dányi & Traser, 2008) the number of recorded species has been steadily increasing (Traser & Dányi, 2008; Traser *et al.*, 2009; Traser, 2010; Traser *et al.*, 2011; Winkler *et al.*, 2011; Winkler & Traser, 2012) to the current number of 430.

MATERIAL AND METHODS

Pseudosinella bohemica was collected in Tüskevár, com. Veszprém, Hungary (47°7' 12.55" N, 17°20'3.90" E, 146 m a.s.l.) on 16 October 2011 in the litter of a lowland hornbeam-pedunculate-oak forest close to the stream Torna (leg. D. Winkler).

Folsomides marchicus was found in soil samples taken on the Tétényi Plateau, Budapest, Hungary (47°25'46.02"N, 18°58'21.58"E, 207 m a.s.l.) on 10 December 2011 (leg. M. Korda). The specimens were collected in xerophilous dolomite-steppe meadow associations.

The terminology follows Gisin (1967) and Mateos (2008) for *P. bohemica* and Potapov (2001) for *F. marchicus*.

Abbreviations used in the text: Ant. = Antennal segments; Th. I–III = thoracic tergites; Abd. I–VI = abdominal tergites.

RESULTS

Pseudosinella bohemica Rusek, 1979

(Figs. 1–11)

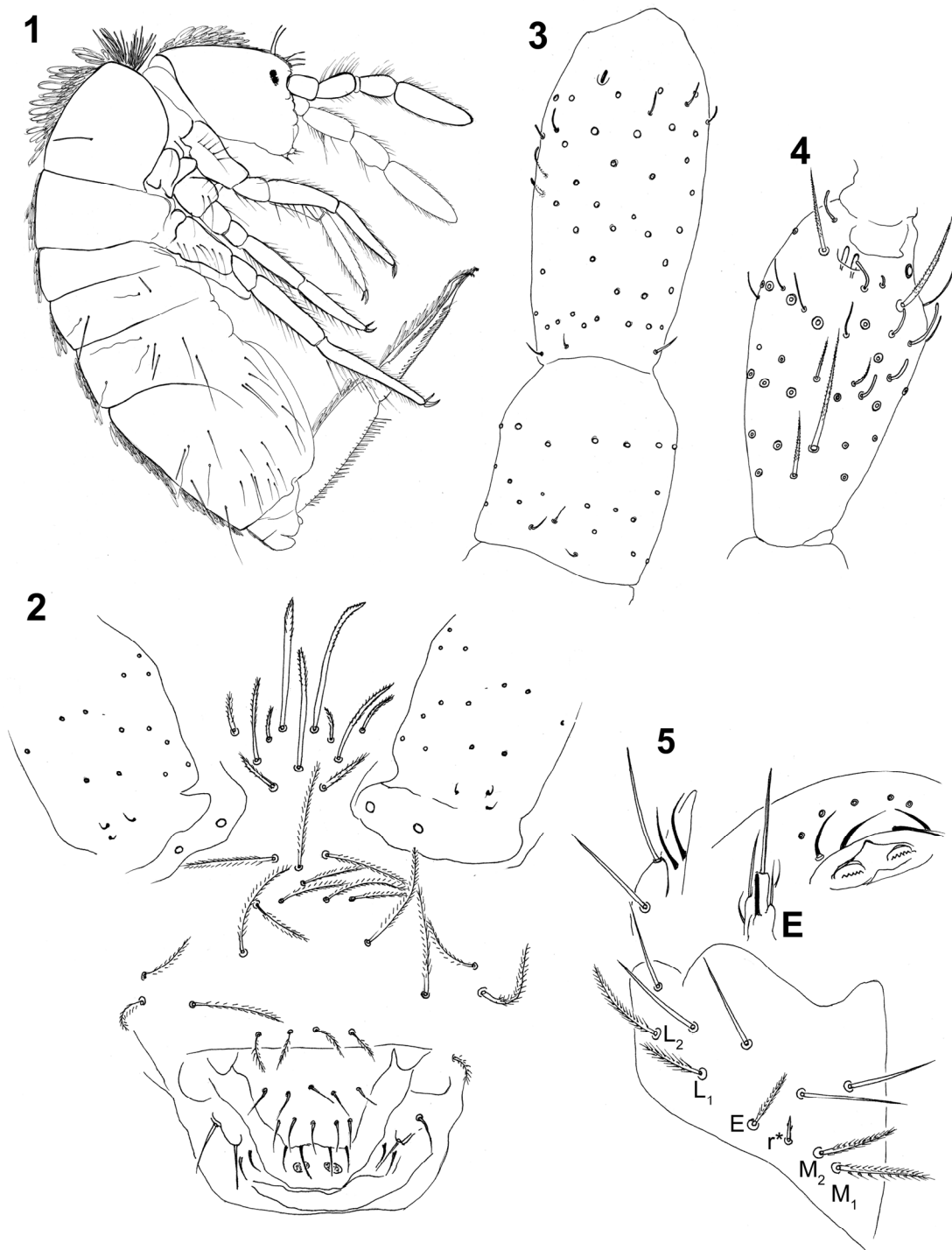
Material examined. Altogether ca. 100 ♂ and ♀ kept in D. Winkler's collection at the Institute of Wildlife Management and Vertebrate Zoology, University of West Hungary.

Description. Body length 0.86 mm (without head and furca), head diagonal 0.26 mm. Color pale with an orange hue. Head and body densely covered with scales (Fig. 1). Antennae and legs without scales. Eye patch bluish black. Eyes 2+2, B closely above A. Antenna 1.26 times the head length. Ratio of antennal joints I–IV = 1:1.5:1.5:3.0. Two lenticular organs ventrally on each antennal base (Fig. 2). Setae on the antennal joints I–III as in Figs. 3–4. Ant. IV without apical bulb. Labrum and frontoclypeal area as in Fig. 2. Prelabral setae ciliated, labral setae smooth, in 4/554 arrangement. The labrum forms an inverted, wide 'V' below the anterior row of setae. Maxillary outer lobe with 2 sublobal hairs on the sublobal plate. The modified seta on the external labial papilla 'E' reaches to the top of the papilla which bears 5 other setae (Fig. 5). Formula of the labial triangle $M_1M_2r^*EL_1L_2$ (Fig. 5): $L_1 < L_2$ and r^*

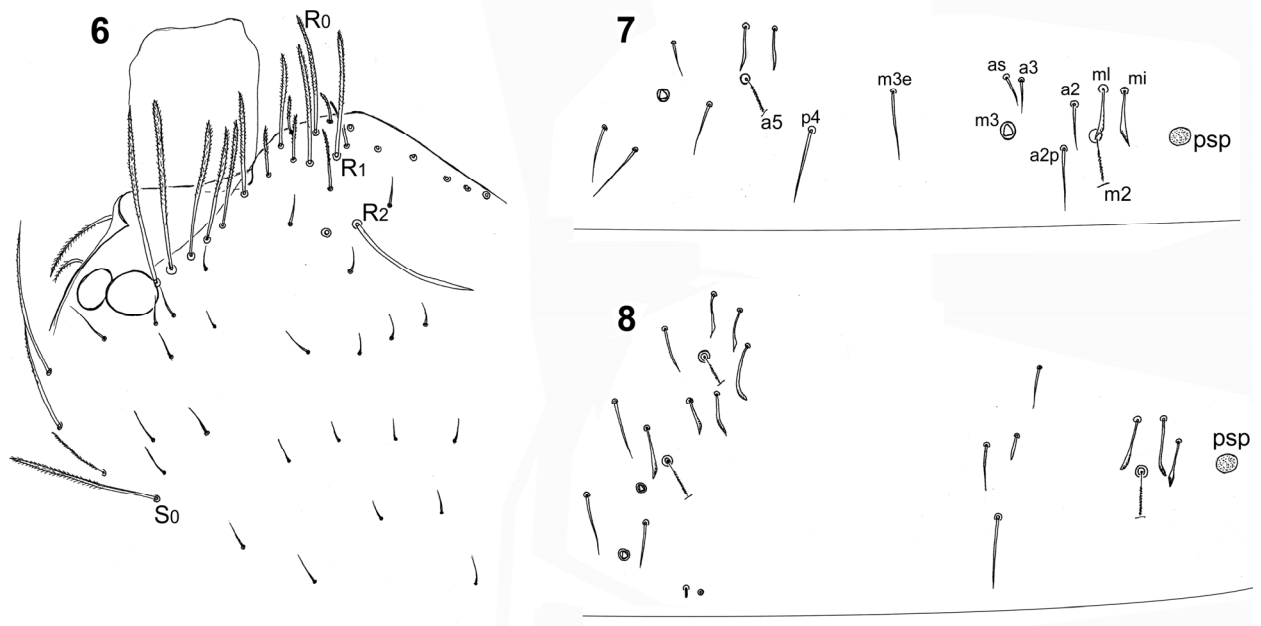
¹Dr. Dániel Winkler, Institute of Wildlife Management and Vertebrate Zoology, University of West Hungary, H-9400 Sopron, Bajcsy-Zs. u. 4., Hungary; E-mail: dwinkler@emk.nyme.hu

²Márton Korda, Institute of Botany and Nature Conservation, University of West Hungary, H-9400 Sopron, Bajcsy-Zs. u. 4., Hungary. E-mail: korda.marton@gmail.com

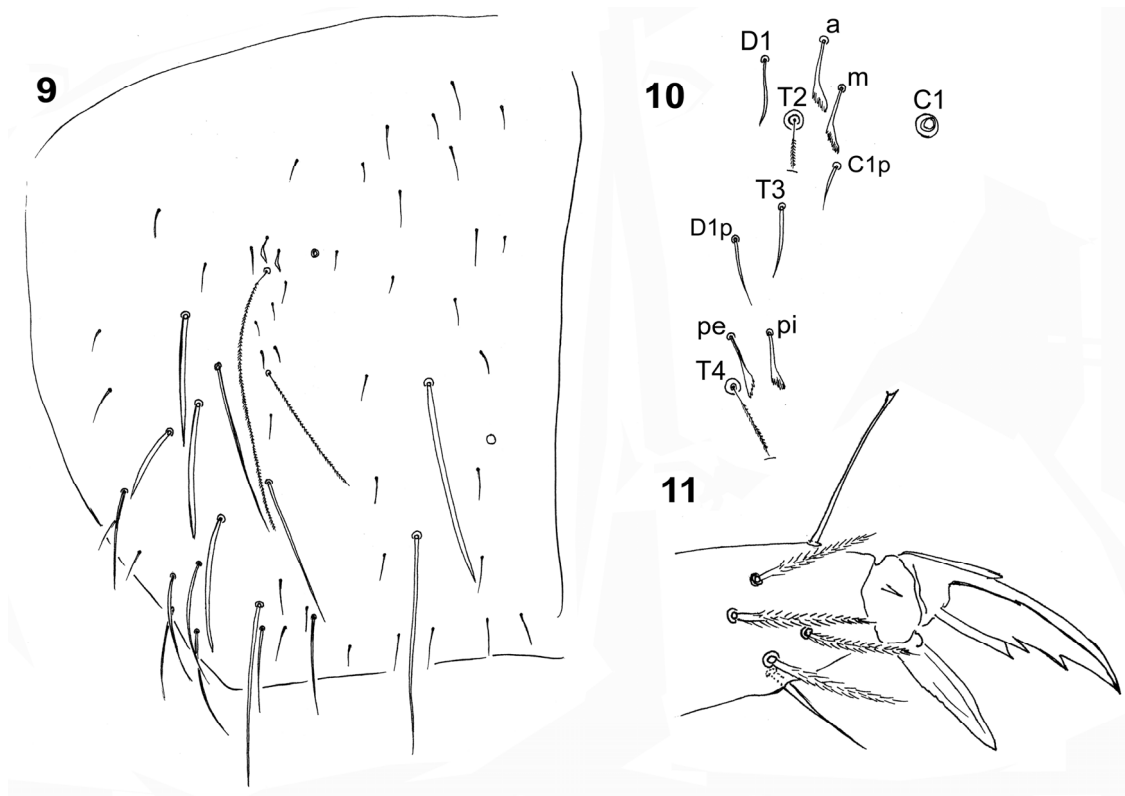
³Dr. György Traser, Institute of Silviculture and Forest Protection, University of West Hungary, H-9400 Sopron, Bajcsy-Zs. u. 4., Hungary. E-mail: traser@emk.nyme.hu



Figures 1–5. *Pseudosinella bohémica*, 1 = Habitus, 2 = Mouthparts and frontoclypeal area with antennal basal organ, 3 = Ant. I-II chaetotaxy, 4 = Ant. III chaetotaxy, 5 = Labial triangle with labial papilla 'E'



Figures 6–8. *Pseudosinella bohémica*, 6 = Dorsal head chaetotaxy, 7 = Abd. II complete chaetotaxy (left side), 8 = Abd. III complete chaetotaxy (left side)



Figures 9–11. *Pseudosinella bohémica*, 9 = Abd. IV complete chaetotaxy, 10 = Abd. IV trichobothrial complex, 11 = Claw and empodium (leg III)

shortened, nearly smooth, only with 1 or 2 tiny barbs. All 5 'a' setae of the anterior row smooth. At the base of the labial palps 3 proximal setae. (9)10+(9)10 'A' setae between the apex of the head and the eyes. Along the labial ventral groove 4+4 ciliated setae. Dorsal cephalic macrochaetae $R_0R_{1s}R_1R_2S_0$ as in Fig. 6. Body macrochaetae 10/0101+2. Abd. II chaetotaxy paBq₁q₂ (notation after Gisin 1967), and m₂, a_{2p}, a₂, mi, ml, as, a₃, m₃, m_{3e}, p₄, a₅ (trichobothria m₂ and a₅; notation after Mateos 2008) (Fig. 7). Abd. III chaetotaxy as in Fig. 8. Chaetotaxy and trichobothrial complex of Abd. IV as in Figs. 9–10.

Claws with paired proximal teeth, the outer one somewhat bigger and positioned slightly lower. The unpaired subapical tooth is distinct, a very small apical tooth hardly observable (Fig. 11). Lateral and external teeth smooth, clearly visible. Outer margin of the empodium very finely serrated. Tenent hair clavate. Manubrial plate with 2+2 setae on both sides of the 2 pseudopori. Ventral tube with 5+5 smooth laterodistal setae, 5+5 ciliated setae on the anterior side, and 11 unpaired setae (3+3+1+1+1+1+1) on the posterior side. Trochanteral organ on leg III with 10–11 setulae forming roughly a V.

Remarks. *P. bohémica* was formerly known only from the Czech Republic, Austria and Bulgaria (Bedos & Fjellberg 2011). The Hungarian specimens basically fit the description by Rusek (1979), but the chaetotaxy of Ant. II–III clearly differs from Rusek's illustration. Furthermore, in our specimens one of the 3 accessorial setae at the base of the anterior trichobothria on Abd. IV is nearly smooth (D1, Fig. 10), whereas all these setae appear fan-shaped in Rusek's Fig. 4. The taxonomic significance of these differences remains open.

***Folsomides marchicus* (Frenzel, 1941)**

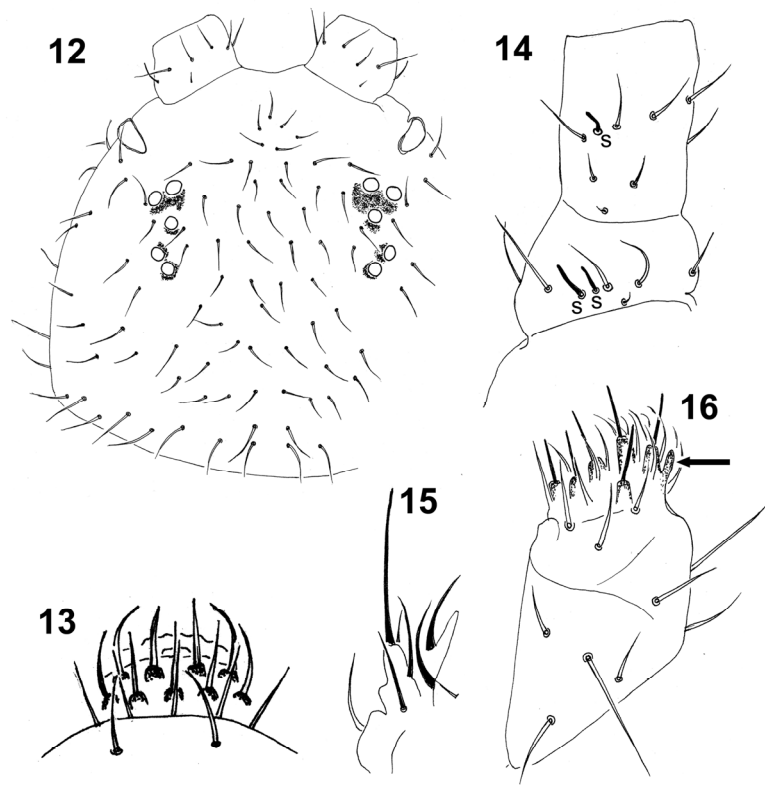
(Figs. 12–23)

Material examined. 10 ♀ held in Gy. Traser's personal collection.

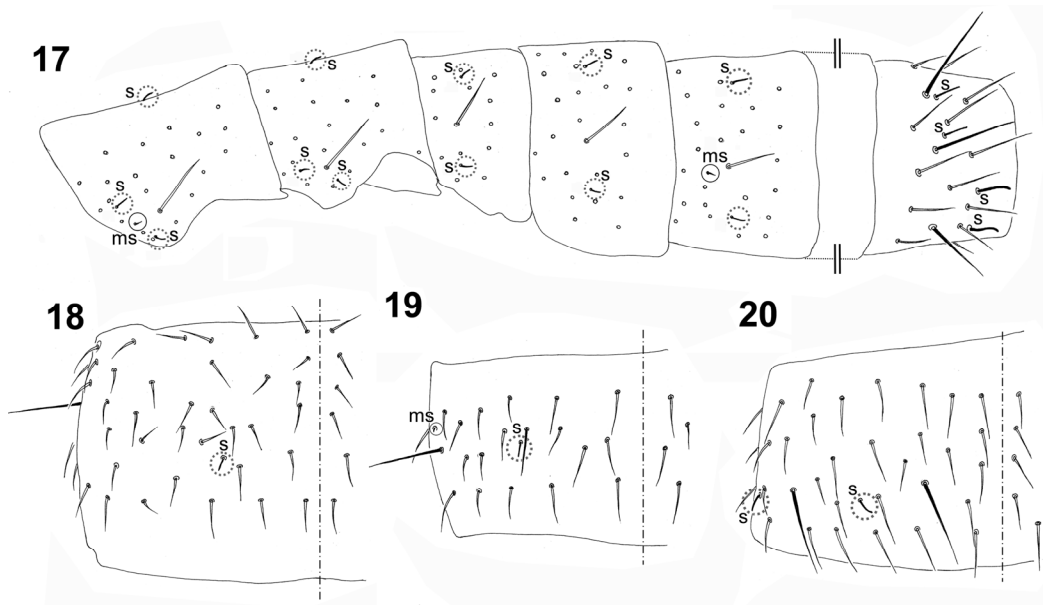
Description. Total body length 0.8 mm (including the 0.18 mm long head), antennal length 0.15 mm. Body shape rather short and stout. The decline between Abd. IV and V, characteristic for the genus *Folsomides*, inconspicuous. Body colour dark grey to nearly black. 5+5 eyes in dark eye patches (Fig. 12). Postantennal organ elongated, rather broad, about 2.5–3.0 times the length of nearest eye, usually with 2 posterior setae. 2/554 labral setae (Fig. 13). Ventral chaetotaxy of Ant. I–II as in Fig. 14. Maxillary outer lobe (Fig. 15) with bifurcated maxillary palp and 3 sublobal hairs. Labium with modified thick finger-like projection (Fig. 16). Sensillae ('s') on the body short, shorter than the half length of the surrounding setae. Th. II – Abd. V with 3,3/2,2,2,2,4 sensillae ('s') and 1,0/0,0,1 microsensillae ('ms') (Fig. 17). The lower pair of sensillae on Abd. V is slightly thicker than the upper pair. Dorsomedial chaetotaxy of Th. II, Abd. III and Abd. IV as in Figs. 18–20. The medial sensilla 's' on Abd. IV is inserted far from the subaxial macrochaeta (Fig. 20). Macrochaetae of Th. II – Abd. V as 11/11133. The subaxial macrochaeta on Abd. IV 0.41, on Abd. V 0.75 times the tergite length. Ventral chaetotaxy of the anal lobe as in Fig. 21. Ventral tube with 3+3 laterodistal and 2 posterior setae. Furca with 3 posterior and 0 anterior setae (Fig. 22). Mucro ± separated from the dens, bidentate, with a lamella. Tibiotarsi I–III with 20,20,22 setae (Fig. 23). Empodium about half the length of the claw.

Remarks. According to the Fauna Europaea database (Potapov & Fjellberg 2011), *F. marchicus* is present in many European countries including the southern areas. Compared to specimens from Israel (Kaprus & Nevo 2003), our specimens differ in the number of setae on the dens and on the laterodistal part of the ventral tube. They conform however, to redescription by Potapov (2001).

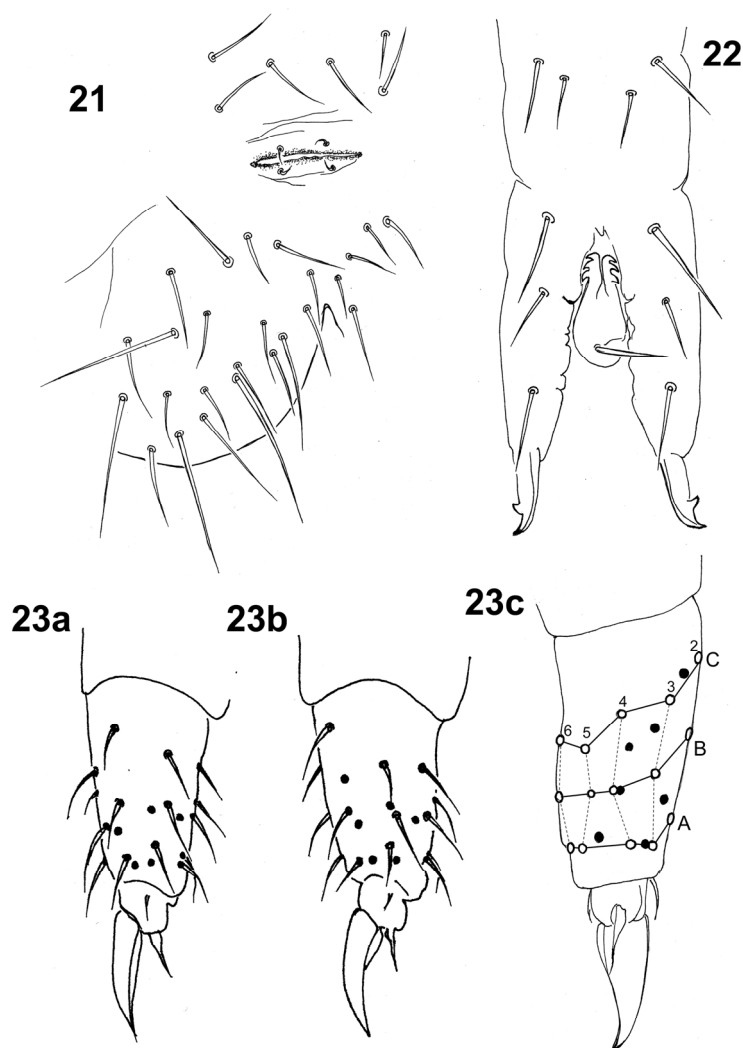
Acknowledgements – The study was made possible with the support of the Social Renewal Operation Programme TÁMOP 4.2.1.B-09/1/KONV-2010-0006 research project co-funded by the European Social Fund.



Figures 12–16. *Folsomides marchicus*, 12 = Dorsal head chaetotaxy, 13 = Labrum; 14 = Ventral chaetotaxy of Ant. I–II
15 = Maxillary outer lobe with 3 sublobal hairs, 16 = Labium in ventral view with modified thick finger-like projection (arrow)



Figures 17–20. *Folsomides marchicus*, 17 = Th. II – Abd. III, Abd. V, pattern of sensillae (dotted circle) and microsensillae (circle), 18 = Mesothorax dorsomedial; 19 = Abd. III dorsomedial; 20 = Abd. IV dorsomedial



Figures 21–23. *Folsomides marchicus*, 21 = Ventral chaetotaxy of anal lobe, 22 = Furca; 23a–c = Chaetotaxy of Tita I–III

REFERENCES

- BEDOS, A. & FJELLBERG, A. (2011): *Entomobryidae*. In: Deharveng, L. (ed.) *Collembola. Fauna Europaea version 2.4*, <http://www.faunaeur.org>, [accessed 10 February 2012]
- DÁNYI, L. & TRASER, GY. (2008): An annotated checklist of the springtail fauna of Hungary (Hexapoda: Collembola). *Opuscula Zoologica*, 38: 3–82.
- GISIN, H. (1967) Espèces nouvelles et lignées évolutives de *Pseudosinella* endogés (Collembola). *Memorias e estudos do Museu Zoológico da Universidade de Coimbra*, 301: 1–25.
- KAPRUS, I.J. & NEVO, E. (2003): New Species of Collembola (Entognatha) from Israel. *Vestnik zoologii*, 37(4): 65–70.
- MATEOS, E. (2008): The European *Lepidocyrtus* Bourlet, 1839 (Collembola: Entomobryidae). *Zootaxa*, 1769: 35–59.
- POTAPOV, M. (2001): Synopses on Palearctic Collembola: Isotomidae. *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 73(2): 603 pp.
- POTAPOV, M. & FJELLBERG, A. (2011): *Isotomidae*. In: Deharveng, L. (ed.) *Collembola. Fauna Europaea version 2.4*, <http://www.faunaeur.org>, [accessed 10 February 2012]

- RUSEK, J. (1979): Three new *Pseudosinella* species from Czechoslovakia (Collembola, Entomobryidae). *Acta Entomologica Bohemoslovaca*, 76: 255–265.
- TRASER, GY. & DÁNYI, L. (2008): *Lepidocyrtus mariani* sp. n., a new springtail species from Hungary (Collembola: Entomobryidae). *Opuscula Zoologica*, 39(1): 91–98.
- TRASER, GY. (2010): A Collembola fauna (Hexapoda: Entognatha) Porva körzetében a harmadik Biodiverzitás Nap gyűjtése alapján. *Folia Musei historico-naturalis Bakonyiensis*, 27: 49–54.
- TRASER, GY., WINKLER, D. & KECSKEMÉTI, G. (2009): *A vegetáció és a talaj hatása az ugróvillás sűrűsége a Szárhalmi erdőben*. In: Lakatos, F. & Kui, B. szerk.: Kari Tudományos Konferencia. Nyugat-magyarországi Egyetem, Erdőmérnöki Kar, Sopron, pp. 179–182.
- TRASER, GY., WINKLER, D. & MOLNÁR, M. (2011): A mezőföldi Szent László-víz völgyének ugróvillás (Collembola) faunája. *Folia Musei historico-naturalis Bakonyiensis*, 28: 71–79.
- WINKLER, D. & TRASER, GY. (2012): *A Lajta Project ugróvillás (Collembola) faunája*. In: Faragó S. [ed.]: *A Lajta Project - Egy tartamos mezei vad és ökoszisztéma vizsgálat 20 éve. in press.*
- WINKLER, D., KORDA, M. & TRASER, GY. (2011): Two new species of Collembola for the fauna of Hungary. *Opuscula Zoologica*, 42(2): 199–206.