

Two New Uropodina Species from Ethiopia (Acari: Mesostigmata)

Authors: Kontschán, Jenő, and Starý, Josef

Source: African Invertebrates, 54(1) : 49-56

Published By: KwaZulu-Natal Museum

URL: <https://doi.org/10.5733/afin.054.0102>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Two new Uropodina species from Ethiopia (Acari: Mesostigmata)

Jenő Kotschán^{1,2*} and Josef Stary³

¹Plant Protection Institute, Centre for Agricultural Research, Hungarian Academy of Sciences, P.O. Box 102, Budapest H-1525, Hungary; kotschan.jeno@agrar.mta.hu

²Department of Zoology and Animal Ecology, Szent István University, Páter Károly Str. 1., Gödöllő H-2100, Hungary

³Biology Centre AS CR, Institute of Soil Biology, Na Sádkách, 7370 05 České Budějovice, Czech Republic; jstary@upb.cas.cz

* Corresponding author

ABSTRACT

Two new Uropodina species from Ethiopia are described and illustrated. *Neodiscopoma fabiani* sp. n. is the second species known from the genus in Africa. The other new species, *Trichouropoda szabadi* sp. n., belongs to the *Trichouropoda ovalis* group. Notes concerning the genus *Neodiscopoma* and comments in respect of the available name of *Neodiscopoma franzi* Marais & Theron, 1986 are given.

KEY WORDS: Acari, Uropodina, mites, Afrotropical, Ethiopia, new species, new synonymy.

INTRODUCTION

The soils of tropical regions are very species-rich in terms of soil-dwelling mites, especially Uropodina (Lindquist *et al.* 2009). Despite this, the soil fauna of most tropical countries has scarcely been studied, with probably only about 10 % of the fauna in these regions currently being known. The Ethiopian Uropodina fauna is amongst the poorly documented faunas of Africa, with only one species are listed, namely *Trichouropoda jeanelli* (André, 1945) (Wiśniewski 1993).

During examination of unsorted samples from East Africa, deposited at the Institute of Soil Biology (České Budějovice, Czech Republic), we found two new and interesting species of Uropodina in a single sample from Ethiopia. They are described here.

MATERIAL AND METHODS

All specimens of the two new species were found in the same sample. After separation from the other mites that were present, the specimens examined were cleared in lactic acid and drawings were made with the aid of a drawing tube. All specimens are stored in ethanol and have been deposited in the Soil Zoology Collections of the Hungarian Natural History Museum, Budapest (HNHM) and in the Biology Centre AS CR, Institute of Soil Biology, České Budějovice (ISB). Abbreviations: *h*—hypostomal setae, *ad*—adanal setae, *pa*—postanal setae, *eg*—eugenital setae. All measurements are given in micrometres (µm).

TAXONOMY

Genus *Neodiscopoma* Vitzthum, 1943

In Hirschmann's (1993) Uropodina system, which was based mainly on the gnathosomal processes (e.g. shapes of epistome, tritosternum, chelicerae and hypostomal setae), the genus *Neodiscopoma* is treated as a species group within the genus *Uropoda*, as the *Uropoda splendida* group. We do not agree with Hirschmann's view, and discuss the

species of the *Uropoda splendida* group as species belonging to the genus *Neodiscopoma*. Synapomorphies of *Neodiscopoma* include (all of these are missing in other taxa of the genus *Uropoda* s.l.): central area of dorsal shield elevated from the other parts, this area having strongly sclerotized margins; marginal shield reduced on caudal part; and setae in caudal area situated on small platelets. The genus *Neodiscopoma* is widely distributed in the Palaearctic region. Species of this genus can be found in Europe, the Middle East and Japan. Extra-Palaearctic species of the genus occur in Malaysia and Indonesia, with one species recorded from Tanzania. When Hirschmann (in Wiśniewski & Hirschmann 1993) moved the species *N. franzi* Marais & Theron, 1986 into the genus *Uropoda*, this species became a junior homonym of *Uropoda franzi* Hirschmann & Zirngiebl-Nicol, 1969. Therefore, Hirschmann (Wiśniewski & Hirschmann 1993) proposed a new name for this species (*U. theroni* Hirschmann, 1993). By restoring *Neodiscopoma* to generic rank, the original name *Neodiscopoma franzi* Marais & Theron, 1986 once again becomes available and the alternative name, *U. theroni* Hirschmann, 1993, becomes its junior synonym.

***Neodiscopoma fabiani* sp. n.**

Figs 1–13

Etymology: We dedicate the new species to the memory of Dr Tamás Fábíán, geographer in the Department of Physical Geography and Geoinformatics of the University of Szeged, who was shot by terrorists in January 2012 in the northern part of Ethiopia.

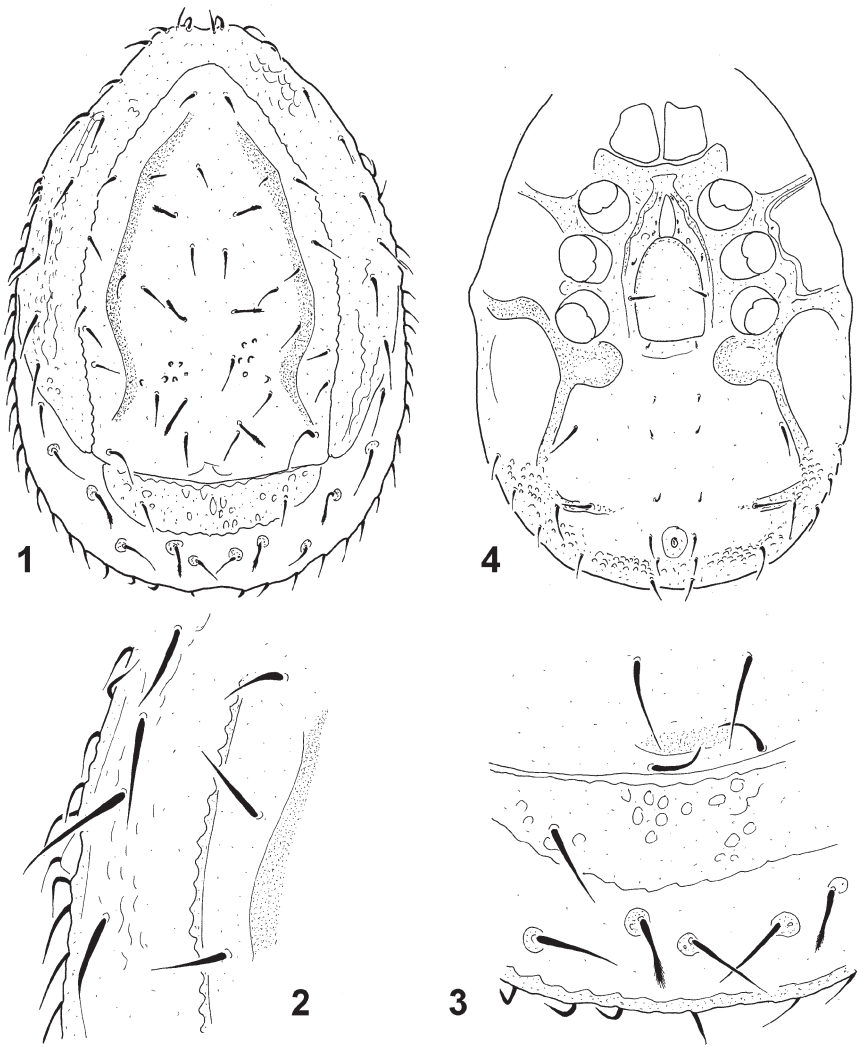
Description:

Female.

Idiosoma: Length 920–940 μm , width 630–640 μm ($n=3$). Body shape oval, colour reddish brown.

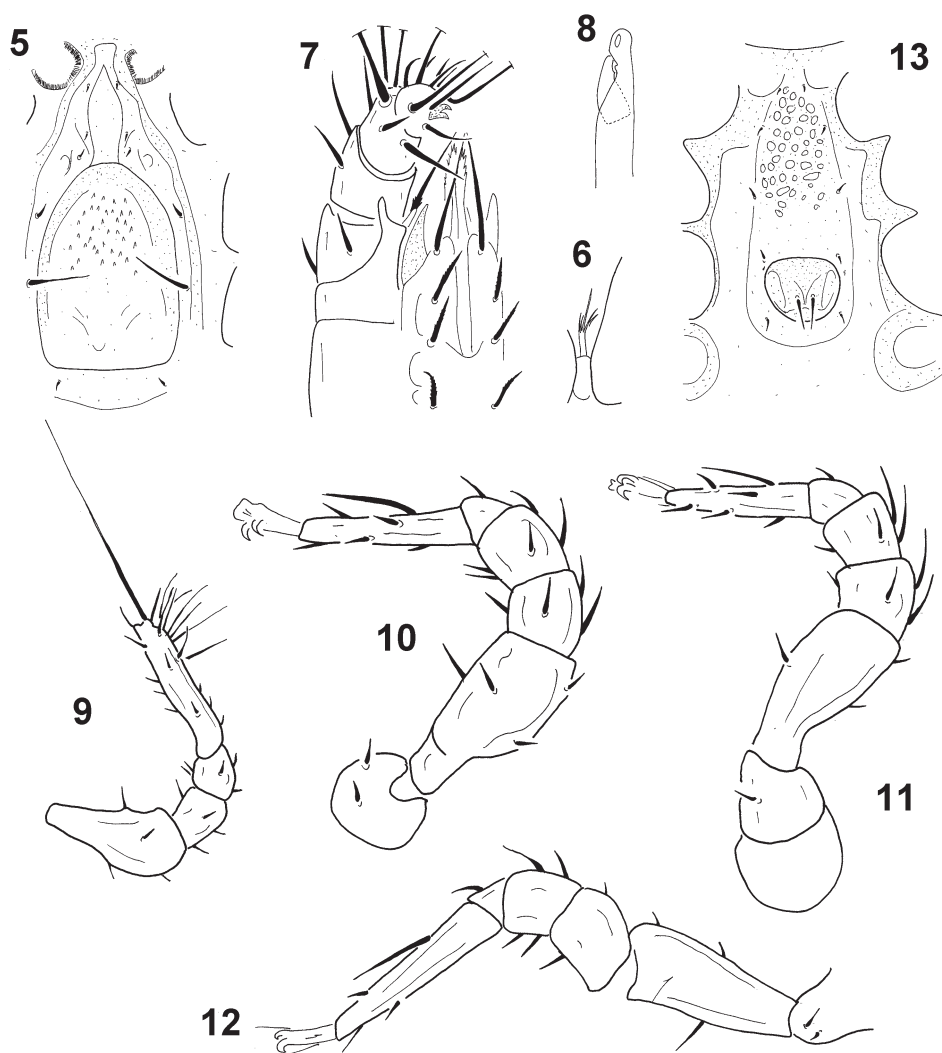
Dorsal aspect (Fig. 1): Dorsal and marginal shields completely separated, margin of dorsal shield undulate. Central area of dorsal shield elevated from the other parts, margin of elevated area strongly sclerotized. Dorsal setae smooth and needle-like (*ca* 45–60 μm) except row j, where three pairs of apically pilose setae are situated (*ca* 55–75 μm). Dorsal shield without sculptured pattern, only some oval pits at level of coxae IV. Pygidial shield present, its margin undulate and bearing one pair of smooth and needle-like setae (*ca* 50–60 μm), surface of this plate covered by oval pits. Marginal shield reduced on caudal part, its surface covered by reticulate sculptured pattern and bearing smooth and needle-like setae (*ca* 70–80 μm) (Fig. 2). Caudal area covered by membranous cuticle, where six pairs of setae are situated on small platelets, two pairs of setae apically pilose (*ca* 70–80 μm), other caudal setae similar in shape and length to setae on marginal shield (Fig. 3).

Ventral aspect (Fig. 4): Ornamentation of sternal shield lacking, but U-shaped, strongly sclerotized band situated anterior to genital shield and two rounded depressions anterior to coxae II (Fig. 5). Six pairs of sternal setae present, all smooth and needle-like, St1, St2, St3 and St6 very short (*ca* 6–8 μm), St4 longer (*ca* 15 μm), St5 very long (*ca* 45–50 μm). St1–St3 situated near anterior process of genital shield, St4 at level of central area of coxae III, St5 at level of anterior margin of coxae IV, St6 placed near basal edges of genital shield (Fig. 5). Ventral shield centrally smooth, several oval pits situated in lateral and caudal areas. Ventral setae in central area short (*ca* 10–14 μm), smooth and



Figs 1–4. *Neodiscopoma fabiani* sp. n., female, holotype: (1) body, dorsal view; (2) marginal setae; (3) caudal setae; (4) body, ventral view.

needle-like, other setae in lateral and caudal areas long (*ca* 60–70 μ m), smooth and needle-like; *ad* similar in shape and length to long ventral setae, *pa* absent. Pedofossae present, but very shallow and without ornamentation, and separate furrows on tarsi IV absent. Margin of pedofossae IV strongly sclerotized, formed a ring posterior to coxae IV. Stigmata situated between coxae II and III. Peritremes with long L-shaped prestigmatid and long L-shaped poststigmatid parts. Genital shield of female linguliform, anterior margin rounded and bearing a robust and anteriorly peaked process. Genital shield placed between coxae II and IV, without sculptured pattern, but several short spines can be seen under this shield (Fig. 5). Base of tritosternum narrow, its laciniae smooth and apically divided into four short lateral branches and one long central branch (Fig. 6).



Figs 5–13. *Neodiscopoma fabiani* sp. n.: (5–12) female, holotype: (5) intercoxal area; (6) tritosternum; (7) ventral view of gnathosoma and palps; (8) chelicerae; (9–12) legs I–IV, lateral view; (13) intercoxal area of male.

Gnathosoma (Fig. 7): Corniculi horn-like, internal malae marginally serrate and longer than corniculi. Hypostomal setae: *h1* long (ca 55 μ m), smooth and setiform; *h2*, *h3* and *h4* short (ca 20–25 μ m), marginally serrate. Epistome basally serrate and apically pilose. Chelicerae without internal sclerotized nodes, fixed digit with apical sensory organ and longer than movable digit, both digits bearing a single tooth (Fig. 8). Trochanter of palp with one short smooth seta (not illustrated in Fig. 7, because it was covered by corniculus) and one long basally serrate seta placed on small protuberance. Other setae of palp smooth and needle-like.

Legs (Figs 9–12): First leg without claws, needle-like setae present on all segments.

TABLE 1

Distinguishing characters of the African *Neodiscopoma* species (*N. franzi* and *N. fabiani*).

Characters	<i>N. franzi</i>	<i>N. fabiani</i>
Dorsal idiosoma		
Pilose setae	absent	present
Pygidial shield	absent	present
Oval pits in anterior area of dorsal shield	present	absent
Ventral idiosoma		
Sternal setae	all setae short	two pairs of them longer
Short setae on ventral shield	one pair	three pairs
Poststigmatid part of peritremes	absent	present

Male.

Idiosoma: Length 940–1020 μm , width 650–670 μm ($n=10$). Shape, ornamentation and chaetotaxy of dorsal parts as in female. Sternal setae short (*ca* 5–8 μm) and needle-like, St1 situated at level of anterior margin of coxae II, St2 at level of posterior margin of coxae II, St3 at level of central area of coxae III, St4 near anterior margin of genital shield, St5 near posterior margin of genital shield. Sternal shield smooth, only some oval pits situated in central area, between St1 and St3. Genital shield oval and placed between coxae IV and bearing one pair of smooth and needle-like (*ca* 30 μm) *eg* (Fig. 13). Ventral setae and ornamentation similar to those of female.

Comparison: The new species differs from the other *Neodiscopoma* species in the presence of a pygidial shield. The differences between the two African species are summarized in Table 1.

Holotype: ♀ ETHIOPIA: 10 km S Ginchi city, 8°53'N 38°09'E, 2900 m, Cholomu forest, sample of mosses on trees, 15.xi.2009, L.B. Rybalov (HNHM).

Paratypes: 2♀ 10♂ same data as for holotype (1♀ 5♂ ISB, 1♀ 5♂ HNHM).

Genus *Trichouropoda* Berlese, 1916***Trichouropoda szabadi* sp. n.**

Figs 14–26

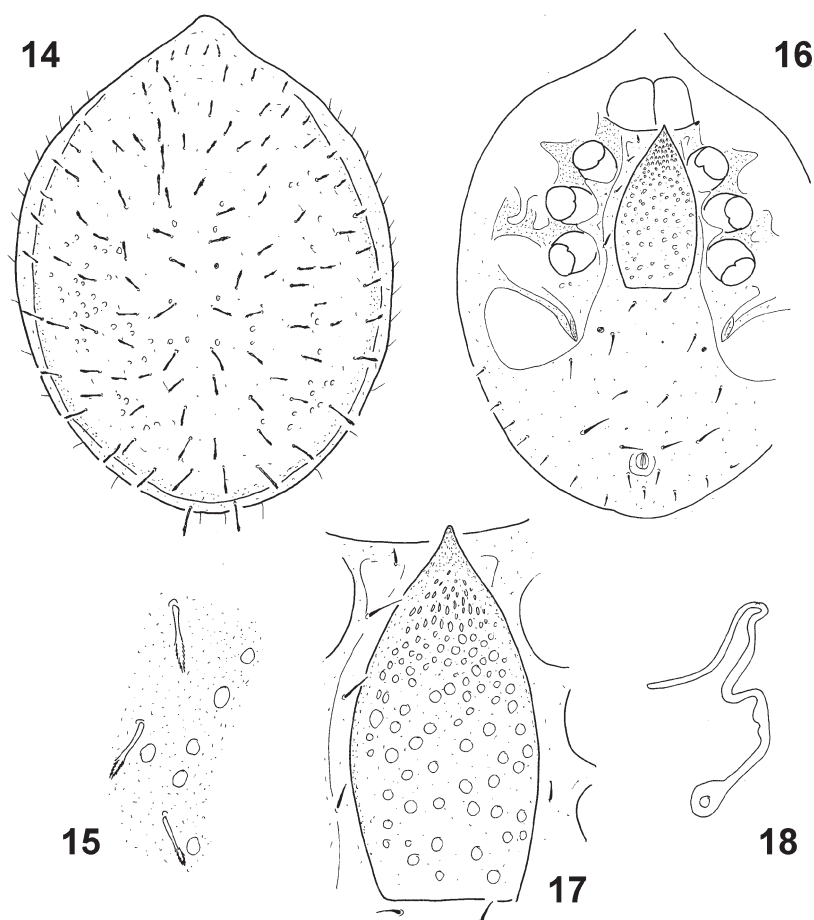
Etymology: We dedicate the new species to the memory of Dr Gábor Szabad, medical researcher in the Department of Dermatology and Allergology, Albert Szent-Györgyi Medical Center of the University of Szeged, who was shot by terrorists in January 2012 in the northern part of Ethiopia.

Description:

Female.

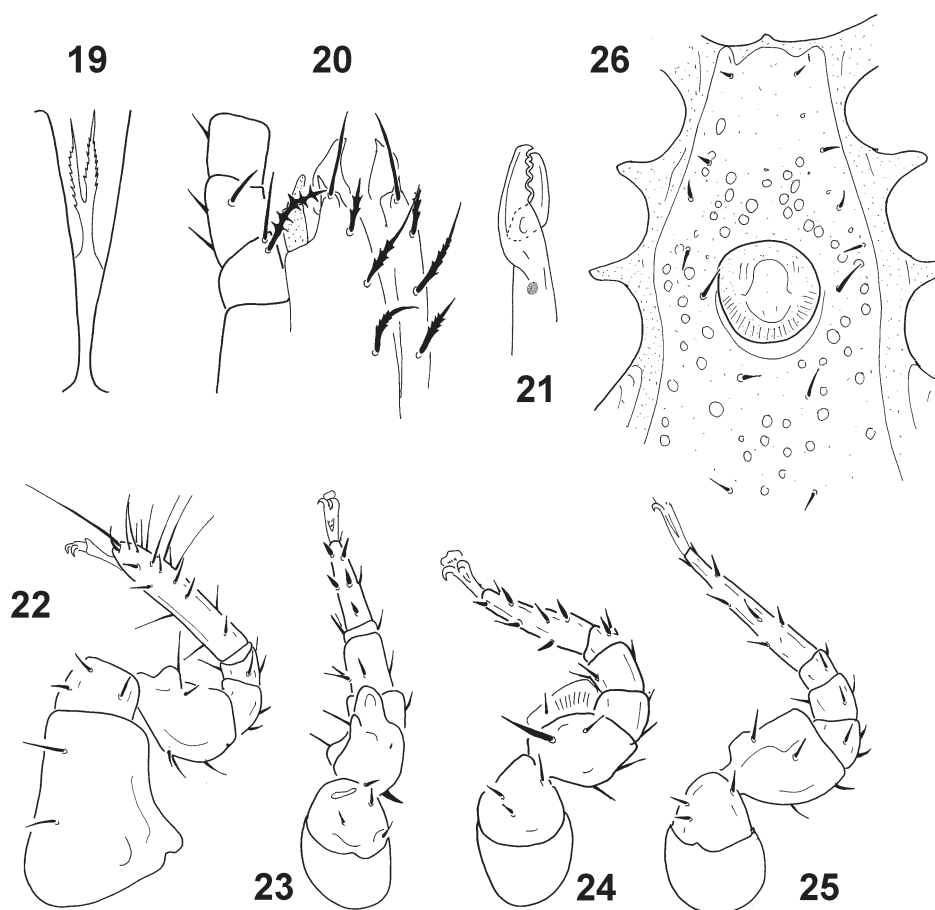
Idiosoma: length of 820–980 μm , width 610–740 μm ($n=4$). Body shape oval, dorsal part domed, colour reddish brown.

Dorsal aspect (Fig. 14): Dorsal and marginal shields fused anteriorly, dorsal shield polytrichous, all dorsal setae short (*ca* 40–50 μm) and apically pilose. Surface of dorsal shield covered by oval pits (Fig. 15). Marginal shield complete, not reduced in caudal region, bearing smooth and needle-like setae (*ca* 20 μm), surface without sculpture.



Figs 14–18. *Trichouropoda szabadi* sp. n., female, holotype: (14) body, dorsal view; (15) dorsal setae and ornamentation; (16) body, ventral view; (17) intercoxal area; (18) peritreme.

Ventral aspect (Fig. 16): Surface of sternal shield smooth. Five pairs of smooth and needle-like sternal setae present, St1 (*ca* 8 μ m) placed near anterior margin of sternal shield, St2 (*ca* 12 μ m) at level of central area of coxae II, St3 (*ca* 12 μ m) at level of posterior margins of coxae II, St4 (*ca* 20 μ m) at level of central area of coxae IV, St5 (*ca* 15 μ m) near basal edges of genital shield. Ventral shield bears four pairs of smooth and needle-like setae (*ca* 25–40 μ m); *ad* and *pa* similar in shape to ventral setae, but shorter (*ad*1 *ca* 33 μ m, *ad*2 *ca* 23 μ m and *pa* *ca* 15 μ m); several short (*ca* 15–20 μ m) and needle-like setae situated near caudal margin of ventral shield. Anal opening oval and elevated from surface of ventral shield. Metapodal lines present. Pedofossae deep and their surface smooth, with separate furrows on tarsi IV. Surface of ventral shield smooth. Genital shield scutiform, anteriorly pointed, covered by oval pits basally and centrally, but anterior area with oblong elliptic pits (Fig. 17). Stigmata situated between coxae II and III, prestigmatid area long with two curves, poststigmatid part absent (Fig. 18). Tritosternum with narrow base, laciniae divided into two serrate branches (Fig. 19).



Figs 19–26. *Trichouropoda szabadi* sp. n.: (19–25) female, holotype: (19) tritosternum (lateral parts covered by coxae I); (20) ventral view of gnathosoma and palps; (21) chelicerae; (22–25) legs I–IV, leg I in ventral view, other legs in lateral view; (26) intercoxal area of male.

Gnathosoma (Fig. 20): Setae *h1* situated near anterior margin of gnathosoma on small protuberances, smooth and needle-like (*ca* 30 μ m), *h2* short (*ca* 18 μ m) and marginally serrate, *h3* long (*ca* 38 μ m), basally serrate and apically smooth, *h4* long (*ca* 23 μ m) and marginally serrate. Palp trochanter with one marginally serrate seta and one smooth and needle-like seta, other setae on palp smooth. Corniculi short and horn-like, laterally with one tooth, internal malae longer than corniculi, smooth and wide. Epistome marginally serrate. Chelicerae short and robust, movable digit as long as fixed digit, with three teeth, fixed digit with four teeth, internal sclerotized node present (Fig. 21).

Legs (Figs 22–25): All legs with ambulacral claws, all setae on legs smooth.

Male.

Idiosoma: Length of 850 μ m, width 750 μ m (*n*=1). Shape and dorsal aspect as in female.

Ventral aspect (Fig. 26): Sternal shield covered by oval pits, six pairs of needle-like sternal setae present, St1–St4 and St6 short (*ca* 9–14 μ m), St5 long (*ca* 21 μ m). St1

placed near anterior margin of sternal shield, St2 at level of posterior margin of coxae II, St3 at level of anterior margin of coxae III, St4 at level of posterior margin of coxae III, St5 near lateral margin of genital shield, St6 near caudal margin of genital shield. One pair of lyriform fissures situated near St1. Genital shield circular, without sculptured pattern and *eg*, situated between coxae IV.

Gnathosoma: As in female.

Comparison: The new species belongs to the *Trichouropoda ovalis* group (Hirschmann & Wiśniewski 1986). A common character within this group is the presence of oval pits on the surface of the body. The new species can be easily separated from the other species of this group on the basis of the anterior ornamentation on the female genital shield, the smooth ventral shield and the number of sternal setae on the male, which is six pairs in the new species and five pairs in the previously described ones. This character combination is not found in other species in this species group.

Holotype: ♀ ETHIOPIA: 10 km S Ginchi city, 8°53'N 38°09'E, 2900 m, Cholomu forest, sample of mosses on trees, 15.xi.2009, leg. L.B. Rybalov (HNHM).

Paratypes: 3♀ 1♂ same data as for holotype (2♀ 1♂ ISB, 1♀ 1♂ HNHM).

ACKNOWLEDGEMENTS

We would like to thank Dr S. Ermilov (Nizhniy Novgorod, Russia), renowned oribatologist, for sending material from Ethiopia. Dr Hans Klompen (Columbus, OH, USA) and an anonymous reviewer are acknowledged for their comments on the manuscript. The study was supported by the Academy of Sciences of the Czech Republic, Research Plan No. AVOZ60660521.

REFERENCES

- HIRSCHMANN, W. 1993. Gangsystematik der Parasitiformes Teil 550. Bestimmungstabellen der Uropodiden der Erde. Atlas der Ganggattungen der Atrichopygidiina. *Acarologie. Schriftenreihe für Vergleichende Milbenkunde* **40**: 292–370.
- HIRSCHMANN, W. & WIŚNIEWSKI, J. 1986. Gangsystematik der Parasitiformes Teil 491. Weltweite Revision der Ganggattung *Trichouropoda* Berlese 1916. I. Die *ovalis*-Gruppe. (Trichouropodini, Uropodinae). *Acarologie. Schriftenreihe für Vergleichende Milbenkunde* **33**: 1–81.
- LINDQUIST, E.E., KRANTZ, G.W. & WALTER, D.E. 2009. Order Mesostigmata. In: Krantz, G.W. & Walter, D.E., eds, *A manual of acarology*. 3rd ed. Lubbock, Texas, USA: Texas Tech Univ. Press, pp. 124–232.
- WIŚNIEWSKI, J. 1993. Gangsystematik der Parasitiformes Teil 549. Die Uropodiden der Erde nach Zoogeographischen Regionen und Subregionen geordnet (mit Angabe der Länder). *Acarologie. Schriftenreihe für Vergleichende Milbenkunde* **40**: 221–291.
- WIŚNIEWSKI, J. & HIRSCHMANN, W. 1993. Gangsystematik der Parasitiformes Teil 548. Katalog der Ganggattungen, Untergattungen, Gruppen und Arten der Uropodiden der Erde. *Acarologie. Schriftenreihe für Vergleichende Milbenkunde* **40**: 1–220.