

## Two New Records of *Nenteria* Oudemans, 1915 (Acari: Uropodina: Trematuridae) for Turkey

Durmuş Ali BAL

Education Faculty of Erzincan, Atatürk University, 24030, Erzincan - TURKEY

Muhlis ÖZKAN

Faculty of Science and Arts of Department Biology, Atatürk University, 25240, Erzurum - TURKEY

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**Abstract:** Two species of *Nenteria*, collected from Erzincan plain, *Nenteria stylifera* and *Nenteria stammeri*, are new records for the fauna of Turkey. Their morphological features were re-examined and diagrams of them were drawn. In addition, their zoogeographical distribution is given.

**Key Words:** Acari, Uropodina, *Nenteria*, New Records, Systematics, Turkey

### Türkiye Faunası İçin Yeni İki *Nenteria* Oudemans, 1915 (Acari: Uropodina: Trematuridae) Türü

**Özet:** Erzincan ovasından toplanan *Nenteria* cinsinin iki türü, *Nenteria stylifera* ve *Nenteria stammeri*, Türkiye faunası için yeni kayıttır. Bu türlerin morfolojik özellikleri yeniden incelenerek şekilleri çizildi ve ayrıca zoocoğrafik dağılımları verildi.

**Anahtar Sözcükler:** Acari, Uropodina, *Nenteria*, Yeni Kayıtlar, Sistematik, Türkiye

### Introduction

The genus *Nenteria* was described by Oudemans (1915) with the type species *Uropoda tropica*. This genus is represented by 124 species worldwide, and 28 of them are distributed in the Palearctic region. Our knowledge about the Uropodids of Turkey is insufficient. To date, two species of Uropodina, *Crinitodiscus (Oriendiscus) pawlowskii* and *Crinitodiscus (Oriendiscus) rafalskii*, have been recorded from Turkey (1-3). This paper is a review of the morphological features and the distribution of the two species, which are new records for the Turkish fauna. The morphological and setal nomenclature are mainly derived from Hirschmann and Wisniewski (1993).

### Materials and Methods

The litter, soil, lichen and moss samples were taken from different habitats in Erzincan plain from May 1997 to June 1998. In total, 168 samplings were done and the locality and features were recorded. The samples were

placed in plastic bags, labelled and taken to the laboratory. Later, they were put into Berlese funnels. The samples were extracted for 5-7 days. At the end of this process, the bottles were removed from the apparatus and their contents were put into petri dishes, and picked up with the help of a needle and micro-pipettes under a stereo microscope. They were fixed in 70% ethanol and 1-2 drops glycerine. The examination and drawing were carried out using a Nikon (type-104) microscope.

### Results

Family: Trematuridae Berlese, 1917

Key For the Known Genera of Family Trematuridae from Turkey

1. Epistome dentate, its prolongation lancet in shape, chelicerae with a dorsal setae, corniculi with 1-5 denticles, lacinae of hypostome without paralacinae laterally ..... *Trichouropoda* Berlese, 1916

- Epistome without dentate, its prolongation cudgel in shape, chelicerae without a dorsal setae, corniculi conical and without denticle, prolongation of tritosternum with long middle branch, laciniae of hypostome with paralacinae laterally.....  
.....*Nenteria* Oudemans, 1915

Genus: **NENTERIA** OUDEMANS, 1915

Chelicerae with nodus and multidentate, hyaline appendages short and rounded, sensillum distale underside, cavicula fixi short and swallow, the ratio of movable digit to fixed digit: 3.20-14.50. Movable digit with one or two, fixed digit usually 2 or 3 denticles. Condilus doorknob-shaped, the ratio of the middle part to the movable digit: 3.20-3.7. Corniculi narrow, horn-like, one sharp ended and its interior side denticled. Paralacinae large, smooth and rounded; protosternum funnel-like and smooth. Deutosternum distinct, bearing sclerotized tubercles, with one-two or more denticles. C<sub>1</sub> usually smooth; C<sub>2</sub> - C<sub>4</sub> denticled. Base of the tritosternum four-sided or vase-shaped; laciniae usually with 3, rarely 2 or 5 branched. Epistome consists of two parts: base and prolongation; the base part narrowed and conical, the prolongation cudgel shaped and divided into 2 or 3 branches distally.

**NENTERIA STYLIFERA** (BERLESE, 1904)

Female

Idiosoma oval 512/326 µm in size, slightly narrowed at the front side and forming a cape. Dorsal shield with about 72 pairs short of setae, setal distribution untidy. The setae do not reach base of following setae. However, two pairs of setae, found at posterior end, longer than the others. Setae of marginal shield are short (Fig. 1A, B).

Palpal coxae fused with each other, by beginning from the level of C<sub>1</sub>; C<sub>2</sub> - C<sub>4</sub> branched or with triangular denticled; C<sub>2</sub> short and do not reach base of C<sub>1</sub>; C<sub>3</sub> reaches base of C<sub>1</sub>; C<sub>4</sub> not branched and reaches base of C<sub>3</sub>. Corniculi horn-like, far from each other anteriorly (Fig. 3C). Chelicerae with nodus, movable digit possesses 2 denticles, fixed digit bearing a hyaline appendage and with three denticles (Fig. 1D). Epistome cudgel in shape and its tip rounded, middle region denticulate, base part rectangular, front end blunt and both sides denticulate (Fig. 1E). Ventrianal shield smooth posteriorly, its free part three furcated. Appendages of tritosternum three branched, middle part longer and denticulated, lateral ones short and smooth (Fig. 1F). Peritrema twisted in

front of coxae II with an appendage continuing after stigmatal opening.

Coxae of leg I large and fused at mid-posterior end, the triangle between front sides narrowed. The fossae of other three legs highly obvious. The length of whip-shaped setae on tarsi I two times longer than other tarsal setae. Claws of legs II-IV fine and hook-like, extended anteriorly; femora I and IV, and trochantera I with chitinous squamosal trotter (Fig. 2A-D).

**Deutonymph**

Idiosoma oval and 480 µm in length, 347 µm in width. Setae on the marginal shield thorn-like, smooth and short and inserted in a chitinous tubercle. Sternal shield with pitted pattern, its setae short, smooth and thorn shaped (Fig. 1C). Other features same as in the female (Fig. 1B).

Materials Examined

Erzincan, soil and litter from poplar woodland (*Populus* sp.) in the east region of Karasu Bridge. 20.10.1997, 283 ♀ ♀, 41 deutonymphs; 14.11.1997, 616 ♀ ♀, 146 deutonymphs; 10.1.1998, 325 ♀ ♀, 122 deutonymphs; 9.6.1998; 73 ♀ ♀, 12 deutonymphs.

**NENTERIA STAMMERI**, HIRSCHMANN & Z-NICOL, 1962

**Deutonymph**

Idiosoma 419 µm in length, 293 µm in width, narrowing anteriorly and forming a cape. Dorsal shield entire, setal contribution untidy, setae short and do not reach base of following ones. Marginal shields divided and resemble shields of a tortoise, upper side setae smooth, thorn-like and short, arising from chitinous tubercles (Fig. 3A, B).

C<sub>1</sub> needle shaped, long and reaching end of laciniae. C<sub>3</sub> fairly long, smooth, spindle-like and passing base of C<sub>1</sub>; C<sub>4</sub> with thorn and reaching base of C<sub>3</sub>. Laciniae of hypostome smooth and without denticle. Corniculi horn-like, its ends sharp and far from each other. Hypostomal constriction occurs between C<sub>3</sub> and C<sub>4</sub>. Chelicerae with nodus, movable digit with 2, fixed digit with 3 denticles, and bearing a small hyaline appendage (Fig. 3D). Pattern of sternal shield, resembling semicircle, arranged oppositely. Sternal setae short, smooth and thorn-like.

Coxae I fairly large, approaching each other in coxal triangle and a small part of tritosternum can be seen from outside. Setae situated on anal and ventral shields

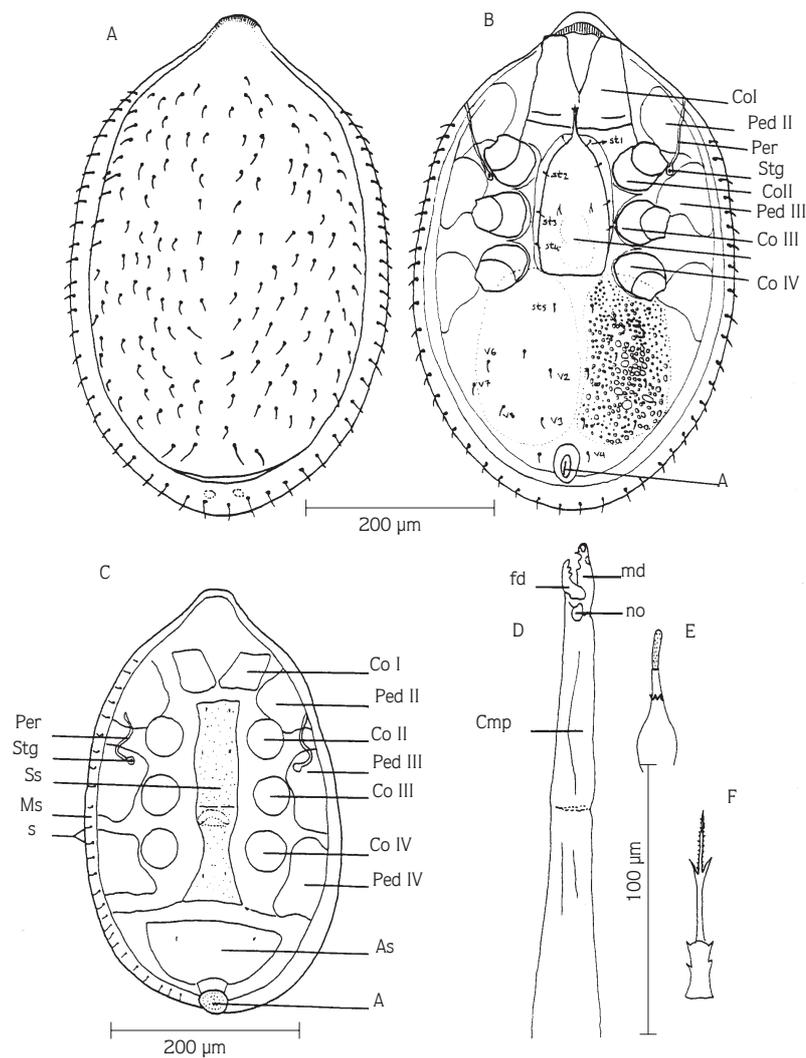


Figure 1. *Nenteria stylifera*: Female; A) Dorsal view, B) Ventral view, Deutonymph; C) Ventral view, Female; D) Chelicerae, E) Epistome, F) Tritosternum.

resemble sternal setae. Anus basket-like, its wall well sclerotized and a pair of thorn-like anal setae existing on circumanal area. The base of tritosternum in a bowl shape, two projections existing anteriorly. Its appendage three pieced, middle part longer than the other, and knob with denticle. Peritreme starts at level of coxae I and II, slightly twisting and finishing with a stigmatal opening between coxae II and III.

Legs usually short and broad, a dense setation present at the end of tarsi I. Whip setae long and approximately equal to length of tarsi. A chitinous trotter present on femora. Other leg pairs possess one poorly developed pair of digits. Setae of legs needle-like and usually similar to each other.

#### Material examined

Erzincan, litter and soil sample from green areas, Terzibaba Cemetery, 14.05.1997, 3 deutonymphs.

#### Discussion

*N. stylifera* is a widespread species in Europe, and is known from Germany, Austria, Belgium, Czechoslovakia, Italy, Spain, Hungary and Russia to date (4). The finding that the species has also been caught in Turkey shows that the zoogeographical distribution of this species is wider than previously considered and indicates that it is not continent endemic.

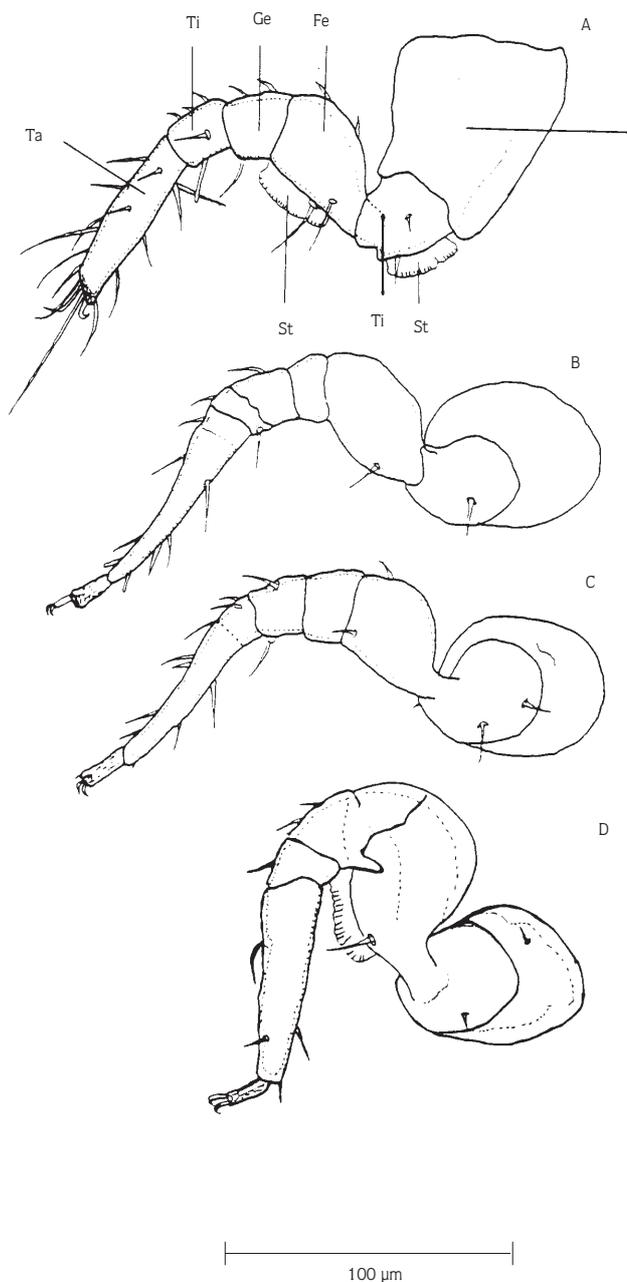


Figure 2. *Nenteria styliifera*: Female: A) Leg I. B) Leg II. C) Leg III. D) Leg IV.

*Nenteria styliifera* is known to live regularly in nests of ants and wasps, on moss, decayed or decaying woods, in litter under deciduous trees, on grass and field soil (5). However, in accordance with the habitats given before for *Nenteria*, our specimens were also collected from poplar woodland with rich organic materials.

Some effort has been made to simplify the classification of *Nenteria* to form species-groups. In such

grouping, *N. styliifera* has been seen to be close to the *N. pasifica* (Vitzhum, 1935) (Marquises Islands), *N. mahunkai*, Hirschmann 1972 (Chili), *N. venezolana* (Sellnick, 1963) (Venezuela), but has been distinguished from the other similar species by the branching prolongation of the epigynial shield anteriorly. The other important feature is the location of the sternal setae and genital shield that extend posteriorly, and  $st_1$  and  $st_2$  have been found to be close to the epigynial shield (4-6). The idiosomal size has been given as 495-530/370-355  $\mu\text{m}$  (7), in the same way, the sizes of our specimens are in agreement with these values. Whatever agreement the shape of epigynial shield has shown in general, there can be some differentiation, such as the ratio of length to width. The ratio of the shield has been given as 2.23 but that of our specimens is 2.04. In terms of ratios and identification of the epigynial shield, which is thin and bullet shaped, our specimens are very different from *Nenteria styliifera* but close to *N. pasifica* (2.08), *N. stammeri* (Hirschmann and Nicol, 1962) (2.07) and *N. microycha* (Trägardh, 1952) (2.00); however, in terms of other features *N. styliifera* differed from these species (8).

It is emphasized that ten transverse rowed small denticles have been found on its hypostome (9) but it was not possible to determine this feature in our specimens. The features given for the epistome are the same in general but in our specimens the knob in the free end is poorer than that given by Hirschmann and Z-Nicol (9). Our specimens have similarities with Hirschmann-Z. Nicol's (9) in terms of the location of the setae (Fig. 1A-F, 2A-D, 3C). The small pits on the sternal shield are widely set and large, according to these authors. Our specimens possess especially small pits but also, rarely, large ones. The other important characteristic was seen in the peritrema. In preceding specimens, the peritrema possesses a prolongation behind the stigmatal opening, but in ours, the peritrema does not bear an extension.

These findings have indicated that our knowledge on the distribution and variation intervals of this species is inadequate. These cases should be recorded as features of *N. styliifera* and considered that the current ones may be changed by collecting new data on new specimens and reviewing the species.

*N. stammeri* Hirschmann and Z-Nicol, 1962 has been known from the West Palearctic region (Germany, Spain, Romania and Lithuania) (4,5). It seems that this species is

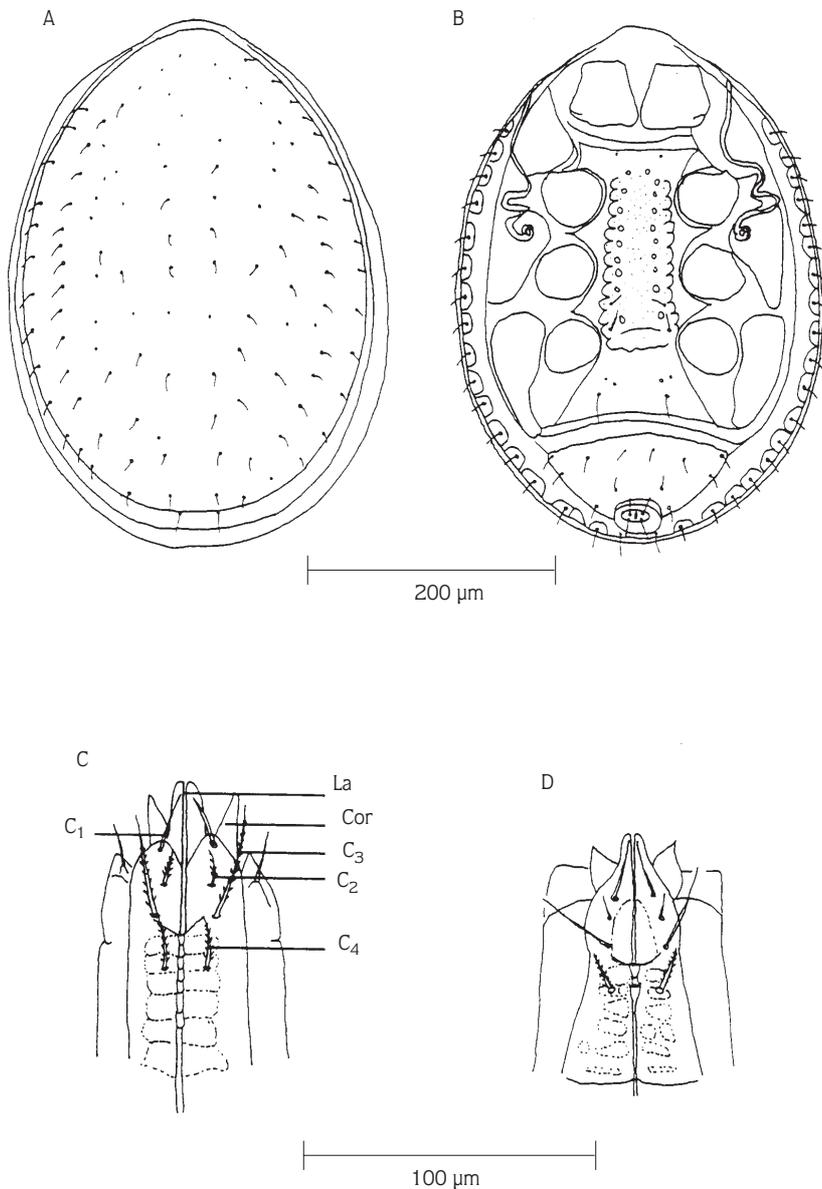


Figure 3. *Nenteria stammeri*: Deutonymph; A) Ventral view, B) Dorsal view. *Nenteria stylifera*: Female; C) Ventral view of gnathosoma. *Nenteria stammeri*: D) Ventral view of gnathosoma.

not continent endemic any longer as it has also been caught in Turkey. This species had been collected from dungy areas, under deciduous trees, from greenhouse and deposited material under broken glass (4,5), but our specimens were caught from the habitat with high humidity and protected grassland.

According to Hirschmann and Wisniewski, the deutonymph of *N. stammeri* is 480/370 µm in size (10), but these values were 440/307 µm in our specimens. Deutonymphs of *N. stammeri* are flattened dorsoventrally and possess an elliptic shape longitudinally; sclerotization

is weak, sharpness and narrowness at the front end are distinctive, dorsal shield with small pits and ventral setae short and thorn-like (10). These features have been used as features of a species-group (4). This kind of evaluation undoubtedly has caused some complexities and difficulties in separation of the species in this group that does not have enough distinctive features. Upper group problems should be reconsidered adequately and reviewed also in uropodids.

The deutonymph of *N. stammeri* Hirschmann and Z-Nicol, 1962 has been seen to be close to that of *N.*

*ritzemai* Oudemans 1903 (which is distributed in Europe: Germany, Holland and Belgium, in South America: Brazil and Trinidad), *N. piloselloides* Hirschmann and Hiramatsu 1978 (in the Middle East: Israel), *N. micherdezinskii* Hirschmann and Z-Nicol 1969 (in Asia: Vietnam), *N. mesoamericana* Wisniewski and Hirschmann 1985 (in Central America), *N. ritzemaisimilis* Hirschmann and Hiramatsu 1978 (Japan). Nevertheless, it can be distinguished by the posterior margin of the dorsal shield without a chitinous arc, two whip-shaped setae not existing dorsally and a sternal shield with numerous small pits. The features of our specimens have shown agreement the ones given before, but a detailed comparison was not made, since mature specimens were not caught.

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## Abbreviations

As: Anal shield, Ms: Marginal shield, Gs: Genital shield, Ss: Sternal shield,

A: Anus, Ped I-IV: Pedofossae I-IV Per: Peritrema, Stg: stigmatal opening,

Tri: Tritosternum, Ep: Epistome, Ch: Chelicerae, fd: fixed digit, no: nodus,

md: movable digit, Cmp: middle part, Cor: Corniculi, St1-St5: Sternal setae,

V<sub>1</sub>-V<sub>8</sub>: Ventral setae, C1-C4: Coxal hypostomal setae, s: setae, Co: I-IV: Coxae I-IV,

L<sub>1</sub> -L<sub>4</sub>: Leg I-IV, Co: Coxae, Tr: Trochanter, Fe: Femur, Ge: Genu, Ti: Tibia,

Ta: Tarsus, St: Squamosal trotter, La: Lacinia