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# New Records and Description of a New Subspecies for the Water Mite Fauna (Acari, Hydrachnidia) of Turkey from the Eastern Black Sea Coast

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**Abstract:** A new subspecies, *Mixobates brachypalpis ozkani* subsp. nov., is described from a stream in the Rize region (Eastern Black Sea coast, Turkey). The new subspecies can be easily distinguished from the type material of *M. brachypalpis*, a species reported only from the *locus typicus* in Russia, by the more elongated and slender I-L-5/6. In addition, 3 water mite species (*Torrenticola oraviensis* (Láska, 1953), *Torrenticola thori* (Halbert, 1944) and *Mideopsis roztoczensis* Biesiadka and Kovalik, 1979) are reported for the first time from Turkey.

**Key Words:** Acari, water mites, taxonomy, new subspecies, new records, Turkey

## Doğu Karadeniz Kıyılarından Türkiye Su Kenesi Faunası İçin Yeni Kayıtlar ve Bir Alttür Tanımı (Acari, Hydrachnidia, Hygrobatidae)

**Özet:** *Mixobates brachypalpis ozkani* subsp. nov. Rize yöresinden (Türkiye'nin Doğu Karadeniz kıyıları) yeni bir alttür olarak tanımlanmıştır. Bu alttür, sadece Rusya da yayıldığı bilenen *M. brachypalpis* türünün tip örneği I.B/5-6.' den daha uzun ve narin olmasıyla kolaylıkla ayrit edilebilir. Ayrıca bu çalışmada üç su kenesi türü (*Torrenticola oraviensis* (Láska, 1953), *Torrenticola thori* (Halbert, 1944) and *Mideopsis roztoczensis* Biesiadka and Kovalik, 1979) de Türkiye faunası için yeni kayıt olarak verilmiştir.

**Anahtar Sözcükler:** Acari, Su kenesi, Taksonomi, Yeni alttür, Yeni kayıtlar, Türkiye

## Introduction

The genus *Mixobates* was described by Thor (1905). To date, 13 species have been described in this genus (Tuzovskij and Gerecke, 2003). *Mixobates* species are recorded from patchy localities only, generally found in low numbers of specimens, mostly in mossy riffles of low order streams (Tuzovskij and Gerecke, 2003).

Very little is known about the water mites in running waters in Turkey and only a few regions have been intensively studied (e.g., Özkan, 1982; Boyacı and Özkan, 1994; Smit, 1995; Özkan et al., 1996; Turan and Pešić, 2005). The aim of this paper is to present new data that contribute to our knowledge about the morphology, geographical distribution, and habitat preference of Turkish members of the water mite species recently

collected in the running waters of the Eastern Black Sea coast of Turkey.

## Materials and Methods

Water mites were collected by hand netting, sorted on the spot from the living material, conserved in Koenike's fluid and dissected as described elsewhere (e.g., Gerecke, 1991). The holotype and 2 paratypes of the new subspecies were deposited in the Zoological Museum of Ege University (İzmir, Turkey); a further 2 paratypes were found in the Museum of the Natural History of Podgorica (Montenegro). In the section "Material examined" collection site abbreviations are derived from the geographical database managed by V. Pešić.

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The setae terminology for *Mixobates* follows Tuzovskij and Gerecke (2003): Fcx – setae of the cheliceral segment, Pe – *praeanales externae*. The composition of the material is given as: (males/females/deutonymphs), and the following abbreviations are used: Ac-1 = first acetabulum, Cx-1 = first coxae, dL = dorsal length, H = height, L = length, I-L-6 = Leg 1, sixth segment, P-1 = palp, first segment, W = width. All measurements are given in micrometres.

**Results**

**Family TORRENTICOLIDAE**

Genus *Torrenticola* Piersig, 1896

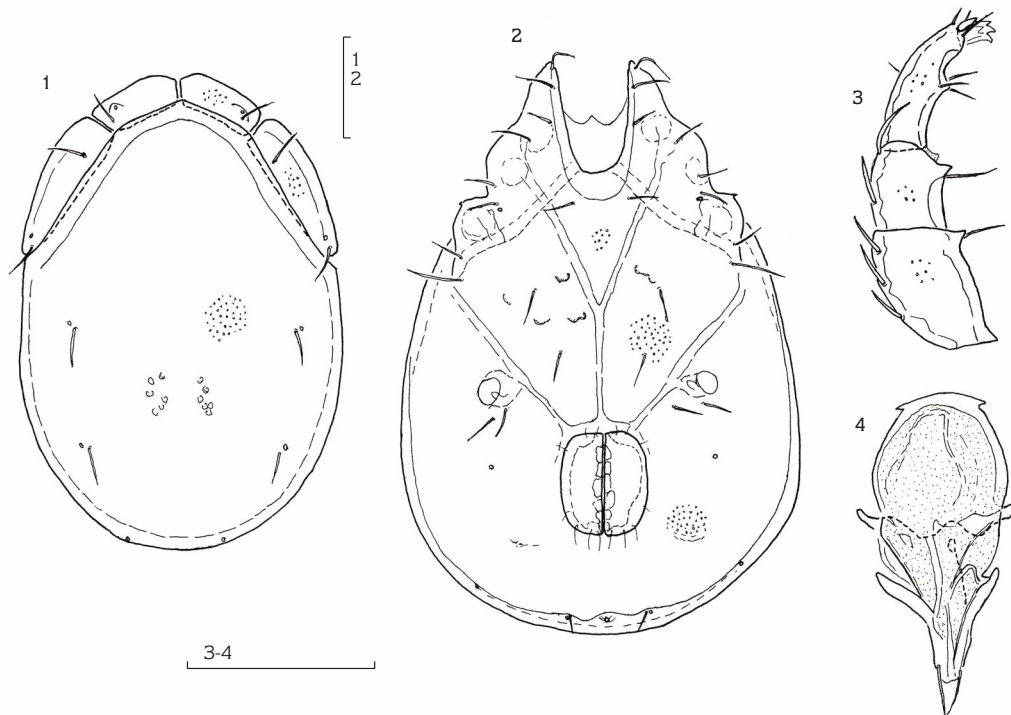
Subgenus *Torrenticola* Piersig, 1896

*Torrenticola oraviensis* (Láska, 1953)

Material examined: TR3 Rize Province, Cayeli town area, Erenler stream (on road to Hemsin), 19.07.2005, leg. Pešić & Vukasinovic- Pešić (3/0/0); TR19 Artvin Province, Hopa stream near Koyuncular village (near Hopa town), 28.07.2005, leg. Pešić, Turan & Vukasinovic-Pešić (1/0/0).

Morphology: Male: Idiosoma (ventral view: Figure 2) L 673, W 459, dorsal shield (Figure 2) L 572, W 400, L/W ratio 1.43; dorsal plate L 538; shoulder plate L 184; frontal plate L 106; shoulder/frontal plate L ratio 1.74; gnathosomal bay L 137, Cx-1 total L 287, Cx-1 medial L 149, Cx-2+3 medial L 148; ratio Cx-1 L/Cx-2+3 medial L 1.93; Cx-1 medial L/Cx-2+3 medial L 1.94; genital field L/W 124/100, L/W ratio 1.24; ejaculatory complex (Figure 4) L 175; distance genital field–excretory pore 96, genital field–caudal idiosoma margin 119; gnathosoma ventral L 259; chelicera L 306, ratio chelicerae basal segment /claw L 4.7; palp (Figure 3) total L 267, dorsal length and relative length (in parentheses given as % of total length): P-1 30 (11.2), P-2 82 (30.7), P-3 50 (18.7), P-4 85 (31.3), P-5 20 (7.5); P-2/P-4 ratio 0.97; ventrodiscal protrusions of P-2 and P-3 short and pointed.

Remarks: In view of idiosoma dimensions, a reduced genital field and a relatively long median suture line of Cx-2+3 in males, ventrodiscal protrusions of P-2 and P-3 short and pointed, absence of long hairs at the posterior margin of the genital field and the ejaculatory complex bearing well-developed proximal horns, the Turkish



Figures 1-4. *Torrenticola oraviensis* (Láska, 1953), male: 1 = dorsal shield; 2 = idiosoma, ventral view; 3 = palp (P-2/5), medial view; 4 = ejaculatory complex. Scale bars = 0.1 mm.

specimens show a general conformity with *Torrenticola oraviensis* (Láska, 1953). The dimensions of the Turkish specimen agree well with the variability range of Macedonian populations (Di Sabatino et al., 2003).

Distribution (first record from Turkey): Austria, Czech Republic, Italy, Serbia and Montenegro, Macedonia, Greece.

Subgenus *Megapalpis* Halbert, 1944

*Torrenticola thori* (Halbert, 1944)

Material examined: TR11 Rize Province, small stream in the lower part of Çağlayan stream near Fındıklı town, 23.07.2005, leg. Pešić, Turan & Vukasinovic-Pešić (0/1/0); TR19 Artvin Province, Hopa stream near Koyuncular village (near Hopa town), 28.07.2005, leg. Pešić, Turan & Vukasinovic-Pešić (0/2/0).

Morphology: Female: Idiosoma (ventral view: Figure 5) L 875, W 563, dorsal shield L 831, W 431, L/W ratio 1.93; dorsal plate L 731; shoulder plate L 230; frontal plate L 144; shoulder/frontal plate L ratio 1.6; gnathosomal bay L 142, Cx-1 total L 310, Cx-1 medial L 159, Cx-2+3 medial L 13; ratio Cx-1 L/Cx-2+3 medial L 1.95; Cx-1 medial L/Cx-2+3 medial L 24.8; genital field L/W 218/181, L/W ratio 1.2; distance genital

field–excretory pore 255, genital field–caudal idiosoma margin 322; gnathosoma (Figure 7) ventral L 413; chelicera (Figure 6) L 480, ratio chelicerae basal segment/claw L 1.54; palp (Figure 7) total L 488, dorsal length and relative length (in parentheses given as % of total length): P-1 51 (10.5), P-2 194 (39.8), P-3 53 (10.9), P-4 167 (34.2), P-5 23 (4.7); P-2/P-4 ratio 1.16.

Remarks: *T. thori* is characterised by the slender shape of body and mouthparts, with particularly long cheliceral claws (ratio basal segment/claw <2.0). Figures 5-7 show some morphological details of the specimen from Rize province.

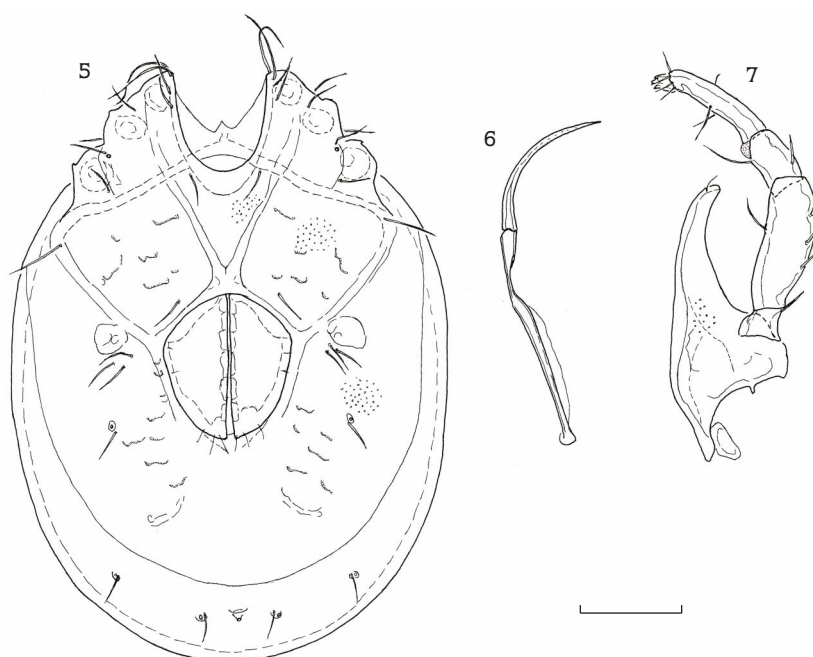
Distribution (first record from Turkey): Western, Eastern and Central Europe (Gerecke et al., 2005), Iran (Pešić et al., in press).

Family HYGROBATIDAE

Genus *Mixobates* Thor, 1905

*Mixobates brachypalpis ozkani* subsp. nov.

Type series: Holotype: male dissected and slide mounted in Hoyer's fluid; Rize province, Güneysu town, upper part of Kangel stream (tributary of Taşlı stream) near Kangel village, 18.07.2005, leg. Pešić &



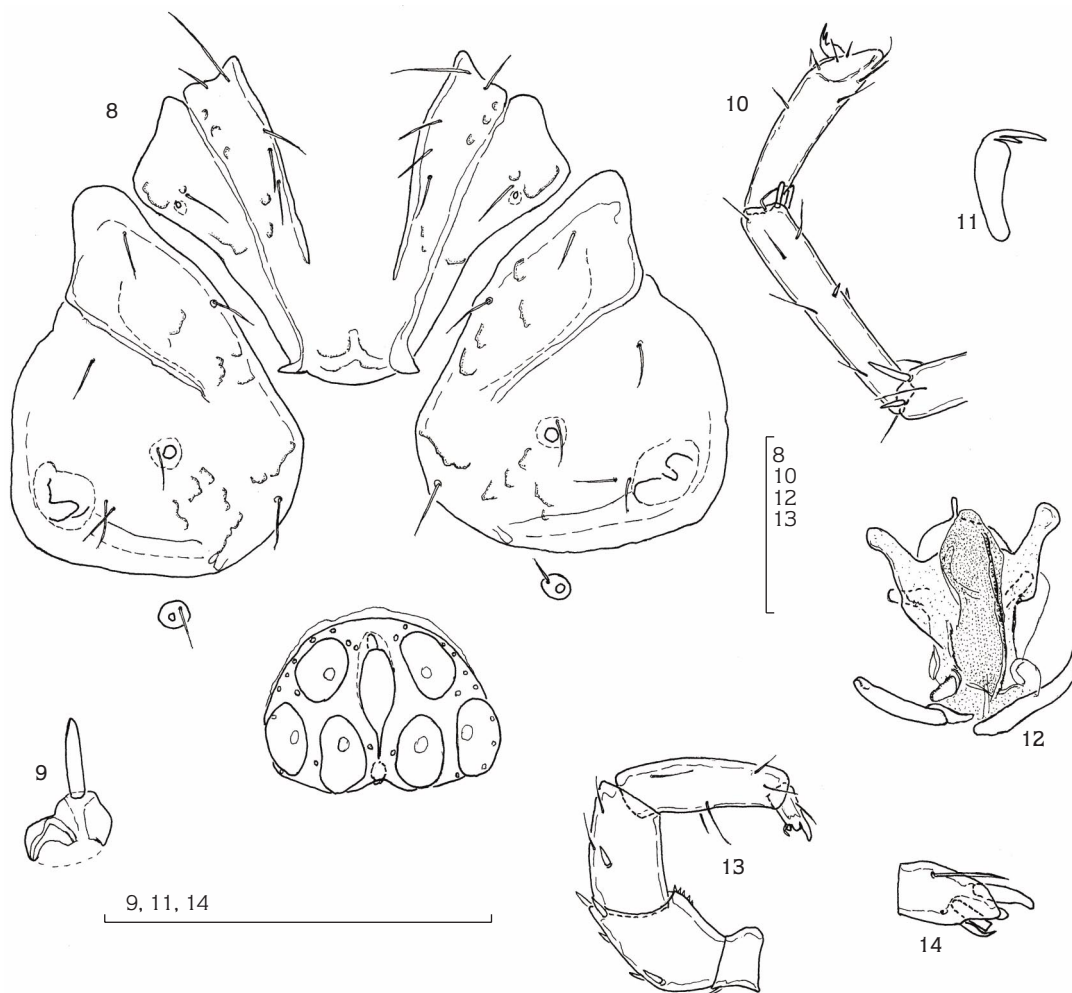
Figures 5-7. *Torrenticola thori* (Halbert, 1944), female: 5 = idiosoma, ventral view; 6 = chelicera; 7 = gnathosoma and palp, lateral view. Scale bar = 0.1 mm.

Vukasinovic- Pešić. Paratypes: 4 females, same data as holotype, one of them dissected and slide mounted in Hoyer's fluid.

**Description**

Male: Idiosoma L 531, W 444; Setae Fch (Figure 9) thickened, longer than diameter of its insertion sclerite; Cx-1+2 (Figure 8) weakly narrowed posteriorly and with broad, convex mediocaudal margin; suture line Cx-3/4 not reaching the medial margin of the plate; glandularia Pe 27 mm from the suture line Cx-3/4; first leg as depicted in Figure 10: I-L-5 dL 144, maximum H 29, L/H 5.0, with a pair of ventral setae placed slightly distally from the centre of the segment, a fine whip-shaped seta anteriorly at the distal margin, and a pair of club-shaped

ventrodistal setae (L 17): I-L-6 L 120, maximum H 27, L/H 4.4, L ratio I-L-5/6 1.2, distally slightly thickened; claws bearing a weakly developed claw blade (Figure 11). Genital field (Figure 8) roundish-triangular, L 96, W 133; acetabula covering a large part of the area of the plates, in triangular position, maximum diameter of acetabula 1-3: 37-41-43; gonopore L about 2/3 genital field L, 14-15 genital hairs on each side, ejaculatory complex (Figure 12) L 140. Chelicera basal segment L 147, claw L 69. Palpus (Figure 13) total L 312, dL and relative L (in parentheses given as % of total length): P-1 27 (8.7), P-2 82 (26.2), P-3 74 (23.7), P-4 102 (32.6), P-5 27 (8.7); P-2 ventrodistally without projection, bearing 8-9 fine dents; P-3 with straight and smooth ventral margin,



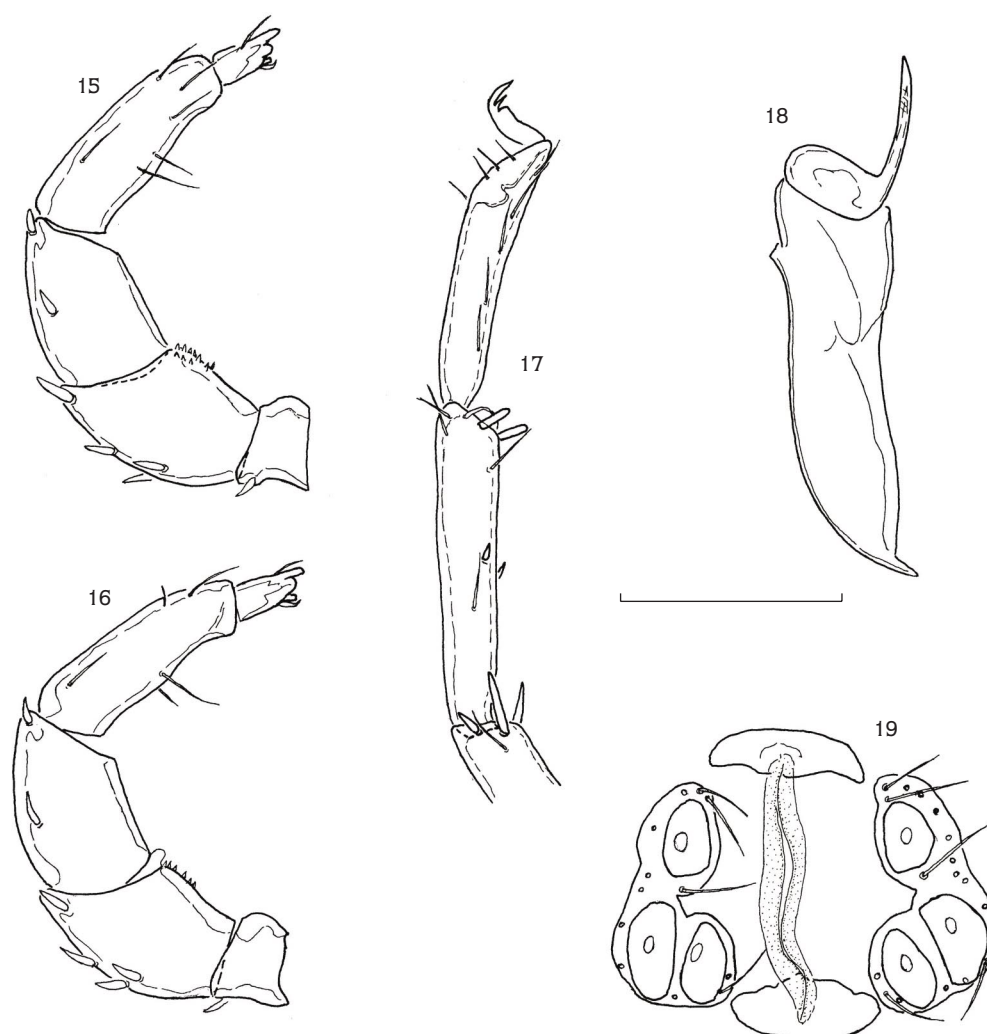
Figures 8-14. *Mixobates brachypalpis ozkani* subsp. nov., male: 8 = coxal and genital field; 9 = seta Fch; 10 = I-L-5/6; 11 = claw; 12 = ejaculatory complex; 13 = palp, lateral view; 14 = P-5. Scale bars = 0.1 mm.

ventral margin of P-4 slightly protruding distally near the insertion of the paired ventral hairs, P-5 (Figure 14) rather short, dorsodistal claw strong, 2 ventrodiscal claws strongly different in shape and dimensions: one of them truncated, the other pointed and bent dorsally.

Female: Idiosoma L 603, W 519; coxal field as in male; first leg as depicted in Figure 17: I-L-5 dL 159, maximum H 31, L/H 5.1, club-shaped setae L 17; I-L-6 L 142, maximum H 28, L/H 5.1, L ratio I-L-5/6 1.1; genital field (Figure 19) L/W 148/181, praegenitale W 77, postgenitale W 62, W ratio prae-/postgenitale 1.24; genital plate L 108, medial margin with deep indentation on the level of the second acetabula; maximum diameter of acetabula 1-3: 38-46-40; chelicera (Figure 18) basal

segment L 173, claw L 84. Palpus (Figures 15-16) as described for the male, total L 358, dL and relative L (in parentheses given as % of total length): P-1 33 (9.2), P-2 96 (26.8), P-3 86 (24.0), P-4 113 (31.6), P-5 30 (8.4).

Discussion: Due to the particular shape of the ventrodiscal claws on P-5 and the presence of ventral thickening on P-4, the Turkish specimens show a general conformity with *M. brachypalpis* Tuzovskij, 2003, a species known only from the *locus typicus* in Russia (Krasnodar-Sewersk region). The Turkish specimens can be easily distinguished from the material type of *M. brachypalpis* (in parentheses, from Tuzovskij and Gerecke, 2003, measurements calculated from figures)



Figures 15-19. *Mixobates brachypalpis ozkani* subsp. nov., female: 15 = palp, lateral view; 16 = palp, medial view; 17 = I-L-5/6; 18 = chelicera; 19 = genital field. Scale bar = 0.1 mm.

by the more elongated and slender I-L-5/6, ratio L/H I-L-5 5.1, I-L-6 4.4-5.1 in both sexes (ratio L/H I-L-5 3.3, I-L-6 3.1 in male). Further differences are found in club-shaped ventrodiscal setae I-L-5 (more pointed in type material of *M. brachypalpis*) and less developed ventral thickening on P-4. However, all these characters are known to be variable (Tuzovskij, pers. communication) and probably these specimens represents a Turkish race of *M. brachypalpis*.

Due to the shape of I-L-5/6 and the posterior part of Cx-1/2 (little narrowed, with largely rounded medioposterior margin) the new subspecies resembles *M. processifer* and *M. incurvatus*. *M. brachypalpis* can be easily distinguished from both species due to the presence of ventral thickening on P-4 and the particular shape of the ventrodiscal claws on P-5.

**Etymology:** The subspecies is named after Prof. Dr. Muhlis Özkan in recognition of his studies of the Turkish water mite species.

**Biology:** As indicated by only, so far, known record, *M. brachypalpis ozkani* subsp. nov. is a rhitrobiontic species.

**Distribution:** Turkey, only known from the *locus typicus*.

#### Family MIDEOPSIDAE

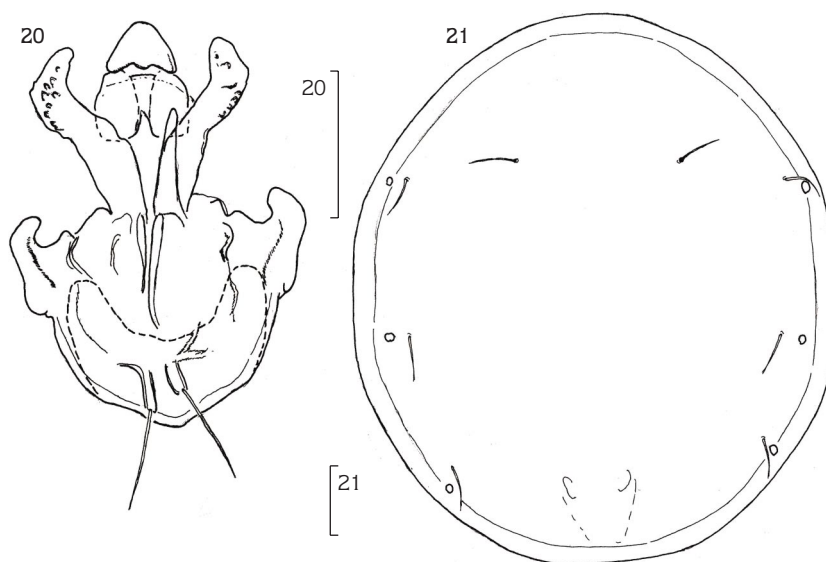
Genus *Mideopsis* Neuman, 1880

#### *Mideopsis roztoczensis* Biesiadka and Kovalik, 1979

**Material examined:** TR5 Rize province, Çiftekavak stream near Rize city, 20.07.2005, leg. Pešić, Turan & Vukasinovic- Pešić (0/2/0); TR13 Rize province, small stream in lower part of Gaplayam stream near Findıklı town, 23.07.2005, leg. Pešić, Turan & Vukasinovic- Pešić (1/0/0); TR15 Yeniol stream, 10 km E Ardesen (on road to Findıklı city), 28.07.2005, leg. Pešić, Turan & Vukasinovic- Pešić (6/7/0).

**Remarks:** This species has probably been confused for a long time with *Mideopsis orbicularis* (Müller). *Mideopsis roztoczensis* can be distinguished from *M. orbicularis* at a glance owing to the high convexity of its dorsal shield (Figure 21), the setting of the excretory pore a short distance from the posterior end of the genital field (30 mm in the male from Rize province), and the structure of the copulatory organ (Biesiadka and Kovalik, 1979): in *M. roztoczensis* the basic part of the copulatory organ is wedge-like (Figure 20), while in *M. orbicularis* it is regularly rounded.

**Distribution** (first record from Turkey): Poland, Germany, Balkans, Iran.



Figures 20-21. *Mideopsis roztoczensis* Biesiadka and Kovalik, 1979, male: 20 = ejaculatory complex; 21 = dorsal shield. Scale bars = 0.1 mm.

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