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A New *Hydrovolzia* Species (Acari: Hydrachnellae: Hydrovolziidae) for the Turkish Fauna

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Abstract: Characteristics of male and female *Hydrovolzia placophora* (Monti, 1905), which is a new species for the Turkish fauna, are given, along with its description and distribution throughout the world.

Key Words: Turkey, Systematics, *Hydrovolzia placophora*, new record, Hydrovolziidae Hydrachnellae, Acari

Türkiye Faunası İçin Yeni Bir Su Kenesi (Acari, Hydrachnellae, Hydrovolziidae) Türü: *Hydrovolzia placophora* (Monti, 1905)

Özet: Bu çalışmada Türkiye faunası için yeni olan *Hydrovolzia placophora* (Monti, 1905)'nin erkek ve dişilerinin yapısal özellikleri ve dünyadaki dağılımları verilmektedir.

Anahtar Sözcükler: Türkiye, Sistematik, *Hydrovolzia placophora*, yeni kayıt, Hydrovolziidae, Hydrachnellae, Acari

Introduction

Fifteen species of *Hydrovolzia* have been identified to date (Sokolow, 1940; Viets, 1956; Szalay, 1964; Bader, 1979; Bader and Sepasgosarian, 1979). Seven of these are found in Asia (*H. birmanica*: Burma, *H. infrigata*: India, *H. japonica*: Japan, *H. javanica*: Java, *H. tenuipalpis*: Burma, and *H. persica*: Iran). Only one subspecies of *H. persica* namely *hydrovolzias* has been reported for Turkey (Özkan, 1982).

In this study, *Hydrovolzia placophora* (a new species for the Turkish fauna), which is unique to Europe and ecologically regarded as the characteristic species of Rheopsammokrenon, is described on the basis of its structural characteristics and zoogeographic distribution.

Materials and Methods

Samples were collected, preserved and prepared according to the methods given by Özkan (1981). Sample figures were drawn and the dimensions were measured in micrometers.

Findings

Hydrovolziidae Thor, 1905

Integument is thickly striped. Frontal plate width is longer than its length and it is not connected to the other dorsal plates. Dorsal plate length is longer than its width and it has 4 setae on it. There are 5 or 10 smaller plates, on both sides of the dorsal plate.

Lateral eyes with or without capsules. There is no middle eye. Both sexes may have gland opening.

*Hydrovolziidae*s have gland openings, and the opening and the setae accompanying this opening are in different plates. Posterior coxae extend lateral to the body. Acetabular plates fully cover the acetabular openings like a flap and the surface of this plate has no bulge or hollowness.

Excretory duct is on the sclerotized plate and just behind the genital area. The legs are generally in simple claw form. However, in some species, weak and small claws can rarely be found on the upper part of the legs. Swimming setae absent. It also has a well developed

infracapitulum. Sexual dimorphism can be observed; there are significant differences in the forming and setae rigging of palps between sexes. Male palps of our samples are surprisingly larger than female ones. Acetabular plates are the most obvious part of the sexual dimorphism.

Acetabular plates of males are perfectly circular, but the plates of females are oval. The plates under the integuments of males are another example of sexual dimorphism. Indeed, this is generally considered with the penis skeleton. In male individuals coxae are very close to each other, or even in some individuals the first coxae are possibly touching.

Hydrovolziidae Thor, 1905

Genotypus: *Hydrovolzia placophora*

The body of these species is longer and thinner than that of other water mites. The frontal plate is wide and there are lateral plates on both sides of the central dorsal plate. Gland openings may be found on the lateral plates. The integument behind the plates is striped. Eyes are framed by a chitin. On the central part of the body, there are secondary plates, 2 of which are large. They are partially under the integument.

The excretory duct is on the plate. Coxae are in 4 groups and the secondary group coxae extend to the rear part of the body. There are no swimming setae on the legs. There is sexual dimorphism. The genital plates of males are smaller than those of females.

Hydrovolzia placophora (Monti, 1905)

Female

The size of the body is 675 (627 – 707) / 448 (413 – 493) μm and the front margin is concave (Figure 1A, B). The length and width of the frontal plate are 318 (300 – 353) μm and 318 (300 – 333) μm , respectively. The distance between the eyes is 191 (187 – 200) μm .

Frontal plate's surface is covered with dotted cavities. There are locally dispersed large cavities on the central part of this plate. Dorsal plate is large and it has a flat front edge and a round posterior edge. On the central part of this plate, there are large dotted cavities. At the edge of this plate, there is an area consisting of small cavities appearing as a narrow band.

There are 5 pairs of setae on the dorsal plate. The glands are on each plate. The first lateral plate is made up of 2 segments. The setae are on the first segment and the gland openings are on the second small segment. The length and width of the dorsal plate are 464 (440 - 507) μm , and 213 (200 - 227) μm , respectively.

The capitulum size is 204 (200 - 213) / 129 (107 - 147) μm . Chelicerae with a thin and short claw is supplemented with hyaline and its upper margin is slightly convex, without elevation. The length and width of chelicerae are 195 (187 – 200) μm , and 49 (40 – 53) μm , respectively. The length of the claw is 46 μm (Figure 1C).

All the other setae are branched except for the one in P₅. The distribution of setae between the palp segments is in the form 2-1-3-1 (Figure 1D). The length of the upper and lower part of the palp segments is 18 (13 – 27) – 80 (77 – 82) – 58 (53 – 67) – 93 (87 – 98) – 40 (38 – 41) = 289 (279 – 307) μm , and 27 (25 – 29) – 38 (34 – 40) – 76 (67 – 80) – 76 (67 – 80) – 40 (37 – 42) = 257 (235 – 267) μm . Their heights are 49 (40 – 53) – 53 (49 – 56) – 58 (53 – 67) – 38 (35 – 40) – 16 (13 – 17) μm . The lengths of the coxae are 187 (182–194) – 164 (160 – 173) – 93 (80 – 107) – 84 (80 – 93) μm . The posterior edge of the first group coxae is convex. The front part of the genital plate is narrow and the rear part is wide. The size of this plate is 115 (107 – 120) / 75 (67 – 80) μm . There are 5 pairs of setae on each plate, 3 of which are on the rear part, with 2 on the front part.

The excretory duct is on the front of the plate and its size is 111 (93 – 120) / 107 (95 – 112) μm . The length of the rear dorsal plate is 125 (107 – 147) μm and it is oval. The surface of both plates is covered with randomly distributed dotted cavities. Setae on the legs are branched and they are short and thick. Claws are strong. The lengths of the first, second, third and fourth legs are 53 (48 – 59) – 67 (62– 74) – 76 (67 – 80) – 80 (77 – 85) – 80 (78 – 83) – 93 (89 – 95) = 455 μm , 53 (49 – 55) – 76 (67 – 80) – 76 (67 – 80) – 80 (76 – 84) – 84 (80 – 93) – 107 (98 – 110) = 476 μm , 67 (62 – 70) – 93 (90 – 95) – 98 (91 – 105) – 98 (93 – 107) – 107 (95 – 115) – 128 (120 – 133) = 591 μm and 67 (60 – 72) – 89 (80 – 93) – 102 (93 – 107) – 106 (107 – 120) – 107 (100 – 115) – 124 (120 – 133) = 595 μm , respectively.

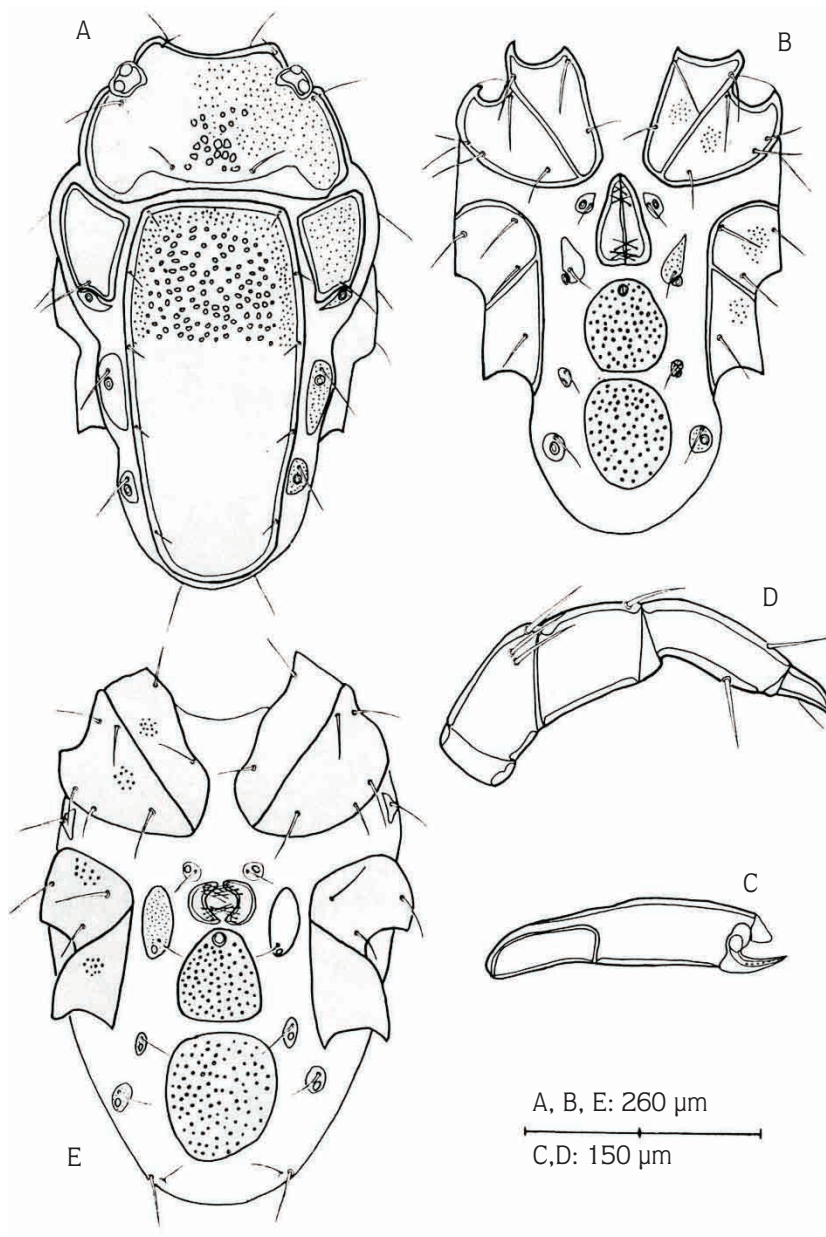


Figure 1. *Hydrovolzia placophora*: Female; A) Body, dorsal view B) Body, ventral view C) Chelicerae D) Palp, inner Male; E) Body, ventral view

Male

The characteristics of the male's body are similar to those of females in terms of plate and setae rigging (Figure 1E). The sizes of the male body is 649 (613 – 693) / 453 (440 – 467) μm . The sizes of the frontal and the dorsal plates are 164 (160 – 173) / 328 (320 – 333)

μm and 449 (427 – 480) / 222 (213 – 240) μm , respectively. The distance between the eyes is 169 (160 – 173) μm . The length of the capitulum is 178 (147 – 200) μm and its height is 138 (133 – 147) μm . The length of the chelicerae is 196 (187 – 200) μm . The height of the base segment and the length of the claw are 47 (40 – 53) μm and 40 μm , respectively.

The lengths of the upper and lower parts of palp segments are 24 (17 – 27) – 84 (80 – 93) – 62 (53 – 67) – 98 (93 – 107) – 40 (37 – 44) = 308 (283 – 334) μm and 24 (17 – 27) – 27 (24 – 29) – 76 (67 – 80) – 76 (67 – 80) – 40 (38 – 43) = 243 (218 – 294) μm , respectively. Their heights are 53 (48 – 59) – 58 (53 – 67) – 58 (54 – 69) – 31 (27 – 35) – 14 (13 – 17) μm . The lengths of coxae are 187 (173 – 200) – 160 (133 – 173) – 124 (120 – 133) – 93 (80 – 107) μm .

The acetabular plate is small and semicircular. The length and width of this plate are 53 μm and 89 μm , respectively.

There are 8 weak and thin setae on each plate. Excretory duct is 3-cornered, narrow on the front and broad on the rear part. The size of this duct is 111 (93 – 133) / 107 (93 – 120) μm . The posterior ventral plate is round and its size is 138 (107 – 173) / 129 (120 – 133) μm .

The seta rigging of legs and claws is similar to that of the female.

First leg is 58 (53 – 67) – 80 (67 – 93) – 76 (67 – 80) – 84 (80 – 93) – 89 (80 – 93) – 102 (93 – 107) = 489 (440 – 533) μm .

Second leg is 58 (53 – 67) – 82 (80 – 93) – 84 (81 – 95) – 84 (80 – 93) – 88 (80 – 93) – 120 (107 – 133) = 516 (481 – 574) μm .

Third leg is 62 (53 – 67) – 93 (80 – 107) – 88 (80 – 93) – 93 (85 – 108) – 102 (93 – 107) – 120 (107 – 133) = 558 (506 – 600) μm .

Fourth leg is 67 (58 – 74) – 87 (84 – 93) – 88 (80 – 93) – 98 (93 – 107) – 102 (93 – 107) – 124 (120 – 133) = 566 (533 – 600) μm length.

Examined specimens

A stream with plenty of moss, 12. 7. 2000, 15 ♀, 7 ♂, İnkizdere; a creek, 20.6.1999, 8 ♂, 3 ♀, Kalkandere; a creek, covered by moss, 30.5.1999, 5 ♀, Ardeşen, Rize.

Distribution

France, Switzerland, Italy, Austria, Germany, England, Spain, Sicily, Romania and Sweden (Viets, 1956; Gerecke, 1991). This species is a new record for the Turkish fauna.

Results and Discussion

Hydrovolzia placophora is unique to Europe. This species is found in Switzerland, northern Italy, Austria, England, Spain and Romania at 935 – 2100 m, 700 – 2050 m, 900 m, 91 – 609 m, 2300 m and 2100 m altitudes, respectively (Lundblad, 1956; Bader, 1975). In southern Italy, it is not found above 1000 m, but in Sicily species are found in the rivers at an altitude of 1600 – 1700 m.

It has been reported that in Turkey they live on the coast and at altitudes higher than previously known. It has been reported that these species live in small creeks with dense vegetation, especially in deep waters and they have no swimming ability. Specimens were collected from the edges of small creeks. Their habitats show similarities to those previously recorded.

The discovery of this species, which is very abundant in Europe, in Turkey shows that it lives in a larger region than previously known. Fourteen species of *Hydrovolzia* have been identified so far and *H. placophora* is the most abundant of these species (Viets, 1956).

In females, the size of the body and the length of the palp are 710 – 920 / 525 – 620 μm and 21 – 88 – 81 – 130 – 53 = 373 μm , respectively. The size of the oval acetabular plate is 126 / 73 μm . In males, the size of the body and the length of the palp are 675 – 870 / 460 – 530 μm and 21 – 91 – 88 – 140 – 53 = 393 μm , respectively.

The size of the round acetabular plate and the length of chelicerae are given as 73 / 90 μm and 280 (claw 75) μm , respectively (Viets, 1936; Szalay, 1964; Bader, 1975).

In specimens from Sicily, the length and the height of the palp and the size of the front and rear dorsal plates have been recorded as 10 – 77 – 72 – 113 – 42 = 314 μm , 42 – 50 – 55 – 39 – 16 μm , 217 / 409 μm and 543 / 330 μm , respectively. The size of the excretory plate is 157 / 185 μm . The size of the plate behind the excretory duct is 203 / 251 μm (Gerecke, 1991).

The palps of our male specimens are shorter than those of male specimens reported previously. Although our specimens are small in some respects, they are in close agreement from the structural point of view.

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