

## The Species of the Genus *Monatractides* Viets, 1926 (Acari, Hydrachnidia, Torrenticolidae) in Turkey

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**Abstract:** The morphological characters, measurements, habitats, and global distributions of *Monatractides stadleri* (Walter, 1921) and *M. lusitanicus* (Lundblad, 1941) from springs of Western Anatolia are described and compared with each other. Furthermore, a key to species of *Monatractides* known from Turkey is given.

**Key Words:** Hydrachnidia, *Monatractides*, Turkey

### Türkiye'den *Monatractides* Viets, 1926 Cinsi Su Kenesi (Acari, Hydrachnidia, Torrenticolidae) Türleri

**Özet:** *Monatractides stadleri* (Walter, 1921) ve *M. lusitanicus* (Lundblad, 1941) türlerinin dünya üzerindeki dağılımları, habitatları, ölçümleri ve morfolojik karakterleri tanımlanmış ve türler birbiri ile karşılaştırılmıştır. Ayrıca Türkiye'den bilinen *Monatractides* türleri için teşhis anahtarı verilmiştir.

**Anahtar Sözcükler:** Hydrachnidia, *Monatractides*, Türkiye

At the beginning of the 21st century, knowledge of arthropod biodiversity in southern regions of both the Palearctic and Nearctic is still fragmentary. Ironically, faunistic research is considered of secondary importance in both Europe and Turkey, while habitats supporting native biodiversity in important refugial areas are under increasing threat of irreversible degradation (Bader, 1988).

Most Torrenticolid species neither prefer low water temperatures nor are limited to the vicinity of spring habitats; in contrast, many insect orders are present in the Taurus Mountain with a particularly high number of species (Ephemeroptera, Plecoptera, and Trichoptera). As a consequence, Torrenticolid mites colonize upper running waters at medium and low altitudes equally distributed all over the North and South Anatolia Taurus Mountains.

At present, 5 species of the genus *Monatractides* K.Viets: *M. stadleri* (Walter, 1921), *M. lusitanicus*

(Lundblad, 1941), *M. aberratus* (Lundblad, 1941), *M. vafaei* Pestic, 2004, and *M. adoratus* Di Sabatino and Gerecke, 1996 are known from Turkey (Turan and Pesiç, 2003; Boyacı, 2006; Pesiç et al., 2006).

According to Wiles (1997), the subfamily *Torrenticolinae* includes 4 genera: *Torrenticola* Piersig, *Monatractides* Viets, *Pseudotorrenticola* Walter, and *Neoatractides* Lundblad. The following system by Wiles is now the one accepted by most water mite researchers.

The purpose of this paper is to contribute to and to continue the faunistic, ecological, and systematical studies on Turkish Torrenticolid water mites.

All water mite specimens were collected from mosses on stones and washed under pressured tap water, collected in containers and then live pick sorted, preserved, and mounted on slides using standard techniques currently employed in water mite research (Cook, 1974).

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**Systematic**

Genus *Monatractides* Viets, 1926

*Monatractides* Viets, 1926

*Synaptia* Bader, 1988

*Rusetriella* Viets, 1931

*Rusetria* Thor, 1897

Diagnosis: Adult.

Capitulum with short posterodorsal projections; rostrum much narrower than remainder of capitulum when viewed dorsally; no glands present on third coxae; palp variable; but not with well developed distoventral setae and no associated projections on P<sub>2</sub> and P<sub>3</sub>.

Distribution: North America, Europe, Africa, Asia, Australia.

Remarks: *Monatractides* differs from other genera in the Torrenticolinae in the plesiomorphic structure of the palps and the infracapitulum, which has long dorsal apodemes. *Monatractides* is more closely related to *Testudacarus* than are other genera; both have similar gnathosoma morphology and apically located Epimera 4.

*Monatractides* may be considered an ancient clade from which other genera and subgenera evolved following the break up of Pangea or a recent clade that has subsequently spread to Australia.

Key to the subfamilies and genera of Torrenticolidae

- 1. Three pairs of acetabula; condyles over IV-Leg sockets .....*Testudacarinae*
  - Six pairs of acetabula; without condyles over IV-Leg sockets..... Torrenticolinae 2
- 2. Infracapitulum attached to a long protrusible tube..... *Pseudotorrenticola*
  - Infracapitulum not attached to a long protrusible tube.....3
- 3. Infracapitulum with long dorso-posterior apodemes. Palp with general dimensions; PII and PIII without ventral extensions but each bearing a seta or PII triangular in lateral view with no ventral seta ..... *Monatractides*
  - Infracapitulum with short dorso-posterior apodemes and long ventral-posterior extension. Palp variable, PII and PIII variously modified and often with ventral extensions..... 4

- 4. Palp with 4 or 5 segments. PIV short, not more than twice as long as wide. PV with broad, blunt terminal setae..... *Neotractides*
  - Palp with 5 segments. PIV long, more than 3 times as long as wide. PV with slender terminal setae..... *Torrenticola*

The key to the species of *Monatractides* known from Turkey

- 1. Capitulum cylindrical; capitular bay narrow ..... *M. adoratus*
  - Capitulum not cylindrical and capitular bay not narrow .....2
- 2. Frontal plate larger than the shoulder plates..... *M. aberratus*
  - Frontal plate not larger than the shoulder plates ..... 3
- 3. P<sub>4</sub> shortened but P<sub>1</sub> longer ..... *M. lusitanicus*
  - Not so.....4
- 4. Relatively short median suture line of coxae ..... *M. stadleri*
  - Knob-shaped protrusions at the margin of the gnathosomal bay, a rather long medial suture line ..... *M. vafaei*

***Monatractides lusitanicus* (Lundblad, 1941)**

Geographical distribution: Iberian Peninsula, Tyrrhenian islands, Sicily, Turkey, and Iran (Pesiç et al., 2006).

Females: body brown and oval; capitular bay usually longer than wide; anal glands located above excretory pore and distant from the line of the first sclerotization. This species has a relatively straight ventral side of infracapitulum and absence of the typical genital hairs on the terminal end of genital plates.

Male: The male can be distinguished by a longer medial suture of the coxae and, as in the female, a much longer second segment of palps compared to the fourth.

Materials examined: 14.08.2001, 14 ♀♀, 7 ♂♂; 18.06.2003, 21 ♀♀, 10 ♂♂. Kızıldağ, Isparta. This species was found in running waters with permanent down flow or with large parts of the streambed drying up during summer.

Remarks: A thorough description of this species was given by Lundblad (1956). The main characteristics are very small species (males 730  $\mu\text{m}$ , females 805  $\mu\text{m}$  in length; total length of palp 176-182  $\mu\text{m}$ ); with slender body. It can be distinguished by the structure of chelicera and gnathosoma from similar species. Shoulder platelets small (172-160  $\mu\text{m}$ ), only slightly longer than anterior platelets (ratio 1.3); chelicerae strong, ratio chelicerae basal segment/claw 5.1.  $P_4$  shortened (22.7%-26.4% total length) but  $P_1$  longer than in other species of *Monatractides* (15.9%-15.4% total length) (for detailed measurements, see Table).

*Monatractides stadleri* (Walter, 1924)

Geographical distribution: Central, West, and South Europe, Turkey (Turan and Pesiç, 2005; Pesiç et al., 2006)

Female: body brown and spherical; integument with secondary suture lines; capitular bay usually longer than wide and shallow; and anal glands located above excretory pore and distant from the line of the first sclerotization. There is a slight sexual dimorphism of the genital field.

Male: Shapes of body, plates, palp, and capitulum similar to those illustrated for the female. Males are smaller than females.

Materials examined: 12.07.2001, 8♀♀, 4 ♂♂; 18.06.2003, 13 ♀♀, 6 ♂♂ Eğirdir, Isparta. 12.05.1997, 18 ♀♀, 3 ♂♂, Kocaağız stream, Düzce, originating from a point source and forming a fast flowing spring brook with submerged vegetation as in cold, first order stream and often enriched in mosses.

Remarks: The first description of *M. stadleri* is based on a single female specimen. Its main characteristics are the relatively short median suture line of coxae II+III and the thick chelicerae. However, only the short median suture line of coxae II+III is not reliable. It can be distinguished by the structure of chelicera and gnathosoma from similar species. *M. stadleri* has a relatively short median suture line of coxae II+III (female 85  $\mu\text{m}$ , male 75  $\mu\text{m}$ , ratio median sutures; coxae-I/ II+III 1.5) and thick chelicerae; medio-lateral-distal margins of  $P_2$  and  $P_3$  indented vaginae, mediodistal margin of  $P_4$  bears a remarkably big seta (for detailed measurements, see Table).

Table. Measurements (in  $\mu\text{m}$ ) of various organs of *M. stadleri* and *M. lusitanicus*.

|                                   | <i>M. stadleri</i> |      | <i>M. lusitanicus</i> |       |
|-----------------------------------|--------------------|------|-----------------------|-------|
|                                   | Female             | Male | Female                | Male  |
| Ventral length                    | 1155               | 980  | 805                   | 730   |
| Ventral width                     | 945                | 795  | 570                   | 600   |
| Capitular bay length              | 200                | 170  | 175                   | 120   |
| Capitular bay width               | 65                 | 65   | 65                    | 51    |
| Coxae-1 length                    | 350                | 275  | 320                   | 230   |
| Coxae-1 median length             | 150                | 130  | 140                   | 110   |
| Coxae-2+3, median length          | 75                 | 80   | 45                    | 75    |
| Genital organ, length             | 223                | 200  | 180                   | 155   |
| Genital organ, widths             | 205                | 170  | 165                   | 80    |
| Genital organ, l. /w.             | 1.09               | 1.76 | 1.09                  | 1.94  |
| Dist. genital org. excretory pore | 250                | 190  | 205                   | 165   |
| Dist. genital org. -caudal        | 505                | 385  | 270                   | 260   |
| Dorsal shield, total length       | 1152               | 870  | 715                   | 625   |
| Dorsal plate length               | 870                | 710  | 636                   | 560   |
| Dorsal plate, width               | 835                | 660  | 502                   | 425   |
| Dorsal plate, l. /w.              | 1.04               | 1.08 | 1.27                  | 1.32  |
| Shoulder platelets, length        | 230                | 186  | 172                   | 160   |
| Anterior platelets, length        | 160                | 144  | 130                   | 120   |
| Shoulder pl. / Anterior pl.       | 1.44               | 1.30 | 1.32                  | 1.33  |
| Capitulum, ventr. length          | 220                | 192  | 165                   | 195   |
| Capitulum, dors. length           | 245                | 238  | 195                   | 208   |
| Capitulum, height                 | 165                | 150  | 100                   | 98    |
| Chelicera, bas. seg., length      | 240                | 238  | 192                   | 183   |
| Chelicera, claw                   | 50                 | 42   | 38                    | 35    |
| Chelicera, total length           | 290                | 284  | 230                   | 218   |
| Palp measurements Dorsal length   |                    |      |                       |       |
| P-1                               | 28                 | 28   | 28                    | 28    |
| P-2                               | 85                 | 78   | 55                    | 53    |
| P-3                               | 55                 | 53   | 38                    | 38    |
| P-4                               | 75                 | 68   | 40                    | 48    |
| P-5                               | 18                 | 15   | 15                    | 15    |
| Total length                      | 261                | 242  | 176                   | 182   |
| Dorsal length (% total length)    |                    |      |                       |       |
| P-1                               | 10.7               | 11.6 | 15.9                  | 15.4  |
| P-2                               | 33                 | 32.2 | 31.13                 | 9.12  |
| P-3                               | 21.08              | 21.9 | 21.5                  | 20.88 |
| P-4                               | 29.09              | 28.1 | 22.7                  | 26.40 |
| P-5                               | 7.03               | 6.2  | 8.52                  | 8.24  |
| Ratio p-2/p-4                     |                    | 1.13 | 1.15                  | 1.38  |
| 1.10                              |                    |      |                       |       |
| Height                            |                    |      |                       |       |
| P-1                               | 45                 | 45   | 28                    | 28    |
| P-2                               | 56                 | 51   | 28                    | 43    |
| P-3                               | 50                 | 48   | 38                    | 35    |
| P-4                               | 35                 | 33   | 25                    | 28    |
| P-5                               | 13                 | 13   | 23                    | 15    |
| Ratio dorsal l./h.P-1             |                    |      |                       |       |
| P-1                               | 6.22               | 6.22 | 1                     | 1     |
| P-2                               | 1.52               | 1.53 | 1.96                  | 1.23  |
| P-3                               | 1.1                | 1.10 | 1                     | 1.09  |
| P-4                               | 2.14               | 2.06 | 1.6                   | 1.71  |
| P-5                               | 1.38               | 1.15 | 0.65                  | 1     |

*M. stadleri* is somewhat lenitophilous, but nevertheless found exclusively in lotic habitats; there, it

lives between the leaf litters in shadowed inlets mainly of the lower parts of running waters (Sabatino et al., 1992).

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