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BRACHYPODA (HEMIBRACHYPODA) BADERI
(ACARI, HYDRACHNELLAE, ATURIDAE): A NEW SPECIES FROM RUNNING WATERS OF CENTRAL ITALY(*)(**)

BY A. DI SABATINO and B. CICOLANI ***

WATER MITE NEW SPECIES ITALY
ACARIEN D'EAU DOUCE ESPÈCE NOUVELLE ITALIE

ABSTRACT : Male, female and nymph of Brachypoda baderi n. sp. are described. A comparison is made to the closely related species B. mutila (Walter). An identification key to the males of the European species of the genus is also given.

ACARIEN D'EAU DOUCE ESPÈCE NOUVELLE ITALIE

RÉSUMÉ : Le mâle, la femelle et la nymphe de Brachypoda baderi n. sp. sont décrits. Une comparaison avec l'espèce voisine B. mutila (Walter) est donnée. Une clé pour les mâles des espèces européennes du genre est établie.

The investigation of specimens collected during a research on water-mites from running waters in the central Apennines (Italy) carried out by the Department of Environmental Sciences (Dipartimento di Scienze Ambientali) of the University of L’Aquila (CICOLANI, 1983; CICOLANI & SISINO, 1983; CICOLANI & DI SABATINO 1985), resulted in the discovery of a new species of the genus Brachypoda (Lebert, 1879) which is described and illustrated in this paper.

Family Aturidae Thor
Subfamily Axonopsinae Viets

Brachypoda (Hemibrachypoda) baderi n. sp.

TYPE-MATERIAL (Preps-101 to 109). Holotype male (prep. 101); allotype female (prep. 102); paratype (preps 103 to 109) 4 females, 1 male, 2 nymphs. All specimens are completely dissected and mounted on slide in Faure solution; all the type-material was collected from the S. Giovanni stream (the Vomano river basin, Gran Sasso; 15 October 1986; CICOLANI & DI SABATINO coll.).

Types and paratypes are in the Department of Environmental Sciences collection at the University of L’Aquila.

MALE (holotype). Body : form oval; colour yellow with two violet stains (the first inserted between the ocular plates, the second covering the entire terminal end of the body); length 462 µm, breadth 375 µm (mounted); insertion of the fourth pair of legs is separated by 220 µm. Genital area (fig. 3) : form elliptical, length 53 µm, width 164 µm; diameter of the genital papilla 20 µm; distance between end of genital area and end of body 45 µm.

Gnathosoma. Infracapitulum : narrow and elon-
Figs. 1-5: Brachypoda baderi n. sp.
gated (maximal length 93 µm, maximal width 62 µm); length of chelicerae 108 µm, claw 43.5 µm; size and morphology of palpal segments as in table 1 and fig. 10. P II with four pectinate setae on the extensor surface, ventral side straight with reduced terminal projection, P III short and narrow with terminal hyaline expansion, P IV long and very narrow at the base, the ventral sensitive spina is placed 37 µm from the proximal margin, dorsal and external surface hairy, the second internal sensitive setae is inserted close to the end of article, P V without remarkable features.

Legs: dimension of single article as in table 2; sexual dimorphism of the fourth pair of legs is very characteristic (fig. 6). IV-leg-4 with three long and two smaller setae and three short bristles on the terminal end of the apophyse; IV-leg-5 longer and curved, the flexory surface with 6-7 setae, much longer in proximity to the terminal side where three long swimming-hairs are inserted. Fifth segment of II, III, and IV leg, with 2, 3, and 3 swimming-hairs respectively.

FEMALE (allotype). Body form and colour as the male, length 550 µm width 412 µm; dorsal shield (length 512 µm, breadth 375 µm) uninterrupted without terminal free platelets (fig. 2); ventral shield as in fig. 1, distance between insertion of the fourth legs 226 µm, genital area composed of two small triangular plates (62 × 56 µm), genital papillae placed in a triangular line, diameter of the posterior 25 µm.

Gnathosoma. Infracapitulum: form and chaetaxy of chelicerae and palps as in the male; dimensions and morphology of palp as in table 1 and fig. 8. Ventral sensitive spina of P IV inserted at 40 µm from the proximal margin, distal margin enlarged as in the male but hairless.

Legs. Dorsal size of single articles as in table 2, without specific characteristics; fifth article of II, III and IV legs with 3, 4, 3 swimming-hairs.

NYMPH. Body: rounded, distance between capsular eyes 145 µm, between antenniformia 84 µm; dorsal shield, maximal length 235 µm, maximal width 204 µm (fig. 5); ventral shield (fig. 4), fourth epimerae separated, provisory genital area provided with two elliptical plates (28 µm high and 40 µm width), with two pairs of genital acetabula 9 µm in diameter, distanced 28 µm from terminal end of fourth epimerae and 44 µm from posterior end of body.

Gnathosoma. Infracapitulum: palps size as in table 1; legs without specific characters, II, III and IV-leg-5 width 1, 3, 2 swimming-hairs, dimensions as shown in table 2.

### Table 1: Palp measurements (dorsal length in µ) of *B. baderi* n. sp.

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### Table 2: Leg measurements (in µ) of *Brachypoda baderi* n. sp.

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### Ecology

*B. baderi* n. sp. living in the slow flowing waters of the S. Giovanni stream, is associated with *Hygrobates nigromaculatus* (dominant — 41 % —), *Lebertia sparsicapillata* (— 39 % —), *Mideopsis crassipes* (— 3 % —) and *Hydrodroma torrenticola* (— 1 % —). The principal characteristics of the station are: 1) altitude m.1000 a. s. l.; 2) temperature 14.5°C; 3) conductivity 290 µs; 4) waterdepth 60 cm; 5) substratum clay.
Figs. 6-10: *Brachypoda* spp.

6. — IV-leg (male *B. baderi* n. sp.). 7. — IV-leg (male *B. mutila*). 8. — Pulp (female *B. baderi* n. sp.). 9. — Ejaculatory complex (*B. baderi* n. sp.). 10. — Pulp (male *B. baderi* n. sp.).
ETYMOLOGY. The species was named after Dr. Carl Bader of Natural History Museum in Basel, in honour of the great contribution he has made to the study of water-mites. The authors would also like to thank Dr. C. Bader for all the assistance he gave them while they were studying at the Museum.

DISCUSSION

Cook (1974) divided the genus Brachypoda into four subgenera (Brachypoda Lebert, 1879; Hemibrachypoda Viets, 1937; Parabrachypoda Viets, 1929 and Ocybrachypoda Cook, 1974). Two species of the genus recorded in Italy: B. (s.s.) versicolor (Müller, 1976), collected in lakes in northern Italy (Largiaoli 1898, 1900, 1901, 1903, 1907; Maglio 1903, 1924, 1949; Ramazotti 1947; Nocentini 1960, 1963, 1966, 1979; Viets, 1958) and B. (Parabrachypoda) montii Maglio, 1924 collected in lake Como (Maglio, 1924) and Strona stream (Maglio, 1949). The subg. Hemibrachypoda includes the species B. modesta Koenike, 1911 distributed throughout in central and northern Europe (Viets, 1978) and B. mutila (Walter, 1928) found in northern Africa (Walter, 1928) and Caucasus (Tuzovski, 1976). B. baderi n. sp. is very similar to the latter but the differences observed between both sexes (by comparing Walter’s type-material in the Natural History Museum of Basel, prep. XIV/29 male and XIV/06 female) are clear and distinct.

B. baderi has the following distinctive characters:

**MALE**

- B. baderi
- B. mutila

a) sexual dimorphism of the fourth leg:

- IV-leg-4: *L 93; 143; w 53, 3 setae at the base of the apophyse, the second is larger. (fig. 6)
- IV-leg-5: with 6-7 setae
- 10-13 spines and setae on the ventral side.

b) palps:

- PIV longer and more slender, ventral sensitive hair further from the proximal margin. (fig. 10)
- * (L = max length; l, w = length and width at the base of the apophyse)

**FEMALE**

- uninterrupted dorsal shield:
- presence of two free terminal platelets fused with the minal platelets of the dorsal shield (fig. 2)

The fusion of terminal platelets on the dorsal shield, in the female of B. baderi, is very interesting in that until now this character was found in three North American species (Cook, 1981) of the subgenus Ocybrachypoda (B. oakcreekensis Habeeb, 1961; B. ojaiensis Cook, 1981 and B. coerulae Cook, 1981). The presence of an uninterrupted dorsal-shield in the subgenus Hemibrachypoda too, means that this character can no longer be used as a diagnostic key to distinguish Axonopsis and Brachypoda-like mites groups (Cook, 1974).

The following artificial key (based on males only) to the six European species of the genus Brachypoda is proposed:

**KEY TO SIX EUROPEAN SPECIES OF THE GENUS BRACHYPODA**

1. Three pairs of genital papillae.......................... 2
2. Four pairs of genital palpillae (fig. 18)................... 2
   — Subg. Parabrachypoda (B. montii, Maglio)
3. Male genital field located well anterior to the posterior end of body (fig. 11-13).......................... 3
   — Male genital field located at the posterior end.... 4
4. Genital platelets distinctly set off by the prominent suture line of the remainder of ventral shield; genital papillae placed in a triangular line (fig. 11).......................... 3
   — Subg. Brachypoda s.s. (B. versicolor, Müller)

   — Genital platelets indistinctly set off by remainder ventral shield; genital papillae in a straight line; IV-leg-4 without apophyse (fig. 13)..........................
   — Subg. Ocybrachypoda (B. celeripes, Viets)

5. Subg. Hemibrachypoda. IV-leg-4 with three peg-like setae; ventral projection of P II reduced........... 5
   — IV-leg-4 with only two peg-like setae; ventral projection of P II well developed. (fig. 16)..................
   — Subg. Ocybrachypoda (B. celeripes, Viets)

   — B. modesta Koenike

5. IV-leg-5 with many short spinae (10-13); IV-leg-4 elongated (fig. 7); female with free platelets at the end of the dorsal shield.......................... B. mutila Walter
   — IV-leg-5 with 6-7 longer setae, IV-leg-4 short and
Figs. 11-20: ventral shields and palps of European Brachypoda (males) spp.

enlarged (fig. 6); female without free platelets, these are fused with the dorsal shield (fig. 2). *B. baderi* n. sp.

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