



Two new species of the genus *Arrenurus* from Pohnpei, Federal States of Micronesia (Acari: Hydrachnidia: Arrenuridae)

HARRY SMIT

Harry Smit, Zoological Museum of the University of Amsterdam, Plantage Middenlaan 64, 1018 DH Amsterdam, The Netherlands.
E-mail: smit.h@wolmail.nl

Abstract

Two new species of the genus *Arrenurus*, *A. cornuatus* and *A. kostkai* are described from high elevation, head water streams on the island of Pohnpei, Micronesia.

Key words: New species, head water streams, Pacific Islands, Micronesia, Pohnpei

Introduction

Few specimens of water mites have been collected from Pacific Island streams, especially higher elevation, head water streams. Uchida (1935, 1939) and Cook & Bright (1983) published 11 species of water mites from the Palau Islands, while Cook (1957) reported two *Arrenurus* species from the main island of Yap in the Caroline Island chain. Viets (1939) reported the occurrence of unnamed *Arrenurus* larvae from Hawaii, but Smit (2004) failed to find the adults. Smith & Cook (2004) described a new *Piona* species from Hawaii, but very likely this is an introduced species.

During an inventory of high elevation, head water streams on the island of Pohnpei, Federal States of Micronesia, two *Arrenurus* species new to science were collected. These were the only water mites collected, and they are described in this paper. The genus *Arrenurus* is the most speciose genus of all water mites. To date, more than 800 species are known. The genus has a cosmopolitan distribution and occurs on every continent except Antarctica. Many *Arrenurus* species have a larval parasitic stage on odonates (Smith *et al.* 2009), which can explain their extended distribution, even to remote islands in the Pacific like Hawaii and Pohnpei. On these remote islands, *Arrenurus* species are the only water mite species found (apart from introduced species).

Material and methods

The following abbreviations have been used: PI-PV = palp segment 1–5; I-leg-4–6 = fourth–sixth segments of first leg; D3 dorsoglandularia 3; a.s.l. = above sea level, ZMAN = Zoological Museum of the University of Amsterdam, BPBM = Bishop Museum, Honolulu. Measurements of paratypes are given in brackets. All measurements are in μm , measurements of palp and leg segments are of the dorsal margins. All material was collected by Richard MacKenzie and Caitlin L. Kryss, with the USDA Forest Service's Institute of Pacific Islands Forestry.

Systematic part

Arrenurus (Micruracarus) cornuatus n. sp.

(Fig. 1–4)

Material examined. Holotype male, Nan Pad stream, Pohnpei, Federal States of Micronesia, 1 July 2008 (ZMAN). Paratypes: three females (one juvenile), same data as holotype (ZMAN); male, Dolent stream, Pohnpei, Micronesia, alt. 460 m a.s.l., 2 February 2009 (ZMAN); 3 males, 3 females, Nan Pad stream, Pohnpei, Micronesia, alt. 590 m a.s.l., 30 June 2008 (BPBM); 1 male, Nan Moatoh stream, Pohnpei, Federal States of Micronesia, 460 m a.s.l., 17 February 2009 (ZMAN).

Diagnosis. Petiole antler-shaped.

Description. Male: Idiosoma 689 (693–753) long and 454 (446–518) wide. The colour cannot be ascertained as the specimen has been fixed in ethanol. Idiosoma anteriorly indented. Dorsal shield rounded, 381 long and 348 wide. Cauda distinctly set off from anterior idiosoma, with two lobes separated by a shallow indentation, each lobe with a concavity. Petiole antler-shaped. Anterior coxae pointed, extending beyond anterior idiosoma margin. Genital plate long and narrow, extending to lateral idiosoma margin but not onto dorsum; gonopore 42 long. Lengths of PI–PV: 22, 76, 56, 97, 50; PII medially with two setae in anteroventral corner and two more dorsally located setae. Lengths of I-leg-4–6: 118, 124, 122. Length of IV-leg-4–6: 180, 146, 150; IV-leg-4 without a spur. Third and fourth legs with numerous swimming setae.

Female: Idiosoma 770 (664–770) long and 640 (583–624) wide. Dorsal shield complete, 616 (575–599) long and 502 (470) wide. Idiosoma anteriorly straight to slightly convex, anterior coxae not extending beyond anterior idiosoma margin. Posterolateral corners of idiosoma distinct. Medial margin of third coxae shorter than medial margin of fourth coxae. Medial distance of fourth coxae shorter than width of one genital valve. Gonopore 136 long and 144 wide, genital valves with distinct chitinized patches. Genital field 454 wide, genital plates narrow and sloping, about three times as long as wide. Lengths of PI–PV: 32, 74, 52, 76, 40; palp as in male. Lengths of I-leg-4–6: 134, 140, 120. Lengths of IV-leg-4–6: 138, 170, 156. Third and fourth legs with numerous swimming setae.

Etymology. Named for the antler-shaped petiole.

Remarks. The petiole of the new species is very distinctive and will separate it from all other *Arrenurus* species. The distinct posterolateral corners of the idiosoma and the shape of the genital field will separate the female from other *Arrenurus* species.

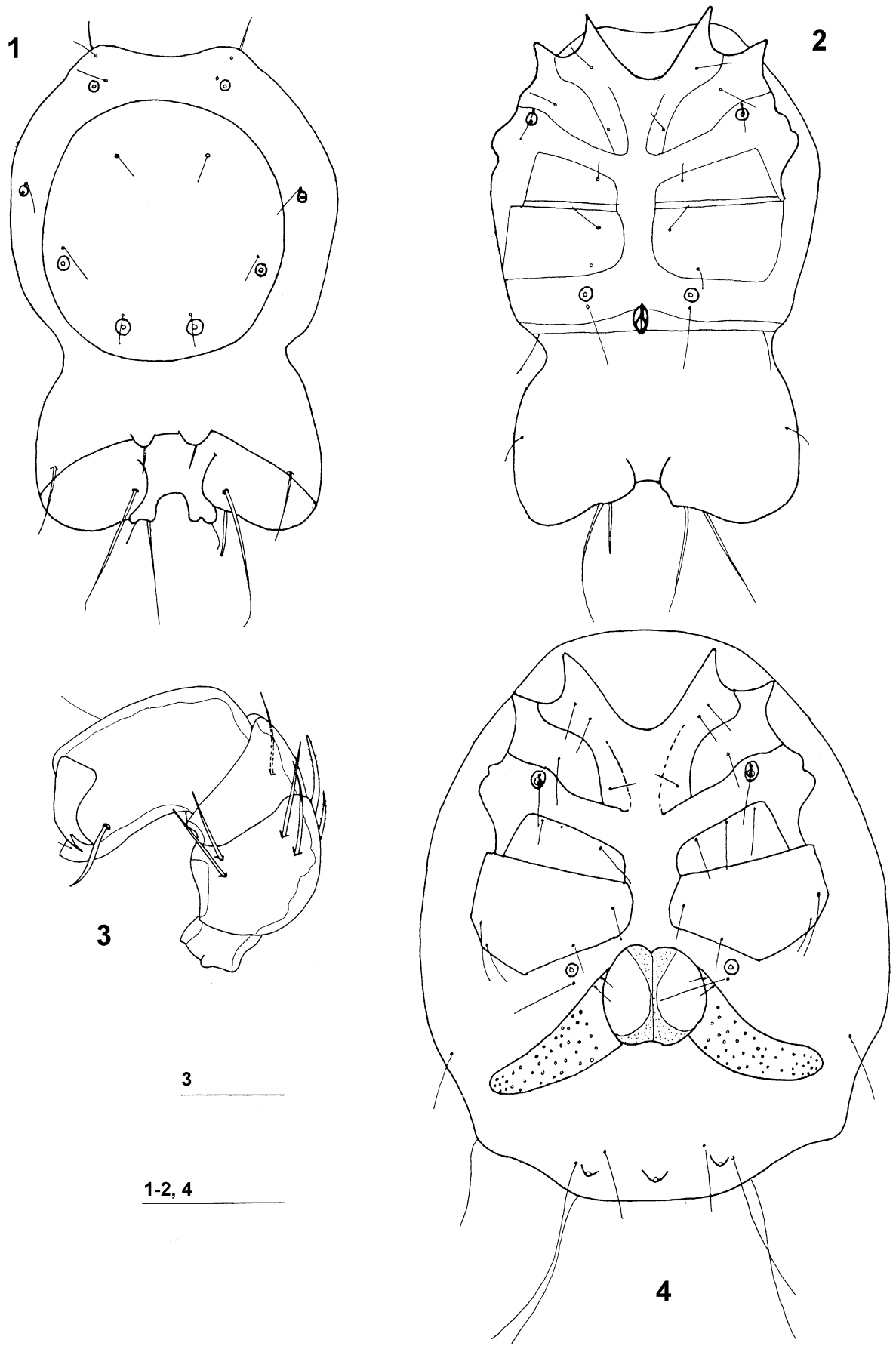
Arrenurus (Megaluracarus) kostkai n. sp.

(Fig. 5–9)

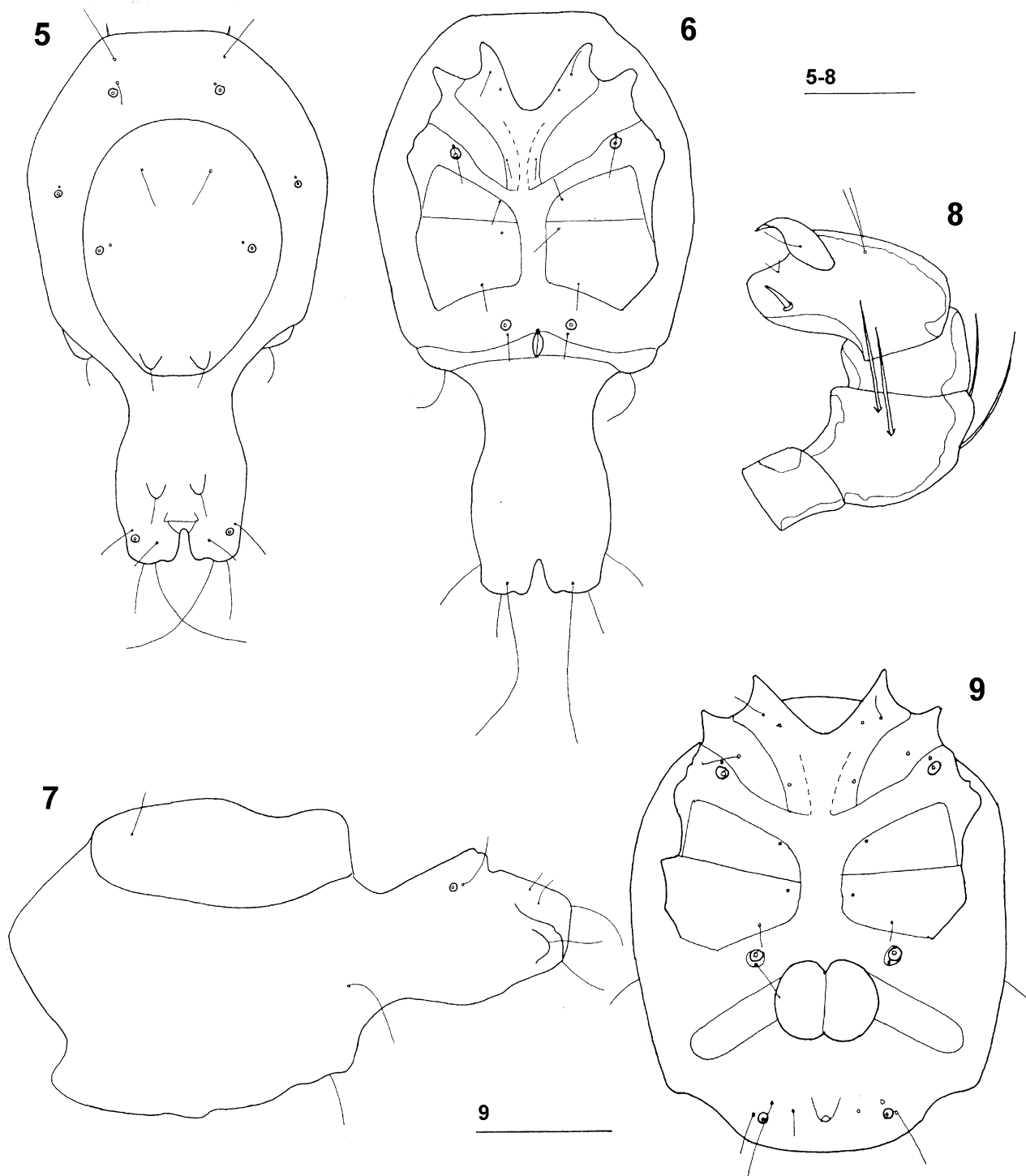
Material examined. Holotype male, Nan Pad stream, Pohnpei, Federal States of Micronesia, alt. 590 a.s.l., 30 June 2008 (ZMAN). Paratypes: one male, 2 females (BPBM), 1 female (ZMAN), same data as holotype; one male, one female, Nan Pad stream, Pohnpei, Federal States of Micronesia, alt. 590, 30 January 2009 (ZMAN); one female, same location, 1 July 2008 (ZMAN); one female, Male Komea stream, Pohnpei, Federal States of Micronesia, 523 m a.s.l., 17 February 2009 (BPBM); one female, Nan Moatoh stream, Pohnpei, Federal States of Micronesia, alt. 600 m a.s.l., 17 February 2009 (BPBM); one female, Salapwuk #2 Sakau stream, Pohnpei, Federal States of Micronesia, alt. 545 m a.s.l., 12 February 2009 (ZMAN).

Diagnosis. D3 of male on large humps, cauda posteriorly with a narrow median cleft, posterior margin of cauda slightly indented; female with straight and obliquely directed narrow genital plates and without swimming setae.

Description. Male: Idiosoma 907 (915–956) long and 543 (502–526) wide, anterior idiosoma margin straight. The colour cannot be ascertained as the specimen has been fixed in ethanol. Dorsal shield complete, 478 long and 381 wide, D3 on large humps. Cauda distinctly set off from anterior idiosoma, posteriorly with a median cleft, posterior cauda margin slightly indented, D4 on humps. Anteriorly of median cleft an area without body pores. Due to fixation in ethanol some structures (glandularia, setae) are not well visible as the



FIGURES 1–4. *Arrenurus cornuatus* n. sp. (figures 1–3 holotype male, figure 4 paratype female): 1 = dorsal view; 2 = ventral view; 3 = palp; 4 = ventral view. Scale bars: 1–2,4 = 200 µm; 3 = 50 µm.



FIGURES 5–9. *Arrenurus kostkai* n. sp. (figures 5–8 holotype male, figure 9 paratype female): 5 = dorsal view; 6 = ventral view; 7 = lateral view; 8 = palp; 9 = ventral view. Scale bars: 5–7,9 = 200 μm; 8 = 50 μm.

holotype is very dark. Therefore, in lateral view only the outline of the idiosoma is illustrated. Gonopore 57 long, genital plates extending to lateral idiosoma margin and there widened and swollen and therefore visible in dorsal view. Lengths of PI–PV: 38, 78, 50, 76, 32; PII medially with two setae. Lengths of I-leg-4–6: 136, 148, 114. Lengths of IV-leg-4–6: 259, 164, 120; IV-leg-4 without a spur. Third and fourth legs with numerous swimming setae.

Female: Idiosoma 656 (616–697) long and 555 (551–599) wide, truncated posteriorly with distinct posterolateral corners. Anterior idiosoma margin slightly convex. Dorsal shield complete, 575 (512–615) long and 462 (429–478) wide. First coxal plates extending beyond anterior idiosoma margin. Medial margin of third coxae shorter than medial margin of fourth coxae. Medial distance of fourth coxae shorter than width of one genital valve. Gonopore 120 long and 154 wide, genital valves without sclerotization but gonopore of one female with triangular anterior and posterior sclerotized patches. Genital field 478 wide, genital plates straight, narrow and obliquely directed. Lengths of PI-PV: 28, 68, 60, 96, 52; PII medially with 2–3 setae. Lengths of I-leg-4–6: 122, 118, 94. Lengths of IV-leg-4–6: 140, 166, 164. All legs without swimming setae.

Etymology. Named in honor of Willy Kostka, currently the executive director of The Micronesian Conservation Trust. Mr. Kostka has played an important role in the conservation and preservation of terrestrial and aquatic ecosystems in Pohnpei and throughout all of Micronesia.

Remarks. The male of the new species is close to *A. dahli* Piersig from New Britain (Papua New Guinea), New Caledonia and the Aru and Buru Islands (Indonesia). This species also has the cauda with a median cleft, D3 and D4 on humps and swollen genital plates. The shape of the posterior margin, however, is different: the posterior margin is oblique without indentation. The absence of swimming setae in the female is unusual, especially as the male does have swimming setae.

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