

THREE NEW SPECIES OF WATER MITES OF THE GENUS ARRENURUS FROM TENNESSEE (ACARINA: ARRENURIDAE)

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ABSTRACT

Three new species of water mites of the genus *Arrenurus* (Acarina: Arrenuridae) are described from Tennessee. *Arrenurus (Megaluracarus) alticarpus* is described from specimens taken in Cumberland and Henderson Counties in Tennessee, and Buncombe and Anson Counties in North Carolina. *Arrenurus (Megaluracarus) friaufi* is described from specimens taken in Haywood County, Tennessee. *Arrenurus (Micruracarus) quadrisemiluniatius* is described from specimens taken in Cumberland County, Tennessee.

INTRODUCTION

Current classification of water mites indicates 7 superfamilies, 53 families and 491 genera and subgenera. The genus *Arrenurus*, one of 8 genera in the family Arrenuridae, is the largest genus of water mites in number of species. In North America, the number of described species stands at about 150. Most species of arrenuri are described on male morphology. The genus *Arrenurus* is divided into four subgenera based primarily on differences in development of the male cauda. A subgeneric key to males can be found in publications by Cook (1954a) and Wilson (1961).

Diagrams of the three new species described do not include the legs since these are much alike throughout the genus. Three diagrams are included for each species: dorsal view, lateral view, and median view of the right palp. Measurements for the holotype are given first followed by the range of size variations of the paratype series in parentheses. Holotype will be deposited in the Field Museum of Natural History (Chicago).

Arrenurus (Megaluracarus) alticarpus, new species

Male: Based on 17 specimens. (See Figures 1-3) Body length 1.39 mm. (1.34-1.44 mm.); body width 0.784 mm. (0.725-0.825 mm.); least width of cauda, near base 0.285 mm. (0.255-0.285 mm.); greatest width of cauda, near middle 0.305 mm. (0.295-0.315 mm.); width of dorsal shield 0.510 mm. (0.450-0.530 mm.).

Body broadly oval, widest near mid-region, with slight indentation just posterior to mid-region; anterior end of body distinctly projecting and broadly rounded with a depression posterolateral to each eye; body proportionally quite high when viewed laterally; dorsal furrow incomplete, passing ventrally at base of cauda and ending somewhat posterior to acetabular plate on each side; non-cauda portion of dorsal shield bearing two pairs of lateral glandularia, median portion with high rounded hump (best seen from lateral view); from dorsal view, cauda slightly constricts near its base and widens to its maximum width near middle, with indentation occurring posterior to widest portion (variable to only slightly indentation in some

specimens), becoming rounded at the posterior end, and with slight lateral flare forming a small median concavity; posterior end with slight median cleft, variable to only slight indentation in some; cauda without a petiole; from lateral view, cauda extends almost straight posteriorly with only a slight hump on anterior mid-dorsal region; posteroventral portion of cauda rounded, more so in some specimens than indicated in diagram; acetabular plates extending slightly up sides of body, but are easily seen from dorsal view; palp segment two bears three medial setae and two longer lateral setae; palp segment three with one medial and one lateral seta; first and second legs bear numerous swimming hairs on proximal segments; third and fourth legs with numerous swimming hairs; IV-leg-4 has cylindrical projection at distal end extending well beyond insertion of fifth segment.

Holotype: Adult male, collected from Harrison Resort Lake, about seven miles south of Crossville in Cumberland County, Tennessee, June 26, 1961.

Paratypes: One male, same locality as holotype, June 14, 1961; one male, same locality, June 28, 1961; one male, same locality, September 1, 1961; two males, from Cub Lake in Natchez Trace State Park in Henderson County, Tennessee, July 14, 1961; one male, same locality, September 6, 1961; one male, from a small lake on south side of US 70, three miles west of Black Mountain (east of Asheville) in Buncombe County, North Carolina, July 16, 1963; nine males from a pond on north side of US 74, one mile east of Wadesboro (southeast of Charlotte) in Anson County, North Carolina, July 17, 1963.

Habitat: Water lilies, algae, and other water vegetation in permanent ponds and lakes.

Range: Collected from four locations from western Tennessee to eastern North Carolina.

Discussion: This species is closely related to a group characterized by Cook in 1954b: Cauda long and constricted at the base, widest near the middle, and tapering towards the posterior end. Of those included within the group, this species seems more related to *A. scutelliformis*, but differs by having: (1) the body does not taper as abruptly near base of cauda as seen dorsally, (2) the rounded projection anterior to eyes more prominent, (3) the cauda from a lateral view not rounded dorsally nor ventrally, and (4) the body from a lateral view much taller. This species also resembles *A. odatus* described by Cook in 1976 in two respects: (1) the general shape and height of body from lateral view is similar, and (2) the palp is very similar, even to number and position of setae. This species also seems related to *A. uniformis* described by Marshall in 1921 from a single specimen collected in Ontario. It resembles *uniformis* except: (1) Marshall's dorsal diagram indicates no prominent projections anterior to eyes, and (2) her lateral diagram indicates cauda to be rounded dorsally and ventrally, especially on ventral side, making the cauda seem somewhat constricted at its base. This species also resembles *A. elongatus* described by Marshall in 1924 from a single specimen collected in Sitka, Alaska. It resembles *elongatus* dorsally except in the new species: (1) the dorsal shield is smaller, and (2) the eyes are closer together.

The new species differs from other closely related species in the following set of characteristics: (1) the tall, somewhat thick body as seen laterally, (2) cauda projects almost straight posteriorly with only a slight dorsoanterior hump and almost no rounding of the cauda ventrally as seen from lateral view, (3) dorsal shield with a high, oval shaped, median hump which can be seen easily from a lateral view, and (4) rather prominent projection anterior to eyes.

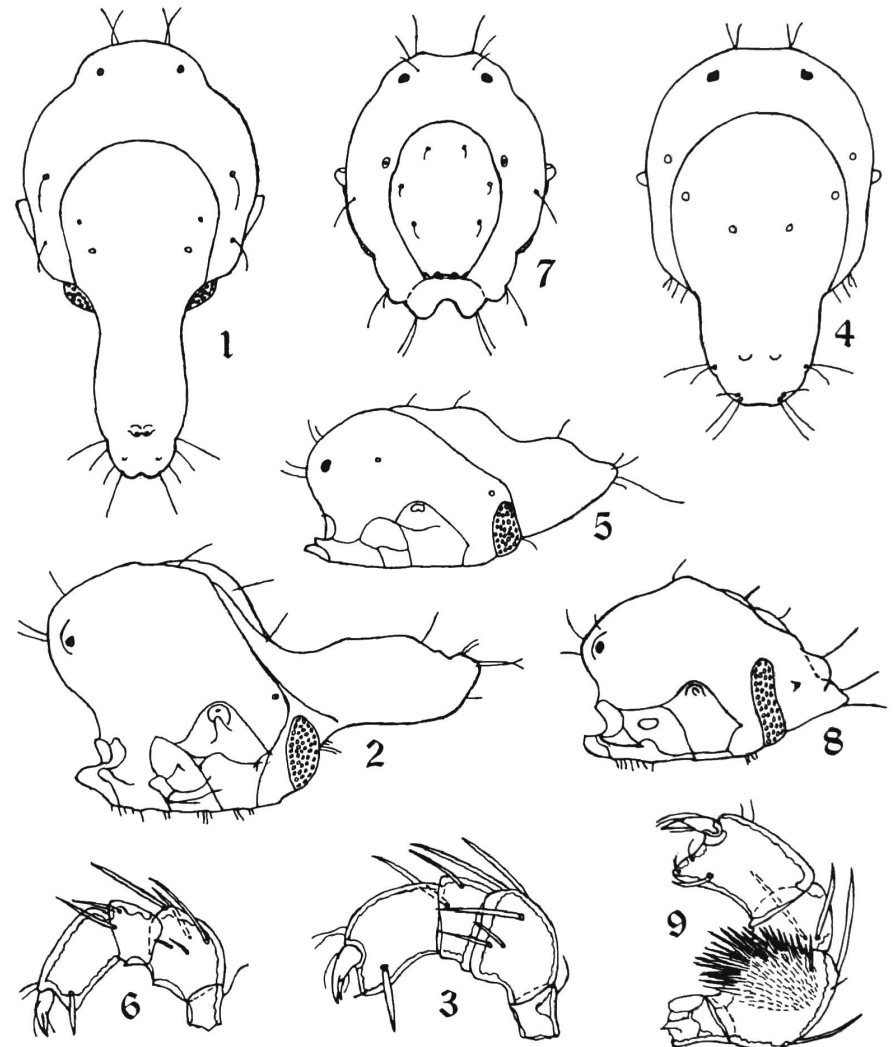


FIG. 1: Dorsal and medial views of three new species of water mites. 1-3 *Arrenurus alticarpus* n. sp., male. 1. dorsal view. 2. lateral view. 3. median view of right palp. 4-6 *Arrenurus friaufi* n. sp., male. 4. dorsal view. 5. lateral view. 6. median view of right palp. 7-9 *Arrenurus quadrisemiluniatius* n. sp., male. 7. dorsal view. 8. lateral view. 9. median view of right palp.

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Arrenurus (Megaluracarus) friaufi, new species

Male: Based on 6 specimens. (See Figures 4-6) Body length 0.725 mm. (0.725-0.765 mm.); body width 0.470 mm. (0.47-0.49 mm.); cauda width at base 0.255 mm. (0.235-0.255 mm.); dorsal shield width 0.355 mm. (0.355-0.375 mm.).

Body proper obovate, widest just anterior to mid-region, with sides almost straight posterior to mid-region or with slight indentation, anterior end of body broadly rounded with no projection anterior to eyes, with a slight to no indentation between eyes; dorsal furrow passing ventrally at base of cauda immediately posterior to acetabular plates; acetabular plates extend only slightly up sides of body, not usually visible from dorsal view; non-caudal portion of dorsal shield bearing two pairs of glandularia, the more posterior pair of which are much closer medially; cauda short and widest at its base giving somewhat broad attachment to body, narrowing rapidly posterior to mid-region, without a median cleft or petiole at posterior end but with a very slight to no indentation; ventral side of cauda from lateral view curves dorsally, and on dorsal side has a smooth rounded hump in mid-region; non-caudal portion of dorsal shield bearing two rounded humps, not distinctly separated but higher than ventral shield portion of body; palp segment two bearing two short and three long setae (one on lateral side); palp segment three with two setae, one medial and one lateral; distal end of IV-leg-4 extending beyond insertion of fifth segment, third and fourth legs have well developed swimming hairs.

Holotype: Adult male, collected from Shaw Lake, five miles east of Brownsville and five miles south of US 70 in Haywood County, Tennessee, September 7, 1961.

Paratypes: Four males, same date and locality as holotype; one male, same locality, July 12, 1961.

Habitat: Small lake, water discolored brown, with algae and grass.

Range: Known only from type locality.

Discussion: This species is closely related to the *A. birgei*-group. Of the species in the group, this species seems more related to *A. succisus*, but shares many characteristics with *A. neobirgei* and *A. veracundus*. This species differs from *succisus* by having: (1) a shorter cauda, narrowing more abruptly posteriorly, and (2) from lateral view, posterior hump on non-caudal portion of dorsal shield not as high and rounded. This species resembles *neobirgei* but differs by having: (1) cauda wider at base as seen dorsally, and tapers more posteriorly with a less distinct median indentation at the end, (2) cauda similar in shape as seen laterally, but with a more rounded dorsal hump, and (3) humps on non-caudal portion of dorsal shield more distinct. This species also resembles *veracundus*, although somewhat smaller, and also differs by having: (1) shorter, more tapering cauda, as seen dorsally, and (2) cauda similar in shape laterally but not as constricted at its base. This new species and the three mentioned above all have very similar palps in the number and general location of setae.

The new species differs from all the others by having a cauda which: (1) is wider at its base, and (2) appears much shorter since it narrows much more abruptly posteriorly.

Arrenurus (Micruracarus) quadrisemiluniatu, new species

Male: Based on 6 specimens. (See Figures 7-9) Body length 0.805 mm. (0.805-0.865 mm.); body width 0.665 mm. (0.665-0.685 mm.); width of cauda at base 0.430 mm. (0.430-0.480 mm.); width of cauda at posterolateral projections 0.355 mm. (0.355-0.395 mm.); width of dorsal shield 0.385 mm. (0.375-0.395 mm.).

Body oval, widest near mid-region, anterior end of body projecting and concave between eyes; dorsal shield truncate posteriorly; lateral humps present on dorsal portion of ventral shield; acetabular plates extending well up onto sides of body; non-caudal portion of dorsal shield bears a pair of low lateral humps, posterior to which is a somewhat higher median hump (seen best in lateral view); cauda short and widest at its base giving a broad attachment to the body, narrowing rapidly to the somewhat rounded posterolateral projections, which join medially another pair of somewhat larger, rounded, posterior projections between which is a well developed, rounded cleft; dorsal cauda area with a slight concavity; palp segment two

bearing two long setae plus numerous short setae on medial surface; palp segment three with one medial and one lateral seta; distal ends of IV-leg-2,3,4,5 extending slightly beyond insertions, with segments two and three slightly longer than four and five; second, third, and fourth legs with swimming hairs, with only a few on the first leg.

Holotype: Adult male, collected from Harrison Resort Lake, about seven miles south of Crossville in Cumberland County, Tennessee, September 1, 1961.

Paratypes: Two males, same locality as holotype, June 14, 1961; one male, from a small lake on north side of US 70, about five miles east of Crossville (just west of Oak Lawn Motel), Cumberland County, Tennessee, August 25, 1959; two males, same locality, June 26, 1961.

Habitat: Water lilies, algae, and other water vegetation in permanent lakes.

Range: Known only from two lakes in Cumberland County, Tennessee.

Discussion: This species is closely related to a group of four species (*A. setiger*, *A. pseudosetiger*, *A. crenellatus*, *A. neo-crenellatus*), all of which are rather small with short caudae; cauda areas with slight concavities and having shallow to deep median clefts; posterolateral portions of cauda more or less projecting and divided into two pairs. The new species differs from *setiger* by having: (1) cauda much wider at its base, (2) the pair of posterolateral projections of cauda extend slightly more posterior and are slightly constricted laterally giving them a somewhat rounded appearance (best seen in lateral view), (3) the pair of posteromedial projections of cauda extend more posteriorly and are more rounded, and (4) the posterior median cleft of cauda is deeper and more rounded. The new species differs from *pseudosetiger* by having: (1) concavity between eyes anteriorly, (2) body narrows posteriorly, and (3) cauda not constricted at its base and posterolateral projections more distinct. The new species differs from *crenellatus* by having: (1) concavity between eyes anteriorly, (2) no peg-like petiole in caudal concavity, and (3) cauda narrower and posterolateral projections more distinct. The new species differs from *neo-crenellatus* by having: (1) cauda more broadly attached at its base and narrows more posteriorly, (2) the pair of caudal posterolateral projections much smaller and more rounded, (3) the pair of caudal posteromedial projections smaller and more rounded, (4) the posteromedial cleft of cauda deeper and more rounded, and (5) no peg-like petiole in caudal concavity.

The new species differs from the above four species most noticeably by having: (1) cauda broadly attached to body with distinct narrowing posteriorly, (2) the posterolateral and posteromedial pairs of caudal projections smaller and more rounded, and (3) the posteromedial cleft deeper and more rounded.

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