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NEW AND INCOMPLETELY KNOWN GENERA AND SPECIES OF ARRENUROIDEA (ACARI, HYDRACARINA) FROM SOUTH AFRICA

by David R. COOK *

SUMMARY: This paper treats the following arrenuroidean taxa taken in South African streams: two new genera, a new subgenus and five new species belonging to the Athienemanniinae, Stygohydracarus (Vicinahydracarus) amala, Penemundamella renona, P. temona, P. denona, Bleptomundamella venona; a new subgenus and species of Mideopsis, M. (Mixomideopsis) sandola, and a new species of Momoniella, M. vucaba. Africasia obscuripora is redescribed and the subfamily Africasinae is transferred to the family Athienemanniidae.

HYDRACARINA ARRENUROIDEA SOUTH AFRICA

INTRODUCTION

This paper deals mostly with new South African genera, subgenera and species belonging to the arrenuroidean families Momoniidae, Mideopsidae and Athienemanniidae. With the exception of the Momoniella, all the new species have their closest relatives in the Palearctic or Holarctic regions, rather than former Gondwanan areas or tropical Africa. The subfamily Africasinae was proposed by Cook (1974) and assigned to the Arrenuridae. For reasons to be discussed along with the redescriptions of Africasia obscuripora, it is being reassigned to the family Athienemanniidae.

Primary types are deposited in the Field Museum of Natural History (Chicago). Measurements are given in micrometers. If paratypes are available, size variation is given in parentheses following measurements of the primary types.

MOMONIIDAE

Momoniella vucaba, n. sp.
(Figs. 1–4)

Male: Dorsal and ventral shields present; dorsal shield 456 in length, 386 in width; dorsal shield bearing the postocularia, one pair of glandularia and four pairs of prominent apophyses; dorsal furrow with four pairs of glandularia platelets and four pairs of lyrifissure sclerites, these much smaller than the

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FIGS. 1–4: Monioniella vacaba, n. sp. (Male). 1.—ventral shield. 2.—palp. 3.—dorsal shield. 4.—distal segments of first leg.

glandularia platelets (Figs. 3); ventral shield 577 in length, 425 in width; anterior coxal group noticeably projecting with distinct ridges separating the first and second and second and third coxae; gonopore 50 in length, 24 in width; three pairs of genital acetabula, these occupying most of the area of the gonopore; gonopore closely flanked by three or four pairs of small setae; coxoglandularia 2 flanking the gonopore slightly anterior to middle; Figure 1 illustrates the structure of the ventral shield; dorsal lengths of palpal segments I–V, 23, 52, 38, 48, 34; ventral side of P-IV with one hair-like and one peg-like seta slightly proximal to middle (Fig. 2); capitulum 97 in length, chelicera 104 in length; dorsal lengths of segments 4–6 of the first leg, 79, 155, 96; dorsoproximal portion of I-Leg-6 with three relatively short projections of approximately equal size; the recurved claw of this segment with the rounded clawlet extending nearly to the tip of major clawlet (Fig. 4); dorsal lengths of segments 4–6 of the fourth leg, 93, 114, 121; swimming setae absent.

**FEMALE:** Unknown.

**TYPES:** Holotype male, Houtbosloop on Rt. 539 at “Dinosaurpark” south of Sabie, Eastern Transvaal, 27 May 1984. Temperature 11° C.

**DISCUSSION:** The present species is most closely related to *M. africana*, described by Cook (1966) from Liberia, but differs as follows: the lyrifissure platelets of the dorsal furrow are proportionally much smaller than the glandularia platelets, the two clawlets of the first leg are much nearer the same length (Fig. 4) and P-II is proportionally higher.

**MIDEOPSIDAE**

Subgenus *Mixomideopsis*, n. subgen.

**DIAGNOSIS:** Characters of the genus *Mideopsis* as given by Cook (1974); three pairs of genital acetabula; dorsal and ventral shields completely separated; all coxal suture lines distinct and the medial suture lines well separated from each other (Figs. 5, 7);
medial suture lines of fourth coxae not reduced to medial angles; coxoglandularia 2 in a line with the first pair of acetabula; dorsal shield with a V-shaped ridge; P-IV with a proximally placed ventral projection (Fig. 8); swimming setae present.

**Type species:** *Mideopsis (Mixomideopsis) sandola*, n. sp.

**Discussion:** The new subgenus is somewhat intermediate between the Holarctic subgenus *Xystonotus* and the South American species assigned to the typical subgenus. It differs from both in having all suture lines distinct and well separated from each other medially. It shares with *Xystonotus* the coxoglandularia 2 flanking the anterior portion of the gonopore but differs in its possession of swimming setae. The new subgenus also differs from the South American members of the typical subgenus in placement of coxoglandularia 2, these latter structures being placed far anterior to the genital field in the South American forms. Everything considered, the new subgenus seems most closely related to the Holarctic subgenus *Xystonotus*.

*Mideopsis (Mixomideopsis) sandola*, n. sp.

(Figs. 5–10)

**Male:** Integument without a colour pattern; dorsal and ventral shields present; dorsal shield 570 in length, 433 in width; dorsal shield bearing the postocularia, three pairs of glandularia and a V-shaped ridge which is better illustrated (Fig. 9) than described; ventral shield 653 in length, 496 in width; anterior coxae projecting slightly beyond body proper; all coxal suture lines distinct, with the medial margins of the third and fourth coxae well separated from each other (Fig. 5); a curved ridge on each side extending anterolaterally from the suture lines between the third and fourth coxae; medial margins of fourth coxae well developed, not reduced to medial angles; genital field extending into a deep bay formed by the fourth coxae; coxoglandularia 2 in a line with the first of three pairs of genital acetabula; gonopore 100 in length, 26 in width; gonopore flanked by five pairs of small setae; dorsal lengths of palpal segments I-V, 31, 41, 38, 90, 34; palp as described and illustrated for the female; capitulum 101 in length, chelicera 117 in length; Figure 10 illustrates a lateral view of the capitulum, chelicera and palp; dorsal lengths of segments 46 of the first leg, 93, 104, 138; dorsal lengths of segments 46 of the fourth leg, 125, 162, 166; no sexual dimorphism of the legs; III-Leg-3, III-Leg-4 and IV-Leg-4 each with a single long swimming seta; III-Leg-5 and IV-Leg-5 each with two swimming setae, although those of the fourth leg are longest.

**Female:** Basically similar to male except for genital field region and minor differences in the shape of the fourth coxae (compare Figs. 5 and 7) and mostly only measurements are given; dorsal shield 654 in length, 517 in width; ventral shield 700 in length, 577 in width; medial suture lines of third and fourth coxae somewhat farther apart and posterior edges of fourth coxae more rounded than in male; gonopore 145 in length, 131 in width; the three pairs of genital acetabula with irregular medial margins; dorsal lengths of palpal segments I-V, 33, 52, 51, 107, 36; P-IV relatively long and narrow, with the ventral projection near proximal end; structure of palp better illustrated (Fig. 8) than described; capitulum 114 in length, chelicera 134 in length; dorsal lengths of segments 4–6 of the first leg, 100, 114, 148; Figure 6 shows I-Leg-5 & 6; dorsal lengths of segments 4–6 of the fourth leg, 142, 186, 190; swimming setae as described for the male.

**Types:** Holotype male, allotype female, from the Homtini River north-west of Knysna, Eastern Cape Province, 10 June 1984. This is a small stream (6–8 feet wide) with the stained waters characteristic of this region. Temperature 9.5°C.

**Discussion:** The characters given under the discussion of the subgenus are sufficient to distinguish the new species from all others.

**Athienemanniidae**

Members of this family have been reported from all major land areas except South America (the neotropical Plaumanniinae have recently been shifted
The two known species from Australia, *Notomundamella harveyi* Cook, 1986 and *Mellamunda acares* Harvey, 1988, belong to the *Notomundamellinae*, a group very distinct from the *Athienemanniinae*, the subfamily to which the Holarctic and African species belong. The New Zealand *Anamundamella zelandica* Cook, 1992, although assigned to the subfamily *Athienemanniinae*, is not closely related to the Holarctic and African genera. It is apparent that the new African species have their closest affinities with the European members of the subfamily and that there is no Gondwanan connection. It therefore seems likely that when the higher elevations of East Africa are adequately collected other members of *Athienemanniinae* will be taken.

**Subgenus Vicinihydracarus, n. subg.**

**Diagnosis:** Characters of the genus *Stygohydracarus* as given by Cook (1974). *Vicinihydracarus* is closely related to but differs from the nominate subgenus primarily in structure of the genital field. Male gonopore widening and open posteriorly when viewed ventrally in the new subgenus, narrowing and closed...
when viewed ventrally in the nominate subgenus. The gonopore is flanked laterally by four pairs of setae in the African subgenus, but these setae absent in the European species.

**Type Species:** *Stygohydracarus (Vicinihydracarus) amalus* n. sp.

*Stygohydracarus (Vicinihydracarus) amalus*, n. sp. (Figs. 11–16)

**Male:** Integument colourless, but eyes well developed; dorsal and ventral shields present; dorsal shield 373 in length, 304 in width; dorsal shield somewhat truncate anteriorly, tapering posteriorly (Fig. 11), and bearing three pairs of glandularia and the postocularia; ventral shield 440 in length, 334 in width; anterior coxae projecting beyond the body proper; capitular bay relatively large, 104 in width; coxal suture lines well developed; ridges present on each side extending posteriorly and anterolaterally from insertions of the fourth legs; genital field area slightly raised, with four pairs of setae closely flanking gonopore and two pairs at lateral edges of genital field; small indented-areas present on the abruptly curved posterior edges of genital field; gonopore 69 in length, 14 in greatest width; gonopore open posteriorly when viewed ventrally; eight pairs of genital acetabula, these in a single row on each side except the most posterior which are double; the first two pairs of acetabula much larger and then becoming smaller posteriorly; Figure 13 shows the structure of the genital field region; dorsal lengths of palpal segments I–V, 17, 50, 41, 66, 39; palpal segments rotated, relatively stocky and distoventral corner of P-IV pointed (Fig. 12); capitulum 117 in length, chelicera 128 in length; ventral side of capitulum indented when viewed laterally (Fig. 15); dorsal lengths of segments 4–6 of first leg, 48, t’-85, 90; Figure 16 illustrates these segments; dorsal lengths of segments 4–6 of the fourth leg, 66, 78, 90; all legs stocky, without swimming setae and not exhibiting a sexual dimorphism.

**Female:** Unknown.

**Types:** Holotype male, from a small branch of the Hoekraal River (east of the main river) near Karatara (north-west of Knysna), Eastern Cape Province, 10 June 1984. Stream 2–3 feet wide, deeply stained, and with little flow. Temperature 8.5° C.

**Discussion:** The characters listed for the subgenus will distinguish the new species from the European members of the genus. The European species are interstitial and, as the present species is colourless and was taken by stirring up bottom deposits in the stream, it also likely is interstitial.

**Genus Penemundamella, n. gen.**

**Diagnosis:** Characters of the Athienemanniinae as given by Cook (1986); posterior suture lines of the fourth coxae indistinct and no ridges extending posteriorly from region of insertion of fourth legs; legs and palp not exhibiting a sexual dimorphism; a few swimming setae present on the third and fourth legs; male gonopore with a single row of acetabula on each side; a median concavity, flanked by a row of small setae on each side, extending anterior to the gonopore (Figs. 23, 26); males with tufts of setae-like integumental extensions near posterior end of ventral shield (Figs. 17, 25); female gonopore relatively large, flanked by narrow but distinct acetabular plates which are fused with the ventral shield, and bear numerous genital acetabula, mostly in two rows.

**Type Species:** *Penemundamella renona*, n. sp.

**Discussion:** The new genus seems most closely related to the Palearctic genus *Mundamella* Viets. Males share the relatively narrow gonopore, non-projecting anterior coxae and the peculiar tufts of setae-like integumental extensions at posterior end of the ventral shield (Figs. 17, 25). Both males and females of *Mundamella* possess well-developed posterior suture lines of the fourth coxae and ridges extending both anterolaterally and posteriorly from the region of insertion of the fourth legs, structures absent in the new genus. The genital acetabula are more numerous and in more rows in the European genus. The male gonopore of *Mundamella*, which is much wider anteriorly than posteriorly, has up to three rows of acetabula on each side anteriorly, as opposed to basically a
single row on each side in the new genus. The acetabula can be up to four to five rows wide in the females of the European genus, two acetabula wide in *Penemundamella*.

*Penemundamella renona*, n. sp.

(Male: dorsal and ventral shields present; integument colourless; dorsal shield 349 (368) in length, 319 (324) in width; dorsal shield without ridges and nearly truncate posteriorly (Fig. 19); ventral shield 380 (394) in length, 334 (348) in width; anterior coxae not protecting beyond body proper, capitular bay U-shaped; the more lateral glandularia forming small bulges on the outer margin; posterior coxal suture lines of the fourth coxae nearly obliterated; gonopore 83 (83) in length, 19 (20) in width; genital acetabula 11–14 on each side and basically in single rows; coxoglandularia 2 placed roughly in a line with the fourth pair of acetabula; a shallow groove extending anteriorly from the gonopore which is flanked by 5–7 pairs of small setae; excretory pore flanked by a pair of glandularia and the characteristic tufts of setae-like integumental extensions (Figs. 23); these extensions quite variable, with as few as three on one side of the paratype, but up to ten in the holotype; dorsal lengths of the palpal segments: P-I, 20 (18 P-II, 42 (48); P-III, 26 (27); P-IV, 62 (66); PV, 19 (19); palp rotated (Fig. 18 shows a dorsal view of P-IV and V); capitulum 65 (69) in length, chelicera 76 (80) in length; these structures as illustrated for the female; dorsal lengths of the distal segments of the first leg: I-Leg-4, 40 (41); I-Leg-5, 55 (57); I-Leg-6, 66 (69); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 77.

Figs. 11–16. *Stygohydracarus (Vicinihydracarus) amalus*, n. sp. (Male). ll.—dorsal shield. 12.—distal segments of palp. 13.—genital field. 15.—lateral view of capitulum, chelicera and palp. 16.—distal segments of first leg.
(79); IV-Leg5, 93 (95); IV-Leg-6, 90 (93); legs not exhibiting a sexual dimorphism; swimming setae as described for the female.

**FEMALE:** Dorsal and ventral shields present; integument colourless; dorsal shield oval, narrowing anteriorly and 388 (395-410) in length, 348 (350-358) in width; ventral shield 430 (430-449) in length, 392 (380-388) in width; ventral shield noticeably narrowing anteriorly and with small glandularia bumps on the outer margins; capitular bay U-shaped, posterior margins of fourth coxae obliterated; genital field 155 (145-152) in width; gonopore 111 (107-120) in width; narrow acetabular plates, bearing 16-23 pairs of genital acetabula, fused with the ventral shield (Fig. 22); dorsal lengths of the palpal segments: P-I, 21 (19-20); P-II, 52 (52); P-III, 28 (26-28); P-IV, 66 (62-66); P-V, 22 (20-22); palp rotated as in the male and with the distal corner of P-IV somewhat roundly pointed (Fig. 18); capitulum 76 (72-76) in length, chelicera 83 (76-83) in length; Figure 21 illustrates a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 41 (39-44); I-Leg-5, 62 (59-60); I-Leg-6, 72 (72-76); Figure 20 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, (76-78); IV-Leg-5 (93-100); IV-Leg-6 (95-100); III-Leg-4 and 5 each with three, IV-Leg-4 with one, IV-Leg-5 with three or four swimming setae, these longer than the following segment.

**TYPES:** Holotype male, allotype female, 1 paratype male, 3 paratype females, Krokodilspruit south-east of Dullstroom, Eastern Cape Province, 28 May, 1984. Stream six feet wide, bottom sand and rocks. Temperature 7° C.

**DISCUSSION:** See remarks under the following species.

*Penemundamella temona,* n. sp.  
(Figs. 23-32)

**MALE:** Dorsal and ventral shields present; integument colourless; dorsal shield 502 in length, 426 in width; dorsal shield with very slight indications of ridges as indicated for the following species (Fig. 36) and rounded posteriorly (Fig. 27); ventral shield 540 in length, 456 in width; anterior coxae not projecting beyond body proper; capitular bay a rounded V-shape; posterior suture lines of the fourth coxae obliterated; gonopore 124 in length, 10 in width; genital acetabula 14-16 on each side and in single rows; coxoglandularia 2 placed roughly in a line with the tenth pair of genital acetabula; a shallow groove extending anteriorly from the gonopore region which is flanked by 11 pairs of small setae (Fig. 26); excretory pore flanked by a pair of glandularia, with a pair of setae-like integumental tufts slightly anterior; these tufts composed of 9-11 filaments which are mostly knobbed at the tips (Fig. 25); dorsal lengths of segments I-V of the palp, 27, 62, 35, 79, 24; palp rotated; capitulum 100 in length, chelicera 104 in length; Figure 29 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of segments 4-6 of the first leg, 59, 76, 88; dorsal lengths of segments 4-6 of the fourth leg, 100, 121, 114; no sexual dimorphism of the legs; swimming setae as described for the female.

**FEMALE:** Dorsal and ventral shields present; integument colourless; dorsal shield oval, tapering anteriorly and 562 (532-550) in length, 486 (460-547) in width; dorsal shield with a very slight development of the lateral ridges as indicated in the following species (Fig. 36); ventral shield 623 (562-593) in length, 532 (494-517) in width; anterior coxae not projecting beyond the body proper; capitular bay relatively shallow and wide and a somewhat rounded V-shape; posterior suture lines of the fourth coxae obliterated; genital field 166 (162-166) in length, gonopore 121 (114-118) in length; genital acetabula 20-25 on each side and these on narrow acetabular plates which are fused with the ventral shield; dorsal lengths of the palpal segments: PI, 28 (24-27); P-II, 69 (62-67); P-III, 35 (31-35); P-IV, 90 (83-90); P-V, 26 (24-27); palp segments rotated, distal end of P-V roundly pointed (Fig. 31); capitulum 103 (94-100) in length, chelicera 108 (104) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 59 (55-59); I-Leg-5, 76 (73-76); I-Leg-6, 93 (90-93); Figure 28 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 103 (97);
IV-Leg-5, 124 (121); IV-Leg-6, 117 (107-117); fourth segments of third and fourth legs each with one, fifth segments of third and fourth legs each with two stiff swimming setae; swimming setae shorter than the following segment.

TYPES: Holotype male, allotype female, 3 paratype females, from the Kaaimans River east of George, 10 June 1994. Stream 5–10 feet wide, bottom sand and rocks, water deeply stained. Temperature 9.5°C.

DISCUSSION: The present species is most closely related to the preceding but differs as follows: In males of the present species the dorsal shield is proportionally narrower and more rounded posteriorly (compare Figs. 19 and 27). The coxoglandularia 2 are more posterior relative to the gonopore (roughly in line with the fourth pair of acetabula in *renona*, in a line with the tenth pair in the present species). Also the small setae flanking the median depression anterior to the gonopore are more numerous in *temona*. The tufts of setae-like integumental extensions are knobbed at the tips in the present species, but without knobs in the related species (compare Figs. 23 and 26). In the female, the genital fields are about the same actual size, but because the present species is much larger, its genital field is proportionally much smaller (compare Figs. 22, 30). The capitular bay is more V-shaped in the present species, the segments of the first leg are less stocky (compare Figs. 20 and 28), and the swimming setae are shorter and less numerous.

**Penemundamella denona**, n. sp.
(Figs. 33–37)

FEMALE: Dorsal and ventral shields present and both are noticeably wider anteriorly than posteriorly (Figs. 35, 36); integument a uniform dark rose colour; dorsal shield 577 in length, 486 in width and with distinct lateral ridges slightly medial to the dorsal glandularia (Fig. 36); ventral shield 608 in length, 532 in width; anterior coxae not projecting beyond the body proper; capitular bay more or less U-shaped; posterior suture lines of the fourth coxae obliterated; genital field 156 in width; gonopore 114 in width; 16–17 genital acetabula on each side, these on narrow acetabular plates which are fused with the ventral shield; dorsal lengths of segments I–V of the palp, 27, 62, 31, 83, 29; palpal segments rotated; distal end of P-IV rounded (Fig. 37); capitulum 114 in length, chelicera 117 in length; Figure 34 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of segments 4–6 of the first leg, 59, 85, 93; Fig. 33 illustrates these segments; dorsal lengths of segments 4–6 of the fourth leg, 104, 125, 121; III-Leg-4, IV-Leg-4 & 5 each with one, III-Leg-5 with two short stiff swimming setae.

MALE: Unknown.

TYPES: Holotype female, same collection data as the preceding species, *P. temona*.

DISCUSSION: It is unfortunate that the male was not collected, for it would likely exhibit most of the characters distinguishing the present species. However, the “reversed” shape of the dorsal and ventral shields, with these plates wider anteriorly than posteriorly, is very unusual and will easily identify it. Also, the distal end of P-IV is more rounded than in the preceding two species.

**Bleptomundamella**, n. gen.

DIAGNOSIS: Characters of the Athienemanniinae as given by COOK (1986); posterior suture lines of the fourth coxae indistinct; no ridges extending anterolaterally from region of insertion of the fourth legs, but short ridges extending posteriorly from these openings; third and fourth legs of male exhibiting a strong sexual dimorphism; several long swimming setae present on the third and fourth legs; palps showing sexual dimorphism with the male palp being much stockier (compare Figs. 44, 47); gonopore of male with a single row of acetabula on each side; a deep oval cavity present anterior to the gonopore over which extend a series of blade-like setae (Figs. 38–39); a median concavity present posterior to the gonopore which is flanked by a number of setae; the tufts of setae-like projections characteristic of the previous genus reduced to one or two filaments on
each side; females similar to those of the previous genus but with slightly projecting anterior coxae, short ridges extending posteriorly from region of insertion of the fourth legs, and the acetabular plates are wider (with up to three acetabula in a row, Fig. 40).

**Type species:** *Bleptomundamella wenona*, n. sp.

**Discussion:** The new genus has obvious affinities with *Penemundamella*; the most striking differences are found in the male. There is a deep oval pit anterior to the gonopore which is flanked by blade-like setae (Fig. 39) and the third and fourth legs exhibit a strong sexual dimorphism. The deep pit and its highly modified setae apparently are an elaboration of the shallow anterior groove and flanking small setae (Figs. 23, 26) of the previous genus. However, this pit along with the type of sexual dimorphism of the legs suggest there has been an alteration in sexual behaviour. The pit likely is a storage area for spermatophores and the modified legs used to transfer them, a situation similar to that found in many members of the Pionidae. Females of the present genus do not exhibit good generic characters, although the wider acetabular plates and moderate development of ridges on the first coxae and those extending posteriorly from the region of insertion of the fourth legs may prove diagnostic.

*Bleptomundamella wenona*, n. sp.
(Figs. 38–48)

**Male:** Dorsal and ventral shields present; dorsal shield 471 (506) in length, 358 (376) in width; dorsal shield with lateral ridges as indicated in Figure 43; ventral shield 502 (532) in length, 395 (420) in width;
Figs. 38–45: Bleptomundamella wenona, n. sp. 38. —Ventral shield, male. 39. —Genital field region, male. 40. —Ventral shield, female. 41. —Distal segments of fourth leg, male. 42. —Distal segments of third leg, male. 43. —Dorsal shield, male. 44. —Palp, female. 45. —Dorsal shield, female.
first coxae extending slightly beyond anterior edge of body proper and with a pronounced ridge running parallel to the outer edge; capitular bay relatively large and U-shaped; posterior suture lines of fourth coxae obliterated; gonopore 111 (121) in length, 12 (14) in width, and extending slightly into the anterior genital pit; genital acetabula 18–23 on each side and in single rows; a deep genital pit 110 (114) in length, 83 (87) in width, located anterior to the gonopore; numerous blade-like setae partially covering the pit; a shallow median depression, containing several small setae, extending posteriorly from the gonopore region; the tufts of setae-like integumental extensions, so characteristic of males of Penemundamella, reduced to only one or two filaments (Fig. 39); dorsal lengths of the palpal segments: P-I, 27 (27); P-II, 80 (86); P-III, 26 (29); P-IV, 66 (72); P-V, 24; palp exhibiting a sexual dimorphism, with P-II much higher than in the female; palpal segments rotated; capitulum 121 (121) in length, chelicera 114 (118) in length; Figure 47 illustrates a lateral view of the capitulum, chelicera and palp, Figure 48 shows a dorsal view of P-IV; dorsal lengths of the distal segments of the third leg: III-Leg-4, 62 (66); III-Leg-5, 103 (100); III-Leg-6, 96 (93); these segments stocky; III-Leg-6 expanded distally, somewhat bowed and terminating in enlarged claws (Fig. 42); III-Leg-4 & 5 each with four long swimming setae; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 83 (80); IV-Leg-5, 96 (96); IV-Leg-6, 86 (90); these segments even more expanded than those of the third leg, especially IV-Leg-6 (Fig. 41); claw sockets of these legs very wide; IV-Leg-4 & 5 each with four or five long swimming setae.

FEMALE: Dorsal and ventral shields present; dorsal shield 8532 (518) in length, 425 (420) in width; dorsal shield oval, narrowest anteriorly and bearing lateral ridges as indicated in Figure 45; ventral shield 570 5 5 6 in length, 464 (470) in width; first coxae projecting slightly beyond body proper and with ridges parallel to the outer margins; short ridges extending, posteriorly from region of insertion of the fourth legs; posterior suture lines of the fourth coxae indistinct; genital field 15G (i52) in width; gonopore 104 (110) in width; 2433 genital acetabula on each side, these often three rows wide, and located on acetabular plates which are fused with the ventral shield; dorsal lengths of the palpal segments: P-I, 26 (26); P-II, 62 (65); P-III, 26 (25); P-IV, 62 (66); P-V, 22 (23); P-LI noticeably less high than in male (compare Figs. 44, 47); capitulum 110 (110) in length, chelicera 111 (107) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 54 52); I-Leg-5, 74 (76); I-Leg-6, 93 (93); Figure 4 G illustrates these segments; dorsal lengths of segments 4-G of the fourth leg, 93, 104, 97; swimming setae as described for the male.

TYPES: Holotype male, allotype female, 1 paratype male, 1 paratype female, from the Krokodilspruit southeast of Dullstroom, Eastern Cape Province, 28 May 1984. Stream six feet wide, bottom sand and rocks. Temperature 7° C.

DISCUSSION: Characters listed under the generic discussion will easily separate the present species from all others.

AFRICASIINAE

Discussion: This subfamily was erected by Cook (1974) and includes only the distinctive genus Africasia. Although the similarities of the mouth parts to those of the Athienemanniidae were pointed out, the fact that the genital acetabula of Africasia all lie on the ventral shield with none in the gonopore was considered a profound enough character to justify placing the subfamily in this Arrenuridae. More recent findings have shown that position of the acetabula in relation to the gonopore is much more variable within the Arrenuroidea than was previously thought. Especially interesting in this context was the finding of a member of the Arrenuridae with acetabula in the gonopore; the male of Thoracophoracarus (Xenhoracophoracarus) chilensis described by Cook (1988) from Valdivia Province, Chile, has a pair of acetabula in the gonopore. It now appears that the following characters of the mouth parts are more important in defining the Athienemanniidae than position of the acetabula: (1) the spatulate distal end of the capitulum, which appears more or less pointed in lateral view (Fig. 54) but broad in a dorsal or ventral view (Fig. 53), (2) the more lateral of the two
pairs of setae at the distal end of the capitulum are very long, (3) the palp is uncate but the segments are rotated. Additionally, the Athienemanniidae tend to be dorso-ventrally flattened while the Arrenuridae have a body which is high and shows no evidence of dorso-ventral flattening. Several papers have in recent years suggested a close association of *Africasia* with the Athienemanniidae, and, based on the above listed criteria, the Africasiinae must be shifted to that family.

*Africasia obscuripora* (Viets)
(Figs. 49–54)


**MALE**: Dorsal and ventral shields present; dorsal shield 388–410 in length, 334–357 in width; integument of dorsal shield with five areas (two pairs of lateral and one posteromedial) of radiating lines as indicated on the left side of Figure 52, although these areas are thinner in some individuals; right hand side of this figure illustrates the characteristic colour pattern; ventral shield 450–458 in length, 389–410 in width; outer margin of ventral shield irregular; anterior coxae projecting; outer margins of third and fourth coxae nearly forming a straight line; gonopore 59–69 in length; 12–18 genital acetabula on each side; dorsal lengths of the palpal segments: P-I, 24–25; P-II, 47–53; P-III, 26–27; P-IV, 60–64; P-V, 24–27; palpal segments rotated; distal end of the uncate P-IV with one long thin seta and one short somewhat thickened seta (Fig. 51); capitulum 103–105 in length, chelicera 112–114 in length; palp as described for the male; Figure 54 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 52–53; I-Leg-5, 66–76; I-Leg-6, 87–93; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 76–80; IV-Leg-5, 90–100; IV-Leg-6, 103–105; swimming setae as described for the male.

**FEMALE**: Dorsal and ventral shields present; dorsal shield 410–432 in length, 365–373 in width; structure and colour pattern as in the male; ventral shield 464–501 in length, 418–440 in width; ventral shield rather similar to that of male except in region of the genital field; gonopore 90–97 in length, 90–96 in width; genital acetabula 13 to 17 on each side, these on ill defined acetabular plates (Fig. 49); dorsal lengths of the palpal segments: P-I, 26–28; P-II, 48–52; P-III, 31–33; P-IV, 67–69; P-V, 24; capitulum 100–107 in length, chelicera 112–114 in length; palp as described for the male; Figure 54 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the second leg: II-Leg-4, 48–52; II-Leg-5, 66–76; II-Leg-6, 87–93; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 76–80; IV-Leg-5, 90–100; IV-Leg-6, 103–105; swimming setae as described for the male.

**MATERIAL EXAMINED**: 3 males, 3 females, from the *Kaaimans* River east of George, Eastern Cape Province, 10 June 1934. Stream 10 feet wide, water deeply stained. Temperature 9.5° C.

**DISCUSSION**: Two additional *Africasia* species possess the five radiating lines of the dorsal shield, the Liberian species, *A. radiata* Cook, 1966 and the Indian species, *A. mahadensis* Cook, 1967. The present species differs from both others in possessing far fewer genital acetabula and a different colour pattern, the pattern being continuous in the Liberian and Indian species.

**REFERENCES**


