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First collections of water mites (Acari: Hydrachnidia) from Honduras: descriptions of six new species

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Abstract

First collections of water mites (Acari: Hydrachnidia) from Honduras indicate a rich fauna. Nineteen species from just three sites yielded six species new to science. New species described and discussed are: *Hydrodroma moralesi* n. sp., *Flabellifrontipoda triscutata* n. sp., *Monatractides angelae* n. sp., *Pseudotorrenticola espinasseae* n. sp., *Atractides jenniferae* n. sp. and *Recifella cusucoensis* n. sp.

Keywords: Neotropical, water mites, Honduras, Hydrachnidia

Introduction

K. O. Viets (1977a, 1977b, 1977c, 1977d, 1977e, 1978a, 1978b) listed 62 species of Central American water mites of which 43 were new to science. David Cook (1980) described a further 200 species from Mexico and Guatemala in his seminal work on Central American water mites. Further additions from Mexico by Cramer, Otero-Colina and Galicia (listed by Viets 1987 and Cramer 1988), Cramer (1992) and Cramer and Smith (1991, 1993) significantly increased the species list so that today there are approximately 300 species reported for Central America and Mexico (Goldschmidt 2002).

Honduras lies across the Neotropical land bridge between North and South America from the Atlantic to the Pacific Ocean. Less than 10% of the land area remains as forest, most of it under threat (SERNA 2003). Pristine freshwaters are often located in isolated mountainous and recently protected areas (JICA 2002). Natural freshwater ecosystems were severely affected by Hurricane Mitch. The effects (landslides, flood damage and siltation) remained visible when samples were collected by the University of Glamorgan tropical field course to Honduras in 2003. Water mites were found in a small stream and small shallow river in pine forests of Cusuco National Park, and in a stony stream in regenerating moist rainforest at El Paraiso in the Merendon Mountains near the Atlantic coast.

Although small, the first collections from Honduras indicate a rich fauna with 19 species including six new to science, from just three sites. *Hydrodroma moralesi* n. sp., *Frontipoda* (*Flabellifrontipoda*) *triscutata* n. sp., *Monatractides angelae* n. sp., *Pseudotorrenticola espinasseae* n. sp., *Atractides jenniferae* n. sp. and *Recifella cusucoensis* n.

sp. are described and new records discussed. Clearly there is much to be learned of the water mite fauna of Central America.

Materials and methods

Mites were collected using dip nets (0.3 mm mesh), sieved through Endecott sieves (30 cm diameter, 3.0 mm and 0.3 mm mesh), transferred to a white tray and live mites picked out before preservation in Koenike's solution (glacial acetic acid: alcohol: water, 1:5:4). In the laboratory mites were cleared in Lundblad's solution for between 1 and 7 days (up to 150 days) to remove lipids, washed in Koenike's solution then dissected and displayed in double coverslip mounts. Mites were dissected at the edge of a 22 mm diameter coverslip in glycerin jelly and parts orientated in the middle of the coverslip. When the jelly had set, the round coverglass was inverted on to a square 22 mm coverglass of fresh glycerin jelly. When set the double coverslip was placed on an aluminium mount over a 21 mm hole and sealed with glyceel.

The nomenclature for the descriptions follows Wiles (1997a, 1997b). All measurements are in μm . Abbreviations are: A, antennal glandularia; D, dorsoglandularia; E, epimeroglandularia; g, lyrifissure L, lateroglandularia; R, ocularia; V, ventroglandularia; Ep, epimeron (=coxa *sensu* Cook, 1966); Gp, genital plate; Ib, infracapitular bay; Ib-Gp, distance between back of infracapitular bay and front of genital plates; MS, median suture from the point of fusion of epimeral sutures between first and second epimera medially to the front of the genital plates; P, pedipalp (*sensu* Harvey, 1996); I-Leg-6, first leg sixth segment (tarsus). Holotype slide preparations will be deposited in the Natural History Museum, London; other preparations may be held by the author prior to deposition.

Species list for Honduras

Slide preparation number prefixed by H. Local sites: 1, River Piedra Muqlu, El Paraiso, Merendon Mts; 2, River El Carago, Cusuco N. P.; 3, River Cusuco, Cusuco N. P. Country codes: A, Argentina; CO, Colombia; CR, Costa Rica; GU, Guatemala; MX, Mexico.

Hydrodroma clavipes Lundblad, 1953 [H18, H19—3—CO, CR, MX]

Hydrodroma moralesi n. sp. [H17—2]

Sperchon (*Mixosperchon*) *mexicanus* Cook, 1980 [H2—2—MX]

Lebertia (*Pseudolebertia*) *azteca* Cook, 1980 [H11, H15, H41—3—MX]

Frontipoda (*Flabellifrontipoda*) *triscutata* n. sp. [H16—2]

Monatractides angelae n. sp. [H32, H33—2]

Monatractides lembaba Cook, 1980 [H22—1—CR, MX]

Torrenticola colombiana (Lundblad, 1941) [H4, H12, H13, H27—2, 3—A, CO]

Pseudotorrenticola espinasseae n. sp. [H1, H3, H34—2]

Hygrobatas (*Hygrobatas*) *clevarius* Cook, 1980 [H26—1—A]

Hygrobatas tenuis K. O. Viets, 1978 [H24—1—A, CR, GU]

Atractides davidsi Viets, 1978 [H36, H37, H38—3—GU]

Atractides jenniferae n. sp. [H7, H4—1]

Atractides sinuatifipes Lundblad, 1953 [H8, H25, H28, H30, H31, H39, H40—1, 2, 3—CO, GU, A?]

Atractidella mesoamericana Cook, 1980 [H6, H10—1—CR, MX]

Recifella cusucoensis n. sp. [H35—2]

Species of uncertain designation

Mideopsis (Mideopsis) magna Cook, 1980 ♀ [H29—1—MX]

Corticacarus coldomus Cook, 1980 [H5, H20, H24—1, 2—A]

Arrenurus zukovus Cook, 1980 ♀ [H21—2—MX]

Descriptions of new species

***Hydrodroma moralesi* n. sp.**

(Figure 1)

Male. Small red species. Epimera typical, heavily sculptured: each genital plate narrow with 22–24 acetabula and 13 genital plate setae: genital plate length 123, maximum width 42; genital pore length 90; ejaculatory complex without distal horns. Pedipalps short, P4 short and broad, P3 distal setae of similar length approximately 127 long; length P1–5 26, 38, 27, 75, 37. Legs typical, without swimming setae.

Material examined. HOLOTYPE: ♂. **Honduras:** (Site 2) R. El Carago, small stream, near Cusuco National Park entrance, Merendon mountains, altitude 640 m, 6 April 2003. Slide: holotype: H17♂.

Etymology. Named after E. Morales for services to conservation in Honduras.

Discussion. The palp and the genital plate are the shortest and the number of acetabula per plate the fewest of all the species of *Hydrodroma* described. It is the only species without

Figure 1. *Hydrodroma moralesi* n. sp. ♂. (a) Venter showing epimera, genital field and anal plate; (b) ejaculatory complex, arrow indicates location of 'horns' on other species; (c) palp. Scale bar: 66 µm (a); 28 µm (b); 17 µm (c).

swimming setae or distal horns on the ejaculatory complex. The nearest species in size is *H. liberiensis* Cook, 1966. It has less than 30 acetabula on a single genital plate that is 50% longer than that of *H. moralesi* n. sp., a slender pedipalp with P4 is of typical proportions and legs with swimming setae.

***Frontipoda (Flabellifrontipoda) triscutata* n. sp.**

(Figure 2)

Male. Colour blue black, body laterally compressed, length 624, width 282, height 418. Dorsal furrow with three sets of three platelets, medial platelet 2 located between anterior lateral platelets; posterior medial platelet long, located between lateral platelets 2 and 3. R2 (postocularia) located on anteromedial platelet, L1 in dorsal furrow integument with lyrifissures g2–5, all other glandularia on lightly sculptured ventral shield. Excretory pore on plate behind genital field. Ventral shield encloses genital acetabula, length genital plate

Figure 2. *Frontipoda (Flabellifrontipoda) triscutata* n. sp. ♂. (a) Dorsum; (b) lateral view; (c) IV-Leg-4–6; (d) pedipalp; (e) excretory pore plate—genital field ventral; (f) venter. Scale bar: 96 μ m (a, b, e, f); 58 μ m (c); 41 μ m (d).

129. Median suture line complete between infracapitular bay and genital field, length Ib–Gp 239. Pedipalp typical, length P1–5 31, 40, 29, 48, 14. Legs with six to nine swimming setae on II–III–IV–Leg-5, IV–Leg-6 terminating in a long distal seta > than length of tarsus, length I–Leg-3–6 37, 46, 66, 73; II–Leg-3–6 50, 73, 89, 96; III–Leg-3–6 63, 90, 119, 122; IV–Leg-3–6 66, 86, 102, 83.

Material examined. HOLOTYPE: ♀. **Honduras:** (Site 2) R. El Carago, small stream, near Cusuco National Park entrance, Merendon mountains, altitude 640 m, 6 April 2003. Slide: H16♀.

Etymology. Name refers to the three rows of three platelets in the dorsal furrow.

Discussion. This species has a unique distribution of three sets of three well-developed platelets in the dorsal furrow.

***Monatractides angelae* n. sp.**

(Figure 3)

Male. Colour pale ruddy red. Small species; dorsal shield length 481, width 371; ventral shield length 574, width 415. Dorsal plates 1+2 with anterior lateral platelets showing remnants of dividing suture line; D2 and D3 located on and D4 located posterior to, dorsal plate; ventral shield typical; length MS 53, Ib–Gp 109; V1 on ventral plate, V2–4 and excretory pore located posterior to ventral plate; infracapitular bay not tapering, narrow, length 129, width 38. Length genital flap 110, width across both flaps 86. Ejaculatory complex with wide bulbous distal end tapering strongly to genital pore. Infracapitulum and pedipalp typical; length P1–5: 23, 46, 31, 41, 18. I–Leg-6 and 2–Leg-6 short and broad, <2 × as long as broad, length I–Leg-6 73, height I–Leg-6 42, II–Leg-6 more strongly tapering proximally than I–Leg-6.

Female. Similar to male but larger with shorter MS and broader genital plates. Length dorsal shield 549, width 422. MS 37, Ib–Gp 97, V1 just on ventral plate; infracapitular bay 143, width 43. Length genital flap 149, width across both genital flaps 133. Length P1–5: 23, 43, 32, 41, 13. Legs similar to male.

Material examined. HOLOTYPE: ♂. **Honduras:** (Site 2) R. El Carago, small stream, near Cusuco National Park entrance, Merendon mountains, altitude 640 m, 8 April 2003. Slide: holotype H33♂, paratype 1 H2♀, paratype 3 H34Nymph.

Etymology. Named after Angela Todd, Glamorgan University, who collected the specimens.

Discussion. The broad tibia of the first two pairs of legs and the pattern of fused anterior platelets are diagnostic of the species. Other species with a broad I–Leg-6 and II–Leg-6 include: *M. sakina* Cook, 1967 from India and the Malay Peninsula (unpublished record), *M. venusta venusta* (Viets, 1935), known from a single specimen from Sumatra; *M. venusta africana* Cook, 1966, *M. stigeophora* Cook, 1966 and *M. neostigeophora* Cook, 1966 from Liberia. The new species is of similar small size and shape to *M. venusta* and *M. sakina* and has a similar cheliceral claw (not enlarged). However, the pattern of anterior platelet fusion differs from that of similar species, which show no plate fusion.

Figure 3. *Monatractides angelae* n. sp. (a) Venter ♂; (b) dorsum ♂; (c) pedipalp ♂; (d) infracapitulum ♂; (e) I-Leg ♂; (f) ejaculatory complex; (g) venter ♀. Scale bar: 101 μm (a, b, g); 17 μm (c); 28 μm (d); 41 μm (e, f).

***Pseudotorrenticola espinasseae* n. sp.**

(Figure 4)

Male. Rosy red pigment on dorsal shield. Large species; dorsal shield length 743, width 608; ventral shield length 940, width 710. Dorsal plates 1+1 with anterior pair of platelets fused together and posterior platelets fused to large dorsal plate; D2 and D3 located on, and D4 located posterior to, dorsal plate. Ventral shield typical; length MS 51, Ib–Gp 279; V1 on ventral plate, V2–4 and excretory pore located posterior to ventral plate; infracapitular bay very shallow, tapering to point posteriorly, length 42, width apically 51. Length genital flap 186, width across both flaps 186. Ejaculatory complex with wide bulbous distal end. Infracapitulum extendable to 338; infracapitulum long, length 584, narrow with long thin rostrum, length 254; chelicera stylet-like, 351 long, claw 51 long;

Figure 4. *Pseudotorrenticola espinasseae* n. sp. (a) Venter ♂, arrow to subapical epimeroglandularium 4; (b) lateral view infracapitulum; (c) pedipalp ♂, inset ventral view of pedipalp; (d) ejaculatory complex of *Pseudotorrenticola sharpae* Wiles; (e) ejaculatory complex; (f) dorsum ♂; (g) venter ♀. Scale bar: 216 µm (a, b, f, g); 41 µm (c); 101 µm (d, e).

pedipalp P2 of similar length to P3, much reduced, $P4:P3 < 0.5$; length P1–5: 46, 111, 107, 31, 10. Legs typical.

Female. Similar to male but MS is longer. Dorsal shield length 727, width 634; ventral shield length 871, width 660; MS 102, Ib–Gp 271. Length genital flap 169, width across both flaps 148. Infracapitulum 525. Legs typical.

Material examined. HOLOTYPE: ♂. **Honduras:** (Site 2) R. El Carago, small stream, near Cusuco National Park entrance, Merendon mountains, altitude 640 m, 13 February 2003. Slide H1♂, paratype 1 H3♀.

Etymology. Named after Claire Espinasse, Glamorgan University who collected the specimens.

Discussion. The pattern of dorsal plate fusion (1+1) and the configuration of the palp segments are diagnostic of the new species. *Pseudotorrenticola boettgeri* K. O. Viets, 1977 from Guatemala, *P. quinquescutata* Lundblad, 1954 from Spain, *P. mitchelli* Cook, 1966 from Liberia and *P. sharpae* Wiles, 1997 from Thailand and Borneo, have a relatively much longer P4 and separate dorsal plates (1+4). The ejaculatory complex of *P. espinasseae* is of the type with a large, broad distal bulb, *P. sharpae* has a small distal bulb. *Pseudotorrenticola chiricahua* Smith, 1991 from

Arizona, USA and *P. africana* K. O. Viets, 1981 have separate anterior platelets, and posterior platelets fused to the large dorsal plate (2+4); a pedipalp with reduced P4 ($P4:P3 > 0.5$), but not to the extent of *P. espinasseae*, and a shorter rostrum.

***Atractides jenniferae* n. sp.**

(Figure 5)

Male. R2, D1–4, g3 located on large single dorsal plate length 410, width 310; A1–2, R1, L1–4 and lyrifissures g1, g2, g4, g5 free in dorsal integument. Venter with well-developed ventral shield length 430, width 350, which incorporates epimera, genital field and V3. V1, V2, V4 and anal plate separate and free in integument. Posterior margins of EpIV convex. Length gonopore 33. Pedipalp slender with lateral flanges at the distal margin of P4; length

Figure 5. *Atractides jenniferae* n. sp. (a) Venter ♂; (b) dorsum ♂; (c) pedipalp ♂; (d) I-Leg ♂; (e) lateral view infracapitulum; (f) pedipalp ♀; (g) dorsum ♀; (h) venter ♀, note scales of male and female idiosoma are different. Scale bar: 101 µm (a, b); 28 µm (c); 41 µm (d); 50 µm (e); 34 µm (f); 69 µm (g, h).

P1–P5 26, 48, 47, 71, 26; P4 latero-median seta slender. Infracapitulum slender length 131, rostrum long, length 36. I-Leg-6 short, only slightly bowed; I-Leg-5 ventral distal setae typical; swimming setae absent. Lengths I-Leg-3–6 71, 105, 102, 79; II-Leg-3–6 56, 75, 79, 88; III-Leg-3–6 53, 86, 86, 96; IV-Leg-3–6 105, 123, 123, 117.

Female. Dorsum with all setae free in integument and some secondary sclerotization, length 697, width 431. Muscle platelets absent. Venter with secondary sclerotization of epimera and genital plates; epimera typical, EpI+II separate from EpIII+IV. Genital plate broad, length 92, width 42; gonopore length 92. V1–V4 free in integument, V3 and V4 located lateral to genital plates. Pedipalp slender, P4 with lateral flanges distally, P4 latero-median seta slender; length P1–4 38, 64, 87, 97, 31. Infracapitulum length 174, rostrum 62. I-Leg-6 short, only slightly bowed; I-Leg-5 ventral distal setae typical; swimming setae absent. Lengths I-Leg-3–6 97, 127, 124, 82; II-Leg-3–6 67, 87, 92, 95; III-Leg-3–6 70, 104, 102, 114; IV-Leg-3–6 127, 142, 149, 130.

Material examined. HOLOTYPE: ♂. **Honduras:** (Site 1) Piedra Muqlu, El Paraiso, Merendon Mountains, altitude 100 m, 11 February 2003. Slide: holotype H7♂, paratype 1 H4♀.

Etymology. Named after Jennifer Spelling who collected the specimens on the Glamorgan University Tropical Ecology field course to Honduras in 2003.

Discussion. Similar to other ‘megapoid’ forms. Males can be distinguished by the absence of V4 on the ventral plate, the large dorsal plate and the lateral flanges to the pedipalp P4. Females are similar to *A. tembolus* Cook, 1980 (males unknown) from Mexico but lack muscle platelets on the dorsum and have a lateral flange on P4 that is lacking in *A. tembolus*.

***Recifella (Eorecifella) cusucoensis* n. sp.**

(Figure 6)

Female. Dorsum typical of *Recifella*, length 423, width 411. D1–D3 located on the dorsal shield, length 378, width 361. Postocularia R1 and D4 free in dorsal furrow and all other glandularia incorporated into the ventral shield. Ventral shield typical. E2 located at posterolateral margin of EpII, V3 and E4 lie behind EpIV, V1 have no glands and V2 are located posterior to the genital acetabula. Internal apodemes of EpI/EpII reach behind the EpIII/EpIV suture line. Suture lines between epimera indistinct. Acetabula distributed in a long band behind EpIV. Pedipalp P5 with a large dorso-distal claw; length P1–P5 16, 59, 32, 62, 29. Legs with large rillborsten setae on I-Leg and II-Legs; swimming setae on III-Leg-4 3, III-Leg-5 2, IV-Leg-3 1+1, IV-Leg-4 2+2, IV-Leg-5 2+(1 small?).

Material examined. HOLOTYPE: ♀. **Honduras:** (Site 2) R. El Carago, small stream, near Cusuco National Park entrance, Merendon mountains, altitude 640 m, 6 April 2003. Slide: H34♀.

Etymology. *Cusucoensis* refers to the holotype locality in the Cusuco National Park, Honduras.

Discussion. The proportions of the pedipalp with a large terminal claw are, in contrast to other neotropical species, typical of New Guinea *Recifella* species. Females do not show

Figure 6. *Recicfella cusucoensis* n. sp. ♀. (a) Venter; (b) dorsal shield; (c) pedipalp; (d) I-Leg-2-6; (e) IV-Leg-1-6. Scale bar: 89 µm (a, b); 30 µm (c); 75 µm (d, e).

subgeneric characters but Cook (1980) considers females without pronounced tubercles on P4 to belong to the subgenus *Eorecicfella* Cook, 1980, a subgenus characterized by a lack of pronounced sexual dimorphism. *R. cusucoensis* has the longest internal apodemes of EpI so far described for the genus as they reach to EpIV. Pedipalp shape and narrow genital field are diagnostic of this species.

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