

**SIX NEW SPECIES IN THE SUBGENUS *POLYATAX*
(ACARI: UNIONICOLIDAE: *UNIONICOLA*) FROM NORTH AMERICA,
WITH A RE-EVALUATION OF RELATED TAXA**

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ABSTRACT—Six new species (*Unionicola megachela*, *U. dobsoni*, *U. viviparaicola*, *U. hensleyi*, *U. causeyae* and *U. australindistincta*) are described for the first time and placed in the subgenus *Polyatax*. These species are intermediate in character states between the subgenera *Polyatax* and *Neoatax*. The subgenus *Neoatax* is synonymized with *Polyatax* and abandoned. *Ampullariatax* new subgenus is erected for South and Central American taxa.

INTRODUCTION

Many adult and nymphal *Unionicola* are parasites of fresh-water mussels (Unionacea and Mutelacea) and snails (Viviparidae and Ampullariidae), while others are free-swimming and commonly associated with sponges (Spongillidae) (Cook 1974). Cook (1974) presented the most recent and thorough revision of the taxonomy of the group. Viets (1975, 1980) and Vidrine (1980, 1984 and 1985b) presented partial revisions which further clarified the evolutionary relationships of these mites. The overall classification of the Unionicolinae does not currently represent the holophyletic nature of the group (Vidrine 1980).

This paper deals specifically with a major group of mites that parasitize mussels and snails in Asia, North America and South America. Heretofore, these mites have been placed in two subgenera (in *Unionicola*): *Polyatax* Viets 1933 and *Neoatax* Lundblad 1941. Separation of these two groups has relied upon the presence or absence of sexual dimorphism in the fourth walking legs of the males. Although Cook (1974) recognized that *Polyatax* was polyphyletic, insufficient information existed to permit re-evaluation. Vidrine (1981 and 1983) pointed to similarities between members of *Polyatax* and *Neoatax*.

Six new species are described for the first time in this paper. These new species possess intermediate character states and provide substantial new information that is used to re-evaluate the subgenera.

Holotypes and representative paratypes are deposited in the Canadian National Collections and

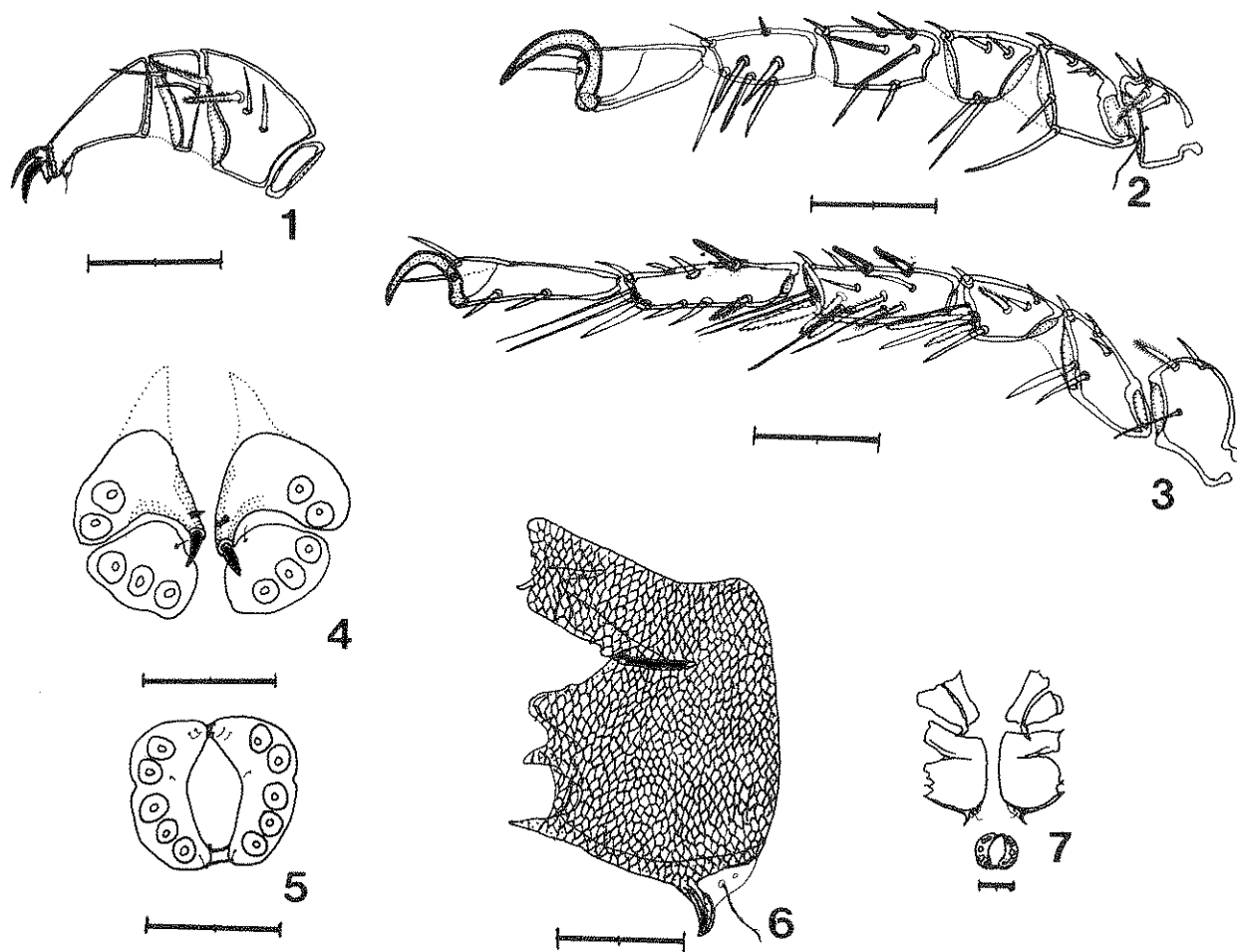
Biosystematics Institute, Agriculture Canada, Ottawa. Additional paratypes are retained in the author's collection.

Terminology for adult structures follows that used by Simmons and Smith (1984). Measurements are expressed in microns and in the format, mean (range). All bars on figures equal 100 microns (0.1 mm).

RESULTS

Subgenus *Polyatax* Viets 1933
Neoatax Lundblad, 1941; new synonymy.

DIAGNOSIS — Character states of the genus *Unionicola*; dorsum usually with a dorsal shield which may be subdivided into several smaller plates; coxal plates variable but usually reticulate; genital fields with 3 to many pairs of acetabula on acetabular plates; female genital field with four acetabular plates, two plates per side of genital opening; anterior acetabular plates of female with elongate inner margins that are produced into a chitinous flap with one or two short, thick spines; posterior acetabular plates of females more round and without an obvious inner flap and with a single short, hair-like spine on the inner margin; male genital field with two plates joined anteriorly and posteriorly by chitinous bands; pedipalpal tarsus not tapered distally and with 2, relatively large, distal claws; first and third pairs of walking legs not nearly equal in length; distal end of walking leg Ta not greatly expanded; claws of walking legs simple or bifid but lacking bifid claws with the dorsal prong longer than



Figs. 1-7. *Unionicola megachela* n. sp.: 1. male palp; 2. male first walking leg; 3. male fourth walking leg; 4. female genital field; 5. male genital field; 6. male posterior coxal group; 7. male venter.

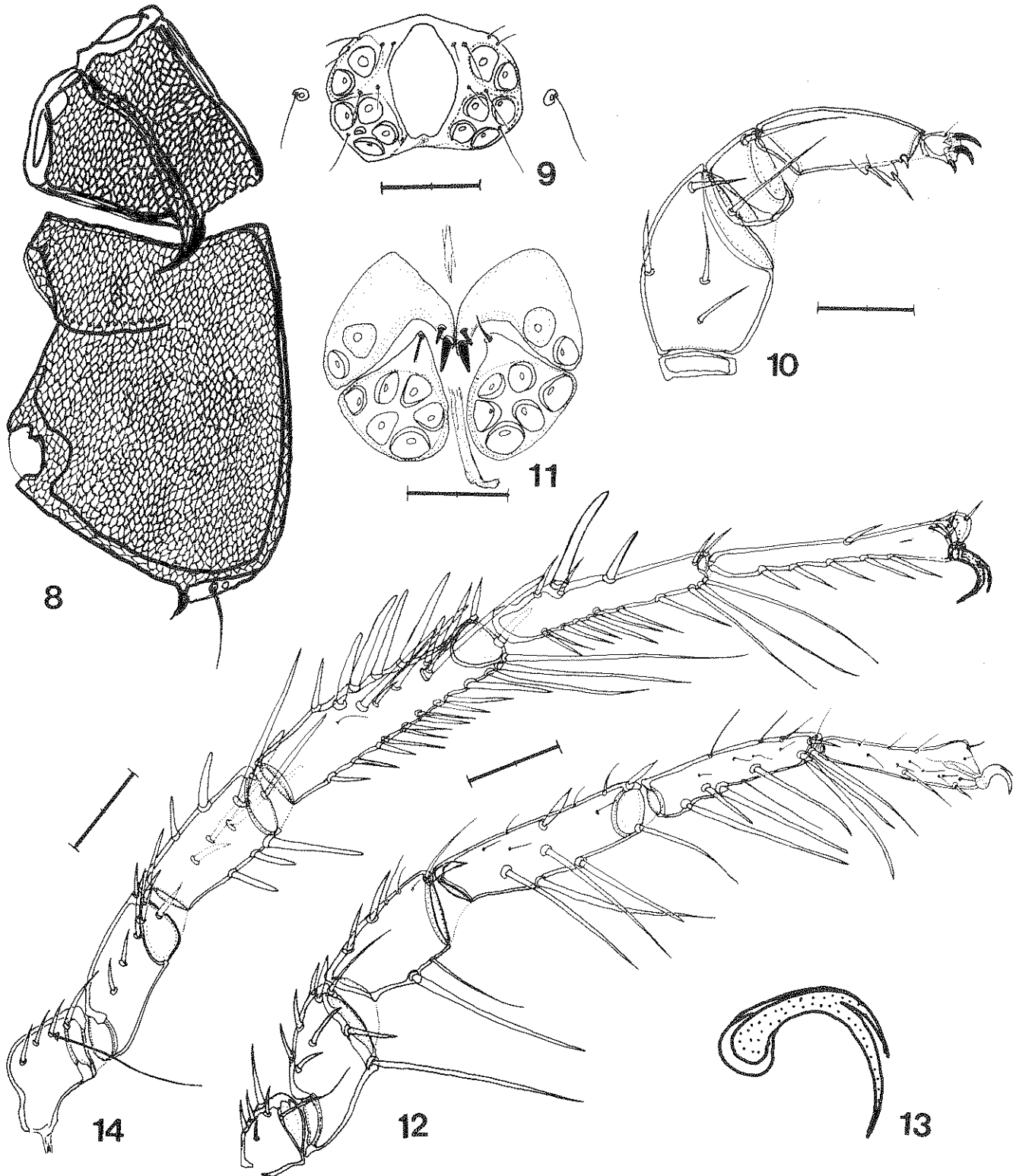
the ventral prong.

REMARKS — *Neoatax* Lundblad is synonymized with *Polyatax* since the presence or absence of sexual dimorphism in the fourth walking legs of the males is insufficient to warrant their separation. *Neoatax* is hereafter abandoned. This move indicates the suggested close relationship between the Asian and North American members of the group (Vidrine 1981, 1983 and 1984). The Central and South American species are apparently divergent and are placed in a new subgenus in this paper.

SPECIES INCLUDED — *U. japonensis* Viets 1933, *U. scutigera* Viets 1926, *U. neokoenikei* Viets 1957, *U. heardi* Vidrine 1985a, *U. serrata* (Wolcott 1898), *U. abnormipes* (Wolcott 1898), *U. indistincta* (Wolcott 1898), and *U. campelomaicola* Marshall 1935. This paper includes six new species.

1. *Unionicola (Polyatax) megachela* new species
(Figs. 1-7, 40)

DESCRIPTION — Character states of subgenus; male and female dorsum with 4 lightly sclerotized plates (fig. 40); coxal plates reticulate, well-sclerotized and possessing posterior projections (figs. 6 and 7); female genital field with anterior acetabular plates each bearing 2 acetabula and a pair of short, thick spines, posterior acetabular plates each bearing 3 acetabula per acetabular plate (fig. 4); male genital field with 5 acetabula per acetabular plate (fig. 5); serrate spines on walking legs and pedipalps (figs. 1 and 3); pedipalps thick and with claws longer than length of the Ta (fig. 1); claws of walking legs large and simple (figs. 2-3); male fourth walking leg slightly dimorphic with the Ge bearing 2, slightly enlarged, dorsal spines, and the Ti bearing a single, slightly enlarged, dorsal



Figs. 8-14. *Unionicola dobsoni* n. sp.: 8. female coxal plates; 9. male genital field; 10. female pedipalp; 11. female genital field; 12. male first walking leg; 13. claw of male fourth walking leg; 14. male fourth walking leg.

(fig. 3).

MALE (3 specimens) — Length including capitulum 667 (650-700); dorsal anterior plates 70 (60-80) long, 53 (40-65) wide; dorsal posterior plates 60 long, 40 wide; length of posterior coxal group 290; genital field 138 (130-150) long, 147 (140-150) wide; dorsal lengths of pedipalp segments: Ge 50; Ti 90 (85-95); Ta 12 (10-15); dorsal lengths of leg segments: leg I: TFe 80 (75-85); Ge 100 (95-105); Ti 95 (90-100); Ta 100 (95-105); leg IV: TFe 88 (85-90); Ge 132 (130-135); Ti 148 (145-150); Ta 147 (145-150).

FEMALE (3 specimens) — Length including capitulum 767 (700-800); dorsal anterior plates 65 long, 50 wide; dorsal posterior plates 50 long, 40 wide; length of posterior coxal group 225; genital field 135 (125-150) long, 200 (190-210) wide; dorsal lengths of pedipalp segments: Ge 53 (50-55); Ti 94 (90-95); Ta 13 (10-15); dorsal lengths of leg segments: leg I: TFe 90 (85-95); Ge 108 (105-110); Ti 102 (100-105); Ta 107 (100-115); leg IV: TFe 93 (90-100); Ge 142 (140-145); Ti 157 (150-160); Ta 155 (150-165).

NOTES — Holotype (male) (CNC type number 18820) from Louisiana Irrigation Canal ca. 5.0 km north of Iowa at Rt. LA 383, Jefferson Davis Parish, Louisiana, collected 2 May 1981 by M. F. and Macky Vidrine. The host mussel was *Amblema dombeyana* (Valenciennes). This mite lives between the labial palps of its hosts, and the adults are more commonly found in the hosts during the winter months. Eggs are deposited in the hosts' mantle tissue in the proximity of the labial palps. Usually 1-5 individuals are found between the labial palps of infested hosts. Hosts include members of 10 genera of fresh-water mussels from Louisiana, Mississippi, Arkansas and Texas (Vidrine 1980). The mite has been discussed by Vidrine (1980) under the manuscript name: *Unionicola (Neotatax)* sp. nov. type R.

REMARKS — *U. megachela* is readily diagnosed by the large tarsal claws on the walking legs, serrated spines and pedipalpal tarsal structure. It occupies a similar habitat and employs the same area for egg deposition as *U. serrata* (Vidrine 1980 and 1983). However, *U. serrata* is generally restricted to sandy-bottom streams, while *U. megachela* prefers muddy-bottom streams.

2. *Unionicola (Polyatax) dobsoni* new species (Figs. 8-14, 38)

DESCRIPTION — Character states of subgenus; dorsum with a reticulated plate (fig. 38); coxal plates well sclerotized and with distinct posterior projections (fig. 8); female genital field with anterior acetabular plates each bearing 2 acetabula and 2 short, thick

spines, and posterior acetabular plates each bearing 6 acetabula and a single, hairlike seta (fig. 11); male genital field with acetabular plates bearing 6-7 acetabula each (fig. 9); pedipalpal tarsal claws nearly equal in length to length of the Ta (fig. 10); tarsal claws of walking legs bifid with the dorsal prongs ca. one-half the length of the ventral prongs (fig. 13); fourth walking leg of the male sexually dimorphic with the Ge appearing slightly concave dorsally and bearing 6 large, dorsal spines, and with the Ti bearing 2, large, dorsal spines (fig. 14).

MALE (holotype) — Length including capitulum 800; dorsal plate 375 long, 250 wide; length of posterior coxal group 375; genital field 150 long, 210 wide; dorsal lengths of pedipalp segments: Ge 55, Ti 120; Ta 30; dorsal lengths of leg segments: leg I: TFe 170; Ge 235; Ti 200; Ta 170; leg IV: TFe 175; Ge 290; Ti 230; Ta 260.

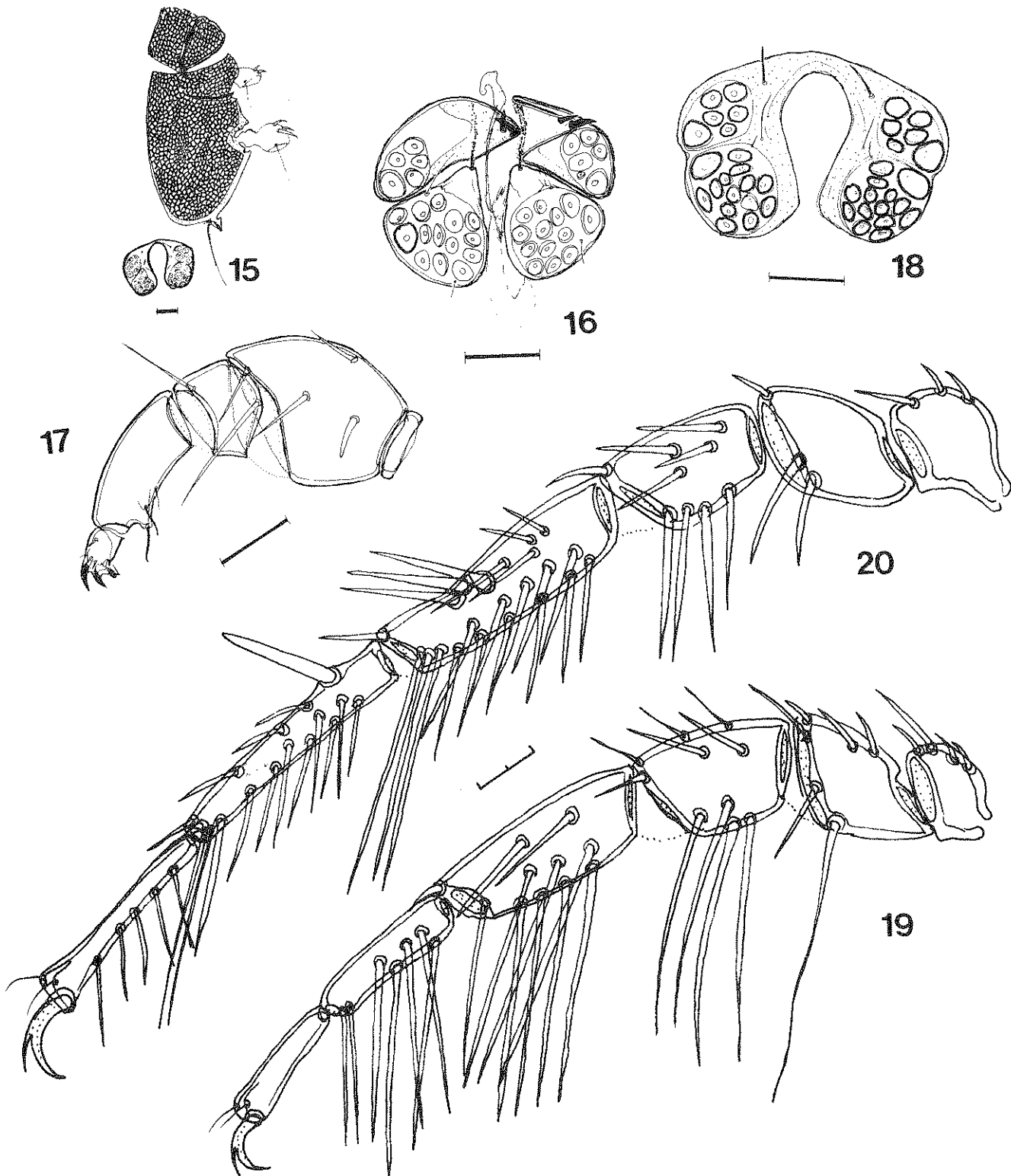
FEMALE (2 specimens) — Length including capitulum 1125 (1100-1150); dorsal plate 400 long, 350 wide; length of posterior coxal group 475 (450-500); genital field 195 (160-230) long, 250 (240-260) wide; dorsal lengths of pedipalp segments: Ge 75; Ti 168 (165-170); Ta 38 (35-40) dorsal lengths of leg segments: leg I: TFe 228 (225-230); Ge 330 (320-340); Ti 263 (250-275); Ta 215 (210-220); leg IV: TFe 233 (230-235); Ge 363 (350-375); Ti 383 (375-390); Ta 313 (310-315).

NOTES — Holotype (male) (CNC type number 18821) from Holmes Creek at Rt. U.S. 90 near Chipley, Holmes County, Florida, collected on 7 July 1977 by M. F. Vidrine. The snail host was *Campeloma geniculum* (Conrad). Dobson (1966) also found snails that were infested with mites in this region and assigned them to *U. campelomaicola*. *U. dobsoni* has been discussed by Vidrine (1980) under the manuscript name: *Unionicola (Polyatax)* sp. nov. type 1.

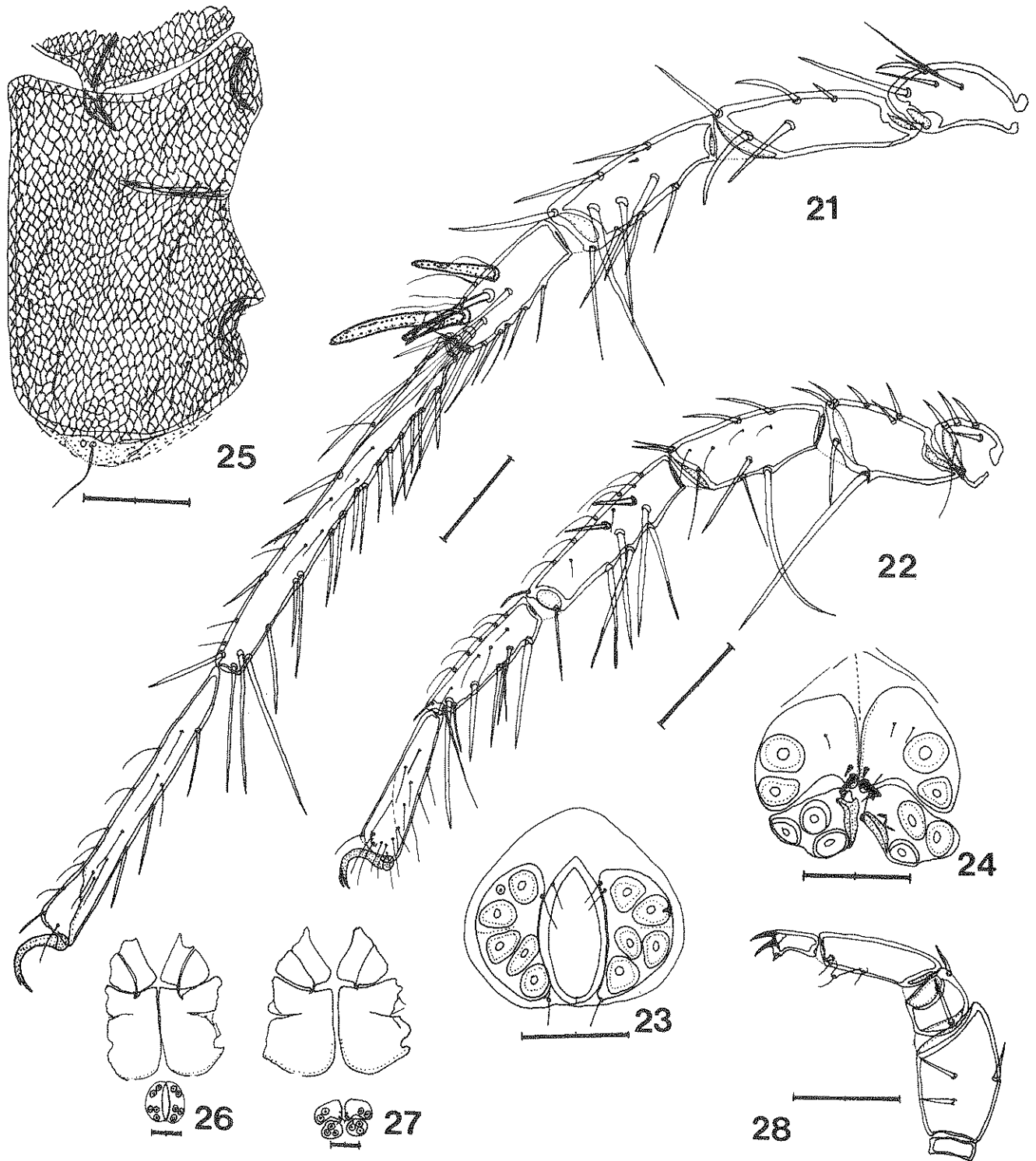
REMARKS — *U. dobsoni* vaguely resembles the much smaller *U. campelomaicola*, but *U. campelomaicola* has a small dorsal shield (fig. 39) and lacks the sexual dimorphism in the fourth walking legs of the males. *U. dobsoni* is only known from its type locality.

3. *Unionicola (Polyatax) viviparaicola* new species (Figs. 15-20, 43-44)

DESCRIPTION — Character states of subgenus; female dorsum with 2 plates (fig. 43); male dorsum with a single plate (fig. 44); coxal plates well-sclerotized with coxal plate IV elongate (fig. 15); coxal plates with posterior projections; genital fields with a large acetabulum on each acetabular plate near the outer edge; female genital field with anterior acetabular plates each bearing 5-10 acetabula and 2, short, thick spines on the inner margin, posterior acetabular plates each



Figs. 15-20. *Unionicola viviparaicola* n. sp.: 15. male coxal plates and genital field; 16. female genital field; 17. female pedipalp; 18. male genital field; 19. male first walking leg; 20. male fourth walking leg.



Figs. 21-28. *Unionicola hensleyi* n. sp.: 21. male fourth walking leg; 22. male first walking leg; 23. male genital field; 24. female genital field; 25. male posterior coxal group; 26. male venter; 27. female venter; 28. male pedipalp.

bearing 13-20 acetabula and a short, hair-like seta on the inner margin (fig. 16); male genital field with two clusters of acetabula per acetabular plate, anterior cluster with 5-9 acetabula and posterior clusters with 11-16 acetabula (fig. 18); Ta claws of pedipalps shorter than length of Ta (fig. 17); tarsal claws of walking legs bifid with the dorsal prong of near equal length with ventral prong (figs. 19 and 20); fourth walking leg of male sexually dimorphic with Ge slightly concave dorsally and bearing 3, thick, dorsal spines, and with Ti bearing a large, dorsal spine (fig. 20).

MALE (3 specimens) — Length including capitulum 1233 (1150-1400); dorsal plate 567 (500-600) long, 342 (300-375) wide; length of posterior coxal group 690 (650-770); genital field 230 (200-260) long, 350 (320-380) wide; dorsal lengths of pedipalp segments: Ge 55 (50-60); Ti 167 (160-180); Ta 53 (50-60); dorsal lengths of leg segments: leg I: TFe 252 (220-275); Ge 350 (320-380); Ti 263 (240-290); Ta 217 (210-220); leg IV: TFe 257 (240-275); Ge 420 (390-450); Ti 398 (370-425); Ta 340 (320-350).

FEMALE (3 specimens) — Length including capitulum 1417 (1300-1500); dorsal plate 375 (350-400) long, 133 (115-150) wide; length of posterior coxal group 773 (750-820); genital field 280 long, 350 wide; dorsal lengths of pedipalp segments: Ti 185 (180-190); Ta 53 (50-55); dorsal lengths of leg segments: leg I: TFe 285 (280-300); Ge 395 (380-420); Ti 292 (280-300); Ta 237 (230-240); leg IV: TFe 300 (290-310); Ge 460 (440-490); Ti 463 (440-490); Ta 365 (350-375).

NOTES — Holotype (male) (CNC type number 18822) from Louisiana Irrigation Canal ca. 5.0 km north of Iowa at Rt. LA 383, Jefferson Davis Parish, Louisiana, collected on 2 May 1981 by M. F. and Macky Vidrine. The snail host was *Viviparus subpurpureus* (Say). *U. viviparaicola* is known only from this snail host from Louisiana, Texas, Arkansas and Illinois. Usually one to 3 mites are found in the mantle cavity of each infected host, but mites may be obtained by permitting the host to remain in a pan of water, where the mites leave the hosts and move toward a light. Eggs are deposited in the mantle near the hosts' head (Vidrine 1983). This species has been discussed by Vidrine (1980) under the manuscript name: *Unionicola (Polyatax)* sp. nov. type K.

REMARKS — *U. viviparaicola* resembles *U. serrata* but the tarsal claws of the walking legs and the sexually dimorphic walking legs of the males are sufficient to separate the two species. The dorsal plates of *U. serrata* (figs. 45-47) are also distinctive. *U. viviparaicola* is distinguished from *U. dobsoni* by the coxal plate, genital field and dorsal plate structures.

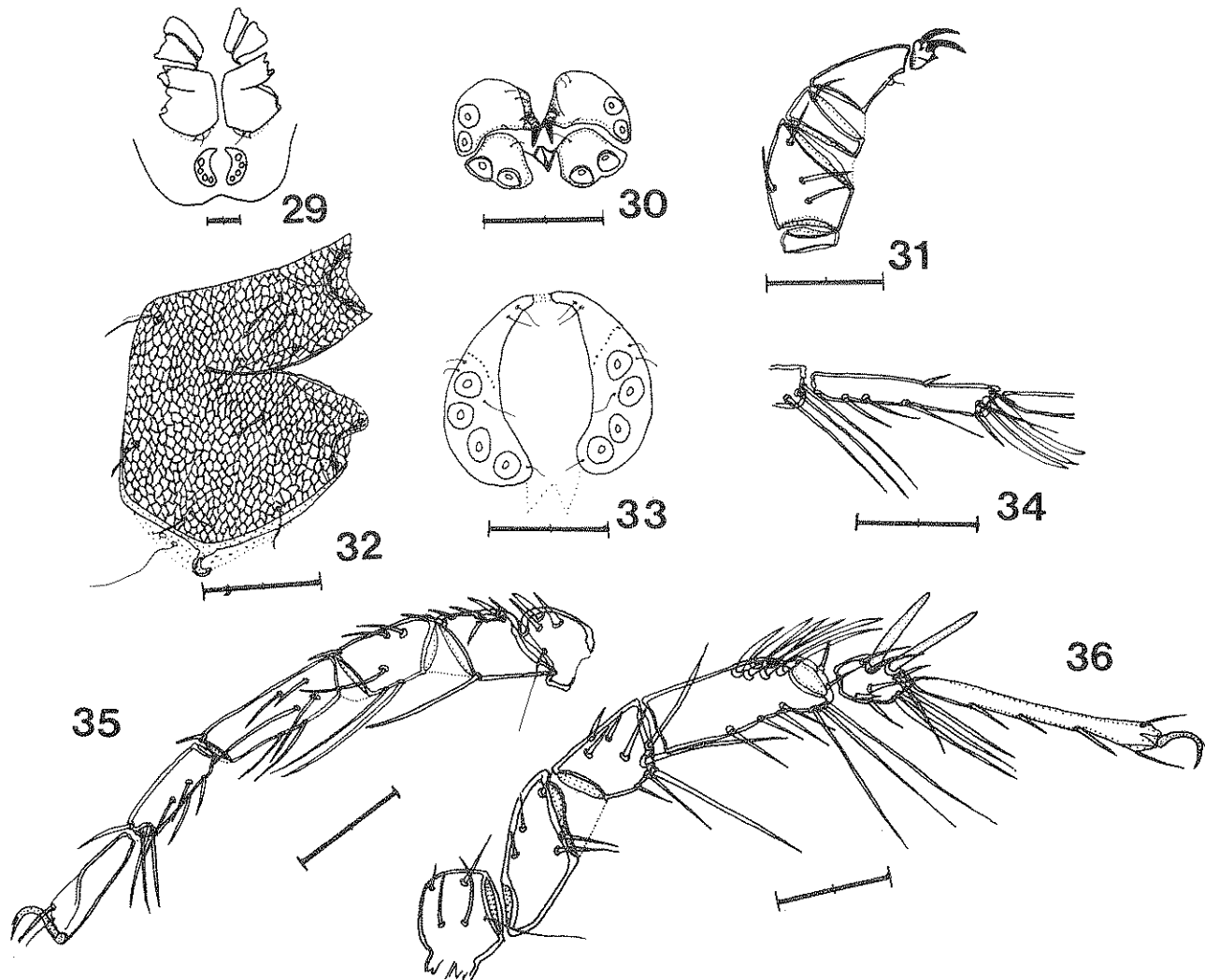
4. *Unionicola (Polyatax) hensleyi* new species (Figs. 21-28, 37)

DESCRIPTION — Character states of subgenus; dorsum with 2 plates (fig. 37); coxal plates well-sclerotized, with coxal plate IV slightly elongate (fig. 25-27); female genital field with anterior acetabular plates each bearing 2 acetabula and 2, short, thick spines on the inner margin, posterior acetabular plates each bearing 3 acetabula and a small, hairlike seta on the inner margin (fig. 24); male genital field with acetabular plates each bearing 5-6 acetabula (fig. 23); tarsal claws of pedipalp shorter than length of Ta (fig. 28); tarsal claws of walking legs bifid with small dorsal prong (figs. 21 and 22); fourth walking leg of male sexually dimorphic with Ge bearing 3 large spines and with Ti elongate (fig. 21).

MALE (2 specimens) — Length including capitulum 675 (650-700); dorsal plate 600 long; length of posterior coxal group 335 (320-350); genital field 125 (100-150) long, 185 (170-200) wide; dorsal lengths of pedipalp segments: Ge 55, Ti 105, Ta 35; dorsal lengths of leg segments: leg I: TFe 148 (145-150); Ge 183 (175-190); Ti 133 (130-135); Ta 140 (130-150); leg IV: TFe 168 (160-175); Ge 153 (150-155); Ti 353 (330-375); Ta 275 (250-300).

FEMALE (3 specimens) — Length including capitulum 800 (750-850); dorsal plate 450 (400-500) long, 238 (225-250) wide; length of posterior coxal group 350; genital field 160 (150-170) long, 213 (200-225) wide; dorsal lengths of pedipalp segments: Ge 68 (65-70); Ti 118 (115-120); Ta 45; dorsal lengths of leg segments: leg I: TFe 165 (160-170); Ge 212 (210-215); Ti 170 (165-175); Ta 160 (150-170); leg IV: TFe 208 (205-210); Ge 255 (250-260); Ti 395 (390-400); Ta 295 (275-310).

NOTES — Holotype (male) (CNC type number 18823) from a small river (locally called Arroyo de Oxitipa) at paved road ca. 3.0 km east of Aquismon, San Luis Potosi Province, Mexico, collected on 9 November 1978 by D. J. Bereza. The only known host mussel is *Frieria iridella* (Pilsbry and Frierson). Additional paratypes are from Rio Carrizal at Rt. MX 180 in Nuevo Progreso, ca. 30.0 km north of road divergence (on Rt. MX 180) to Aldama and Est. Manuel, Tamaulipas Province, Mexico, collected 27 January 1982 by D. J. Bereza, S. V. Hensley and M. F. Vidrine. These mites are only known from the Rio Panuco and the Rio Carrizal systems. Eggs are deposited in the mantle and foot tissues of the hosts. More than 10 individuals were found per infested host. *U. hensleyi* has been discussed by Vidrine (1980) under



Figs. 29-36. *Unionicola causeyae* n. sp.: 29. male venter; 30. female genital field; 31. male pedipalp; 32. male posterior coxal group; 33. male genital field; 34. male Ti of third walking leg; 35. male first walking leg; 36. male fourth walking leg.

the manuscript name: *Unionicola (Neoatax)* sp. nov. type 2.

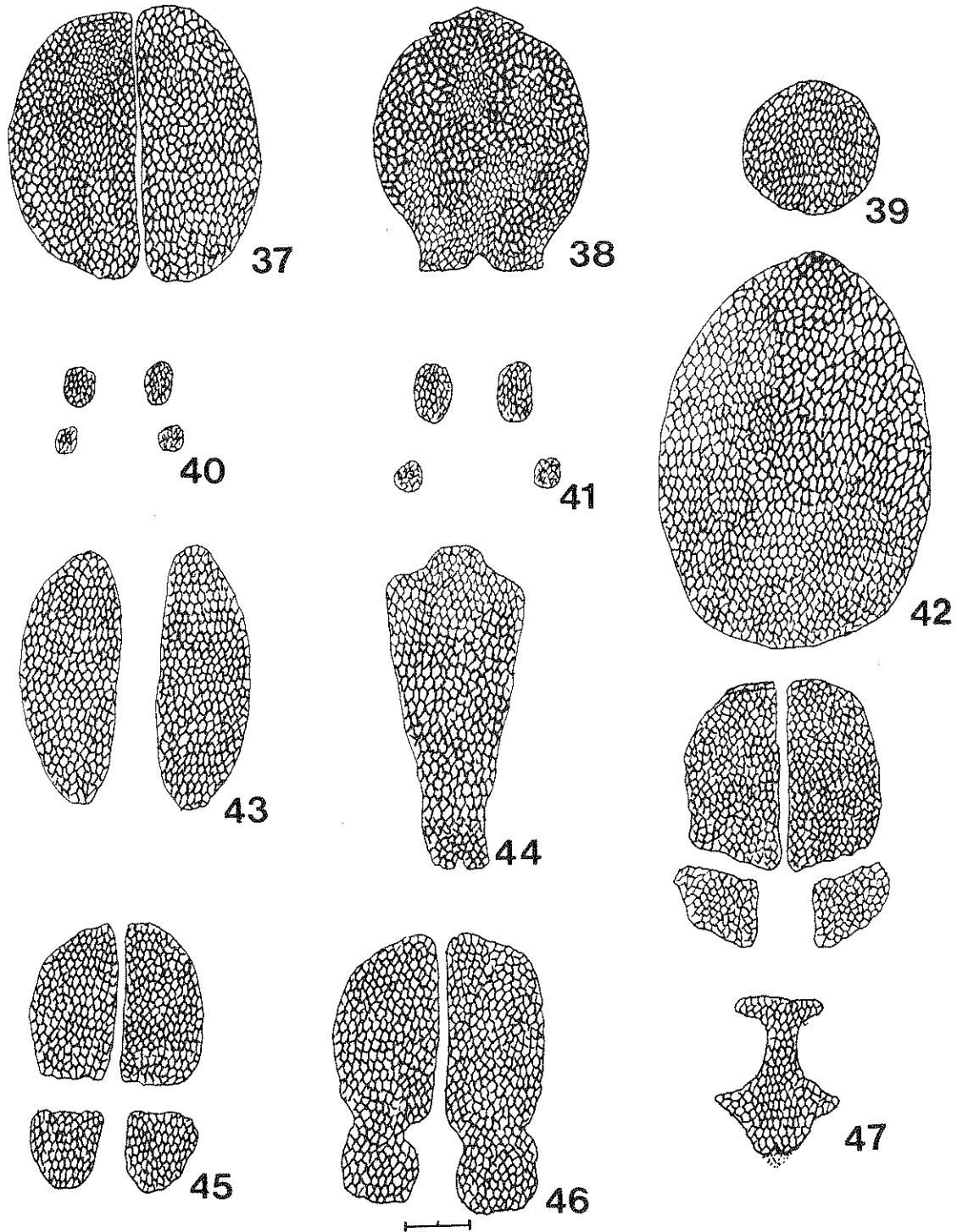
REMARKS — *U. hensleyi* is readily separated from all other species by the unique sexual dimorphism in the fourth walking legs of the males. The dorsal plates are also distinctive.

5. *Unionicola (Polyatax) causeyae* new species
(Figs. 29-36, 41)

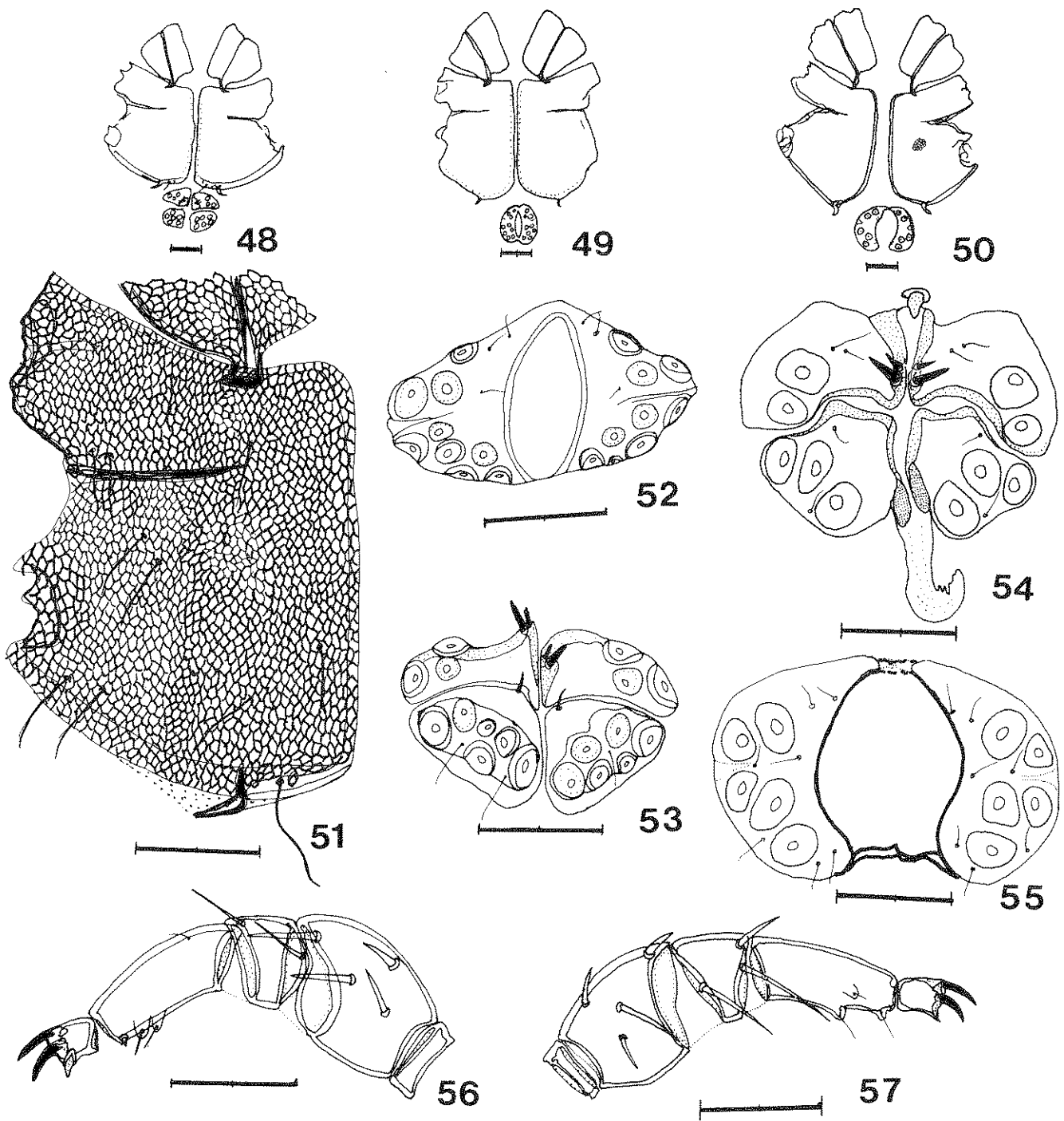
DESCRIPTION — Character states of subgenus; dorsum with 4, lightly sclerotized, nearly circular plates (fig. 41); coxal plates well-sclerotized and with posterior projections (figs. 29 and 32); posterior coxal group not elongate nor extending posterior to the gen-

ital field; female genital field with anterior acetabular plates each bearing 2 acetabula and 2, short, thick spines on the inner margin, posterior acetabular plates each bearing 1-2 acetabula and a small, hairlike seta on the inner margin (fig. 30); male genital field with 2 acetabular plates each bearing 4 acetabula (fig. 33); tarsal claws of pedipalps longer than length of Ta (fig. 31); tarsal claws of all legs minutely bifid with short, dorsal prongs; Ti of male walking leg III with three large distal spines (fig. 34); fourth walking leg of male sexually dimorphic with the Ge bearing 3-6, large, dorsal spines, and Ti bearing 2, large, dorsal spines (fig. 36).

MALE (3 specimens): Length including capitulum 567 (550-600); anterior dorsal plate 60 (50-70) in diam-



Figs. 37-47. *Unionicola hensleyi* n. sp.: 37. female dorsal shield; *Unionicola dobsoni* n. sp.: 38. female dorsal shield; *Unionicola campelomaicola* Marshall 1935: 39. female dorsal shield; *Unionicola megachela* n. sp.: 40. female dorsal shield; *Unionicola causeyae* n. sp.: 41. female dorsal shield; *Unionicola abnormipes* (Wolcott 1898): 42. female dorsal shield; *Unionicola viviparaicola* n. sp.: 43. female dorsal shield; 44. male dorsal shield; *Unionicola serrata* (Wolcott 1898): 45. female dorsal shield; 46. female dorsal shield; 47. male dorsal shield.



Figs. 48-57. *Unionicola australindistincta* n. sp.: 48. Arkansas female venter; 49. Arkansas male venter; 50. Louisiana male venter; 51. Arkansas female posterior coxal group; 52. Arkansas male genital field; 53. Arkansas female genital field; 54. Louisiana female genital field; 55. Louisiana male genital field; 56. Arkansas male pedipalp; 57. Louisiana male pedipalp.

eter; posterior dorsal plate 28 (25-30) in diameter; length of posterior coxal group 215 (200-225); genital field 155 (150-160) long, 188 (175-200) wide; dorsal lengths of pedipalp segments: Ge 33 (30-35); Ti 85 (75-95); Ta 17 (15-20); dorsal lengths of leg segments: leg I: TFe 90 (80-100); Ge 125 (105-140); Ti 93 (85-105); Ta 103 (100-105); leg IV: TFe 92 (85-100); Ge 147 (130-175); Ti 73 (70-75); Ta 210 (180-235).

FEMALE (4 specimens): Length including capitulum 606 (550-650); anterior dorsal plate 70 (50-90) in diameter; posterior dorsal plate 38 (25-50) in diameter; length of posterior coxal group 200 (180-220); genital field 130 (125-135) long, 190 (180-200) wide; dorsal lengths of pedipalp segments: Ge 40 (35-45); Ti 90 (84-97); Ta 18 (15-20); dorsal lengths of leg segments: leg I: TFe 94 (90-100); Ge 130 (120-140); Ti 109 (100-115); Ta 113 (105-120); leg IV: TFe 100 (95-105); Ge 150 (140-160); Ti 165 (155-175); Ta 160 (150-170).

NOTES — Holotype (male) (CNC type number 18824) from Louisiana Irrigation Canal ca. 5.0 km north of Iowa at Rt. LA 383, Jefferson Davis Parish, Louisiana, collected 2 May 1981 by M. F. and Macky Vidrine. The host was *Carunculina parva* (Barnes). These mites have been found in 5 genera of fresh-water mussels from Mississippi, Arkansas, Alabama, Texas, Florida, Maryland, Delaware, North Carolina and Louisiana (Vidrine 1980). Usually 6-10 mites occur in each infested host. Eggs are deposited in an area usually less than 1.0 cm in diameter in the center of the host's mantle. *U. causeyae* has been discussed by Vidrine (1980) under the manuscript name: *Unionicola (Neoatax) sp. nov.* type A.

REMARKS — *U. causeyae* is readily distinguished by the number of acetabula, usually 4 pairs. It most closely resembles *U. abnormipes* but *U. abnormipes* has a dorsal plate covering its entire dorsum (fig. 42). *U. causeyae* and *U. abnormipes* males possess almost identical third and fourth walking legs. *U. abnormipes*, however, employs the entire foot and mantle tissue of hosts for oviposition while *U. causeyae* employs a small central region. Also, *U. abnormipes* possesses elongate coxal plates that extend to and partially surround the genital field, while *U. causeyae* has abbreviated coxal plates.

6. *Unionicola (Polyatax) australindistincta* new species (Figs. 48-67)

DESCRIPTION — Character states of subgenus; dorsum with 1-6 plates with varied amounts of fusion along borders (figs. 62-69); coxal plates well sclerotized and not partially surrounding the genital field (figs. 48-51); female genital field with anterior acetabular plates each bearing 2-4 acetabula and 2, short,

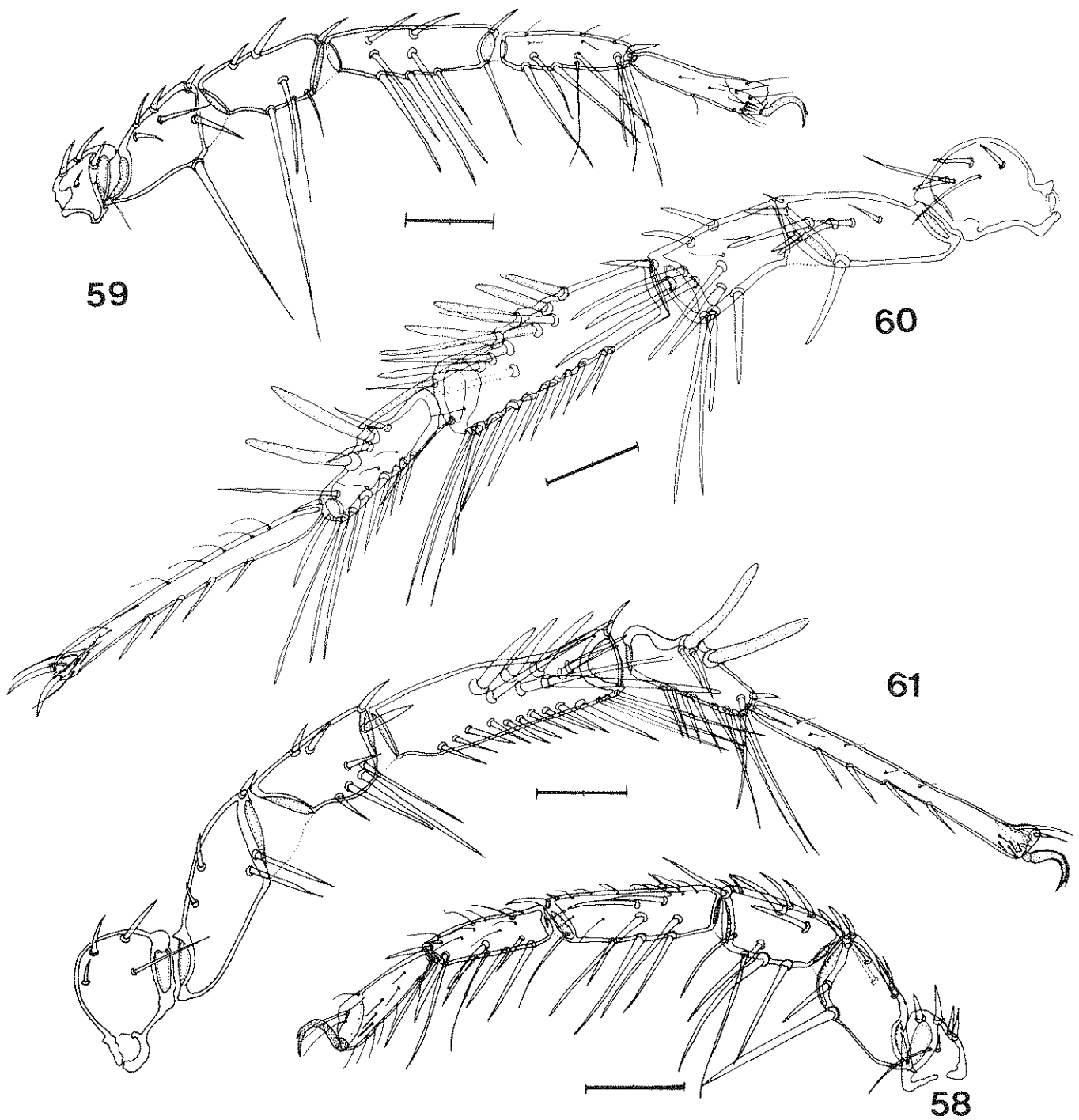
thick spines on the inner margin, posterior acetabular plates each bearing 3-8 acetabula and a small, hairlike seta on the inner margin (figs. 53-54); male genital field with 2 acetabular plates, each bearing 5-11 acetabula (figs. 52 and 55); tarsal claws of pedipalp shorter than length of Ta (figs. 56-57); tarsal claws of walking legs minutely bifid with small dorsal prongs (figs. 58-61); fourth walking legs of males sexually dimorphic with Ge bearing 6-9, large, dorsal spines and with Ti bearing 2, large, dorsal spines (figs. 60-61).

MALE (3 specimens) — Length including capitulum 816 (750-900); dorsal plate 617 (500-750) long, 525 (500-550) wide; length of posterior coxal group 373 (350-400); genital field 200 (160-240) long, 250 (240-260) wide; dorsal lengths of pedipalp segments: Ge 62 (60-65); Ti 112 (100-120); Ta 34 (30-35); dorsal lengths of leg segments: leg I: TFe 137 (130-145); Ge 187 (175-200); Ti 137 (125-155); Ta 137 (120-155); leg IV: TFe 150 (140-160); Ge 265 (240-290); Ti 147 (130-160); Ta 360 (350-380).

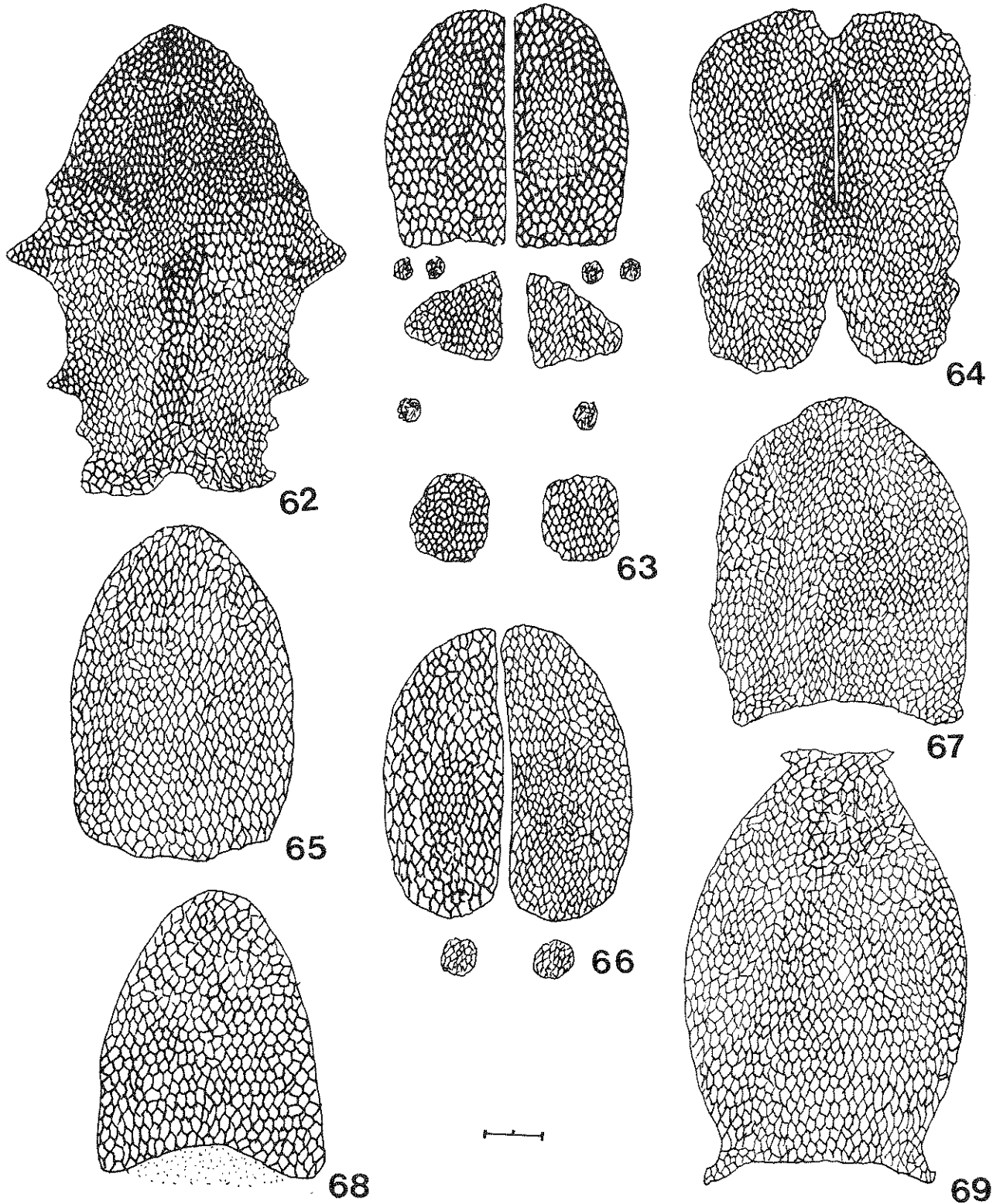
FEMALE (4 specimens) — Length including capitulum 863 (800-900); length of posterior coxal group 364 (330-425); genital field 177 (160-200) long, 230 (220-250) wide; dorsal lengths of pedipalp segments: Ge 68 (55-75); Ti 118 (105-125); Ta 35; dorsal lengths of leg segments: leg I: TFe 160 (140-175); Ge 211 (190-235); Ti 158 (140-180); Ta 150 (130-170); leg IV: TFe 169 (150-180); Ge 261 (235-280); Ti 286 (275-310); Ta 303 (290-320).

NOTES — Holotype (male) (CNC type number 18825) from Louisiana Irrigation Canal ca 5.0 km north of Iowa at Rt. LA 383, Jefferson Davis Parish, Louisiana, collected 2 May 1981 by M. F. and Macky Vidrine. The host mussel was *Proptera purpurata* (Lamarck). Additional paratypes from the same species of host mussel were measured. These paratypes were from: 1. Strawberry River at Rt. U.S. 167, ca. 3.0 km north of Evening Shade, Sharp County, Arkansas, collected on 14 August 1979 by D. J. Bereza and M. F. Vidrine, and 2. Tombigbee River at Rt. U.S. 82, Columbus, Lowndes County, Mississippi, collected 1 July 1978 by D. R. and Beth Clark, Bill Bell and M. F. Vidrine. Infested hosts usually contained 10-100 mites. Eggs are deposited in the entire mantle and foot tissue of the hosts. Although several species of fresh-water mussels were infested, *P. purpurata* was most commonly infested and had greater infestations. The mite is known from Texas, Mississippi, Arkansas, Oklahoma, and Louisiana (Vidrine 1980). *U. australindistincta* has been studied under two manuscript names by Vidrine (1980): *Unionicola (Neoatax) indistincta* form N and form NI.

REMARKS — *U. australindistincta* resembles *U. abnormipes*, *U. causeyae* and *U. indistincta*. *U. aus-*



Figs. 58-61. *Unionicola australindistincta* n. sp.: 58. Arkansas male first walking leg; 59. Louisiana male first walking leg; 60. Arkansas male fourth walking leg; 61. Louisiana male fourth walking leg.



Figs. 62-69. *Unionicola australindistincta* n. sp.: 62. Louisiana male dorsal shield; 63. Louisiana female dorsal shield; 64. Arkansas female dorsal shield; 65. Mississippi male dorsal shield; 66. Mississippi female dorsal shield; 67. Arkansas male dorsal shield; *Unionicola indistincta* (Wolcott): 68. male dorsal shield; 69. female dorsal shield.

tralindistincta is distinguished from *U. abnormipes* by the shape of the coxal plates and the dorsal plates. *U. australindistincta* is distinguished from *U. causeyae* by the shape of the pedipalp tarsus and the dorsal plates. *U. australindistincta* is distinguished from *U. indistincta* by the presence of 2, large dorsal spines on the tibia of the fourth walking leg of the males whereas *U. indistincta* males possess only a single spine. *U. indistincta* is a parasite of *Proptera alata* (Say), a close relative of *P. purpurata* found in the upper Mississippi River drainages. The dorsal plates of *U. indistincta* (figs. 68-69) are similar to those of *U. australindistincta*. Specimens of *U. australindistincta* from Louisiana, Texas, southern Arkansas, southern Mississippi and Oklahoma uniformly tend to have 5 pairs of genital acetabula, while Strawberry River (Ozarkian) and Tombigbee river (Alabama River system) specimens tend to have 6-9 pairs of acetabula. *U. indistincta* also possesses 7-9 pairs of acetabula. *U. australindistincta* is named in order to indicate that it may be merely a southern form of *U. indistincta*, but it occupies a different host and can be distinguished by the male leg structure.

Ampullariatax new subgenus

TYPE SPECIES — *Unionicola ampullariae* (Koenike 1890)

DIAGNOSIS — Character states of the genus *Unionicola*; female genital field with 4 acetabular plates, two on each side of genital opening, anterior and posterior plates of female genital field nearly equal in size and bearing more than 10 acetabula; anterior acetabular plates of females each with an inconspicuous inner flap and one or two, elongate, hair-like setae along inner margin; posterior acetabular plates of females similar to anterior plates and bearing a single, inner, elongate, hairlike setae; male genital field with a pair of acetabular plates joined anteriorly and posteriorly by chitinous bands; pedipalp Ta tapered distally with 2 or 3 small claws at the tip; claws of walking legs bifid with dorsal prong shorter than ventral prong.

REMARKS — These mites are known only from snails of the genus *Ampullaria* (Ampullariidae) in Honduras, Brazil and Argentina. The claw structure of the pedipalpal tarsi and the female genital field structure are unique and sufficient to separate this group from *Polyatax*.

SPECIES INCLUDED — *U. ampullariae* (Koenike 1890), *U. thompsoni* Cook 1974 and *Unionicola* sp. Rosso de Ferradas (1974) (non- *U. ampullariae* — Rosso de Ferradas (1974) described a species from Argentina as *U. ampullariae* which apparently

does not closely match the description of *U. ampullariae* provided by Lundblad, 1941-1942).

DISCUSSION

Six new species described in this paper possess varied degrees of sexual dimorphism of the fourth walking legs of the males. *U. megachela* appears to possess the least modification in the legs and is clearly intermediate between nominal *Polyatax* and *Neoatax*. Presence or absence of sexually dimorphic legs is not sufficient to separate these subgenera when the morphology of the genital fields, pedipalps, and legs are so similar. All of the studied species in this group oviposit in the mantle and foot epithelia of their hosts. However, the Central and South American species previously placed in *Polyatax* possess morphologically different genital fields and pedipalps. They are placed in a newly erected subgenus, *Ampullariatax*.

Ampullariatax are parasites of snails of the genus *Ampullaria* while *Polyatax* are parasites of viviparid snails and unionacean mussels in Asia and North America. Snail parasites include: *U. campelomaicola*, *U. japonensis*, *U. viviparicola* and *U. dobsoni*. Mussel parasites include: *U. scutigera*, *U. neokoenikei*, *U. heardi*, *U. abnormipes*, *U. serrata*, *U. indistincta*, *U. australindistincta*, *U. causeyae*, *U. hensleyi*, and *U. megachela*.

Although *Ampullariatax* and *Polyatax* possess synapomorphic character states with the subgenera *Fulleratax* Vidrine, *Parasitatax* Viets and *Pentatax* Thor, each represents a separate phyletic line of evolution. Knowledge of their distribution, host preferences and life histories remains scant. However, this treatment of these taxa provides a classification that appears to be consistent with a more probable evolutionary history of the group.

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