

A REVISION OF THE SPECIES OF THE GENUS *NEUMANIA* sensu stricta
IN NORTH AMERICA, WITH DESCRIPTIONS OF SEVEN NEW SPECIES
(FOURTH PART)¹

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Neumania punctata Marshall, 1922
(Figs 84, 89, 94, 99, 104)

MALE : length between anterior end of CP-I and posterior end of CP-IV 530 (525-557); body soft; epidermis with numerous small bumps (of chitin?) which give the specific epithet; these are very obvious in the males, less so in females; coxae in four groups; tubercles at end of body of medium size and fused to the acetabular plates; dorsum with a pair of small but well-developed dorsalia; tips of coxae narrowed but not pointed; posterior projections of CP-IV somewhat hook-like; posterior apodemes of anterior CP-I/CP-II coxal group extending to middle of CP-IV (fig. 104); surface of coxae appearing coarsely reticulate; genital field terminal; width of genital field 416 (378-441); width of gonopore 32 (22-42); about 50 genital acetabula on each side; anus fused to the posterior margin of the acetabular plate; dorsal lengths of the palpal segments (fig. 94) : P-I, 32 (31-34); P-II, 105 (101-107); P-III, 62 (57-68); P-IV, 114 (112-114); P-V, 33 (26-36); total palpal length 344 (333-351); note the very long fine setae on both P-III and P-IV; capitulum, including anchoral process, 159 (137-179) in length, 105 (95-126) in width; dorsal lengths of segments of first leg : I-Leg-1, 72 (65-84); I-Leg-2, 133 (126-137); I-Leg-3, 167 (158-179); I-Leg-4, 222 (210-231); I-Leg-5, 258 (252-263); I-Leg-6, 249 (242-257); dorsal lengths of the distal segments of the fourth

leg (fig. 84) : IV-Leg-4, 225 (210-236); IV-Leg-5, 260 (252-273); IV-Leg-6, 250 (242-255); distal end of IV-Leg-3 with 2 (2-3) swimming hairs; distal end of IV-Leg-4 with 5 (4-5) swimming hairs; distal end of IV-Leg-5 with 3 (2-3) swimming hairs; four short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 and seven short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-5.

FEMALE : length between anterior end of CP-I and posterior end of CP-IV 664 (620-725); dorsum and the venter (fig. 89), except for the genital field, as described for the male; genital field terminal; width of genital field 422 (305-462); width of gonopore 104 (63-138); 44-52 genital acetabula on each plate; pregenital sclerite well-removed from acetabular plates and with 3 free setae on each side between these sclerites; dorsal lengths of the palpal segments (fig. 99) : P-I, 39 (31-44); P-II, 128 (114-143); P-III, 77 (68-88); P-IV, 125 (105-141); P-V, 44 (34-52); total palpal length 412 (379-461); capitulum, including anchoral process, 220 (179-252) in length, 136 (116-158) in width; dorsal lengths of segments of first leg : I-Leg-1, 85 (63-95); I-Leg-2, 168 (137-189); I-Leg-3, 199 (183-242); I-Leg-4, 288 (263-347); I-Leg-5, 300 (273-357); I-Leg-6, 268 (231-323); dorsal lengths of the distal segments of the fourth leg : IV-Leg-4, 312 (231-368); IV-Leg-5, 337 (273-389); IV-Leg-6, 311 (221-365); distal end of IV-Leg-3 with 3 (2-5) swimming

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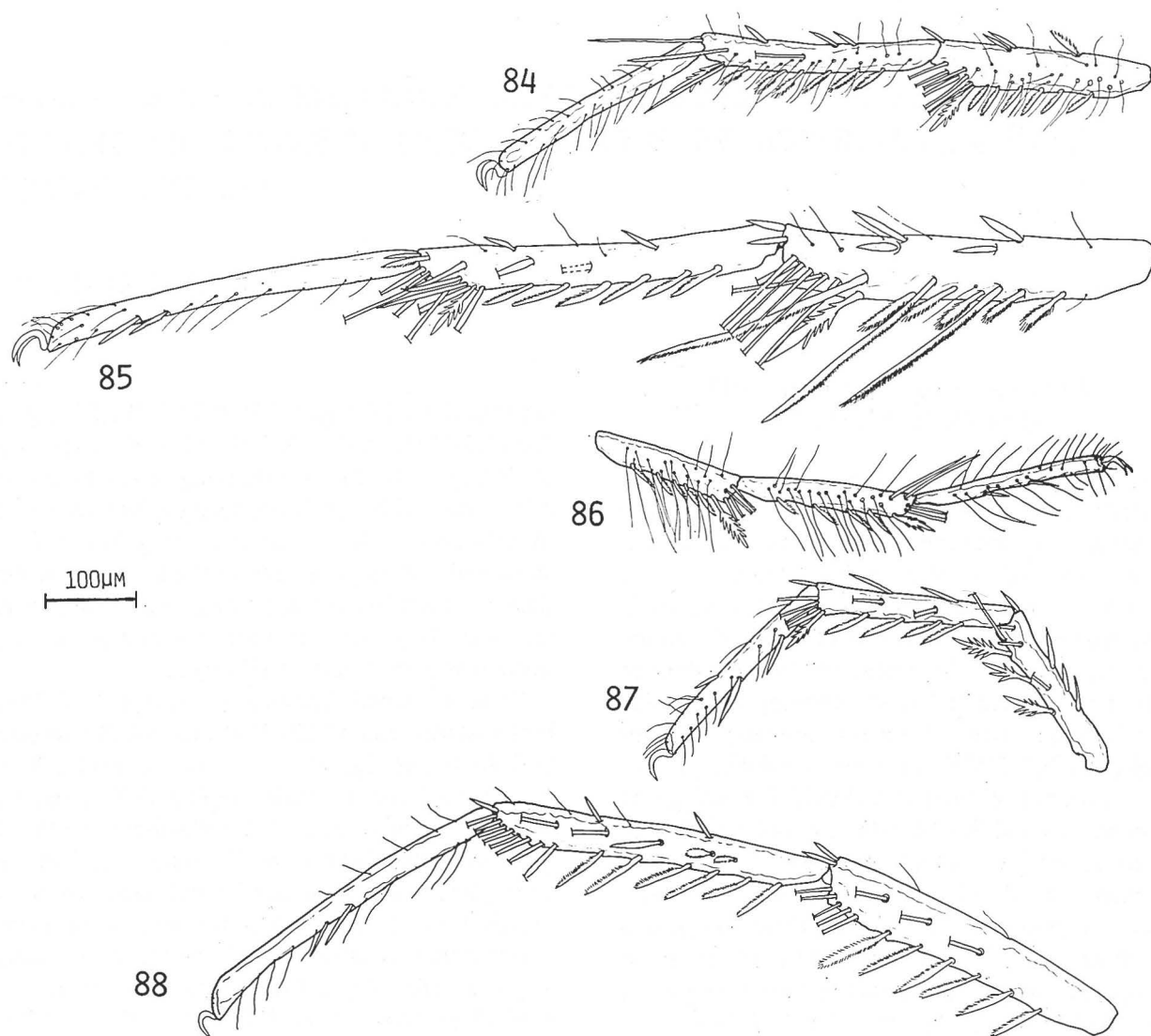


FIG. 84-88 : *Neumania* spp. Distal segments of the male fourth legs.

84. — *N. punctata* Marshall, 1922 (mount NE.JC.244.ROM). 85. — *N. semicircularis* Marshall, 1922 (allotype). 86. — *N. setosipalpa* n. sp. (holotype). 87. — *N. smithi* n. sp. (holotype). 88. — *N. tenuipalpis* Marshall, 1922 (holotype).

hairs ; distal end of IV-Leg-4 with 5 (3-6) swimming hairs ; distal end of IV-Leg-5 with 3 (2-5) swimming hairs ; six short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 and six short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-5.

TYPE MATERIAL : Holotype male from Mirror Lake, Sauk Co., Wisconsin, on 1912.08.26 (Ruth MARSHALL, FMNH, MARSHALL Collection) depo-

sited in the FMNH ; allotype female same locality and data, holotype as deposited in the FMNH.

Material Examined : 8 males and 29 females ; WISCONSIN : 1 male holotype, 1 female allotype. 1 female from Monona Bay, Lake Monona, Madison, Dane Co., on 1909.06.15 (Ruth MARSHALL, FMNH, MARSHALL Collection). BRITISH COLUMBIA : 1 female from Okanagan Lake, at Pyramid Point Provincial Park, Summerland, on 1976.07.13 (I.M. SMITH, CNC, M76-0216). SASKATCHEWAN : 1 female from an unnamed

creek by the 57 Trail, Prince Albert National Park, on 1967.08.29 (J.C. CONROY). ONTARIO : 7 males, 25 females from Chaffey's Locks, Lake Opinicon, Leeds Co., (2 females from *Station III* on 1975.05.10 ; 5 females from *Station X* on 1975.05.11 ; 1 female from *Station XII* on 1975.05.13 ; 3 females from *Station IV* on 1975.05.26 ; 1 female from *Station Vs* on 1975.06.18 ; 2 females from *Station XII* on 1975.06.21 ; 1 male from *Station IIIs*, 3 males, 1 female from *Station IV*, and 1 female from *Station XII* on 1975.07.15 ; 2 females from *Station Vd* on 1975.07.27 ; 2 males from *Station IIIs* on 1975.07.28 ; 2 females from *Station I*, 3 females from *Station Vd*, and 2 females from *Station VI*, on 1975.08.07 ; 1 male from *Station IV* on 1975.09.08 — all by N.L. GERRISH, ROM).

Discussion : This species previously was reported from Wisconsin and Illinois (MARSHALL, 1922, 1933), Iowa (MARSHALL, 1926 as *N. tenuipalpis*), Michigan (MARSHALL, 1927, 1940), Ohio (MILLER, 1925), Pennsylvania (CRIBBINS, 1959), and Ontario (MARSHALL, 1929b).

Neumania semicircularis Marshall, 1922
(Fig. 85, 901, 95, 100, 105)

MALE : length between anterior end of CP-I and posterior end of CP-IV 738 (662-809) ; body soft ; epidermis covered by a very fine stubble of small bumps ; coxae in four groups ; tubercles at end of body of medium size ; dorsum with a pair of very small dorsalia ; tips of coxae narrowed but not pointed ; posterior projections of CP-IV somewhat hook-like ; posterior apodemes of anterior CP-I/CP-II coxal group extending to middle of CP-IV ; surface of coxae appearing reticulate ; genital field terminal ; width of genital field 369 (315-462) ; width of gonopore 63 (53-95) ; numerous (50-70) genital acetabula/plate (fig. 105) ; dorsal lengths of the palpal segments : P-I, 46 (42-49) ; P-II, 139 (125-159) ; P-III, 84 (73-94) ; P-IV, 151 (135-166) ; P-V, 52 (47-62) ; total palpal length 468 (431-524) (fig. 95) ; capitulum, including anchoral process, 186 (168-221) in length, 137 (116-158) in width ; dorsal lengths of segments of first leg : I-Leg-1, 97 (85-105) ; I-Leg-2, 194 (170-212) ; I-Leg-3, 247 (214-282) ; I-Leg-4, 362 (315-389) ; I-Leg-5, 413 (326-452) ; I-Leg-6, 386 (250-437) ; dorsal lengths of the distal segments of the fourth leg (fig. 85) : IV-Leg-4, 386 (326-420) ;

IV-Leg-5, 390 (347-425) ; IV-Leg-6, 379 (323-415) ; distal end of IV-Leg-3 with 3 (3-5) swimming hairs ; distal end of IV-Leg-4 with 8 (5-11) swimming hairs ; distal end of IV-Leg-5 with 6 (2-8) swimming hairs ; six-eight short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 ; and five-six short and one-three large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-5.

FEMALE : length between anterior end of CP-I and posterior end of CP-IV 795 (714-914) ; dorsum and the venter, except for the genital field, as described for the male ; genital field terminal ; width of genital field 439 (336-525) ; width of gonopore 119 (65-189) ; 68-88 genital acetabula on each side ; pregenital sclerite well-removed from acetabular plates and with 3 free setae on each side between these sclerites (fig. 90) ; dorsal lengths of the palpal segments : P-I, 49 (42-57) ; P-II, 151 (137-172) ; P-III, 92 (75-117) ; P-IV, 161 (146-185) ; P-V, 53 (46-63) ; total palpal length 504 (473-555) ; dorsal area of P-IV with 5-7 short setae (fig. 100) ; capitulum, including anchoral process, 235 (184-315) in length, 159 (95-200) in width ; dorsal lengths of segments of first leg : I-Leg-1, 104 (84-128) ; I-Leg-2, 197 (179-231) ; I-Leg-3, 253 (221-288) ; I-Leg-4, 359 (326-399) ; I-Leg-5, 379 (336-430) ; I-Leg-6, 310 (255-399) ; dorsal lengths of the distal segments of the fourth leg : IV-Leg-4, 379 (284-431) ; IV-Leg-5, 398 (368-462) ; IV-Leg-6, 386 (326-462) ; distal end of IV-Leg-3 with 3 (2-4) swimming hairs ; distal end of IV-Leg-4 with 6 (3-8) swimming hairs ; distal end of IV-Leg-5 with 5 (2-8) swimming hairs ; six short and one large (distal) pectinate hairs on the postero-ventral aspect of IV-Leg-4 and five short and two large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-5.

TYPE MATERIAL : Holotype female from Mill Pond Lake, near Spooner, Washburn Co., Wisconsin, on 1909.07.15 (Ruth MARSHALL, FMNH, MARSHALL Collection) deposited in the FMNH ; allotype male from Catfish River, Madison, Dane Co., Wisconsin, on 1915.06.14 (R.A. MUTTKOWSKI, FMNH, MARSHALL Collection), deposited in the FMNH.

Material Examined : 11 males and 53 females ; WISCONSIN : 1 male allotype ; 1 female holotype ; 1 female from Mendota Lake, Madison, Dane Co. (R.A. MUTT-

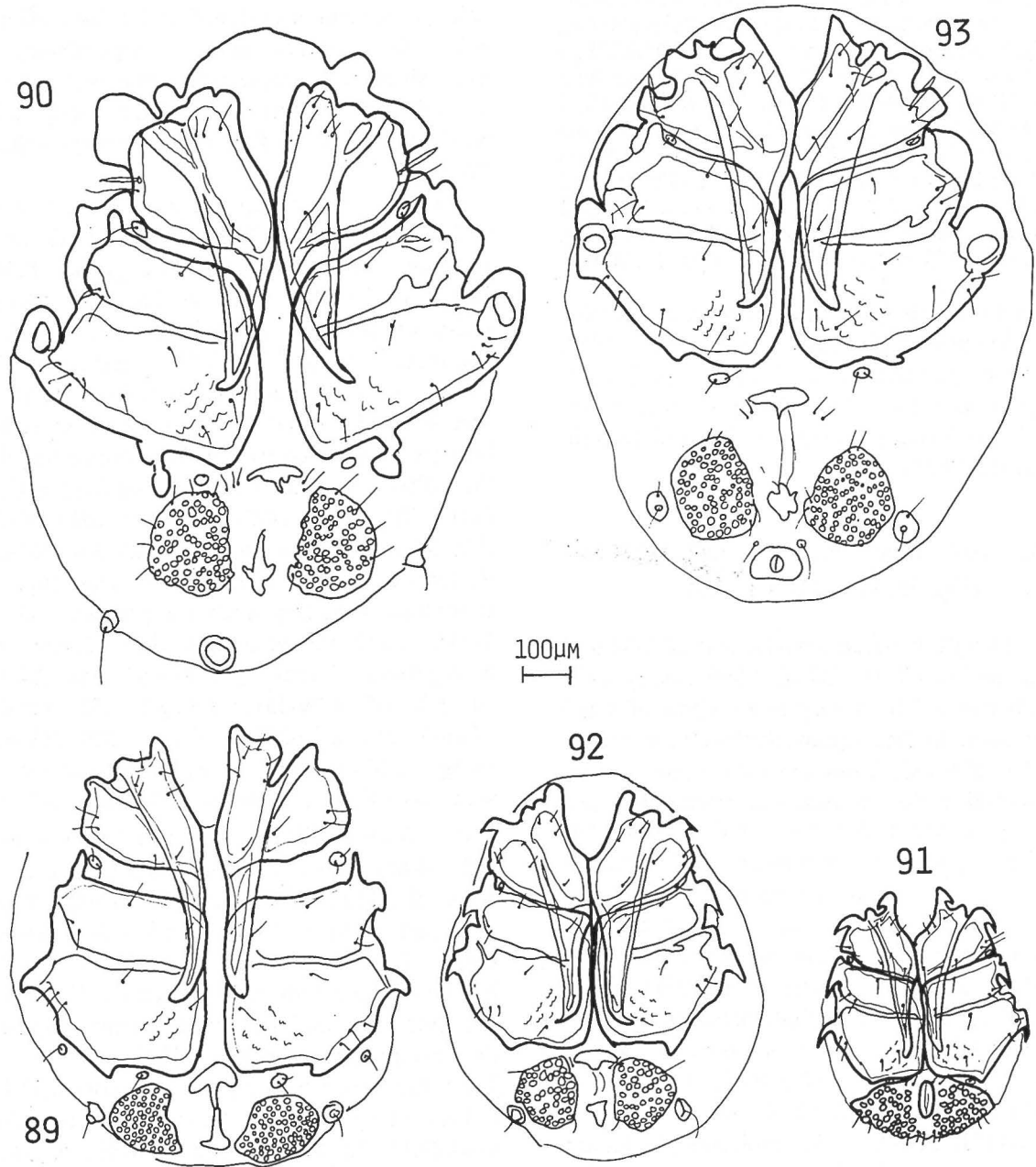


FIG. 89-93. *Neumania* spp. Ventral views.

89. — *N. punctata* Marshall, 1922 female (allotype). 90. — *N. semicircularis* Marshall, 1922 female (mount 83-35-01). 91. — *N. setosipalpa* n. sp. male (holotype). 92. — *Idem*, female (allotype). 93. — *N. tenuipalpis* Marshall, 1922 female (mount NE.JC.06.ROM).

KOWSKI, FMNH, MARSHALL Collection) on 1915.05.09 and 1 female on 1915.08.15; 1 female from Grindstone Creek, crossing County Road K, near Hayward, Sawyer Co., on 1983.07.22 (J.C. CONROY); 1 female from Beyer's Cove, Green Lake, Green Lake Co., on 1983.07.27 (J.C. CONROY); 1 female, from Head of the Lake, Green Lake, at the County Park, Green Lake, Co., on 1983.07.30 (J.C. CONROY); 2 males, 7 females, from the south shore, near Shore Drive, Green Lake, Green Lake Co., (2 females on 1983.07.27; 2 males, 5 females on 1983.07.30 - all by J.C. CONROY); SASKATCHEWAN : 4 females from Echo Lake, on 1939.08.30 (D.R. RAWSON, FMNH, MARSHALL Collection); MANITOBA : 1 male from Muskrat Lake, on 1973.08.23 (R.L. SAUNDERS, J.C. CONROY collection); 1 male from Sturgeon Creek, at Saskatchewan Avenue, Winnipeg, on 1975.07.14 (J.C. CONROY); 3 males, 10 females, from Pond 2 of Fort Whyte Nature Reserve, Winnipeg, various dates 1976-1977 (J.C. CONROY); ONTARIO : 1 male, 13 females from Chaffey's Locks, Lake Opinicon, Leeds Co. (one female from *Station I* on 1975.05.10; 1 female from *Station IV* on 1975.05.11; 1 female from *Station XII* on 1975.05.13; 1 female from *Station IV* and 1 female from *Station III* on 1975.05.26; 1 male from *Station XII* on 1975.06.21; 1 female from *Station IV* on 1975.07.15; 1 female from *Station III*, 1 female from *Station Vd*, and 1 female from *Station XII* on 1975.07.27; 4 females from *Station I* on 1975.08.07 — all by N.L. GERRISH, ROM); NOVA SCOTIA : 1 male, 6 females, from a stream crossing the Port Dufferin-Dufferin Mines Road, Halifax Co., on 1984.09.23 (I.M. and S.C. SMITH, CNC, M84-0098); 1 male from Lake Charlotte at the Highway, Halifax Co., on 1984.09.23 (I.M. and S.C. SMITH, CNC, M84-0100); 2 females from a small stream into Lake Ramsay, Lunenburg Co., on 1984.09.25 (I.M. and S.C. SMITH, CNC, M84-0109); 4 females from Cameron Lake, South Brookfield, Queen's Co., on 1984.09.26 (I.M. and S.C. SMITH, CNC, M84-0109);

Discussion : This is the largest species of *Neumania* s.str. found in North America. This species was previously reported from Wisconsin (MARSHALL, 1922), Iowa (MARSHALL, 1926), Montana (MARSHALL, 1930), Illinois (MARSHALL, 1933), Michigan (MARSHALL, 1940), Pennsylvania (CRIBBINS, 1959), Ontario (MARSHALL, 1929b), Saskatchewan and British Columbia (CONROY, 1968), British Columbia (CONROY and SCUDDER, 1975), and Manitoba (CONROY, 1976). MARSHALL (1933) noted that "the body surface is covered with very fine denticle". Since these are blunt and resemble those on the epidermis of *N. nova-scotiae* and are quite unlike the longer, fine spines of other species (such as *N.*

pubescens), in the description above I have referred to them as 'small bumps'.

***Neumania setosipalpa*, new species**

(Fig. 86, 91, 92, 96, 101)

MALE : length between anterior end of CP-I and posterior end of CP-IV 419 (389-504); body soft; coxae in four groups; tubercles at end of body of moderate size; dorsum with a pair of very small dorsalia; tips of coxae distinctly pointed and somewhat hooklike; posterior projections of CP-IV somewhat hook-like; posterior apodemes of anterior CP-I/CP-II coxal group extending to middle of CP-IV; surface of coxae appearing reticulate; genital field terminal; width of genital field 268 (242-305); width of gonopore 34 (21-42); 34-38 genital acetabula/plate (fig. 91); dorsal lengths of the palpal segments (fig. 96) : P-I, 24 (22-34); P-II, 80 (70-99); P-III, 48 (39-60); P-IV, 86 (75-107); P-V, 32 (26-36); total palpal length 270 (253-336); the palp is similar to that of *Neumania (Lemienia)* species; note the numerous long, fine setae on both P-III and P-IV; capitulum, including anchoral process, 130 (116-147) in length, 89 (84-95) in width; dorsal lengths of segments of first leg : I-Leg-1, 56 (53-63); I-Leg-2, 108 (95-126); I-Leg-3, 127 (111-152); I-Leg-4, 176 (158-210); I-Leg-5, 189 (168-247); I-Leg-6, 220 (179-252); dorsal lengths of the distal segments of the fourth leg (fig. 86) : IV-Leg-4, 179 (158-224); IV-Leg-5, 203 (179-242); IV-Leg-6, 205 (179-242); distal end of IV-Leg-3 with 2 (2-3) swimming hairs; distal end of IV-Leg-4 with 4 (2-6) swimming hairs; distal end of IV-Leg-5 with 4 (3-4) swimming hairs; five short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 and seven pectinate spines on the postero-ventral aspect of IV-Leg-5.

FEMALE : length between anterior end of CP-I and posterior end of CP-IV 520 (515-525); dorsum and the venter, except for the genital field, as described for the male; genital field terminal; width of genital field 336; width of gonopore 105; 42-44 genital acetabula/plate; pregenital sclerite well-removed from acetabular plates and with 2 free setae on each side between these sclerites (fig. 92); dorsal lengths of the palpal segments (fig. 101) : P-I,

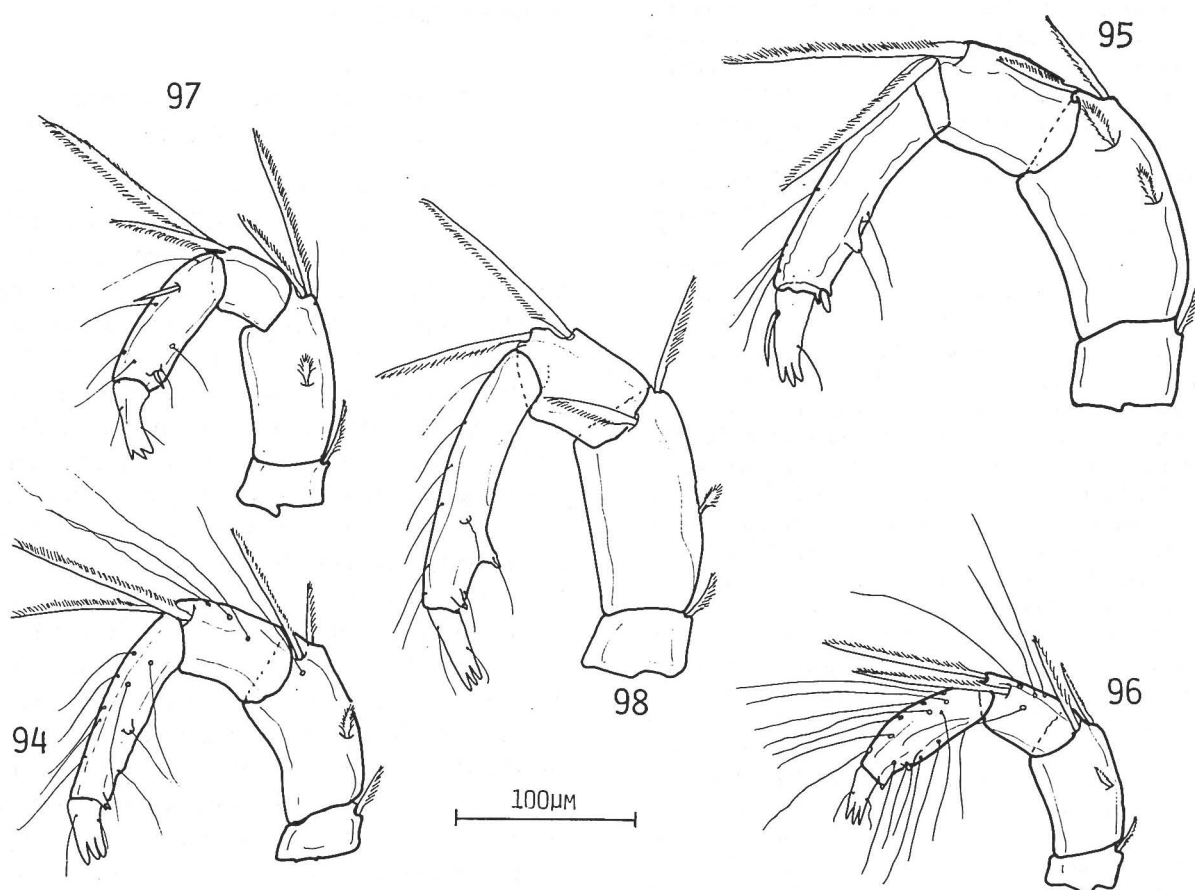


FIG. 94-98 : *Neumania* spp. Male palps.

94. — *N. punctata* Marshall, 1922 (mount NE.JC.244.ROM). 95. — *N. semicircularis* Marshall, 1922 (mount SCR-75-07). 96. — *N. setosipalpa* n. sp. (holotype). 97. — *N. smithae* n. sp. (mount M76-0176-36). 98. — *N. tenuipalpis* Marshall, 1922 (holotype)

34; P-II, 111 (109-112); P-III, 60 (59-60); P-IV, 108 (101-114); P-V, 41 (39-42); total palpal length 362 (345-379); capitulum, including anchoral process, 179 (168-189) in length, 119 (111-126) in width; dorsal lengths of segments of first leg : I-Leg-1, 74; I-Leg-2, 148 (137-158); I-Leg-3, 153 (147-158); I-Leg-4, 226 (221-231); I-Leg-5, 223 (215-231); I-Leg-6, 226 (221-231); dorsal lengths of the distal segments of the fourth leg : IV-Leg-4, 255 (252-257); IV-Leg-5, 268 (263-273); IV-Leg-6, 252; distal end of IV-Leg-3 with 3 swimming hairs; distal end of IV-Leg-4 with 5 swimming hairs; distal end of IV-Leg-5 with 4 (3-5) swimming hairs; five short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 and seven

pectinate spines on the postero-ventral aspect of IV-Leg-5.

TYPE MATERIAL : holotype male (mount M76-0302-37) from Lac Phillipe, Gatineau Park, Quebec, on 1976.07.12 (I.M. SMITH, CNC, M76-0302) deposited in the CNC; allotype female (mount M76-0302-06) same locality and data as holotype, deposited in the CNC; paratypes : one male and one female paratype deposited in the FMNH and one female paratype deposited in the ROM. The remaining paratypes are either in the CNC or are retained in the author's collection.

Material Examined : 10 males and 2 females; QUEBEC : 5 males, 2 females, from Lac Phillipe, Gatineau Park, on 1976.07.12 (I.M. SMITH, CNC, M76-0302);

NOVA SCOTIA : 5 males from a small stream into Lake Ramsay, Lunenburg Co., on 1984.09.25 (I.M. and S.C. SMITH, CNC, M84-0104).

Discussion : This is the only species of *Neumania* found that has the prominent pointed spine-like tips to all the coxal plates. Other species with these spine-like tips, either have them only on CP-IV (*N. bondana* Cook, 1986 — from Australia; *N. nodosa* (Daday, 1898) — from Sri Lanka, India, Java, New Caledonia, and Patau, and *N. uncinata* Walter, 1927 — from France, Spain, and Portugal), or on CP-III (*N. armata* — from the United States and Canada) or, in the case of *N. conroyi* Cook, 1980 (from Mexico) have them on CP-II, CP-III, and CP-IV.

***Neumania smithi*, new species**
(Fig. 87, 97, 102, 106a, 106b)

MALE : length between anterior end of CP-I and posterior end of CP-IV 420 (394-441); body soft; epidermis covered by a moderate stubble of fine, long spines or denticles; coxae in four groups; tubercles at end of body of small size; dorsum with a pair of very small dorsalia; tips of coxae narrowed but not pointed; posterior projections of CP-IV somewhat hook-like; posterior apodemes of anterior CP-I/CP-II coxal group extending to middle of CP-IV; surface of coxae appearing punctate, and weakly reticulate; genital field terminal; width of genital field 293 (255-347); width of gonopore 51 (42-63); about 40-46 genital acetabula/plate (fig. 106a); dorsal lengths of the palpal segments : P-I, 25 (23-26); P-II, 91 (83-101); P-III, 41 (34-45); P-IV, 80 (75-86); P-V, 38 (29-42); total palpal length 273 (259-286) (fig. 97); capitulum, including anchoral process, 137 (126-157) in length, 91 (84-105) in width; dorsal lengths of segments of first leg : I-Leg-1, 56 (48-63); I-Leg-2, 100 (84-110); I-Leg-3, 117 (95-126); I-Leg-4, 164 (137-171); I-Leg-5, 178 (158-184); I-Leg-6, 239 (210-263); dorsal lengths of the distal segments of the fourth leg (fig. 87) : IV-Leg-4, 181 (147-189); IV-Leg-5, 206 (178-221); IV-Leg-6, 215 (179-242); distal end of IV-Leg-3 with 2 (1-4) swimming hairs; distal end of IV-Leg-4 with 4 (2-9) swimming hairs; distal end

of IV-Leg-5 with 3 (2-7) swimming hairs; three long pectinate spines on the postero-ventral aspect of IV-Leg-4 and five long pectinate spines on the postero-ventral aspect of IV-Leg-5.

FEMALE : length between anterior end of CP-I and posterior end of CP-IV 476 (441-504); dorsum and the venter, except for the genital field, as described for the male; epidermis with a loose stubble of fine, long spines; genital field terminal; width of genital field 355 (315-399); width of gonopore 123 (74-158); about 40-50 genital acetabula/plate; pregenital sclerite well-removed from acetabular plates and with no free setae between these sclerites (fig. 106b); dorsal lengths of the palpal segments : P-I, 30 (29-31); P-II, 109 (99-120); P-III, 46 (39-52); P-IV, 94 (83-104); P-V, 44 (39-49); total palpal length 323 (305-351) (fig. 102); capitulum, including anchoral process, 162 (147-179) in length, 116 (105-137) in width; dorsal lengths of segments of first leg : I-Leg-1, 66 (53-74); I-Leg-2, 124 (116-131); I-Leg-3, 149 (137-158); I-Leg-4, 206 (189-221); I-Leg-5, 207 (189-221); I-Leg-6, 238 (221-252); dorsal lengths of the distal segments of the fourth leg : IV-Leg-4, 241 (210-263); IV-Leg-5, 268 (231-284); IV-Leg-6, 253 (231-273); distal end of IV-Leg-3 with 3 (1-3) swimming hairs; distal end of IV-Leg-4 with 5 (4-6) swimming hairs; distal end of IV-Leg-5 with 3 (3-4) swimming hairs; four long pectinate spines on the postero-ventral aspect of IV-Leg-4 and five long pectinate spines on the postero-ventral aspect of IV-Leg-5.

TYPE MATERIAL : holotype male (mount M76-0176-37) from pools in a small stream, in Frog Heaven, near Canyon Rim Lookout, Mount Rainier National Park, Pierce Co., Washington, on 1976.06.30 (I.M. Smith, CNC, M76-0176) deposited in the CNC; allotype female (mount M76-0176-07) same locality and data as holotype, deposited in the CNC; paratypes : one male and one female paratype deposited in each of the FMNH and the ROM. The remaining paratypes are either in the CNC or are retained in the author's collection.

Material Examined : 28 males and 27 females : WASHINGTON : 18 males, 15 females, from pools in a small stream, in Frog Heaven, near Canyon Rim Lookout, Mount Rainier National Park, Pierce Co., on

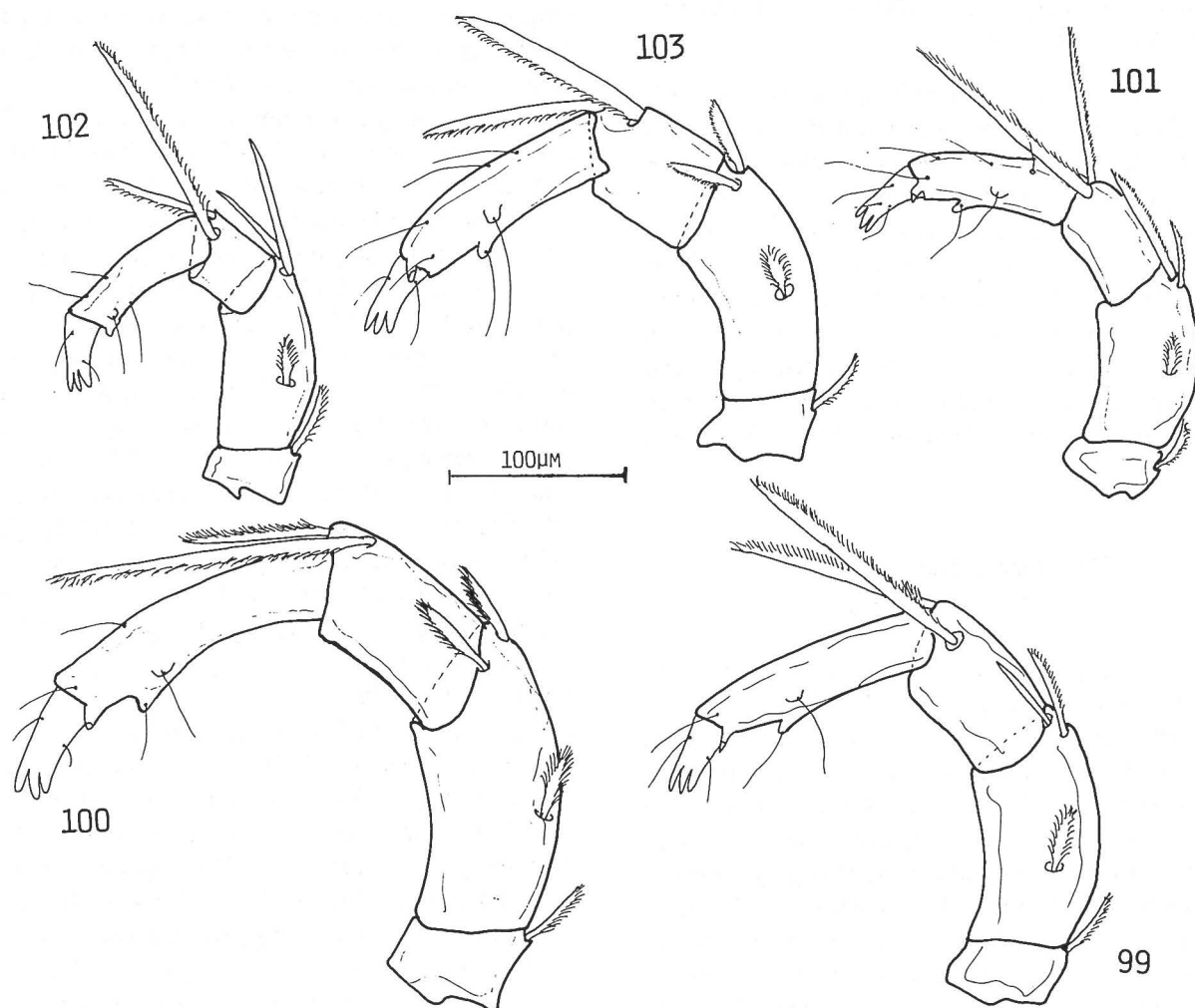


FIG. 99-103 : *Neumania* spp. Female palps.

99. — *N. punctata* Marshall, 1922 (allotype). 100. — *N. semicircularis* Marshall, 1922 (allotype). 101. — *N. setosipalpa* n. sp. (allotype). 102. — *N. smithi* n. sp. (allotype). 103. — *N. tenuipalpis* Marshall, 1922 (mount NE.JC.06.ROM).

1976.06.30 (I.M. SMITH, CNC, M76-0176) ; QUEBEC : 3 females from a tundra pond, Mount Albert Plateau, Gaspésie Provincial Park, Gaspé-Ouest Co., on 1980.07.12 (I.M. SMITH, CNC, M80-0099) ; NEW BRUNSWICK : 1 male, 1 nymph, from Cameron Brook, by the Fraser Coast Road, Mount Carleton Provincial Park, Restigouche Co., on 1980.07.15 (I.M. SMITH, CNC, M80-0105b) ; NOVA SCOTIA : 2 females from a pool on a flood plain, Cheticamp Campground, La Prairie, Highlands National Park, Cape Breton, on 1984.07.09 (I.M. SMITH, CNC, M84-0049) ; 5 males, 1 female, from a pool, between Scottsville and Trout River, Highway 395, Inverness Co., on 1984.09.19 (I.M. and S.C. SMITH, CNC, M84-0080) ; 4 males, 6 females, from the Trout River, by

Highway 395, Inverness Co., on 1984.09.19 (I.M. and S.C. SMITH, CNC, M84-0084).

Discussion : The lack of a long, distal pectinate spine on either IV-Leg-4 or IV-Leg-5 is of note.

Neumania tenuipalpis Marshall, 1922
(Fig. 88, 93, 98, 103, 107)

MALE : length between anterior end of CP-I and posterior end of CP-IV 676 (609-704) ; body soft ; epidermis smooth, with scattered, very small pat-

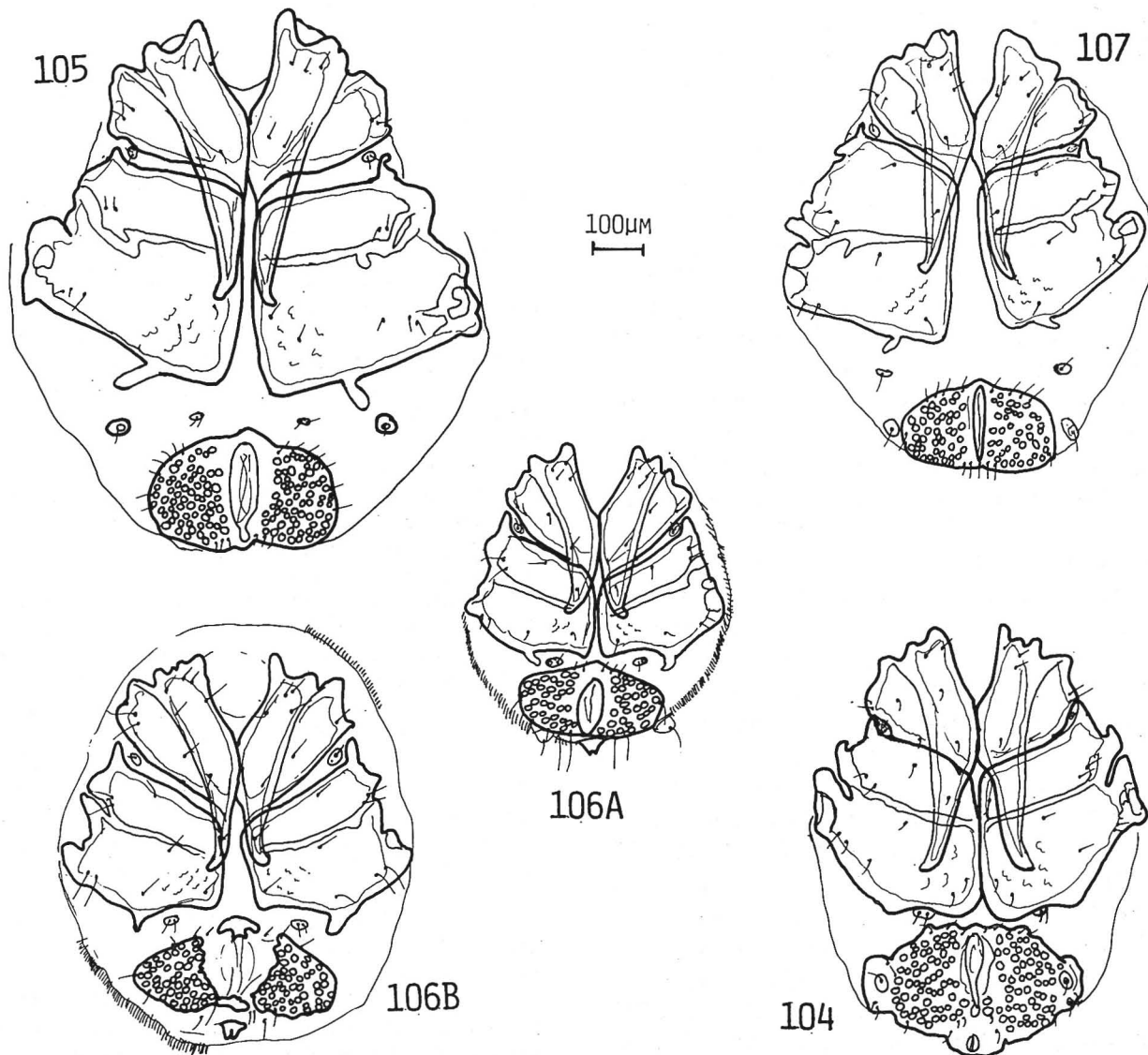


FIG. 104-107 : *Neumania* spp. Ventral views.

104. — *N. punctata* Marshall, 1922, male (mount NE.JC.244.ROM). 105. — *N. semicircularis* Marshall, 1922, male (mount FWA-47-23-2).
106. — *N. smithi* n. sp., male (holotype) (a) female (allotype) (b). 107. — *N. tenuipalpis* Marshall, 1922, male (holotype).

ches (of chitin ?) ; coxae in four groups ; tubercles at end of body of small size ; dorsum with a pair of very small dorsalia ; tips of coxae narrowed but not pointed ; posterior projections of CP-IV somewhat hook-like ; posterior apodemes of anterior CP-I/CP-II coxal group extending to middle of CP-IV ; surface of coxae appearing loosely reticulate ; genital field terminal ; width of genital field 334

(309-383) ; width of gonopore 58 (21-74) ; 40-46 genital acetabula/plate (fig. 107) ; dorsal lengths of the palpal segments : P-I, 39 (21-47) ; P-II, 125 (91-143) ; P-III, 81 (68-94) ; P-IV, 139 (101-156) ; P-V, 49 (34-55) ; total palpal length 431 (341-487) ; dorsal aspect of P-IV with 5-7 long, fine setae (fig. 98) ; capitulum, including anchoral process, 183 (168-200) in length, 130 (116-158) in width ; dorsal

lengths of segments of first leg : I-Leg-1, 88 (82-95); I-Leg-2, 177 (158-200); I-Leg-3, 239 (189-323); I-Leg-4, 328 (273-368); I-Leg-5, 392 (336-420); I-Leg-6, 387 (294-431); dorsal lengths of the distal segments of the fourth leg (fig. 88) : IV-Leg-4, 358 (305-399); IV-Leg-5, 365 (300-410); IV-Leg-6, 358 (302-405); distal end of IV-Leg-3 with 2 (1-3) swimming hairs; distal end of IV-Leg-4 with 5 (2-10) swimming hairs; distal end of IV-Leg-5 with 6 (3-8) swimming hairs; five short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 and six pectinate spines on the postero-ventral aspect of IV-Leg-5.

FEMALE : length between anterior end of CP-I and posterior end of CP-IV 711 (651-798); dorsum and the venter, except for the genital field, as described for the male; genital field terminal; width of genital field 435 (302-588); width of gonopore 114 (63-231); genital acetabula very numerous; pregenital sclerite well-removed from acetabular plates and with four free setae on each side between these sclerites (fig. 93); dorsal lengths of the palpal segments : P-I, 44 (31-55); P-II, 138 (117-156); P-III, 79 (60-99); P-IV, 136 (104-164); P-V, 47 (42-57); total palpal length 443 (390-528) (fig. 103); capitulum, including anchoral process, 217 (179-273) in length, 135 (105-174) in width; dorsal lengths of segments of first leg : I-Leg-1, 97 (84-116); I-Leg-2, 177 (158-200); I-Leg-3, 218 (179-263); I-Leg-4, 313 (273-378); I-Leg-5, 326 (284-389); I-Leg-6, 280 (231-391); dorsal lengths of the distal segments of the fourth leg : IV-Leg-4, 336 (236-410); IV-Leg-5, 363 (305-452); IV-Leg-6, 337 (284-410); distal end of IV-Leg-3 with 3 (2-4) swimming hairs; distal end of IV-Leg-4 with 5 (2-6) swimming hairs; distal end of IV-Leg-5 with 4 (3-5) swimming hairs; seven short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-4 and six short and one large (distal) pectinate spines on the postero-ventral aspect of IV-Leg-5.

TYPE MATERIAL : holotype male from Winchell's Pond, Kilbourn, Bigspring, Adams Co., Wisconsin, on 1912.08.08 (Ruth MARSHALL, FMNH, Marshall Collection) deposited in the FMNH.

Material Examined : 8 males and 44 females : WISCONSIN : 3 females from Spooner Lake, Washburn Co.,

on 1906.08.08 (Ruth MARSHALL, FMNH, MARSHALL Collection); 1 male holotype; 1 female from Nelson Lake, by the Tanning Point Road, near Hayward, Sawyer Co., on 1983.07.21 (J.C. CONROY); 3 females from the Chief River, near Hayward, Sawyer Co., on 1983.07.22 (J.C. CONROY); 2 females from the Tiger Cat Flowage East, Sawyer Co., on 1983.07.25 (J.C. CONROY); 1 female from South Shore of Green Lake, at Shore Drive, on 1983.07.27 (J.C. CONROY); IOWA : 3 males from Upper Gar Lake, Okoboji, Dickinson Co., on 1924.07.26 (Ruth MARSHALL, FMNH, MARSHALL Collection); LOUISIANA : 1 male from a pond in Audobon Park, New Orleans, on 1917.02.17 (E.A. BIRGE, FMNH, MARSHALL Collection); BRITISH COLUMBIA : 1 female from Kanaka Creek, at Kanaka Creek Road and Highway 7, west of Haney, on 1965.08.05 (J.C. and M.E. CONROY); 1 female from Cowichan Lake, at Mesachie Lake Experimental Station, on 1979.06.25 (I.M. SMITH, CNC, M76-0026); 1 female from a beaver pond, by the road to the Ski Area, 10.7 km from Seymour Lake, Hudson Bay Mountain, Smithers, on 1983.07.19 (I.M. SMITH, CNC, M83-0042); MANITOBA : 1 female from West Blue Lake, Duck Mountains Provincial Park, on 1968.09.05 (J.C. CONROY); ONTARIO : 1 male and 26 females from Chaffey's Locks, Lake Opinicon, Leeds Co., (2 females from *Station VII* and 1 female from *Station VIII* on 1975.05.08; 3 females from *Station III* on 1975.05.10; 1 female from *Station IV* on 1975.05.11; 7 females from *Station XII* on 1975.05.13; 1 female from *Station I* on 1975.05.14; 2 females from *Station V* on 1975.05.25; 1 female from *Station Vd* on 1975.06.30; 1 female from *Station IV* and 1 male from *Station XII*, on 1975.07.15; 1 female from *Station IIId* and 1 female from *Station Vd* on 1975.07.27; 2 females from *Station IIIs* on 1975.07.28; 1 female from *Station I* on 1975.08.07; and 1 female from *Station IIId* on 1975.08.08 - all by N.L. GERRISH, ROM); QUEBEC : 2 females from Lac Philipe, Gatineau Park, on 1976.08.17 (I.M. SMITH, D. SPANER, and P. PEHTLA, CNC, M76-0302); NOVA SCOTIA : 1 female from a small lake, Goshen, at the junction of Highways 316 and 276, Guysborough Co., on 1984.09.22 (I.M. and S.C. SMITH, CNC, M84-0094); 2 males, 1 female, from a stream crossing the Port Dufferin-Dufferin Mines Road, Halifax Co., on 1984.09.23 (I.M. and S.C. SMITH, CNC, M84-0098).

Discussion : This species previously was recorded from Wisconsin, and Louisiana (MARSHALL 1922, 1933), Iowa (MARSHALL, 1926), Michigan (MARSHALL, 1940), Pennsylvania (CRIBBINS, 1959), and British Columbia (CONROY, 1968, CONROY and SCUDDER, 1975). MARSHALL (1933) synonymized this species with *N. muttkowski* Marshall, 1922. *N. tenuipalpis* differs from *N. semicircularis* in its

smaller size, the smaller size and fewer patches of epidermal chitin, in the setation of P-III, and in the number and arrangement of the pectinate spines on IV-Leg-4 and IV-Leg-5.

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