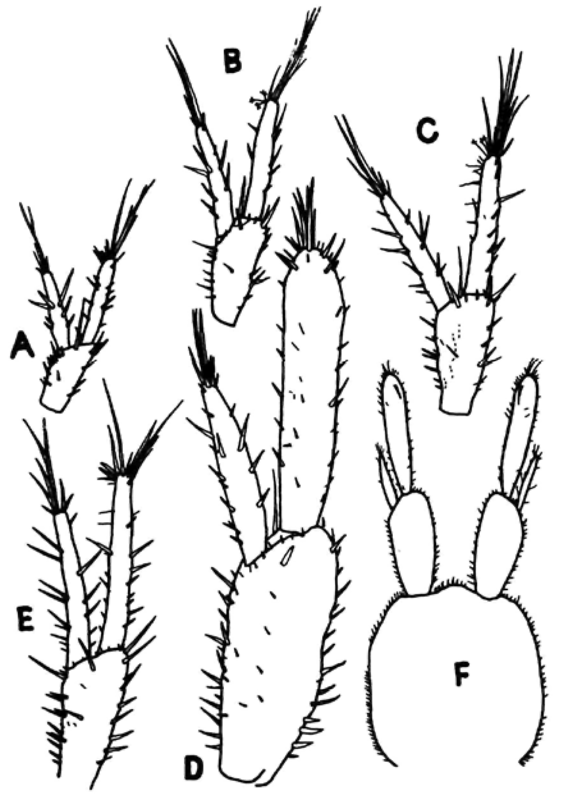

FIGURE 26.—*Asellus kenki*, right uropod or both uropoda and telson, dorsal views: A, 3.5 mm male; B, 5.0 mm male; C, 6.5 mm male; D, 8.2 mm male; E, 6.5 mm ovigerous female; F, 13.0 mm male. From Bowman (1967) with permission.

Eyes: Small, slightly longer than broad, composed of few facets.

Second antenna: 0.75 to 0.8 as long as body (excluding uropoda); flagellum about 70-merous.

Male first pleopod (Figures 25A,B): Peduncle three-quarters as long as exopod, with 3 or 4 coupling spines. Exopod about 1.6 times longer than wide, distal part with concave lateral margin, bent laterad, and bearing 5 long plumose setae on broad apex and several shorter setae proximal to apical setae; distal part of lateral margin with row of setules.

Male second pleopod (Figures 25C–E): Peduncle about one-third longer than wide, with about 5 setae on distomedial margin and 5 short setae on posterior surface near proximolateral margin. Exopod about three-quarters as long as peduncle; proximal segment cupulate, inserted into peduncle by truncate base with heavily sclerotized lateral margin, bearing rectangular flap on posterior surface, distal part of segment widening into rounded lobes on each side; lateral lobe with sclerotized margin continuous with that of base, bearing 4 or 5 short setae; medial lobe produced beyond insertion of distal segment, margin sclerotized. Distal segment of exopod narrowing apically, armed with plumose setae on lateral margin and distal third of medial margin; proximal third of medial margin with broad sclerotization. Endopod shorter than exopod, with well-developed medial apophysis in proximal part; distal to apophysis endopod curves strongly laterad and ends in 5 processes: a straight rounded lateral process, a medial process consisting of a lobe overriding medial process and a rugose lobe posterior and proximal to it, a medially curving cannular posterior to lateral process, and a broadly rounded posterior process [? caudal process] with a few rugosities [Bowman uses the terms anterior and posterior in place of respectively ventral and dorsal; the latter terms are to be preferred as they are a more accurate description of the position of the appendages in life].

Uropod (Figures 26A–F): In females and immature males, exopod about 1.1 times longer than peduncle; endopod 1.1 times longer than exopod; both rami linear, armed with spines on margins and at apex. Uropod of mature male modified: exopod shorter than peduncle; endopod spatulate, much longer and broader than exopod.

MATERIAL EXAMINED.—MARYLAND: Montgomery County, 3♂♂, 3 ovigerous ♀♀, 1 nonovigerous ♀, col. C.R. Shoemaker, 28.v.1916 (USNM).

In all fundamental details this material agreed closely with Bowman's description of *A. kenki*. However, the second antennae of one specimen were as long as the body, the first pleopod (male) lacked a notch on the inner edge of the distal segment and more coupling protuberances (6) were on the proximal segment, and the broadly rounded posterior or dorsal process at the tip of the endopodite of the second pleopod was by no means as prominent as suggested by Bowman's drawings.

GEOGRAPHICAL DISTRIBUTION AND ECOLOGY.—Bowman gives a long list of material examined by him. This had been collected from various localities in the District of Columbia, Maryland, Pennsylvania, and Virginia. The additional material seen by me is therefore well within the known range of distribution of this species. As a basis for comparison with the geographical distribution of other North American species

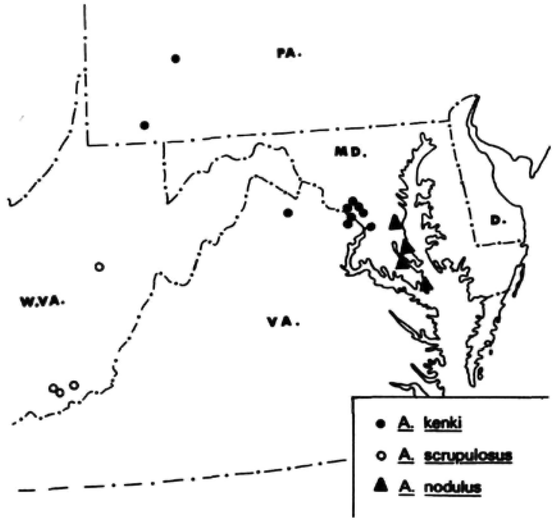

FIGURE 27.—Geographical distribution.

of *Asellus,* Bowman's records and the single new one are combined in Figure 27. The figure indicates the restriction of the species to a relatively small region in the central part of the far eastern side of the United States.

According to Bowman (1967), *A. kenki* is an inhabitant of springs and spring-fed streams and is not found in large streams and ponds within its range of distribution. The associated fauna in the type locality and some further ecological remarks are also noted by Bowman.

Asellus aquaticus (Linnaeus)

FIGURE 28

Oniscus aquaticus Linnaeus, 1758, p. 637.—Otho Fabricius, 1780, p. 251.

Asellus aquaticus (L.).—Geoffrey St. Hilaire, 1764, p. 672.—Sars, 1899, p. 97.—Racovitza, 1919, pp. 31–41, figs. 1–6.—Richardson, 1905, pp. 428–431, fig. 486.—Stephensen, 1917, pp. 239–240.—Van Name, 1936, pp. 458–459, fig. 287.—Birstein, 1951, pp. 57–60, figs. 18–26.—Williams, 1962b, pp. 78–80.

Asellus vulgaris Latreille, 1803, p. 359.—Not Gould, 1841, p. 337.

Asellus grönlandicus? Krøyer, 1838, p. 318—Not Packard, 1867, p. 296.—Hansen, 1888, p. 190.

A complete synonymy for *Asellus aquaticus* would be extremely long and complex and is not needed here, as this species is probably restricted to the Palaearctic and more complete synonymies have been given elsewhere (e.g., Bovallius, 1886; Gruner, 1965). The synonymies and references given above cover the orginal description and generic transference, the most pertinent references to *A. aquaticus* in the Palaearctic, and all references to the synonyms of the species in North America.

Asellus aquaticus was first indicated as present in North America by Otho Fabricius (1780) who recorded it from Greenland. A further Greenland record was given by Krøyer (1838) who recorded what he said was undoubtedly the same species as Fabricius, but who tentatively gave it separate specific status (as *A. grönlandicus*), a separation of which Hansen (1888), who referred to it as "*A. grønlandicus,*" had great doubts. Richardson (1905) gave yet another record of *A. aquaticus* in Greenland based upon material sent her by the Museum of Comparative Zoology at Harvard and labeled "*Asellus grönlandicus.*"

Stephensen (1917) summarized the old records of *A. aquaticus* in Greenland, and on the basis of his summary and a personal communication from Dr. Ulrich Røen, who had examined many hundreds of freshwater localities in Greenland, I came to the conclusion (Williams, 1962b) that *A. aquaticus* is probably absent from Greenland. It is now necessary to add, however, that a collection of material in the Museum of Comparative Zoology at Harvard and clearly labeled "M C Z Greenland *Asellus aquaticus* (Linnaeus)" on examination proved to contain material which is probably *A. aquaticus.* The material consisted of two specimens, both of which had dried out and were in very bad condition. Gentle warming in alcohol helped to soften them, but unfortunately one was still completely unrecognizable at the species level. The other, however, though impossible to identify definitively to species, could be seen to possess many features characteristic of *A. aquaticus.* The most important features are indicated in Figures 28A–C. From these it can be seen that the specimen (a male) possessed a prominent basal spur on the endopod of the second pleopod (a feature possessed by no other epigean species recorded from North America), its first pleopod can reasonably be reconstructed to a shape similar to that of the first pleopod of *A. aquaticus,* and the propodus of its first peraeopod lacked a triangular projection near the midpoint of its palm. This material would seem to be that examined by Richardson in 1905, and my reexamination of it, therefore, gives support to her identification as *A. aquaticus.*

The reexamination although solving partly one of the problems associated with records of *A. aquaticus* in

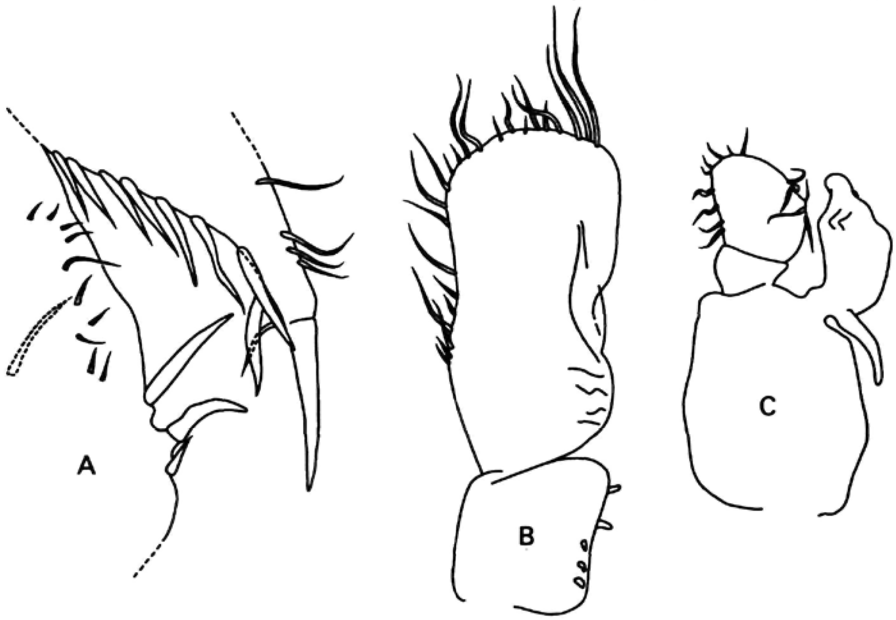

FIGURE 28.—*Asellus ?aquaticus,* least damaged specimen (male) labeled "MCZ Greenland *Asellus aquaticus* (Linnaeus)": A, palm of propodus and part of dactylus of first peraeopod; B, first pleopod; C, second pleopod.

North America, namely reliable identification, does not really clarify the present status of the species. The conclusion remains, it seems reasonable to state, that *A. aquaticus* is not present in Greenland, a conclusion with which Dr. Røen (personal communication, 7 June 1967), who has examined many further Greenland localities since his original communication to me (see Røen, 1962), still agrees. The specimens belonging to the Museum of Comparative Zoology may, as suggested by Røen (in Williams, 1962b, p. 80) for older records, have come originally from Denmark in ships' water tanks, have been introduced temporarily to suitable waters in Greenland near ship bases there, and then have been collected as a "native" species.

It should be added that *A. aquaticus* has not been recorded for North America outside Greenland, and no further material has been encountered during the present study of North American collections. Packard's (1867) record of *A. aquaticus* from Labrador related in fact to a terrestial isopod (Johansen, 1926).

The name *Asellus vulgaris* advanced by Latreille in 1803 for European material has been consistently synonymized with *A. aquaticus* (see, for example, Birstein, 1951; Gruner, 1965), and there is little to gainsay this. Gould recorded a taxon he referred to as "*A. vulgaris?* Latr." from Massachusetts in 1841, but as he says only that is was common, was larger than the two species described by Say [1818, *A. communis* and *A. lineatus* (=*Lirceus lineatus*)], and that he could find no differences from "the foreign species," we are left in considerable doubt as to identity of his specimens. In view of the almost certain absence of *A. aquaticus* from North America apart from Greenland, it is most unlikely that Gould's specimens were *A. aquaticus.* Through the courtesy of Dr. H. W. Levi and Miss A. B. Bliss, I have examined all available material of *Asellus* in the Museum of Comparative Zoology, the principal institution for the deposition of zoological material in Massachusetts, and did not encounter any material that could have been seen by Gould. Gould's species has been synonymized with *A. communis* by Richardson (1905) and Van Name (1936), but neither author advanced reasons for this synonymy. The identity of the species recorded by Gould must remain unknown.

Asellus racovitzai, new species

Asellus communis Say.—Racovitza, 1920, pp. 79–95, figs. 52–73.

As indicated under *A. communis,* Racovitza (1920) described fully a species, which he took to be *A. com-*

munis Say, on the basis of three specimens (2♂♂, 1♀) from the Potomac River, Virginia, a locality some 125 miles from the place where we may presume Say had collected his material of *A. communis*. Racovitza's assumption of conspecificity between this material and *A. communis* appears to have been quite arbitrary. As the neotype of *A. communis* is quite clearly a different species from the one described by Racovitza, a new name now needs to be applied to the species described by him. It is appropriate that this be *A. racovitzai* in his honor.

There is no doubt of the identity of *A. racovitzai* or of the fact that it is a species quite distinct from *A. communis;* not only is Racovitza's description very complete, but also there is still in existence the remains of the collection from whence came the three specimens sent to him. Examination of this confirmed the accuracy of his description.

During the examination of material referable to *A. racovitzai,* it became clear that two minor taxa were involved, one widespread in northeastern United States and southeastern Canada but occurring also in British Columbia and Washington State (see below), and one confined to a smaller region (Georgia and Florida) in southeastern United States. The differences between these two taxa are considered to be of subspecific value. The taxon first described by Racovitza is regarded as the nominate subspecies and its further description given here and the selection of type material for it is based upon the remains of the collection in the United States National Museum from which Racovitza was sent 3 specimens; the taxon known thus far only from the southeast United States is given the name *A. racovitzai australis*.

Asellus racovitzai racovitzai, new subspecies

FIGURES 29, 31, 32

Asellus communis Say—Racovitza, 1920, pp. 79–95, figs. 52–73.

TYPE MATERIAL AND TYPE LOCALITY.—Holotype: adult ♂, USNM 122066. Allotype: adult nonovigerous ♀, USNM 122067. Paratypes: 18 ♂♂, 2 nonovigerous and 2 ovigerous ♀♀, USNM 122068. Type locality (according to data on original label in type collection): edge of Potomac River just below aqueduct bridge [Washington, D.C.], Virginia side. The collection was made 15 March 1896 by W. P. Hay.

DESCRIPTION OF HOLOTYPE.—Body: Length, 13.5 mm; greatest width, 5.0 mm.

Head: Eyes large and distinct.

First antenna: Flagellum 15-merous and tip reaching to point about two-thirds distally along last segment of peduncle of second antenna; penultimate 2 segments bear aesthetascs. First and third segments of peduncle subequal in length, and about two-thirds length of second segment. First peduncle segment about 1.5 times as long as wide; second and third segments respectively 4 and 3 times as long as wide.

Second antenna: Length (8.0 mm) about three-fifths (0.59) body length. Flagellum 67-merous.

First peraeopod (Figure 29A): Propodus 1.3 times as long as wide, almost subtriangular; palm with a single large triangular projection about 1.5 times width of opposing dactylus and about twice as long as basal width situated near midpoint, a small projection between larger projection and point of attachment of dactylus, 2 large and 1 small teethlike spines at proximal end, and a submarginal row of spines on inner and outer surfaces.

First pleopod (Figure 29B): Total length of appendage 1.1 times as long as second pleopod. Sympod subrectangular, about three-fourths as wide as long; inner margin with 2 hooklike protuberances for coupling. Distal segment also subrectangular, but distal width less than proximal width; outer margin not concave; twice as long as wide and almost twice as long as sympod; distal margin and distal two-thirds of outer margin bearing numerous short to moderately long simple spines; inner proximal angle with single spine.

Second pleopod (Figures 29C–E): Sympod subsquare, with 2 simple spines near inner distal angle. Proximal segment of exopod with 6 simple spines on outer margin. Distal segment of exopod ovate with 22 long plumose spines and 3 short simple spines marginally, some minute simple spines on inner margin, and groups of fine setae on surface of segment near inner margin. Endopod narrow, more or less straight in long axis, and about 3 times as long as greatest width; endopod about three-fourths total length of exopod and also of sympod but slightly longer (1.1) than distal segment of exopod; inner and outer apophyses occur basally. Cannula triangular in shape, distal width about half basal width, and not reaching beyond caudal process. Ventral groove wide and prominent. Mesial process well developed, sclerotized, acutely pointed, and almost as long as cannula. Lateral process not developed. Caudal process large, ending in prominent apex distally and bearing several groups

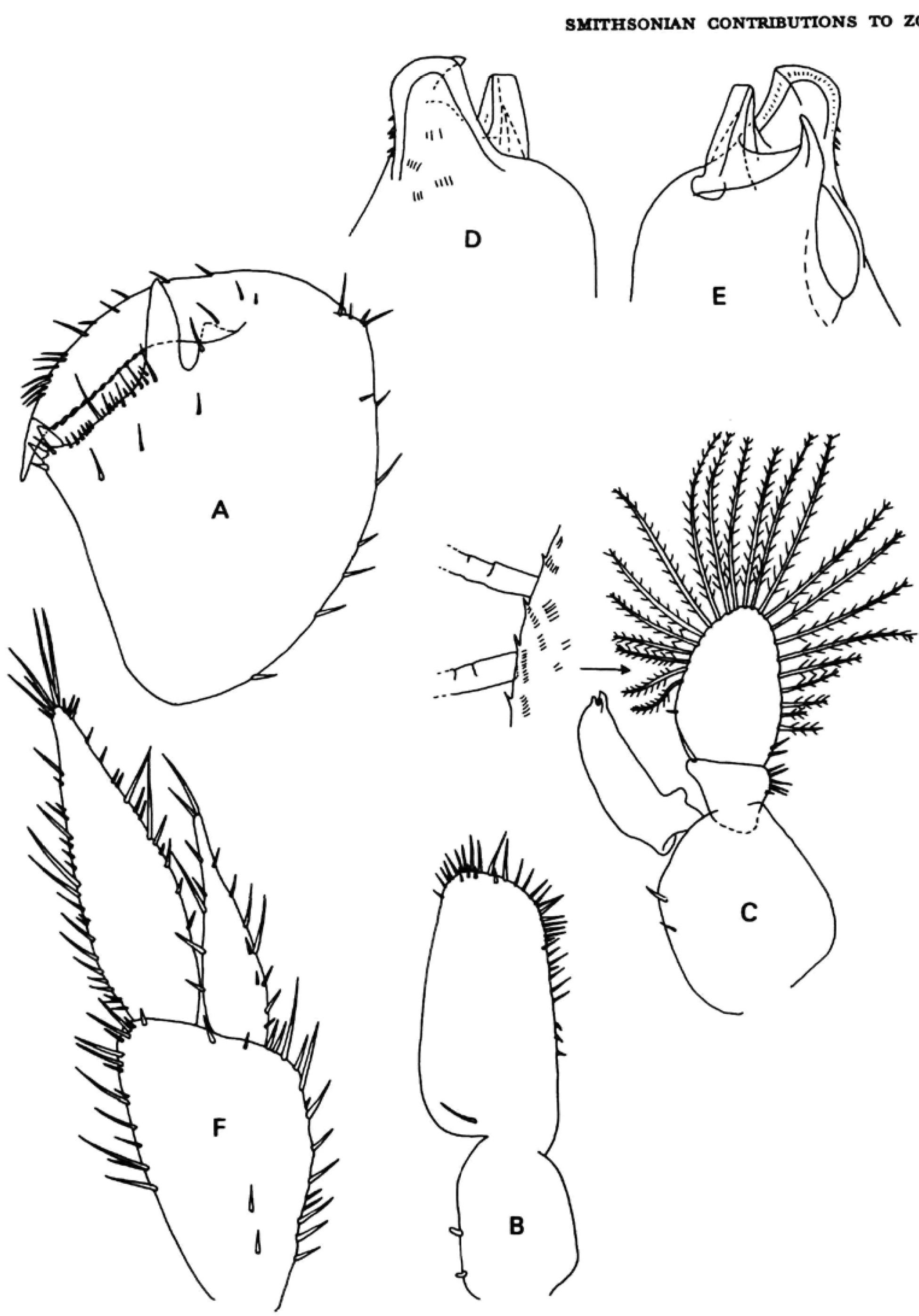

FIGURE 29.—*Asellus racovitzai racovitzai,* holotype: A, dactylus and propodus of first peraeopod; B, first pleopod; C, second pleopod; D, E, respectively dorsal and ventral surfaces of tip of endopodite of second pleopod; F, uropod.

of 3 to 5 fine simple spines on dorsal surface, some of which are visible on outer lateral margin.

Uropod (Figure 29F): About the same length as telson. Peduncle about 1.5 times as long as greatest width with many marginal spines. Exopod almost as long (0.83) as peduncle; endopod slightly longer (1.1) than peduncle and about 3 times as long as wide.

PARTIAL DESCRIPTION OF ALLOTYPE (♀).—First peraeopod: General shape and setation similar to that described for a female paralectotype of *A. attenuatus*. Palmar margin of dactylus with 8 teethlike spines.

"First" pleopod: Shape similar to that described for a female paralectotype of *A. intermedius*, but distal margin and distal half of outer margin with 16 finely plumose spines, and inner proximal angle with 2 short simple spines.

MATERIAL EXAMINED.—GREAT LAKES: Lake Erie: Sta. C–25, 3♂♂, coll. J. Hiltunen, 7.ix.1963; Sta. 145, 28 meters, 6♂♂, coll. J. Hiltunen, 10.ix.1963; 70 localities at various depths from 10.5–30 meters, 250♂♂, all coll. Great Lakes Institute, 3.vi.1963–16.xi.1965 (GLI). Lake Huron: 4 localities at various depths from 21–28 meters, 8♂♂, all coll. Great Lakes Institute, 16–24.xi.1964 (GLI). Lake Ontario: USB CF Sta. 35, ∞♂♂, coll. J. Hiltunen, 16.ix.1964; 25 localities at various depths from 20–42 meters, 63 ♂♂, all coll. Great Lakes Institute, 22.i.1964–6.i.1966 (GLI). Lake St. Clair: Sta. LS–13, ∞♂♂, coll. J. Hiltunen, 5.v.1963. Lake Superior: Munising, Michigan, 1♂, coll. E. L. Bousfield, 26.vi.1957; Batchawana Bay, Ontario, 1♂, 29.viii.1959, 1♂, 7.ix.1959, 2♂♂, 9.ix.1959, 1♂, 25.ix.1959, 2♂♂, 1.x.1959, all coll. M.L.H. Thomas (NMC).

ONTARIO: Toronto, ∞♂♂, coll. A. G. Huntsman, 18.x.1912 (ROM); Hamilton, 3♂♂, coll. Messrs. Spragg and Dymond, 8.iv.1933 (ROM); Lake Simcoe, 1♂, coll. D. S. Rawson, no date (ROM); Humber River,* York County, 4♂♂, coll. Ont. Dept. P. & D., 12.vi.1946 (NMC); Moira River, Hastings County, 2♂♂, coll. Ont. Dept. P. & D., 8.viii.1947 (NMC); Moira River, Hastings County, 1♂, coll. Ont. Dept. P. & D., 27.viii.1947 (NMC); Port Dover, 2♂♂, coll. Ont. Dept. P. & D., June 1955 (NMC); Port Rowan, 1♂, coll. Ont. P. & D., 12.viii.1955 (NMC); Ottawa River, 6♂♂, coll. E. L. Bousfield, 4.v.1957 (NMC); Moira River, Hastings County, 16 ♂♂, coll. E. L. Bousfield, 28.v.1957 (NMC); Walpole Island, 12♂♂, coll. G. B. Wiggins, 6.v.1959 (ROM); Long Point, pond, 2♂♂, coll. D. Barr, 26.v.1963 (ROM); Chaffey's Locks, Leeds County, 3 ♂♂, coll. D. Barr, 21.vi.1964 (ROM); Rondeau Province Park, 1♂, coll. I. M. Smith, 3.vi.1965 (ROM); Dundas, ∞♂♂, coll. N. Kaushik, November 1966; Port Credit, ∞♂♂, coll. R. O. Brinkhurst, 29.iii.1967.

QUEBEC: Lièvre River, ∞♂♂, coll. F. Ide, 8.ix.1928; Gatineau River, 3♂♂, coll. E. L. Bousfield, November 1950 (NMC); Manikuagan, 4♂♂, coll. E. L. Bousfield, 29.viii.1953 (NMC); Fairy Lake, Hull, 3♂♂, coll. E. L. Bousfield, 24.v.1957 (NMC).

DISTRICT OF COLUMBIA: Chain Bridge, 7 ♂♂, coll. A. C. Weed, 13.xii.1908 (USNM).

INDIANA: Ohio River, Evansville, 1♂, coll. U.S. Dept. Interior, 16.vi.1965.

MARYLAND: Marshall Hall, 3♂♂, coll. A. Pizzini, 26.v.1934 (USNM).

MASSACHUSETTS: Amhurst, 3♂♂, coll. H. B. N. Hynes, 23.ix.1960; Bull Hill, Montague, 1♂, coll. H. B. N. Hynes, September 1960.

MICHIGAN: Sugar Island, Chippewa County, 16 ♂♂, coll. J. K. Hiltunen, 8.iii.1967.

VERMONT: Lake Champlain,* 1♂, coll. E.L. Bousfield, 19.vi.1956 (NMC).

WASHINGTON: Echo Lake,* King County, 5♂♂, coll. E.L. Bousfield, 20.vi.1955 (NMC).

GEOGRAPHICAL DISTRIBUTION AND ECOLOGY.—The localities detailed above, together with the type locality, are plotted in Figure 30. In general and except for its absence from Colorado, *A. racovitzai racovitzai* has a somewhat similar distribution to *A. communis*, its main area of distribution being in southeastern Canada and northeastern United States. It seems, however, not to extend so far east as does *A. communis*, although this may be the result of an inadequate number of collections. The occurrence of the subspecies together with *A. communis* (the two taxa occurred in the same collection) in Echo Lake, King County, Washington, is of considerable interest, and Bousfield's remarks on this locality, as well as the comment concerning the possibility of missorting of labels and Hatch's (1947) key, are again pertinent.

The large amount of material examined from the Great Lakes, especially Lakes Erie and Ontario, suggests that *A. racovitzai racovitzai* is the dominant, if not the exclusive, species of *Asellus* in the Great Lakes. The only other species encountered in these collections was *A. forbesi*, and this, as indicated by a single specimen, occurs in Lake Huron. Within the Great Lakes, *A. racovitzai racovitzai* obviously has a wide vertical distribution, for it occurred in collections (GLI) from

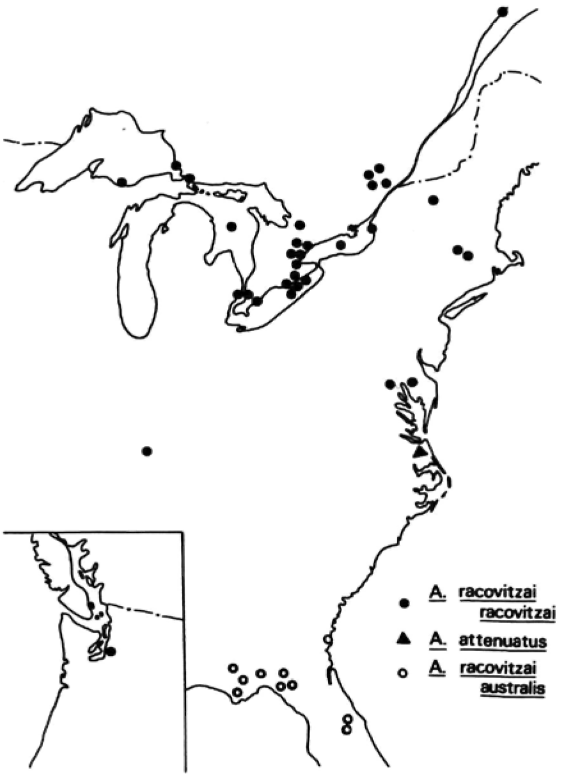

FIGURE 30.—Geographical distribution.

20 to 42 meters deep. Apart from large lakes, the data on labels in collections examined show that the taxon may also occur in creeks, rivers, ponds, small lakes, and swamps. Like *A. communis,* it appears to be wide ranging with regard to choice of macrohabitat.

FURTHER DESCRIPTION (♂).—Body: The smallest male with well-developed secondary sexual characteristics had a body length of 4.0 mm; the largest male examined was 15.0 mm.

First antenna: Flagellum 7- to 15-merous, the number of segments depending to some extent upon the size of the specimen; flagellum tip reaching to proximal third or to distal margin of the last segment of the peduncle of the second antenna; penultimate 2 or 3 segments bear aesthetascs.

Second antenna: Length 0.44 to 0.8 times that of body, the fraction showing a rough inverse correlation with absolute body length (as indicated by plotting the appropriate values for the largest male in each of twenty-seven collections). Flagellum 26- to 92-merous, the number of segments showing a rough direct correlation with body length.

Mouthparts: See Table 1.

First peraeopod: 2 or 3 (usually 2) very strong, teethlike spines at proximal end of palm. Some variation occurs in the shape of the palm and its triangular process (Figure 31). The typical shape is as illustrated for the holotype.

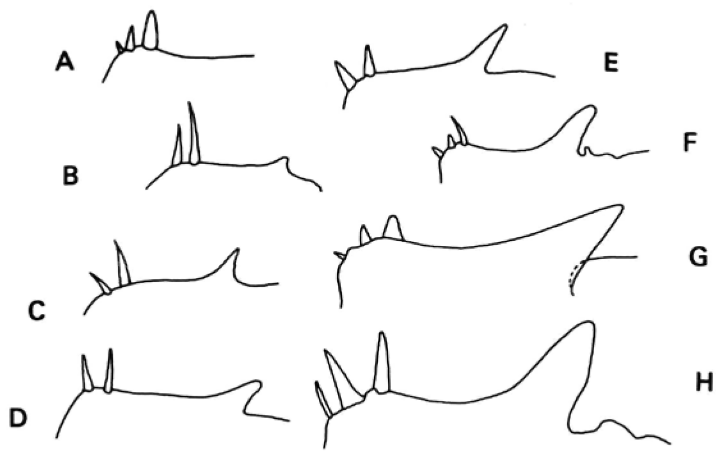

FIGURE 31.—*Asellus racovitzai racovitzai,* extent of variation in palm shape of male first peraeopod: A, Lake Opinicon, Ontario; B, Amhurst, Massachusetts; C, Lake Superior; D, Hull, Quebec; E, Echo Lake, Washington; F, Hamilton, Ontario; G, Washington, D.C.; H, Sugar Island, Michigan.

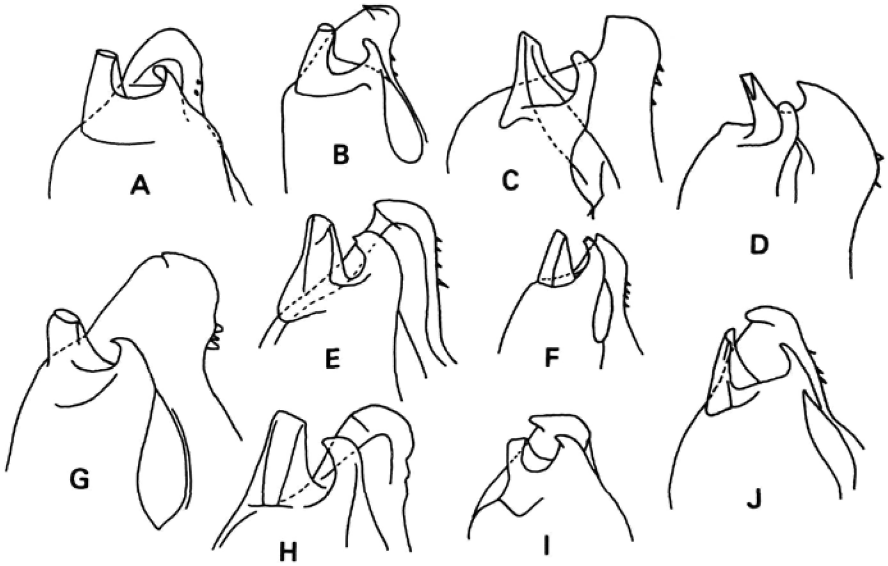

FIGURE 32.—*Asellus racovitzai racovitzai,* extent of variation in morphology of endopodite tip of male second pleopod: A, Lake Erie; B, Batchawana Bay, Lake Superior; C, J, Toronto, Ontario; D, H, Ottawa, Ontario; E, Port Credit, Ontario; F, Sugar Island, Michigan; G, Rondeau Provincial Park, Ontario; I, Echo Lake, Washington.

First pleopod: Total length of appendage 1.0 to 1.3 times as long as second pleopod. Inner margin of sympod with 2 to 5 (usually 2 or 3) coupling hooks. Maximum width of distal segment 0.41 to 0.56 times maximum length; outer margin slightly concave to straight.

Second pleopod: 0 to 4 (usually 2) simple spines near inner distal angle of sympod. Proximal segment of exopod with 2 to 6 spines on outer margin, and distal segment with 13 to 24 marginal spines. Maximum length of distal segment of exopod 0.96 to 1.91 times maximum width. Endopod 1.1 to 1.9 times as long as distal segment of exopod. No gross morphological variations occur in the morphology of the tip of the endopodite, but minor variations occur both within a single collection of specimens and between collections from different localities. The range of variation is illustrated in Figure 32. The cannula may vary from a wide triangular structure (the usual condition, as displayed by Figures 29D,E for the holotype), to a rather narrow tubular one. The mesial process displays its greatest variation in the nature of its tip, which may be acutely pointed or appear to be quite rounded. A somewhat similar sort of variation is displayed by the caudal process which, nevertheless, is always prominent and never reduced. The small spines on the outer lateral edge of the caudal process may or may not be visible according to the position of mounting of the appendage. Figure 32 includes a drawing of the endopodite tip of a specimen collected from Echo Lake, Washington.

Uropod: See Table 2.

Asellus racovitzai australis, new subspecies

FIGURES 33–36

ETYMOLOGY.—From the Latin *australis,* southern.

TYPE MATERIAL AND TYPE LOCALITY.—Holotype: adult ♂, USNM 122687. Allotype: adult nonovigerous ♀, USNM 122688. Paratypes: 17 ♂♂, 5 nonovigerous and 3 ovigerous ♀♀, USNM 122689. Type locality: small spring run, Leon County, Florida (no further data available). The collection was made 10 April 1963 by Dr. W. M. Beck.

DESCRIPTION OF HOLOTYPE.—Body: Length, 9.0 mm.

Head: Eyes large and distinct.

First antenna: Flagellum 8-merous and tip reaching to distal margin of last segment of peduncle of second antenna. First and second segments of peduncle subequal in length; third, three-quarters length of second or first. First peduncle segment twice as long as wide; second and third respectively 3.5 and about 4 times as long as wide.

Second antenna: Length (6.0 mm) two-thirds body length. Flagellum 54-merous.

First peraeopod (Figure 33A): Dactylus slightly longer than palm of propodus. Propodus 1.41 times as long as wide, subtriangular; palm with a large triangular projection near midpoint about twice as long as basal width, a much smaller projection between larger projection and point of attachment of dactylus, 1 large and 2 smaller teethlike spines on a slightly raised proximal projection, and a submarginal row of spines on inner and outer surfaces.

First pleopod (Figure 33B): Total length of appendage 1.08 times that of second pleopod. Sympod subrectangular, 1.4 times as long as wide; inner margin with 4 hooklike protuberances for coupling. Distal segment also subrectangular, but distal corners rounded; inner and outer lateral margins more or less parallel; twice as long as wide and 1.65 times as long as sympod; distal margin and distal half of outer margin with numerous short to moderately long simple spines.

Second pleopod (Figures 33C–E): Sympod subsquare, maximum length only slightly greater (1.12) than maximum width; 2 small simple spines occur near inner distal angle. Proximal segment of exopod with 3 short plumose spines on outer margin. Distal segment of exopod ovate, maximum length 1.66 times maximum width, with 20 short to very long plumose spines on margin. Endopod about three-quarters total length of exopod, and slightly shorter (0.95) than length of distal segment of exopod; endopod narrow, about (2.4) two and a half times maximum width (exclusive of apophyses); inner and outer apophyses occur basally. Cannula wide, not markedly triangular in shape, outer edge thickened and not membranous; slightly shorter than caudal process. Caudal process large, ending in acute point terminally, and bearing groups of fine setae on dorsal surface; lateral margin with some small spines. Mesial process well developed, sclerotized, acutely pointed, and almost as long as cannula.

Uropod (Figure 33F): 1.23 times as long as telson. Peduncle about 3.5 times as long as greatest width with many marginal spines. Exopod about two-thirds as long as peduncle; endopod slightly shorter (0.96) than peduncle.

PARTIAL DESCRIPTION OF ALLOTYPE (♀).—First peraeopod: Shape and setation similar to that described for a female paralectotype of *A. attenuatus*. Palmar margin of dactylus with 9 teethlike spines.

"First" pleopod (Figure 33G): Shape almost subovate; distal margin and distal half of outer margin with 12 finely plumose spines; 3 short simple spines are present submarginally along the proximal half of the inner margin.

MATERIAL EXAMINED.—FLORIDA: Perry Creek, Taylor County, ∞ ♂♂, coll. W. M. Beck, 21.vii.1953; Lafayette County, 21 ♂♂, coll. W. M. Beck, 12.xi.1953; Waddell's Mill Creek, Jackson County, 2 ♂♂, coll. W. M. Beck, 7.x.1954; Withlacoochee River, Madison County, 7 ♂♂, coll. W. M. Beck, 20.vii.1955; Lake Econlockhatchee River, Seminole County, 1 ♂, coll. W. M. Beck, 27.iii.1956; Lake Econlockhatchee River, Iron Bridge, Seminole County, 2 ♂♂, coll. W. M. Beck, 26.vi.1956; Waddell's Mill Creek, Jackson County, 2 ♂♂, coll. W. M. Beck, 28.xi.1960; Torreya St. Park,* Liberty County, 1 ♂, coll. W. M. Beck, 10.xii.1960; Aucilla River, Taylor County, 14 ♂♂, coll. W. M. Beck, 9.iii.1961; Depot Creek, Gulf County, 1 ♂, coll. W. M. Beck, 19.ix.1961; Econlockhatchee River, Seminole County, 26 ♂♂, coll. W. M. Beck, 5.iii.1962; Lake Econlockhatchee River, Orange County, 1 ♂, coll. W. M. Beck, 6.iii.1962; Waddell's Mill Creek,* Jackson County, 3 ♂♂, coll. W. M. Beck, 19.iii.1963.

GEORGIA: Darien,* 1 ♂, coll. E. L. Bousfield, 2.iii.1963.

GEOGRAPHICAL DISTRIBUTION AND ECOLOGY.—This subspecies appears to be confined to the southeast United States (Figure 30). Within this region it has been collected from creeks and rivers.

FURTHER DESCRIPTION (♂).—Body: The largest ♂ examined was 11.0 mm long, and the smallest, 3.0 mm.

First antenna: Flagellum 10- to 16-merous; last 3 penultimate segments bear aesthetascs.

Second antenna: Length 0.67 to 1.0 (usually 0.8 to 1.0) times that of body. Flagellum 46- to 78-merous.

Mouthparts: See Table 1.

First peraeopod: 2 to 4 but usually 3 teethlike spines at proximal end of palm. The range of variation in palm shape is indicated in Figure 34.

First pleopod: Total length of appendage 1.0 to 1.2 times as long as second pleopod. Inner margin of sympod with 2 to 5 coupling hooks. Maximum width of distal segment 0.35 to 0.65 times maximum length; the shape of the distal segment is somewhat variable (Figure 35), but the distal margin is always rounded.

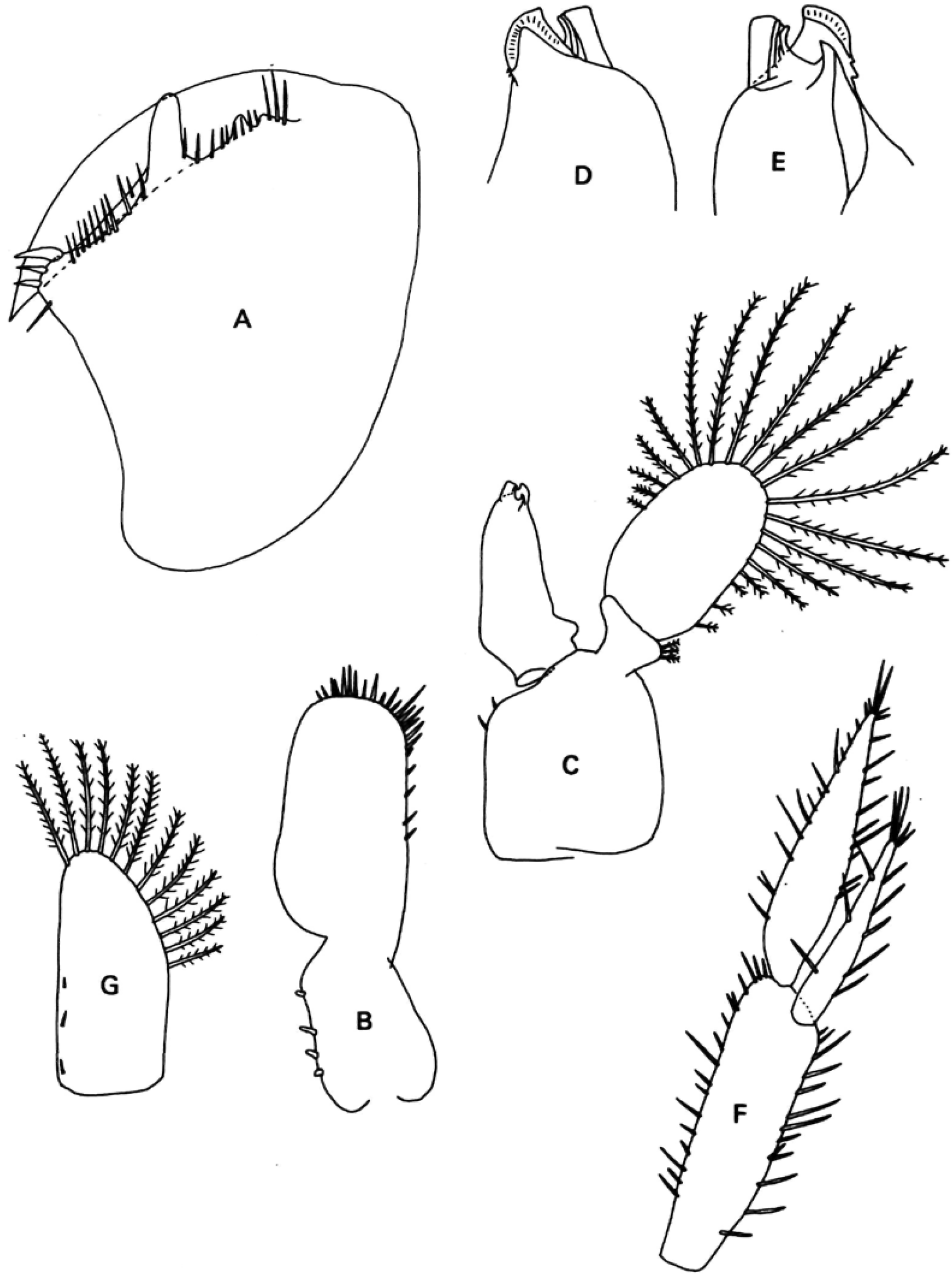

FIGURE 33.—*Asellus racovitzai australis*, A–F, holotype; G, allotype: A, dactylus and propodus of first peraeopod; B, first pleopod; C, second pleopod; D, E, respectively dorsal and ventral surfaces of tip of endopodite of second pleopod; F, uropod; G, "first" pleopod.

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FIGURE 34.—*Asellus racovitzai australis,* extent of variation in palm shape of male first peraeopod: A, Madison County, Florida; B, E, Jackson County, Florida; C, Seminole County, Florida; D, Taylor County, Florida.

Second pleopod: 1 to 4 simple spines near inner distal angle of sympod. Proximal segment of exopod with 2 to 5 spines on outer margin, and distal segment with 14 to 23 marginal spines. Maximum length of distal segment of exopod 1.48 to 2.47 times maximum width. Endopod 0.72 to 1.2 (usually 0.9 to 1.0) times as long as distal segment of exopod. The extent of variation in the morphology of the tip of the endopodite is indicated in Figure 36. Although there is less variation than displayed by *A. racovitzai racovitzai* (cf. Figure 32), nevertheless, the three main components—the caudal process, the cannula, and the mesial process—do display some variation. The usual pattern displayed by these structures is as indicated for the holotype (Figure 33E).

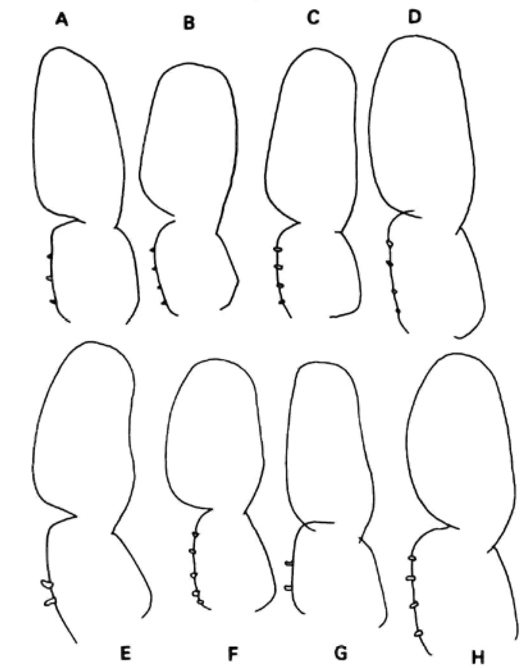

FIGURE 35.—*Asellus racovitzai australis,* extent of variation in shape of first pleopod of male: A, Leon County, Florida; B, F, G, H, Taylor County, Florida; C, Lafayette County, Florida; D, E, Seminole County, Florida.

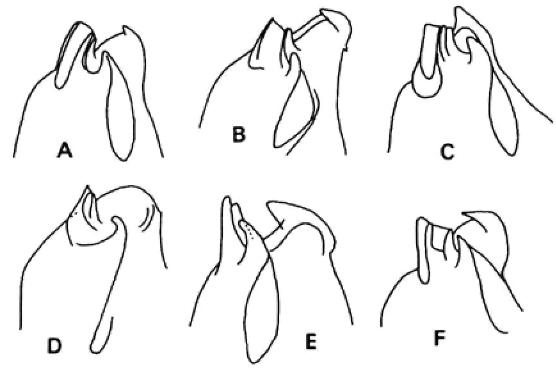

FIGURE 36.—*Asellus racovitzai australis,* extent of variation in morphology of endopodite tip of male second pleopod: A, Taylor County, Florida; B, Lafayette County, Florida; C, F, Seminole County, Florida; D, Darien, Georgia; E, Jackson County, Florida.

Uropod: See Table 2.

SEPARATION OF *A. racovitzai australis* FROM THE NOMINATE SUBSPECIES (♂♂ only).—*Asellus racovitzai australis* is principally distinguished from *A. racovitzai racovitzai* in that: (1) the length of the second antennae relative to body length is greater in *A. racovitzai australis;* (2) the shape of the distal segment of the first pleopod is more rounded in *A. racovitzai australis;* (3) the distal segment of the exopod of the second pleopod is longer relative to the length of the endopod in *A. racovitzai australis,* and in this subspecies it is also longer relative to maximum width; (4) the endopod of the second pleopod is shorter relative to maximum width in *A. racovitzai australis;* and (5) the cannula at the tip of the endopod of the second male pleopod is wider in *A. racovitzai australis* and its outer lateral margin is thickened. The most important of these differences are quantified in Table 4, which also indicates the level of significance of each of the subspecific differences.

Asellus forbesi, new species

FIGURES 37, 38, 40–42

ETYMOLOGY.—Named for S. A. Forbes.

TYPE MATERIAL AND TYPE LOCALITY.—Holotype: adult ♂, USNM 122052. Allotype: adult nonoviger-

TABLE 4.—*Principal differences between* Asellus racovitzai racovitzai *and* Asellus racovitzai australis

[males only]

		A. racovitzai racovitzai	*A. racovitzai australis*
length of second antennae / body length	Range M [a] ±S.D.	0.44–0.80 0.60 0.08	0.67–1.00 0.80 0.09
length of endopod / length of distal segment of exopod (pleopod 2)	Range M [a] ±S.D.	1.05–1.89 1.34 0.18	0.72–1.20 0.96 0.11
length / width (distal segment of exopod, pleopod 2)	Range M [a] ±S.D.	0.96–2.00 1.45 0.20	1.48–2.47 1.78 0.25
length / width (endopod, pleopod 2)	Range M [a] ±S.D.	2.34–3.20 2.78 0.24	2.15–2.80 2.49 0.17

[a] Difference between means highly significant in all comparisons (by "t" test, P=<0.001).

ous ♀, USNM 122053. Paratypes: 5♂♂, 5 nonovigerous and 9 ovigerous ♀♀, USNM 122054. Type locality: flood pool of Rappahannock River, Culpeper County, Virginia. The type collection was made 28 March 1967 by Dr. A. Weaver.

DESCRIPTION OF HOLOTYPE.—Body: Length, 12.5 mm.

Head: Eyes large and distinct.

First antenna: Flagellum 14-merous and tip reaching to point about two-thirds along last segment of peduncle of second antenna; penultimate 3 segments bearing aesthetascs. Second segment of peduncle longest; first, three-quarters length of second; third, two-thirds length of second. First peduncle segment about 1.5 times as long as wide; second and third respectively 4 and 3 times as long as wide.

Second antenna: Length (8.5 mm) about two-thirds (0.68) body length. Flagellum 66-merous.

First peraeopod (Figure 37A): Dactylus distinctly longer than palm of propodus. Propodus 1.2 times as long as wide, subovate; palm with a single large triangular projection near midpoint, a smaller blunt projection between larger projection and point of attachment of dactylus, a single toothlike spine on a low proximal projection with 3 stout spines proximal to this, and a submarginal row of spines on inner and outer surfaces.

First pleopod (Figure 37B): Total length subequal (1.06) to that of second pleopod. Sympod subrectangular, about 1.33 times as long as wide; inner margin with one hooklike protuberance for coupling. Distal segment subovate, widest about one-third towards distal margin; maximum width just over half (0.59) maximum length; several simple short spines occur on the distal margin.

Second pleopod (Figures 37C–E): Sympod subquadrate, maximum length only slightly greater (1.17) than maximum width; medial and lateral margins very slightly convex. Proximal segment of exopod irregularly subtriangular, with 3 short and simple spines on outer margin. Distal segment of exopod ovate, almost twice (1.87) as long as wide, with 13 long plumose spines on margin of distal half of segment, and a row of very fine short spines on inner proximal margin. Endopod two-thirds total length of exopod, and about three-quarters (0.77) length of distal segment of exopod; endopod slightly less (1.86) than twice as long as maximum width (regarded in all specimens of *A. forbesi* as the distance between the outer margin of the outer basal apophysis and the inner proximal angle of endopod). Outer basal apophysis not well developed, rounded in outline; inner basal apophysis scarcely present. Cannula short and wide. Ventral groove prominent. Mesial process sclerotized, large, wide, hooklike, and as long as cannula. Lateral process not prominent. Caudal process wide, margin broadly rounded and sclerotized, without associated hooks or spines, and not protruding far beyond cannula and mesial process.

Uropod (Figures 37F, G): 1.33 times as long as telson. Peduncle about twice as long as maximum width. Exopod two-thirds length of peduncle, endopod as long as peduncle; both rami have several moderately

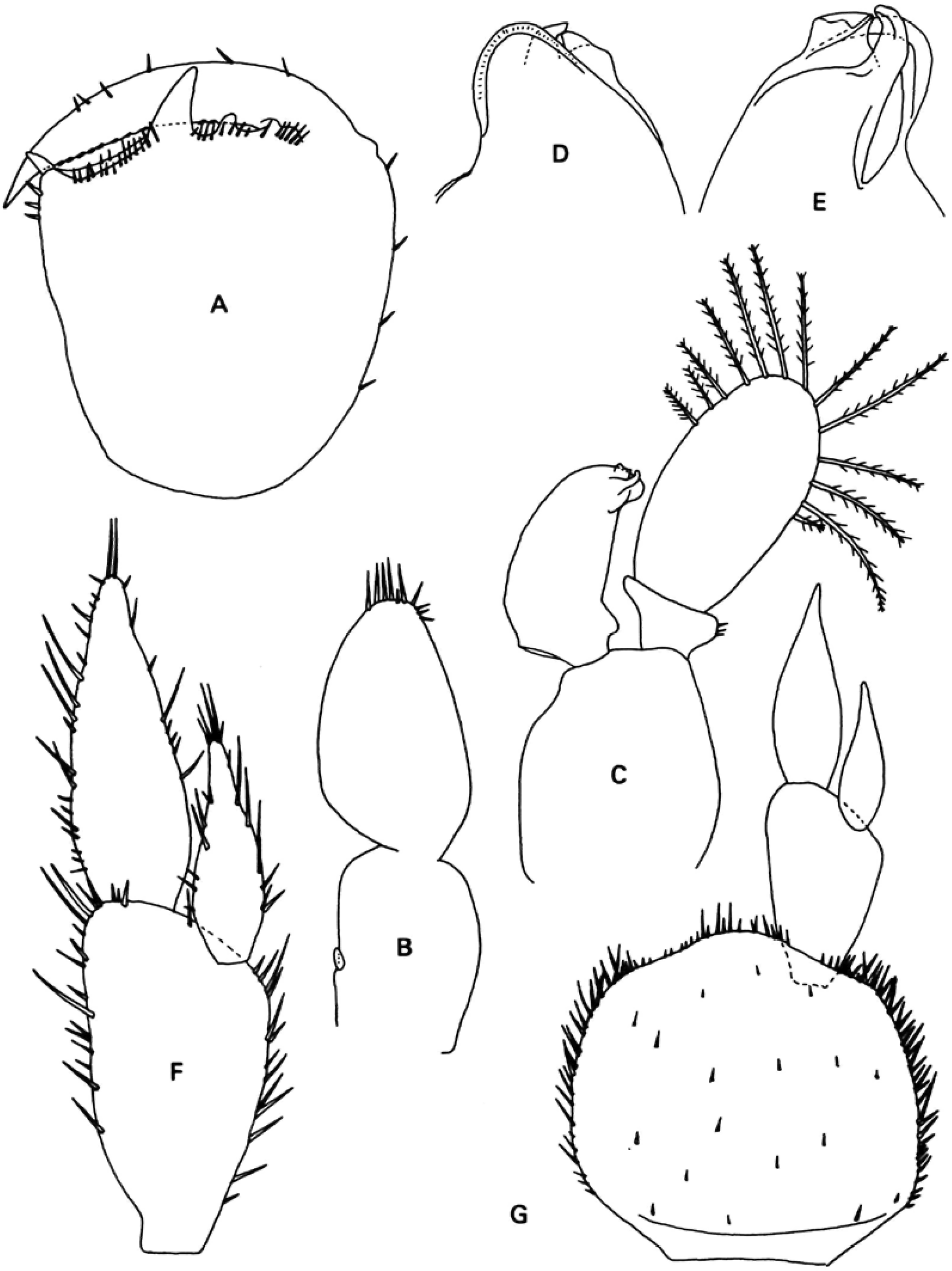

FIGURE 37.—*Asellus forbesi,* holotype: A, dactylus and propodus of first peraeopod; B, first pleopod; C, second pleopod; D, E, respectively dorsal and ventral surfaces of tip of endopodite of second pleopod; F, uropod; G, uropod and telson.

TABLE 5.—*Principal differences between* Asellus forbesi *and* Asellus obtusus
[males only]

		A. forbesi	*A. obtusus*
Maximum body length (mm)	—	18.5	12.5
length of second antennae / body length	Range M * ± S.D.	0.5–1.0 0.75 0.12	0.8–1.5 1.03 0.19
No. of marginal spines on proximal segment of exopod of second pleopod	—	0–4	0
length / width (endopod, pleopod 2)	Range M * ± S.D.	1.65–2.64 2.05 0.22	1.39–1.84 1.63 0.15
uropod length / telson length	Range M * ± S.D.	0.67–1.5 1.16 0.20	1.0–2.0 1.48 0.32

* Difference between means highly significant in all comparisons (by "t" test, P=<0.001).

long and fine spines distally, and numerous stronger ones laterally.

PARTIAL DESCRIPTION OF ALLOTYPE (♀).—First peraeopod (FIGURES 38A, B): Relatively slender, but dactylus and propodus arranged in a subchelate manner. Dactylus distinctly longer than palm of propodus and with 8 teethlike spines on inner margin and a long terminal claw. Propodus subtriangular, about 1.5 times as long as maximum width; palm with a low triangular projection near midpoint, and at proximal end 2 long teethlike spines. Otherwise as described for a female paralectotype of *A. attenuatus*.

"First" pleopod (Figure 38c): Almost subrectangular in shape. Distal margin with 14 long finely plumose spines.

MATERIAL EXAMINED.—GREAT LAKES: Lake Huron: Sta. 13, 15 meters, 1♂, coll. Great Lakes Institute, 6.xi.1963 (GLI).

ONTARIO: Go Home Bay, 1♂, Coll. W. A. Clemens, August 1912 (ROM); New Durham, Brant County, 4♂♂, coll. R. F. Cain, 24.v.1929 (ROM); Lake Nipissing, 1♂, coll. J. Oughton, 8.vii.1929 (ROM); L. Nipissing, 1♂, coll. J. Oughton, 8.viii.1930 (ROM); Laird, ∞ ♂♂, coll. unmarked, June 1931 (ROM); Beattie Point, Ottawa R., 5♂♂, coll. Macoun Field Club, 28.iv.1955 (NMC); Spitler Ck., Holbrook, 3♂♂, coll. Ont. P. & D., 1.vi.1955 NMC); Tillsonburg, 18♂♂, coll. E. L. Bousfield, 30.viii.1956 (NMC); Metcalfe, 3♂♂, coll. W. Sinclair, 4.v.1957 (NMC); Spitler Cr., Norwich, 9♂♂, coll. E. L. Bousfield, 29.v.1957 (NMC); Long Point, 5♂♂, coll. D. Barr, 26.v.1963 (ROM); Rondeau Province Pk., Kent Co., 4♂♂, coll. I. M. Smith, 2.vi.1965 (ROM); Chalk River, ∞ ♂♂, coll. H. B. N. Hynes, 27.v.1966; Perch Creek, 8♂♂, coll. J. Bishop, 2.v.1967; Pond near Laurel Creek Reservoir, ∞ ♂♂, coll. C. Patterson, 16.v.1967.

DISTRICT OF COLUMBIA: Carberry Meadows, ∞ ♂♂, coll. W. P. Hay, 10.xii.1892 (USNM); Piney Branch, 3♂♂, coll. W.H. Ball, 7.iv.1930 (USNM); Piney Branch, ∞ ♂♂, coll. W. H. Ball, 1.v.1930 (USNM); Georgetown, ∞ ♂♂, coll. L. Hubricht, date unmarked (USNM).

INDIANA: Hammond, 4♂♂, coll. V. E. Shelford, 25.iv.1908 (USNM); La Porte, La Porte County, ∞ ♂♂, coll. L. Hubricht, 2.v.1941 (USNM).

IOWA: Riverside, Washington County, ∞ ♂♂, coll. L. Hubricht, 24.iv.1942 (USNM).

KENTUCKY: Bullitt County, 2♂♂, coll. G. A. Cole, 7.iii.1954; Caperton Swamp, 4♂♂, coll. G. A. Cole, 26.iii.1954; Jefferson County, 1♂, coll. G. A. Cole, 2.v.1954; Louisville, 9♂♂, coll. G. A. Cole, 26.xii.1954; Jefferson County, 7♂♂, coll. G. A. Cole, 24.iii.1956 (NMC).

MARYLAND: Great Falls, 7♂♂, coll. W. D. Appel, 9.xi.1912 (USNM); Linden, ∞ ♂♂, coll. J. E. Benedict, 28.ii.1926 (USNM); Hyattsville, ∞ ♂♂, coll. R. Greenfield, 18.ii.1928 (USNM); Hyattsville, ∞ ♂♂, coll. R. Greenfield, 10.ii.1929 (USNM); Ridge, St. Mary's County, 11♂♂, coll. W. H. Ball, 26.iv.1930 (USNM); Point No Point, 1♂, coll. W. H. Ball, 27.iv.1930 (USNM); near Plummer's Island, ∞ ♂♂, coll. W. D. Appel, 5.v.1935 (USNM); near

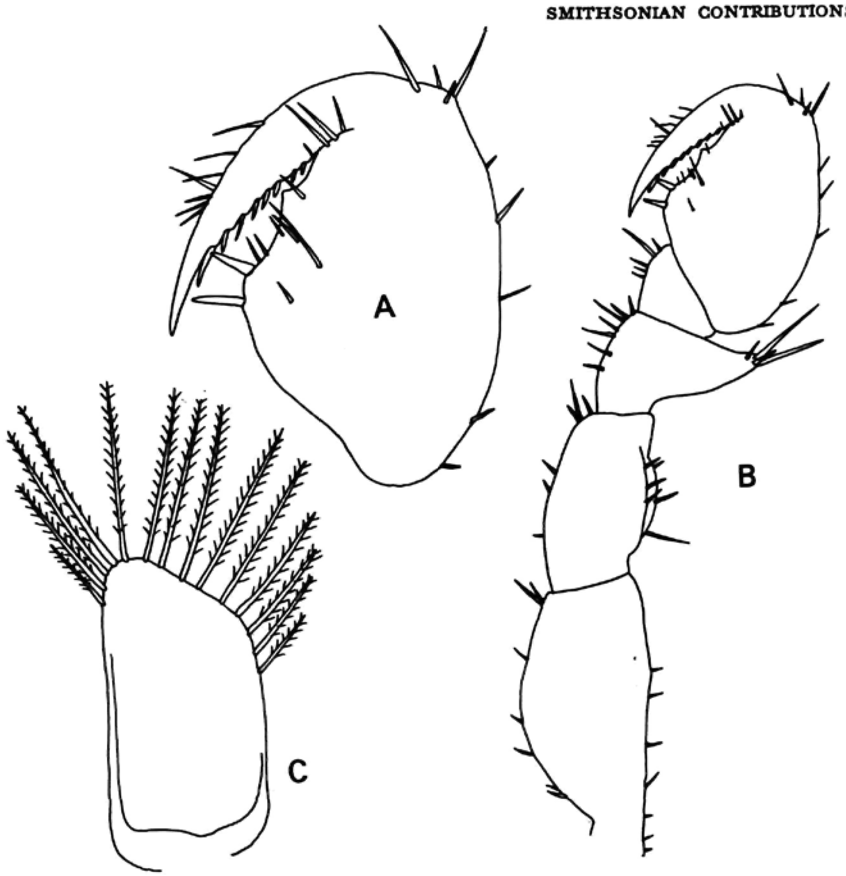

FIGURE 38.—*Asellus forbesi,* allotype: A, dactylus and propodus of first peraeopod; B, first peraeopod; C, "first" pleopod.

Plummer's Island, 5♂♂, coll. W. D. Appel, 19.v.1935 (USNM).

MICHIGAN: Ann Arbor, ∞♂♂, coll. L. Hubricht, 30.iv.1941 (USNM); Fenton, ∞♂♂, coll. L. Hubricht, 19.iv.1942 (USNM); Kalamazoo County, 2♂♂, coll. R. L. Lippson, 12.iv.1967.

MISSOURI: Benbush, St. Louis County, ∞♂♂, coll. L. Hubricht, 8.iii.1936 (USNM); St. Charles, 11♂♂, coll. L. Hubricht, 24.iv.1937 (USNM); River Kirkwood, St. Louis County, ∞♂♂, coll. L. Hubricht, 10.iv.1938 (USNM); Grimsby, ∞♂♂, coll. L. Hubricht, 25.iv.1938 (USNM).

NORTH CAROLINA: Chapel Hill, Durham County, 6♂♂, coll. A. Weaver, 4.xii.1966; Chapel Hill, Durham County, 2♂♂, coll. A. Weaver, 27.iii.1967.

OHIO: Shreve, Wayne County, 2♂♂, coll. W. A. Shear, 23.iii.1967.

SOUTH CAROLINA: Anderson County, 4♂♂, coll. R. Prinz, 6.i.1966.

VIRGINIA: Driver, ∞♂♂, coll. L. Hubricht, 26.iii.1944 (USNM); South Gap, Bland County, 6♂♂, coll. A. Weaver, 21.iii.1967; Prince William County, 14♂♂, coll. A. Weaver, 28.iii.1967; Keysville, 4♂♂, coll. A. Weaver, 28.iii.1967; Culpepper County, 7♂♂, coll. A. Weaver, 28.iii.1967.

WEST VIRGINIA: Mercer County, 3♂♂, coll. W. A. Shear, 16.iv.1966; Mercer County, 1♂, coll. A. Weaver, 1.xii.1966.

GEOGRAPHICAL DISTRIBUTION AND ECOLOGY.—The localities listed above, together with the type locality, are plotted in Figure 39. This indicates that *A. forbesi* is found over a very large area of east-central United States and in southern Ontario. It is clearly one of the most widespread species occurring in North America.

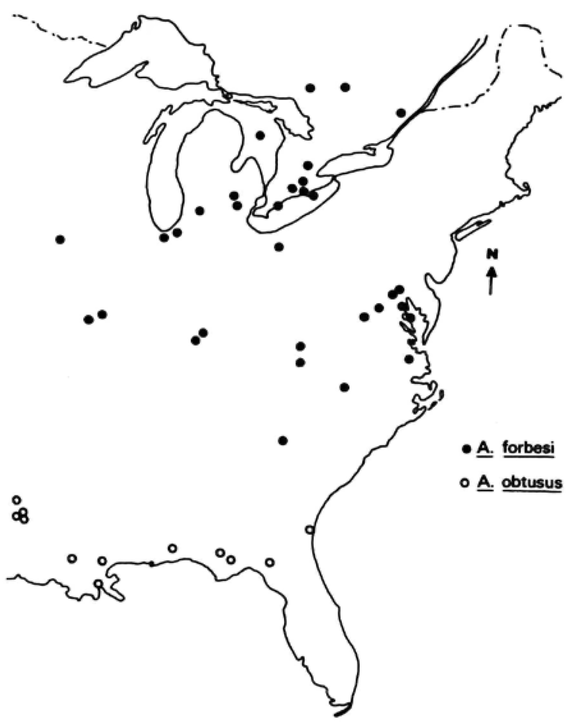

FIGURE 39.—Geographical distribution.

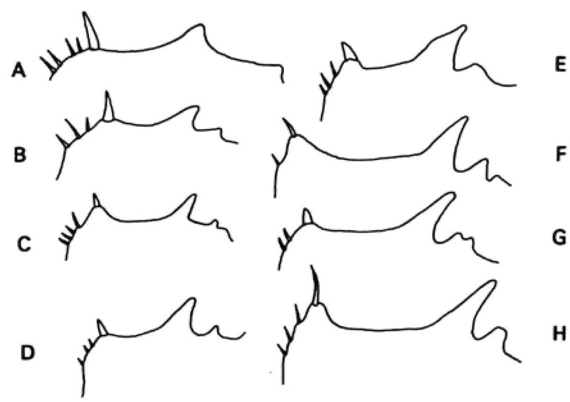

FIGURE 40.—*Asellus forbesi,* extent of variation in palm shape of male first peraeopod: A, Kalamazoo, Michigan; B, Chalk River, Ontario; C, Long Point, Ontario; D, Washington, D.C.; E, Hyattsville, Maryland; F, St. Charles County, Missouri; G, Jefferson County, Kentucky; H, Nansemond County, Virginia.

The most frequently mentioned sort of locality from which collections have been made are temporary ponds, flood pools, and sloughs. However, the species has also been collected from marshes, small creeks, and at least on a few occasions from lakes also. One of the lakes from which it has been collected is Lake Huron where the species was obtained from a depth of 15 m. Like several other geographically widespread species of *Asellus* in North America, *A. forbesi* is clearly able to live in a variety of macrohabitats.

FURTHER DESCRIPTION (♂).—Body: The largest ♂ examined was 18.5 mm long, and the smallest 6.0 mm.

First antenna: Flagellum 10- to 17-merous; flagellum tip reaching to midpoint or to distal end of the last segment of the peduncle of the second antenna; penultimate 3 segments bear aesthetascs.

Second antenna: Length 0.5 to 1.0 times that of body, but usual length between one-half and two-thirds body length. Flagellum 40- to 87-merous depending upon size.

Mouthparts: See Table 1.

First peraeopod: Spine on proximal projection of palm usually toothlike but sometimes relatively slender; proximal projection itself prominent to scarcely developed, and with 1 to 5 relatively long spines on proximal margin. Some variation occurs in the shape of the palm (cf. Figure 40).

First pleopod: Total length of appendage 0.84 to 1.19 times as long as second pleopod. Inner margin of sympod with 0 to 4 (usually 2 or 3) coupling hooks. Maximum width of distal segment 0.48 to 0.69 times maximum length. Distal spines few to numerous, but always simple and of moderate length. The typical shape of the distal segment is subovate, but a little variation occurs.

Second pleopod: Maximum length of sympod from 1.10 to 1.60 (usually 1.2 to 1.4) times maximum width. Proximal segment of exopod with 0 to 4 short and simple spines on outer margin; distal segment with 10 to 20 marginal spines. The shape of the distal segment of the exopod varies from almost subcircular to elongate oval, the maximum length ranging from 1.48 to 2.54 times the maximum width; the usual shape, however, is ovate, and the maximum length is usually about twice the maximum width. Endopod shape is also rather variable, particularly concerning the extent of development of the basal apophyses; an indication of the range of variation is given in Figure 41. Considerable variation in endopod shape may occur even within a single population, but the typical shape is that shown for the holotype (Figure 37G). The maximum length of the endopod is from 1.65 to 2.64 (usually 1.9

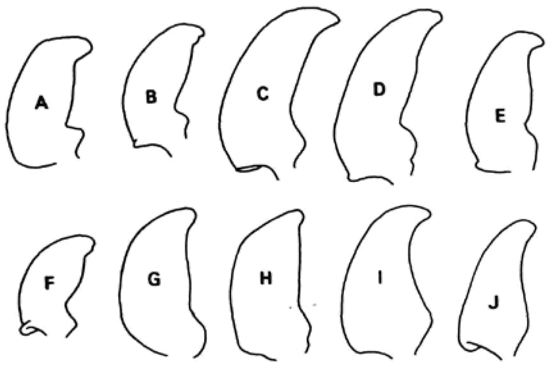

FIGURE 41.—*Asellus forbesi*, extent of variation in endopodite shape of male second pleopod: A, Beattie Point, Ontario; B, Laird, Ontario; C, D, J, Nansemond County, Virginia; E, G, H, paratypes; F, Jefferson County, Kentucky; I, St. Charles County, Missouri.

to 2.3) times the maximum width; the length in proportion to the length of the distal segment of the exopod ranges from 0.60 to 1.04. The morphology of the tip of the endopodite, while constant in fundamental characters, is subject to some variation particularly in the nature of the cannula and the mesial process and the relationship these have to each other. Figure 42 has been compiled to illustrate the range of this variation. As may be seen, the mesial process may appear to be much shorter than the cannula in some specimens, subequal in length in others, and even in some slightly longer; its shape, moreover, is rather variable and its tip may be blunt and rounded or acute and narrow.

Depending to at least some extent it seems upon the state and nature of preservation of the specimen involved and the position of mounting of the pleopod for examination, the cannula may appear as a prominent semitubular structure or as a scarcely visible and almost flattened structure; it is always membranous. The caudal process is always rounded, sometimes irregularly so, sclerotized, and lacks associated protuberances. With regard to the morphology of the tip of the endopodite, *A. forbesi* appears to be one of the more variable of North American epigean species of *Asellus*, and the same can also be applied with respect to the overall shape of the endopod. A study of the available material did not indicate that any of this variation had an obvious geographical basis, although this is not to say of course that the variability is not correlated with the very wide geographical distribution of the species (the wide geographical distribution may be a consequence of the variability).

Uropoda: See Table 2.

REMARKS.—Several collections from the United States and belonging to the USNM had been collected

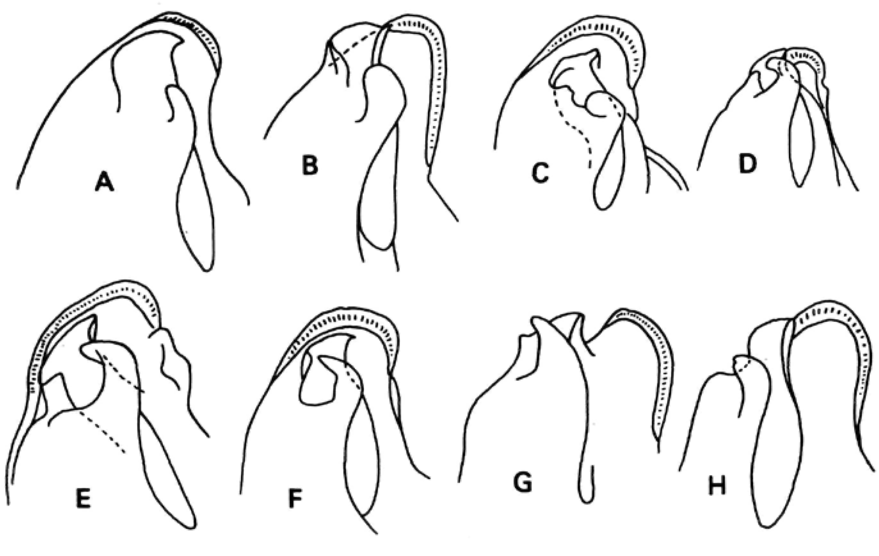

FIGURE 42.—*Asellus forbesi*, extent of variation in morphology of endopodite tip of male second pleopod: A, Brant County, Ontario; B, G, Beattie Point, Ontario; C, Jefferson County, Kentucky; D, Washington, D.C.; E, Hammond, Indiana; F, Chalk River, Ontario; H, Genesee County, Michigan.

by L. Hubricht, and most of these but not all had associated labels indicating that Hubricht regarded the material as belonging to the species "*A. militaris*." Several Canadian collections belonging to the ROM likewise were so labeled, but for these identification had been carried out by J. G. Mackin. As indicated previously, the name *A. militaris* is a synonym for *A. intermedius* and the resurrection of the name by Mackin (1940) following its synonymy with *A. communis* by Hay (1882), Richardson (1905), and Van Name (1936) has no validity. It seems clear, nevertheless, that Mackin and Hubricht, who worked in close collaboration, should be credited with an awareness of the separate identity of the taxon here referred to as *A. forbesi*. In the case of Hubricht the awareness was by no means exact, for some collections that are undoubtedly referable to *A. forbesi* are labeled as "*A. intermedius*."

Asellus obtusus, new species

FIGURES 43–45

ETYMOLOGY.—From the Latin *obtusus*, blunt.

TYPE MATERIAL AND TYPE LOCALITY.—Holotype: adult ♂, USNM 122060. Allotype: adult ovigerous ♀, USNM 122061. Paratypes: 9♂♂, 1 ovigerous ♀, USNM 122062. Type locality: temporary pond, Florenville, St. Tammany Parish, Louisiana. The type collection was made 26 February 1966 by Dr. W. G. Moore.

DESCRIPTION OF HOLOTYPE.—Body: Length, 9.5 mm.

Head: Eyes large and distinct.

First antenna: Flagellum 17-merous and tip reaching to point about one-third along last segment of peduncle of second antenna; penultimate three segments with aesthetascs. Flagellum slightly longer than peduncle. Second segment of peduncle longest; first, three-quarters length of second; third, half length of second. First peduncle segment about twice as long as wide; second and third respectively about 4 and 3.5 times as long as wide.

Second antenna: Length (10.5 mm) slightly greater (1.1) than body. Flagellum 85-merous. Fourth and fifth segments of peduncle respectively 5 and 9 times as long as wide.

First peraeopod (Figure 43A): Propodus 1.4 times as long as wide, of irregular triangular shape; palm with a single large triangular projection near midpoint, a second blunter projection half height of larger projection and lying between this and point of attachment of dactylus, a low proximal projection bearing apically a long stout spine and proximally two smaller spines, and a submarginal row of spines on inner and outer surfaces.

Second to seventh peraeopoda: Segments generally a little more elongated and setose than as described for *A. communis*, and dactyli bear slightly more teethlike marginal spines. The proportions of the segments to each other in a given peraeopod are nevertheless similar to those described for *A. communis*. Figure 43B, which illustrates the fifth peraepod, serves as an example of these differences (cf. Figure 4A).

First pleopod (Figure 44A): Total length subequal (1.1) to that of second pleopod. Sympod subsquare, maximum length only slightly greater (1.14) than maximum width; inner margin with 3 hooklike protuberances for coupling. Distal segment subovate, widest near midpoint; maximum width just over half (0.59) maximum length; several simple short spines occur on distal margin.

Second pleopod (Figures 44B–D): Sympod subrectangular, maximum length 1.3 times maximum width; medial and lateral margins more or less straight. Proximal segment of exopod subrectangular, lacking marginal spines. Distal segment of exopod ovate, maximum length slightly greater (2.1) than twice maximum width, and with 1 short and 13 long plumose spines on margin of distal half of segment. Endopod two-thirds total length of exopod, and three-quarters length of distal segment of exopod; endopod 1.73 times as long as maximum width (regarded in all specimens of *A. obtusus* as the distance between the apex of the outer basal bulge and the inner proximal angle of the endopod). Basal apophyses not developed; inner proximal angle almost a right angle. Cannula very short and wide; outer margin forming a distinct recurved lip. Ventral groove short and wide. Mesial process sclerotized, large, very wide, blunt, and as long as cannula. Lateral process not prominent. Caudal process wide, margin broadly rounded and sclerotized, without associated hooks or spines, and not protruding far beyond cannula and mesial process.

Uropod (Figure 43C): One and three-quarters as long as telson. Peduncle slightly more than twice as long as maximum width. Exopod as long as peduncle, endopod slightly longer (1.13) than peduncle. Both rami and peduncle bear laterally very many long fine and simple spines.

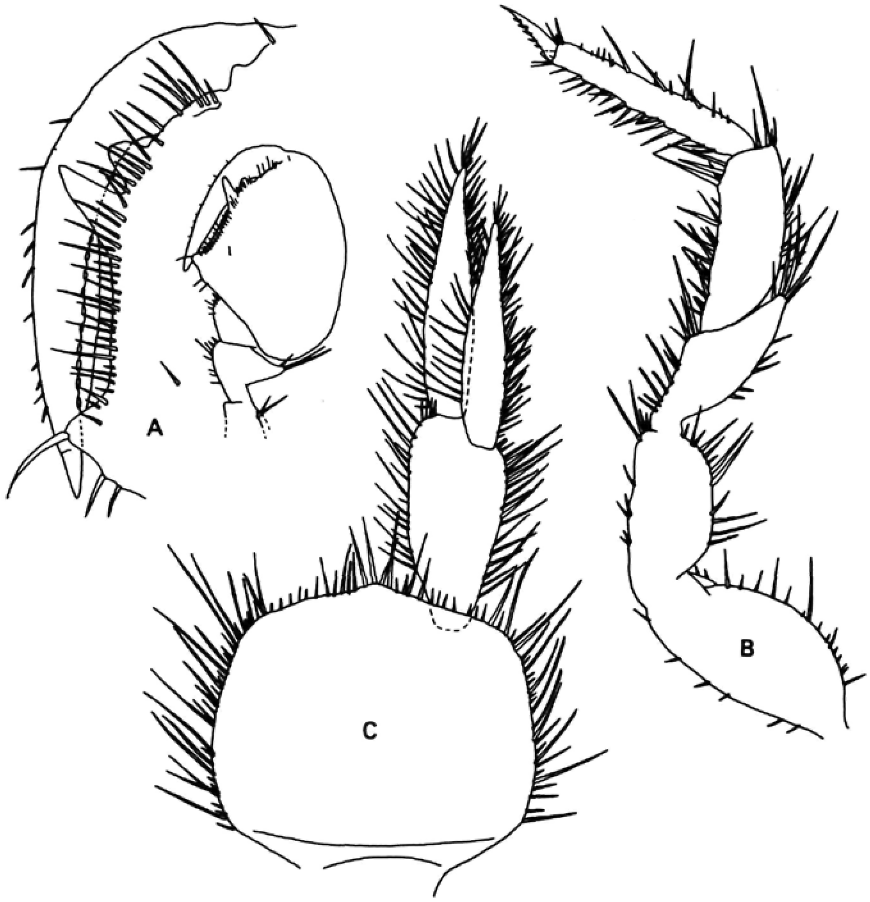

FIGURE 43.—*Asellus obtusus,* holotype: A, distal segments of first peraeopod (palm and dactylus shown in greater detail); B, fifth peraeopod; C, uropod and telson.

Telson (Figure 43C): Lateral and distal margins with numerous short and very long fine and simple spines.

PARTIAL DESCRIPTION OF ALLOTYPE (♀).—First peraeopod (Figure 44E): Relatively slender, but dactylus and propodus almost subchelate. Dactylus about as long as palm of propodus and with 10 stout spines on inner margin and a terminal claw. Otherwise similar to the description given for this appendage in a female paralectotype of *A. attenuatus.*

"First" pleopod: Subtrapezoidal in shape, but broader distally than proximally; generally of similar outline to the "first" pleopod as described for a female paralectotype of *A. attenuatus* (Figure 22C), but width rather broader in proportion to length. Distal margin with 18 long finely plumose spines.

MATERIAL EXAMINED.—FLORIDA: Torreya St. Park,* Liberty County, 1♂, coll. W. Beck, 10.xii.1960; roadside ditch, Jefferson County, ∞♂♂, coll. W. Beck, 17.ix.1961; Waddell's Mill,* Jackson County, 10♂♂, coll. W. Beck, 19.iii.1963; Escambia River, Escambia County, 1♂, coll. W. Beck, 19.xi.1963.

GEORGIA: Darien,* 1♂, coll. E. L. Bousfield, 2.iii.1963 (NCM).

LOUISIANA: Baton Rouge, 1♂, coll. T. E. Simpson, 19.i.1965 (NMC); St. Tammany Parish, 11♂♂, coll. W. G. Moore, 2.ii. 1966; Florenville, St. Tammany Parish, 11♂♂, coll. W. G. Moore, 26.ii.1966; Bridge City, Jefferson Parish, 8♂♂, coll. W. G. Moore, 19.iii.1966; Crown Point, Jefferson Parish, 1♂, coll. W. G. Moore, 4.iii.1967; Bossier Parish, 6♂♂, coll. W. G. Moore, 29.iv.1967; Natchitoches Parish, 10♂♂,