
Part II

by

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This paper is the second in a three part series dealing with the evolution of North American isopods of the genus Asellus. It contains a discussion of the generic status of Asellus, a generic diagnosis, a list of North American species, a key to North American species and the reduction to synonymy of certain nominal species of the genus Asellus. I would like to thank Dr. Perry C. Holt for reviewing this manuscript and Mrs. Patty Lady for typing this manuscript.

DETERMINATION OF THE GENERIC STATUS OF ASELLUS

The following discussion will be concerned with opinions, theories and works of some European and Asiatic workers on the asellids. It should be noted that these references will, of necessity, be rather incomplete. Much of their work is not applicable to the eastern North American fauna and only those papers that have a direct bearing on the North American forms will be mentioned.

The family Asellidae is cosmopolitan in distribution and was formerly considered to be composed of five genera of which two are found in eastern North America: Asellus (worldwide in distribution) and Lirceus (restricted to eastern North America). In 1962, K. Matsumoto of Japan separated the members of the genus Asellus found in Japan into three genera (Asellus s. str., Nipponasellus nov. gen. and Uenasellus nov. gen.).

Henry and Magniez (1968a) stated that the genus Asellus, as understood by most European or American authors, is an accumulation of species, some of which appear to be unrelated to the others. They felt that several workers in the past had recognized evolutionary groups in this unnatural assemblage of species, but had never challenged the superficial unity of this poorly defined genus. Therefore Henry and Magniez (1968b and 1970), following the initiative taken by Matsumoto, further divided the genus Asellus adding five additional genera to the two new ones.
proposed by Matsumoto. This proposed scheme would necessitate the splitting of genus *Asellus* into eight genera.

1. Genus *Asellus* Geoffroy, 1764, n. def.: type-species *Asellus aquaticus* (L.) 1758. This genus contains eurasiatic species.
5. Genus *Baicalasellus* Stammer, 1932: type-species *Asellus baicalensis* Grube, 1872. This genus contains Asiatic species.
7. Genus *Conasellus* Stammer, 1932: type-species *Asellus communis* Say 1818. This genus contains North American species, both epigean and hypogean forms.

It is the purpose of this particular section to present the results of my studies of the validity of these newly established genera through use of comparative anatomical and, where feasible, statistical methods. This is divided into two parts. The first, shorter portion, deals with the presentation of evidence supporting my viewpoint that if "*Pseudobaicalasellus*" is to be considered a valid genus then it must necessarily include the members of the Cannulus Group established by Steeves (1965), which were omitted from it by Henry and Magniez.

The following European workers loaned me specimens for the study:

- Drs. Jean-Paul Henry and Guy Magniez
  Université de Dijon
  Faculté des Sciences
  Laboratoire de Biologie Animale et Générale

- Dr. Torben Wolff
  Department of Marine Invertebrates
  Zoological Museum of the University of Copenhagen

- Dr. Roger J. Lincoln
  British Museum

I feel that the most useful taxonomic characters presented by Henry and Magniez (1970: 357) for identifying a species of "*Pseudobaicalasellus*", are (1) gnathopod of the male lacking processes on the propodi and (2) absence of orifice apophyses of the endopodite of the male second pleopod with the orifice (i.e., the cannula)
ending in a tapering tube. Furthermore the species of “Pseudobaicalasellus” are restricted to the Appalachian Mountain regions. All members of the Cannulus Group display the two above mentioned taxonomic characters and all members of the Cannulus Group are likewise restricted to the Appalachian Mountains. Figure 1 illustrates the distribution of the Cannulus Group and members of the proposed “Pseudobaicalasellus” genus. As can be seen, both groups are restricted to the Appalachian Mountains, and in fact, have an overlapping distribution. If “Pseudobaicalasellus” were a valid genus, it would then include the Cannulus Group.

The second portion of this section concerns the determination of the generic status of the eastern North American isopods. To facilitate the application of comparative anatomical methods, use was made of the lists of characters given by Henry and Magniez (1970: 342, 346, 347, 348, 349, 352, 354 and 357) to be utilized in the generic assignment of a species. For determination of the generic status of the proposed North American genus “Conasellus” the list, Henry and Magniez (1970: 354), consisted of seven specific characters which I compared among seven species in four of Henry and Magniez’s proposed genera. The results of this study are presented in Tables 1, 2, and 3. One character is not included in these tables: the oostegites of the maxillipeds of ovigerous females which in “Conasellus” are supposed to be composed of numerous bristles. Two factors prevented use of this character: (1) the numerous collections (especially troglobitic) which lacked females and (2) the almost complete absence of bristles on the oostegites of ovigerous “Conasellus” females, with a vast majority of examined specimens displaying the membranous condition considered (see below) to be a characteristic of “Pseudobaicalasellus.”

For the proposed restricted North American genus “Pseudobaicalasellus” the list of specific characters was composed of ten characters, Henry and Magniez (1970: 357), which I compared among nine species in four proposed genera. The results of a comparison of the characters are shown in Tables 4, 5, and 6. Again one character is not included, the above mentioned nature of the oostegites of the maxillipeds of ovigerous females which, in this genus, are supposed to be membranous. In both genera a minimum of four specimens per species was utilized giving a total of 484 measurements.

In Tables 1-6, “+” equals the presence of the expressed character or condition in a species and “−” equals its absence. In Tables 1-3 the first four species belong to “Conasellus”, the fifth species to the Cannulus Species Group (“Pseudobaicalasellus”) and the last two species to European genera (Asellus s. str. and “Proasellus” respectively). In Tables 4-6 the first two species belong to the proposed genus “Pseudobaicalasellus”, the third species to the Cannulus Species Group (“Pseudobaicalasellus”), the fourth through seventh species to “Conasellus” and the last two species to European genera (Asellus s. str. and “Proasellus” respectively).

Table 1 compares four anatomical characters of “Conasellus”. Henry and Magniez (1970: 354) stated that the eyed forms of “Conasellus” are better developed than those of Paleartic genera with 30 facets or more in some of them. A large amount of variation is present, however, ranging from none to sixty in species of “Conasellus”. Two species, “C.” scrupulosus and “C.” racovitzai racovitzai, both
Fig. 1. The distribution of the Cannulus Group of Steeves and the so-called genus "Pseudobaicalasellus"
Table 1. A Comparison of some Taxonomix Characters of the genus "Conasellus".

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Number of Facets in Eyes</th>
<th>Uropods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Elongated</td>
</tr>
<tr>
<td>obtusus</td>
<td>30-60</td>
<td>+</td>
</tr>
<tr>
<td>laticaudatus</td>
<td>10-30</td>
<td>-</td>
</tr>
<tr>
<td>brevicauda</td>
<td>15-25</td>
<td>-</td>
</tr>
<tr>
<td>alabamensis</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>holsingeri</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>aquaticus</td>
<td>10-15</td>
<td>+</td>
</tr>
<tr>
<td>coxalis</td>
<td>5-10</td>
<td>+</td>
</tr>
</tbody>
</table>

"+" indicates presence of the character.
"-" indicates the absence of the character.

of which are not shown in the table, range from the epigean to the hypogean environment with concomitant reduction in eye facets from 60 or more to as few as only one or two and in body pigmentation from dark to colorless. The uropods are supposed to be elongated in "Conasellus." There should be a tendency towards regression of the exopodite of the uropod and strong sexual dimorphism. A large amount of variation is again evident with two "Conasellus" species not having elongated uropods (laticaudatus and brevicauda) while three other species (each from a separate genus) have elongated uropods. All "Conasellus" species display regression of the exopodite, but holsingeri (of "Pseudobaicalasellus") and coxalis (of "Proasellus") also have reduced exopodites. Sexual dimorphism is lacking in two "Conasellus" species (laticaudatus and brevicauda) while it is present in two European forms, (A. aquaticus and "Proasellus" coxalis).

Table 2 compares three more characters of "Conasellus". Henry and Magniez (1970: 354) claimed that the propodi te of the gnathopod should have two or three strong apophyses present and sexual dimorphism. Variation within "Conasellus" is noted as "C." brevicauda lacks the apophyses and lacks sexual dimorphism. Intraspecific variation is seen in "C." laticaudatus and "C." alabamensis both of which have, within single populations, specimens that do and specimens that do not exhibit the two characters. Furthermore there should be little specialization of the fourth peraeopod of the male in "Conasellus", but "C." laticaudatus and "C." brevicauda do have some specialization while holsingeri ("Pseudobaicalasellus") does not have any specialization of the fourth peraeopod.

Table 3 compares five more characters of "Conasellus" which were emphasized by Henry and Magniez (1970: 354) who asserted that the propodite of the first pleopod should have numerous coupling hooks and the exopodite should be quadrangular with the distal external angle indented or swollen. The number of hooks varies greatly from a low of two in "C." alabamensis to a high of seven in "C." laticaudatus. A European form, A. aquaticus, has six hooks which is quite
Table 2. A Comparison of Some Taxonomic Characters of the Genus "Conasellus".

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Presence of Two to Three Strong Apophyses</th>
<th>Sexual Dimorphism</th>
<th>Little Specialization of Fourth Peraeopod of Male</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>obtusus</em></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><em>laticaudatus</em></td>
<td>+--</td>
<td>+--</td>
<td>-</td>
</tr>
<tr>
<td><em>brevicauda</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>alabamensis</em></td>
<td>+--</td>
<td>+--</td>
<td>+</td>
</tr>
<tr>
<td><em>holsingeri</em></td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><em>aquaticus</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>coxalis</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

"+" indicates presence of the character.
"-" indicates absence of the character.

Table 3. A Comparison of Some Taxonomic Characters of the Genus "Conasellus".

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Number of Coupling Hooks</th>
<th>Exopodite Quadrangular Shaped</th>
<th>Distal External Angle Indented of Swollen</th>
<th>Presence of Strong Process in External Proximal Region</th>
<th>Number of Orifice Apophyses</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>obtusus</em></td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>3</td>
</tr>
<tr>
<td><em>laticaudatus</em></td>
<td>5-7</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td><em>brevicauda</em></td>
<td>5-6</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><em>alabamensis</em></td>
<td>2-3</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>3</td>
</tr>
<tr>
<td><em>holsingeri</em></td>
<td>3-4</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td><em>aquaticus</em></td>
<td>3-6</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td><em>coxalis</em></td>
<td>3-2</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

"+" indicates presence of the character.
"-" indicates absence of the character.

Comparable with the number present in "Conasellus". Also "C." *sinuncus*, not included in the tabulation of characters, is a member of "Conasellus" which lacks coupling hooks altogether. The quadrangular shape of the exopod is absent in "C." *obtusus* and "C." *alabamensis*, but is present in *holsingeri* of "Pseudobaicalasellus". The distal external angle is indented or swollen only in "C." *brevicauda*. but it is also present in *A. aquaticus* and "Proasellus" *coxalis*, both European forms. The second pleopod of the male should have a strong process in the external proximal region and the orifice is supposed to be surrounded by several (up to three) apophyses in "Conasellus". The process in the external proximal region is missing in "C." *obtusus* and "C." *brevicauda*, but it is present in *holsingeri* of "Pseudobaicala-
There are no apophyses of the orifice in "C." laticaudatus, yet there are three apophyses in A. aquaticus, a European form.

Table 4 compares four of the characters of "Pseudobaicalasellus". According to Henry and Magniez (1970: 357) the propodite of the gnathopod of the male in "Pseudobaicalasellus" should lack the two to three apophyses and have very weak sexual dimorphism. All three of the "Pseudobaicalasellus" species have both of the above features, but these characters are also found in "Conasellus" brevicauda, both European species, and some specimens of "C." laticaudatus and "C." alabamensis. The fourth peraeopods of the male are supposed to show very little specialization. This is true of all three "Pseudobaicalasellus" species as well as "C." obtusus and "C." alabamensis. The second pleopod of the female should be triangular in "Pseudobaicalasellus". This is present in all three species, but also in "Conasellus" laticaudatus, "C." brevicauda, "C." alabamensis and "Proasellus" coxalis.

Table 5 compares six additional characters of "Pseudobaicalasellus". Henry and Magniez (1970: 357) stated that the third pleopods of "Pseudobaicalasellus" have a slightly oblique suture on the exopodite. All specimens examined exhibit this condition which would be expected in view of the fact that this is one of the most reliable diagnostic characters for the separation of the genus Asellus from the genus Lirceus. The fourth pleopod of "Pseudobaicalasellus" is said to have a small proximal segment and a large exopodite. All specimens of the nominal general examined possessed both of these features. The uropods should be elongated, with pronounced regression of the exopodite and strong sexual dimorphism. It has been found that "Pseudobaicalasellus" vandeli lacks elongated uropods, while "C." obtusus, "C." alabamensis, A. aquaticus and "Proasellus," coxalis (last two are European forms) have elongated uropods. No "Pseudobaicalasellus" species has

Table 4. A Comparison of Some Taxonomic Characters of the Genus "Pseudobaicalasellus".

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Propodite of Gnathopod of Male</th>
<th>Little Specialization of Fourth Peraeopod of Male</th>
<th>Female Second Pleopod Triangular Shaped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack Two to Three Strong Apophyses</td>
<td>Weak Sexual Dimorphism</td>
<td></td>
</tr>
<tr>
<td>vandeli</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>simonini</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>holsingeri</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>obtusus</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>laticaudatus</td>
<td>+ -</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>brevicauda</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>alabamensis</td>
<td>+ -</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>aquaticus</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>coxalis</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

"+" indicates presence of the character.
"-" indicates the absence of the character.
Table 5. A Comparison of Some Taxonomic Characters of the Genus "Pseudobaicalasellus".

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Slightly Opaline Suture on Exopodite of Third Pleopod</th>
<th>Fourth Pleopod</th>
<th>Uropods</th>
</tr>
</thead>
<tbody>
<tr>
<td>vandeli</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>simonini</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>holsingeri</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>obtusus</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>laticaudatus</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>brevicauda</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>alabamensis</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>aquaticus</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>coxalis</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
</tbody>
</table>

"+" indicates presence of the character.
"-" indicates the absence of the character.

strong sexual dimorphism of the uropods, but many specimens display slight examples of sexual dimorphism. Of the other species "C." alabamensis has strong sexual dimorphism and "C." laticaudatus has some specimens which reveal strong sexual dimorphism of the uropods.

Table 6 compares five more characters of "Pseudobaicalasellus" that Henry and Magniez (1970: 357) emphasized: the first pleopod of the male should have multiple coupling hooks, the exopodite should not be quadrangular and the distal external angle should not be indented or swollen. All of the "Pseudobaicalasellus" species do have multiple coupling hooks, but this situation is also found in "C." laticaudatus, "C." brevicauda and A. aquaticus. The exopodite is quadrangular in "Pseudobaicalasellus" holsingeri and it is not so in "C." obtusus and "C." alabamensis as well A. aquaticus and "Proasellus" coxalis, both European forms. All "Pseudobaicalasellus" species do not have the distal external angle of the exopod indented or swollen, but this is also true of "C." obtusus, "C." laticaudatus and "C." alabamensis. The second pleopod of the male in "Pseudobaicalasellus" is supposed to lack a strong process in the external proximal region and there should be no orifice apophyses. It has been found that "Pseudobaicalasellus" holsingeri has the strong process in the external proximal region, while "C." obtusus and "C." brevicauda and the two European forms, A. aquaticus and "Proasellus" coxalis, lack the strong process. All "Pseudobaicalasellus" species lack the orifice apophyses, but "C." laticaudatus also lacks the apophyses.

From the data presented above, it is my opinion that it is inadvisable to elevate the previously defined species groups of Asellus to the rank of genera. At least it is felt that this is not justifiable based on the characters used by Henry and Magniez (1970) as generic ones. These characters, as shown, exhibit too much inter- and intraspecific variability.
Table 6. A Comparison of Some Taxonomic Characters of the Genus “Pseudobaicalasellus”.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Number of Coupling Hooks</th>
<th>Exopodite Distal External Quadrangular Angle Indented of Swollen</th>
<th>Presence of Strong Process in External Proximal Region</th>
<th>Number of Orifice Apophyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>vandeli</td>
<td>2-3</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>simonini</td>
<td>3-5</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>holsingeri</td>
<td>3-4</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>obtusus</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>laticaudatus</td>
<td>5-7</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>brevicauda</td>
<td>5-6</td>
<td>+</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>alabamensis</td>
<td>2-3</td>
<td>-</td>
<td>+</td>
<td>3</td>
</tr>
<tr>
<td>aquaticus</td>
<td>3-6</td>
<td>-</td>
<td>+</td>
<td>3</td>
</tr>
<tr>
<td>coxalis</td>
<td>1-2</td>
<td>-</td>
<td>+</td>
<td>2</td>
</tr>
</tbody>
</table>

“+” indicates presence of the character.
“-” indicates the absence of the character.

This view has been supported by data obtained through the statistical analysis of nine characters (ratios of measurements) in nine species, utilizing ten specimens per species. This part of the study was attended by several problems. The European specimens available for examination were greatly limited. Initially sixteen characters were measured in the specimens, but because of missing data in several categories in one or more species only nine characters could be treated in the final analysis. The nine species studied were of four proposed genera as follows: A. aquaticus, the single species in the European genus Asellus s. str.; “P.” meridianus and “P.” coxalis of the European genus “Prosellus”, “Pseudobaicalasellus” holsingeri and “Pseudobaicalasellus” vandeli; and “Conasellus” obtusus, “C.” laticaudatus, “C.” brevicauda and “C.” alabamensis. The unequal distribution of species per genus was again due to the unavailability of material.

As stated above, the characters used consisted of ratios expressed as indices following Miller’s method (1933: 101). The following nine indices were employed: (1) body index (body length, excluding uropods and antennae, divided by the greatest body width); (2) head index (length divided by width); (3) gnathopod index (length divided by width, not including dactylopod); (4) first pleopod index #1 (peduncle length divided by peduncle width); (5) first pleopod index #2 (distal podomere length divided by peduncular proximal podomere length); (6) second pleopod index #1 (endopod length divided by peduncle length); (7) second pleopod index #2 (exopod length divided by peduncle length); (8) second pleopod index #3 (exopod length divided by the endopod length) and (9) second pleopod index #4 (peduncle length divided by peduncle width). All measurements were of males and were taken with an ocular reticule mounted in either a dissecting scope or (when needed) a compound microscope. These characters are those associated with the most useful taxonomic structures, i.e., the gnathopod, first pleopod, and especially...
the second pleopod. The eliminated characters were those associated with highly variable and unreliable structures, such as: first antennae, seventh peraeopod, pleotelson and uropod.

Each measurement was calculated to four decimal places, placed on IBM punch cards and subjected to two tests. The first test was Bartlett's Test of Homogeneity of Variances. The purpose of this test was to determine if the variances of each character in the ten specimens of a species were homogeneous, i.e., not significantly different. The variances were found to be homogeneous. Therefore, the measurements were then subjected to Multivariate Discriminant Function Analysis (Sokal and Rohlf, 1969). Although the technique of discriminant functions has been known for some time, it "...has only recently (due to the availability of digital computers) been much applied in various biological fields, especially in systematics." (Sokal and Rohlf, 1969: 488). The null hypothesis was set as follows: $H_0$: the values of the characters of a specimen will not overlap with those of another specimen. One point must be clarified before continuing this discussion. The attempt was made statistically to see if, within the old genus Asellus, new genera could be formed as proposed by Henry and Magniez (1968b and 1970). All specimens studied possess the necessary characteristics to be placed in the genus Asellus as defined and distinguished, in the following section, from its nearest ally Lirceus. In order to test the null hypothesis, the species placed in a proposed genus of Henry and Magniez (1970) were tested against each other. If they did belong to a single genus then they should overlap in the values obtained for the nine characters measured. The first group to be tested were the two species placed in the proposed genus "Proasellus". It was found that there were no specimens of a species exhibiting values of a single character which overlapped with values derived for the same character in any other specimens of the other species. In other words the two species could not be placed in the newly proposed genus on the basis of the characters analyzed. The next group to be tested were the two species placed in the proposed genus "Pseudobaicalasellus". Again no overlap between characters of any specimens in the two species was found. It can again be stated that based on the statistical characters employed the two species could not be placed in the newly proposed genus. The last group to be tested were the four species of the proposed genus "Conasellus". In this group only one specimen of a species exhibited a character which overlapped with the values for characters of another species. All other specimens had non-overlapping values. The results of these analyses lead to the acceptance of the null hypothesis. All the species studied are members of the single genus Asellus.

Genus Asellus Geoffroy-St. Hilaire, 1764

Caecidotea Packard, 1871: 752. Type-species, by original designation, *Caecidotea stygia* Packard, 1871.


**Diagnosis.** - Eyes: present, reduced or absent depending on the species; facets can range from 0 to 60 or more. Body pigmentation: ranges from heavy pigmentation in some species to total absence of pigmentation in other species. Size of sexually mature adults: ranging from 2.5 mm. in length to 19.0 mm. in length (excluding antennae and uropods). Cephalothorax: without median frontal carina. Antenna 1: flagellum 5- to 18-merous articles; flagellum tip commonly reaching to midpoint or sometimes slightly beyond distal end of peduncle of second antenna. Antenna 2: lacking rudimentary exopodite; flagellum with 32- to 85-merous articles, and ranging from 1/2 to equal the length of the body (excluding uropods).

- Left mandible: with 3-4 teeth in incisor and 4 teeth in lacinia. Right mandible: with 4 teeth in incisor. First maxilla: inner lobe of plate 4-5 setae; outer lobe of plate 10-13 setae. Second maxilla: with 2 laminae; outer lamina with 12-24 setae; inner lamina with 10-15 setae. Maxilliped: with 3-8 coupling hooks; apex of inner plate, distal and outer margin of epipodite, and 4 segments of palp heavily setose; oostegite of maxilliped of ovigerous females bearing numerous setae.

- First peraeopod (gnathopod): sexual dimorphism exhibited with male gnathopod usually larger and better developed than that of female; gnathopod shorter than other peraeopods; palmar margin of propodus of male gnathopod may have from 0 up to 4 processes; opposable margin of dactyl commonly without processes, but often possessing spines or undulations of margin; gnathopod subchelate and shorter than rest of peraeopods. Peraeopods 2-7; slender, uniunguicate; of remaining 6 pairs of legs in both sexes, the fourth pair is shortest, but a little longer that the first pair; each of other pairs of legs successively longer that preceding pair; all the legs very similar morphologically.
First pleopod: absent in female; in male composed of peduncle, which is generally short and squarish with from 0 to 9 coupling hooks and an exopod which is generally broad and oval with numerous marginal setae. Second pleopod of female: generally subtriangular or subcircular with base broadest narrowing toward apex. Second pleopod of male: with 2-jointed exopod; distal segment of exopod normally with many plumose setae, proximal segment of exopod often with setae on lateral border; nonsegmented endopodite serves as copulatory organ containing endopodial groove (for transfer of spermatozoa) and commonly from 1 to 5 additional processes (processes often very complicated in their ornamentation and are most useful taxonomic structures for determination of species). Third pleopod: no sexual dimorphism; exopod always large and forming operculum (= gill covering) over fourth and fifth pairs of pleopods; suture between proximal and distal segments commonly running from middle of median border to lateral border generally in a perpendicular angle, but often variable being somewhat acute or oblique in various species (never forming a strong oblique angle as in Lirceus which runs from distal point of median border obliquely to lateral border); terminal and lateral margins always setose. Pleopods 4-5: partially or totally nonchitinous and serving as gills. Uropods: biramous, with exopod equal to or shorter than endopod.

List of North American Species of *Asellus*

1. *A. communis* Say, 1818
2. *A. styguis* (Packard, 1871)
3. *A. brevicauda* Forbes, 1876
4. *A. intermedius* Forbes, 1876
5. *A. nickajackensis* (Packard, 1881)
6. *A. attenuatus* Richardson, 1900
7. *A. richardsonae* (Hay, 1901)
8. *A. smithii* (Ulrich, 1902)
9. *A. alabamensis* (Strafford, 1911)
10. *A. tridentatus* (Hungerford, 1922)
11. *A. antricolus* (Creaser, 1931)
12. *A. californicus* Miller, 1933
13. *A. macropopodus* (Chase and Blair, 1937)
14. *A. ozarkanus* (Chase and Blair, 1937)
15. *A. dentadactylus* Mackin and Hubricht, 1938
16. *A. montanus* Mackin and Hubricht, 1938
17. *A. hobbsi* (Maloney, 1939)
18. *A. dimorphus* (Mackin and Hubricht, 1940)
19. *A. stiladactylus* (Mackin and Hubricht, 1940)
20. *A. packardi* (Mackin and Hubricht, 1940)
21. *A. spatulatus* (Mackin and Hubricht, 1940)
22. *A. oculatus* (Mackin and Hubricht, 1940)
23. *A. adentus* Mackin and Hubricht, 1940
27. A. simonini Bresson, 1955
28. A. recurvatus Steeves, 1963
29. A. holsingeri Steeves, 1963
30. A. cannulus Steeves, 1963
31. A. parvus Steeves, 1964
32. A. barri Steeves, 1965
33. A. sinuncus Steeves, 1965
34. A. nortoni Steeves, 1966
35. A. kenki Bowman, 1967
36. A. bisetus Steeves, 1968
37. A. reddelli Steeves, 1968
38. A. pilus Steeves, 1968
39. A. incurvus Steeves and Holsinger, 1968
40. A. circulus Steeves and Holsinger, 1968
41. A. scyphus Steeves and Holsinger, 1968
42. A. racovitza Williams, 1970
43. A. forbesi Williams, 1970
44. A. obtusus Williams, 1970
45. A. laticaudatus Williams, 1970
46. A. scrupulosus Williams, 1970
47. A. nodulus Williams, 1970
48. A. occidentalis Williams, 1970
49. A. franzi Holsinger and Steeves, 1971
50. A. catachaetus Fleming and Steeves, 1972
51. A. cyrtorhynchus Fleming and Steeves, 1972
52. A. paurotrigonus Fleming, 1972
53. A. metcalfi, Fleming, 1972
54. A. stevesi Fleming, 1972
55. A. ancythus Fleming, 1972
56. A. holti Fleming, 1972
57. A. foxi Fleming, 1972
58. A. extensolinguulus Fleming, 1972
59. A. serratus Fleming, 1972

KEY TO THE NORTH AMERICAN SPECIES OF THE GENUS ASELLUS

This key is based only on males of the species and, with but few exceptions, is restricted to the most reliable diagnostic character—the endopodal tip of the second pleopod. The terms lateral, mesial, cannula, caudal and accessory refer to processes on the endopodal tip. A. smithii (Ulrich, 1902) is omitted due to insufficient evidence necessary for its identification.

1. Endopodal tip with single process ........................................... 2
   Endopodal tip with two or more processes .................................... 11
2. Cannula slender and generally pointed ..................................... 3
   Cannula short and stout ....................................................... 9
3. Cannula slender and needle-like resembling a stylet
Cannula slender and pointed, but not needle-like and not resembling a stylet

4. Endopod tapering abruptly at apex narrowing to the stylet cannula extending greatly beyond tip of endopod. A. cannulus Steeves, 1963
Endopod not tapering at apex, but forming sickle-shaped structure with stylet cannula not exiting from apex of endopod and extending only short distance beyond tip of endopod. A. californicus Miller, 1933

5. Cannula exhibiting some evidence of torsion
Cannula not exhibiting evidence of torsion

Endopod tapering abruptly at apex; entire endopod exhibiting torsion. A. incurvus Steeves and Holsinger, 1968

7. Endopod generally slender along whole length with distal part of endopod and entire cannula curving mesiad. A. simonini Bresson, 1955
Endopod generally bulbous at proximal end with distal end of endopod and entire cannula curving laterad.

Endopod gradually tapering to long, slender, pointed cannula

9. Cannula arising from midpoint of apex of endopod
Cannula arising from lateral margin of apex of endopod and curving slightly mesiad. A. dimorphus (Mackin and Hubricht, 1940)

10. Cannula exiting from endopod as narrow tube, but apex flairs forming bulbous tip with slight mesial indentation. A. serratus Fleming, 1972
Cannula exiting from endopod as stout deeply grooved structure lacking bulbous tip. A. laticaudatus Williams, 1970

11. Endopodial tip with two processes
Endopodial tip with three or more processes

12. Endopodial tip composed of cannula and lateral process
Endopodial tip composed of cannula and either mesial or caudal process

Lateral process not extended in form of distinctive tongue-like lobe

14. Lateral process very large, subtriangular and bent dorsally at tip. A. occidentalis Williams, 1970
Lateral process not large or bent dorsally at tip cannula protruding beyond apex of endopod

15. Endopod tapering distally, ending in slender, rectilinearly pointed cannula extending greatly beyond tip of endopod; lateral process reduced. A. foxi Fleming, 1972
Endopod not tapering distally; cannula not slender but stout and projecting laterad perpendicular to prominent, rounded lateral process

16. Endopodial tip composed of cannula and mesial process

17. Exopod with single slender seta; endopod with acute medial and lateral apophyses, bluntly rounded mesial process and short, acute cannula with tip directed laterad

18. Caudal process and cannula distinctly projecting beyond apex of endopod and approximately subequal in length

19. Caudal process not projecting greatly beyond apex of endopod and caudal process never subequal in length to cannula

20. Cannula and caudal process slender, pointed and curving laterad beyond apex of endopod; endopod much larger than exopod

21. Cannula forming long, thin, stylet-like structure inscribing complete circle arising mesially with tip directed laterad

22. Endopodial tip with three processes

23. Endopodial tip composed of cannula, caudal and lateral processes

24. Processes of endopodial tip arranged in a coiled or twisted manner; endopod longer than exopod

25. Lateral process greatly reduced in size, forming small, rounded projection lying proximal to terminal elements

26. Lateral process not reduced in size forming large distinct process
26. Caudal process reduced in size forming bluntly rounded lobe ............ 27
   Caudal process not reduced in size but forming large, distinct lobe ...... 28
27. Lateral process large and slender with recurved tip projecting distally beyond apex of endopod ...................... \textit{A. aneylus} Fleming, 1972
   Lateral process lacking recurved tip but forming lobe-like structure on lateral margin endopod ...................... \textit{A. ozarkanus} (Chase and Blair, 1937)
28. Caudal process large with pointed apex, bearing three to five simple spines on dorsal surface; cannula triangular in shape not reaching beyond caudal process ...................... \textit{A. racovitzai} Williams, 1970
   Caudal process large with pointed apex, lacking three to five simple spines on dorsal surface; cannula not triangular in shape but reaching beyond caudal process with apex curving mesiad ...................... \textit{A. paurotrigonus} Fleming, 1972
29. Endopodial tip composed of cannula, mesial and lateral processes ........ 30
   Endopodial tip composed of cannula, mesial and caudal processes ........ 31
30. Lateral process large, slender and distinctly curved laterad ...................... 31
   Lateral process not slender and not curved laterad ...................... 33
31. Cannula very short and stout; cannula much shorter than lateral and mesial processes and curving slightly mesiad ...................... \textit{A. packardi} (Mackin and Hubricht, 1940)
   Cannula long, slender and curving laterad ...................... 32
32. Cannula subequal in length to lateral process and curves laterad crossing under lateral process ...................... \textit{A. richardsonae} (Hay, 1901)
   Cannula shorter than lateral process and reaches only to distal 1/2 of lateral process ...................... \textit{A. catachaetus} Fleming and Steeves, 1972
33. Lateral process very broad, flat lobe-like structure ...................... 34
   Lateral process rounded, finger-like lobe ...................... 35
34. Lateral process with short spines along sclerotized lateral margin; cannula extended beyond mesial process and curving mesiad; mesial process short ...................... \textit{A. tridentatus} (Hungerford, 1922)
   Lateral process lacking short spines along lateral non-sclerotized margin; cannula not extended beyond mesial process and not curving mesiad; mesial process very large and extended greatly beyond other processes ...................... \textit{A. pricei} (Levi, 1949)
35. Cannula, mesial and lateral processes all subequal in length, all forming finger-like lobes tapering gently from endopodial base; lateral margin of lateral process with serrated border ...................... \textit{A. macropropodus} (Chase and Blair, 1937)
   Cannula, mesial and lateral processes not all of equal length; variable in shape; lateral margin of lateral process without serrated border ...................... 36
36. Mesial process wide and four-toothed distally, lateral process small, narrow and hook-like ...................... \textit{A. scrupulosus} Williams, 1970
   Mesial process large, sclerotized, concave distally and lacking four distal teeth; lateral process large, rounded and finger-like ...................... \textit{A. brevicauda} Forbes, 1876
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Species</th>
<th>References</th>
</tr>
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<tbody>
<tr>
<td>37</td>
<td>Mesial and caudal processes heavily sclerotized and exhibiting some</td>
<td><em>A. nodulus</em> Williams, 1970</td>
<td></td>
</tr>
<tr>
<td></td>
<td>degree of torsion</td>
<td></td>
<td></td>
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<tr>
<td>38</td>
<td>Mesial process not heavily sclerotized and endopodial tip not exhibiting</td>
<td></td>
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<tr>
<td></td>
<td>any torsion</td>
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<tr>
<td>39</td>
<td>Mesial process large, wide and bifid; caudal process dentate</td>
<td><em>A. dentadactylus</em> Mackin and Hubricht, 1938</td>
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<tr>
<td>40</td>
<td>Mesial process not bifid; caudal process not dentate</td>
<td></td>
<td></td>
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<tr>
<td>41</td>
<td>Mesial process short and wide; cannula wide with recurved outer lip</td>
<td><em>A. obtusus</em> Williams, 1970</td>
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<tr>
<td>42</td>
<td>Mesial process not bifid; caudal process not dentate</td>
<td></td>
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<tr>
<td>43</td>
<td>Mesial process large, wide and distinctive</td>
<td><em>A. forbesi</em> Williams, 1970</td>
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<tr>
<td>44</td>
<td>Mesial process not large or distinctive</td>
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<tr>
<td>45</td>
<td>Caudal process with few to many rugosities</td>
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<tr>
<td>46</td>
<td>Caudal process smooth lacking rugosities</td>
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<tr>
<td>47</td>
<td>Mesial process with two lobes</td>
<td><em>A. kenki</em> Bowman, 1967</td>
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<tr>
<td>48</td>
<td>Mesial process with only single lobe</td>
<td></td>
<td></td>
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<tr>
<td>49</td>
<td>Mesial process with two distinct lobes and not projecting beyond apex of</td>
<td><em>A. metealfi</em> Fleming, 1972</td>
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<tr>
<td></td>
<td>mesial process lying over all but tip of cannula</td>
<td></td>
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<tr>
<td>50</td>
<td>Mesial process not distinct lobe and not projecting beyond apex of mesial</td>
<td><em>A. nikiakajakensis</em> (Packard, 1881)</td>
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<tr>
<td></td>
<td>process lying over cannula</td>
<td></td>
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<tr>
<td>51</td>
<td>Cannula not projecting beyond caudal process</td>
<td><em>A. hobbsi</em> (Maloney, 1939)</td>
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<tr>
<td>52</td>
<td>Cannula projecting beyond caudal process</td>
<td></td>
<td></td>
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<tr>
<td>53</td>
<td>Lateral process large and sickle-shaped and curving distinctly mesiad</td>
<td><em>A. spatulatus</em> Mackin and Hubricht, 1940</td>
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<tr>
<td>54</td>
<td>Lateral process large, not sickle-shaped and not curving mesiad</td>
<td></td>
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<tr>
<td>55</td>
<td>Lateral process distinctly projecting beyond apex of endopod; mesial</td>
<td><em>A. spatulatus</em> Mackin and Hubricht, 1940</td>
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<td>process lying over all but tip of cannula</td>
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<tr>
<td>56</td>
<td>Lateral process not distinctly projecting beyond apex of endopod; mesial</td>
<td><em>A. spatulatus</em> Mackin and Hubricht, 1940</td>
<td></td>
</tr>
<tr>
<td></td>
<td>process lying over cannula</td>
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</tbody>
</table>
50. Caudal process slender and tube-like and extending beyond endopodial tip .......................................................... 51
   Caudal process not slender or tube-like, but bluntly rounded .......................................................... 54
51. Caudal process extending beyond apex of cannula .......................................................... 52
   Caudal process not extending beyond apex of cannula .......................................................... 53
52. Endopod longer than exopod; cannula slender and extending rectilinearly from endopod apex .................. \textit{A. recurvatus} Steeves, 1963
   Endopod shorter than exopod; cannula slender and curving mesiad .................................................. \textit{A. barri} Steeves, 1965
53. Caudal process very slender, almost thread-like, and always shorter than cannula .......................... \textit{A. antriculatus} (Creaser, 1931)
   Caudal process not thread-like and often subequal to cannula in length .......................................................... \textit{A. alabamensis} Stafford, 1911
54. Caudal process extending beyond other processes .......................................................... 55
   Caudal process not extending beyond other processes .......................................................... 56
55. Caudal process with many tiny setae along medial margin; mesial process with hook-shaped apex .................. \textit{A. adentus} Mackin and Hubricht, 1940
   Caudal process lacking tiny setae along medial margin; mesial process lacking hook-shaped apex .......................... \textit{A. reddelli} Steeves, 1968
56. Mesial process only process extending beyond apex of endopod; mesial process finger-like and curving slightly mesiad; exopod with only two setae .......................... \textit{A. bisetus} Steeves, 1968
   Mesial process, lateral process and cannula all extend beyond apex of endopod; mesial process finger-like and curving slightly laterad; exopod with many setae .......................... \textit{A. oculatus} (Mackin and Hubricht, 1940)
57. Endopodial tip undergone 180° torsion causing all processes be oriented mesiad at right angle to endopodial base; accessory process small and triangular-shaped; caudal process broad, flat and plat-like ........................................................................ \textit{A. stevesi} Fleming, 1972
   Endopodial tip not undergone torsion; accessory process large, broad and sheet-like; caudal process slender, pointed and hook-like extending beyond apex of endopod ........................................................................ \textit{A. cyrtorhyynchus} Fleming and Steeves, 1972
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SYNONYMIES

Certain names applied to the Asellids of North America are synonymies. There follows a treatment of the synonymy of the species involved.

Asellus tridentatus (Hungerford, 1922)


Conasellus tridentatus Henry and Magniez 1970: 356.


Type-specimens. — A. tridentatus (Hungerford, 1922) collected by William Hoffman from a cistern in Lawrence, Kansas in March, 1919. Hololectotype, allolectotype and single paralectotype deposited in Snow Entomological Museum of the University of Kansas.


Remarks. — I had not suspected that A. acuticarpus is a synonym of A. tridentatus until the very recent receipt of type material of A. tridentatus from the Snow Entomological Museum of the University of Kansas through the courtesy of Dr. George W. Byers. The material of A. tridentatus consists of one jar labelled “Caecidotea tridentata Hungerford Type material.” Inside this bottle are six vials all labelled “Type Material”. No holotype or allotype was designated by Hungerford. There are only two collections with labels: (1) “Hunters Pasture rock quarry Pool — Temporary — exposed. March 23, 1922. H. B. Hungerford”, and (2) “scuds found in cistern. April 18, 1919. W. E. H.” The species description by Hungerford listed William Hoffman as the collector, March, 1919, as the date, and a cistern in Lawrence, Kansas as the locality for the type material. Therefore one of the least damaged males from the latter collection was designated the hololectotype, a female was designated the allolectotype and the remaining specimen (a male) was designated the paralectotype of A. tridentatus. Slides of the hololectotype and a male paralectotype were then prepared. The similarity of A. tridentatus to A.
acuticarpus was immediately noted. Comparisons were then made between the slides of *A. tridentatus* and the illustrations of *A. acuticarpus* by Mackin and Hubricht (1940) in the description of *A. acuticarpus*. Comparisons were also made with the eight other *A. acuticarpus* collections in the possession of the writer, including one topotypic collection, as well as USNM material composed of *A. acuticarpus* type material (USNM 108232), plus one additional USNM collection identified as *A. acuticarpus* by L. Hubricht.

All comparisons were of the four reliable diagnostic characters: gnathopod, uropod, and first and second pleopods of the male. These structures examined in all specimens of both nominal species were found to be identical. It must further be stated that the distribution of *A. acuticarpus* it well within that of *A. tridentatus* (no known intervening geographical barriers). Both species have a continuous distributional pattern in the central part of the United States, primarily in the Ozark Plateau region. On the basis of the above observations, *A. acuticarpus* is synonymized with *A. tridentatus*.

**Asellus alabamensis** (Straifford, 1911)


*Conasellus alabamensis* Henry and Magniez 1970: 356.


*Conasellus jordani* Henry and Magniez 1970: 356.

**Type-specimens.** *Asellus alabamensis* (Stafford, 1911) collected by C. F. Baker from a well in Auburn, Alabama. Type-material has been lost. **Diagnosis.** - Palm of propodus of male gnathopod with two processes: median and distal. Opposable margin of dactyl without processes.

First pleopod with three coupling hooks on peduncle. Exopod 1.3 times as long as peduncle.

Second pleopod of male with medial margin of peduncle bearing 2-3 long setae. Basal part of endopodite with small lateral and medial apophyses. Tip of endopodite ending in 4 processes: (1) lateral process, (2) caudal process, (3) mesial process, and (4) cannula.

Uropod as long as pleotelson. Endopodite 0.61 times as long as peduncle. Exopodite 0.44 times as long as endopodite.

**Remarks.** - The status of *Asellus jordani* as a valid species has been questioned by
Steeves (pers. comm.). In December of 1970 I studied the holotype of *Asellus jordani* which is deposited in the National Museum of Natural History (USNM 113604). Comparison of reliable systematic structures of *A. jordani* with those of *A. alabamensis* revealed the two to be conspecific. The *A. alabamensis* material used for comparison was from two sources: (1) the numerous widespread collections of *A. alabamensis* in my care and (2) the topotypic material of *A. alabamensis* placed in the USNM by Dr. H. R. Steeves III. It should also be noted that the type locality for *A. jordani* is well within the range of *A. alabamensis*. I possess one topotypic collection of *A. jordani* and one additional collection from the same county from which *A. jordani* was collected. Both of the collections have been positively identified as *A. alabamensis*. Furthermore I have two collections from Illinois near the type locality (Indiana) of *A. jordani* both identified as *A. alabamensis*. *A. jordani* Eberly is a synonym of *A. alabamensis* (Stafford), since they are within the range of intrapopulational variation in the following respects: (1) similarity in shape, number and orientation of processes on the endopodial tip of the male second pleopod, (2) similarity of first pleopods and (3) similarity in shape and proportions of rami of uropods.

**Asellus communis** (Say, 1818)


*Asellus militaris* Hay 1878: 90.


**Type-specimens.** - *Asellus communis* Say, 1818. Topotypic area is Valley Forge, 20 miles north of Philadelphia in the Valley Forge Creek, a tributary of the Schuylkill River. Neotypes deposited in the Academy of Natural Sciences of Philadelphia.

**Diagnosis.** - Dactylus of male gnathopod as long as propodus palm, with numerous
small teethlike spines. Palmar margin of propodus with 2 processes, one much larger
than other.

First pleopod 1.26 times as long as second pleopod. Peduncle with 5 coupling
hooks. Exopod 1.33 times as long as peduncle.

Peduncle of second pleopod of male with single spine near inner distal angle.
Endopod approximately as long as exopod and 2/3 as long as peduncle. Basal part
of endopod with large inner and outer apophyses. Endopodial tip ending in 2
processes: (1) caudal process and (2) cannula.

Uropod slightly shorter than pleotelson. Exopod 0.69 times as long as peduncle.
Endopod 0.92 times as long as peduncle.

Remarks - In December 1970 (and again in July, 1972), I examined the holotype
and some of the paratypes of *Asellus puebla* deposited in the National Museum of
Natural History (USNM 123083) by Cole and Minckley. These specimens were then
compared with the neotype and topotypes of *Asellus communis* in the National
Museum of Natural History (USNM 7300), plus the several collections of *A.
communis* I possess. The results of these investigations have led to the opinion that
*A. puebla* and *A. communis* are conspecific and should be synonymized since the
specimens are identical in: (1) shape and armament of the endopodial tip of the
male second pleopod, (2) shape of the first pleopod, (3) shape and proportions of
rami of the uropod and (4) shape and armament of the male gnathopod. *A.
puebla* is not within the previously known range of *A. communis*: the latter is
primarily an inhabitant of the northeastern part of the United States and *A. puebla
was collected from Puebla, Mexico. Yet there are western collections of *A. communis.
Williams (1970) lists eight collections of *A. communis* from the Denver area of Colo-
rado and one collection from Echo Lake in King County, Washington. It was further
noted by Williams (1970: 14) "... that *A. communis* may occur in a wide variety of
inland waters: from creeks, rivers, ponds, lakes, reservoirs, and one instance, from a
swamp." It thus seems quite probable that *A. communis* could have migrated from
one or more of its northwestern localities to Mexico or vice versa. Furthermore the
likelihood exists that *A. communis* will be collected in areas intermediate to its
northwestern and its Mexican localities.

Instead of according Cole and Minckley’s discovery the status of a new species,
it should be noted as a new distribution record for *A. communis* which extends the
southern range of the genus from 30° N. latitude to 20° N. latitude.

*Asellus pricei* (Levi, 1949)

*Caecidotea stygia* Richardson 1905: 434 (in part)—Nicholas 1960a: 132 (in part)—Nicholas
Asellus richardsonae Dearolf 1937: 45 (in part).

*Asellus* new species Dearolf 1941: 170-171.

51-52.

196, 197.

*Conasellus pricei* Henry and Magniez 1970: 356.

Conasellus conestogensis Henry and Magniez 1970: 356.
Conasellus condei Henry and Magniez 1970: 356.


Diagnosis - The palmar margin of the propodus of the male gnathopod bears 2 medium-sized processes. Dactylus lacks processes but bears row of heavy spines. Peduncle of first pleopod approximately 0.92 times as long as exopod. Basal area of exopod bears 2 short mesial spines. Peduncle with 5 coupling hooks. Endopod of male second pleopod bearing large median and lateral apohyses. Exopod rounded. Distal mesial margin of peduncle with 2 long setae. Endopodial tip bearing 3 processes: (1) lateral process, (2) cannula and (3) mesial process.

Uropods flattened, exopodite approximately 0.62 times as long as endopodite.

Remarks. According to Levi (1949) the holotype and allotype of A. pricei were deposited in the Academy of Natural Sciences of Philadelphia and paratypes were placed in the USNM and the American Museum of Natural History. Only a single specimen (a male) comprised the type collection of A. conestogensis. This holotype was also deposited in the Academy of Natural Sciences in Philadelphia. A search of the isopod collection at the Academy of Natural Sciences of Philadelphia by Mr. C. W. Hart, Jr., revealed that none of the type material of either species was present nor was there any record indicating that it had been removed (Hart, pers. comm. April 18, 1971). It can therefore be reasonable assumed that the type material of both species is lost.

I studied paratypes and topotypes of A. pricei in the National Museum of Natural History. There are also collections of A. pricei in my possession. Comparison of the above material with the description and illustrations of A. conestogensis given by Levi has led to the opinion that the two are conspecific. Furthermore the type locality of A. conestogensis is well within the range of A. pricei. Although the former species was collected in a creek, Levi (1949: 3) probably correctly assumed that heavy rains the night before the collection was taken had washed the animal out of a sink hole approximately two miles above the type locality.

Asellus condei was described by Chappuis in 1957 from Ogden’s Cave in Frederick County, Virginia. Additional material of A. condei was collected by Chappuis from Skyline Caverns and many additional collections from the general area. All of these collections have been identified as A. pricei from comparisons with paratypic and topotypic material of A. pricei. It is not known where type material of A. condei was deposited by Chappuis. Examination of the illustrations and descriptions of A. condei given by Chappuis together with the evidence gathered from the study of topotypic material leads to the conclusion that A. condei is a synonym of A. pricei. These two species (A. conestogensis and A.
condei) are synonyms of A. pricei. This opinion has been stated previously by Holsinger and Steeves (1971: 190). Although they did not get into details which gave rise to their statement, they did say that the species (A. conestogensis and A. condei) were synonymized with A. pricei "... on the basis of a comparison of pertinent material. . ." The three nominal species are synonyms for all of the taxonomically valuable characters are identical among them. This is especially true in reference to the shape, processes and orientation of the endopodial tip of the male second pleopod as well as the first pleopod.

SUMMARY

This paper is the second in the three part series dealing with the evolution of the North American isopods of the genus Asellus.

The generic status of Asellus is discussed with emphasis placed on the newly proposed genera of Henry and Magniez (1968).

Use is made of comparative anatomical and where feasible statistical methods during this investigation.

The first, shorter portion of the study deals with the presentation of evidence supporting the viewpoint that if “Pseudobaicalasellus” is to be considered a valid genus then it must include the members of the Cannulus Group of Steeves (1965).

The second portion of the study is concerned with the determination of the generic status of the eastern North American isopods.

From the data presented it is felt that it is inadvisable to elevate species-groups of Asellus to the rank of genera.

A generic diagnosis of the genus Asellus is presented.

A list of North American species of the genus Asellus as well as a key to North American species of Asellus is included.

The reduction to synonymy of certain nominal species of the genus Asellus is also given.

RESUME

Cet article est le deuxième d’une série de trois, consacrée à la question de l’évolution des Isopodes d’Amérique du Nord, appartenant au genre Asellus.

Le statut générique d’Asellus, ainsi que la validité des genres proposés récemment par Henry et Magniez (1968), sont discutés.

Au cours de ce travail, des méthodes de comparaisons anatomiques et, lorsque cela était possible, des méthodes statistiques, ont été employées.

La première et la plus courte partie de ce travail montre à l’évidence que, si l’on doit considérer “Pseudobaicalasellus” comme un genre valide, on doit inclure dans celui-ci les espèces du groupe Cannulus de Steeves (1965).

La seconde partie traite de la détermination du rang générique des Isopodes de la partie orientale de l’Amérique du Nord.
Des données présentées, on peut penser qu'il est inopportun d'éllever les groupes d'espèces du genre Asellus au rang de genres.

Une diagnose générique du genre Asellus est proposée.

La liste des espèces d’Asellus d’Amérique du Nord est établie accompagnée d’une clé de détermination de ces mêmes espèces.

Enfin, la réduction à la synonymie de certaines espèces nominales du genre Asellus est donnée.

REFERENCES


