

PRELIMINARY LIST OF THE HYDRACARINA
OF WISCONSIN

REVISION OF PART I

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Part I of the *Preliminary List of the Hydracarina of Wisconsin* (Marshall, 1931) listed, with brief descriptions and drawings, 14 species of the so-called "red mites," belonging to seven genera then included in the Superfamily *Limnocharae*. This group has now been subdivided and other superfamilies recognized so that the genera have a new grouping as will be noted. The classification of Viets (1936) is followed. Former descriptions are supplemented with more drawings and notes, synonymies indicated, and seven more species and varieties added (new forms only in the Genus *Eylais*), bringing the list to 21.

GENUS *HYDRACHNA*

The Hydrachnae are among the largest of the hydracarina and are common in shallow waters throughout the world. They are usually soft bodied, rotund, red or orange, with papillose skin. Between the eyes lies the frontal organ whose function is unknown. On the dorsal side there are developed chitinous structures, usually paired, in a great variety of forms and sizes. The epimera are in four groups which increase in size posteriorly. The genital organ lies between the posterior groups of epimera; it has a pair of united plates, somewhat movable, and covered with fine acetabula. The maxillary organ has a long, curved rostrum at the end of which is the mouth. The mandibles are awl shaped. The palpi are broadest at the base, the segments decreasing in width distally. The legs have swimming hairs.

The genus is now placed with the small African genus *Bergena* in a single family, *Hydrachnidae*, of the Superfamily *Hydrachnae*. Five subgenera are recognized (Viets, 1936:58), distinguished chiefly by the character of the dorsal structures, three represented here by six species and one variety.

Hydrachna canadensis Mar.

Pl. I, Fig. 1-4

The anterior dorsal chitin structures are represented by a pair of irregularly shaped hair-bearing plates a short distance behind each eye capsule; between each plate and the capsule is also a small fleck of chitin. In epimera III there is a small spur-like process on the anterior inner side of each; in IV the inner posterior margins are blunt, with thin subcutaneous processes. In the palpi the proportions of the segments are shown in Fig. 4. The genital organ is broadly heart-shaped in the female; the male is unknown. The male described for this species (Marshall, 1929:63) is now recognized as another species, *H. marshallae* (Lundblad, 1934:34). The nymph is now known; the anterior dorsal structures resemble those of the adult and the epimera IV are similar.

This species belongs to the Subgenus *Rhabdohydrachna*, characterized by a pair of chitin bars or small plates behind each eye capsule. It has been found in Ontario, Manitoba and Michigan as well as in Wisconsin.

Hydrachna miliaria Berl. (= *H. bilunata* Mar.)

Pl. I, Fig. 5-8

Behind each eye capsule is a small, somewhat lunate but sometimes angular plate followed by a smaller, likewise variable, rounded or elongated plate; these plates are alike in adult and nymph. Characteristic of the epimera is the narrow prolongation on the inner posterior margin of IV which is even more pronounced in the nymph. In the palpi the 1st segment is large and broad; the 3rd is longer than the 2nd with a concave outline on the inner proximal side.

The male is now known; the length is about 2.50 mm. The genital organ is very large, fully one-third of its length extending beyond the limits of epimera IV, the anterior margin with a large indentation. Epimera IV have the characteristics of those of the female but they are not as elongated, relatively broader, the posterior inner prolongations shorter.

This species is believed to be the same as one described earlier for South America (see Marshall, 1943b:404). It has been found in British Columbia and appears to be widely distributed throughout the United States.

Lundblad (1934:25) erected a new Subgenus *Tetrahydrachna*, evidently designating this species as the type; later the same author (1941b:360) gave the new name as a synonym for *Scutohydrachna*! Viets (1936:58) considers it a synonym for *Rhabdohydrachna*.

Hydrachna cruenta Müll. (= *H. schneideri americana* Mar.)

Pl. II, Fig. 13-17

This species is recognized by the very large dorsal shield which has a projection extending forward between the eyes; the posterior margin is wavy, more or less convex, the whole outline subject to much variation. The length of the body is 2.00-3.00 mm. In epimera IV the posterior inner border is broadly expanded, especially in the female; in the male the medial border is longer, the entire plate shorter. The genital organ in the female is very broad; in the male, elongated, hardly filling the space between the posterior epimeral groups. The palpi are rather slim; the characteristics of the segments are best shown in Fig. 16. In the nymph there is a large elongated plate immediately behind each eye capsule; epimera show the characters of the adult.

This is the type species of the Subgenus *Hydrachna* with the large unpaired dorsal plate reaching the eye region and enclosing the frontal organ. It is a cosmopolitan species and has been found in widely separated areas in Canada and the United States.

Hydrachna cruenta diminuta Lund.

Pl. II, Fig. 18, 19

In the original description (Lundblad, 1934:10) based on the study of one male (Connecticut), this variety has as its chief character a diminished dorsal shield which does not have a process extending between the eyes; nor does it enclose the anterior hair plates; also, the posterior outline of the shield is distinctly concave. In the former description of the main species (Marshall, 1931:314), Fig. 22 should probably be referred to this variety, although not conforming closely to Lundblad's Fig. 4A. A few specimens from Ontario as well as Wisconsin material (Adams County) are also placed here. Both sexes were represented and the female is now known (Fig. 19). However, in the inclusion of the hair plates between the eyes in the dorsal plate

they do not all conform to the original description but they do show the posterior concavity. In view of the great degree of variability in this respect in the species, the first description of this variety may have to be revised.

Hydrachna magniscutata Mar.

Pl. I, Fig. 9-12

This species resembles *H. cruenta* but is smaller (about 1.15 mm.), the large dorsal plate has but a slight projection between the eyes, irregular in outline or concave; in epimera IV the inner posterior outline is rather short and blunt; the palpi are relatively stouter. In the nymph there are two obovate anterior plates, well removed from the eyes.

It has been found in over twenty bodies of water in Wisconsin and across the United States from New England to Washington as well as in Ontario and Alberta.

Mr. C. O. Berg*, working at the Biological Station of the University of Michigan at Douglas Lake, found several individuals of this species in a pool at Sedge Point. Some of these were blue, a feature already reported (Marshall, 1927:271). Mr. Berg (unpublished correspondence) kept specimens in the laboratory and observed the oviposition in *Potamogetan richardsonii*, many egg galleries being easily visible in the stem. The emergence and development of the larvae were followed and their attachment to *Belostoma flumenium* was seen.

Hydrachna crenulata Mar.

Pl. II, Fig. 20; Pl. III, Fig. 24, 25

The body is almost circular, about 1.90 mm. long, deep red. In the live specimen the anterior dorsal aspect shows two low scallops between the eyes. The dorsal surface is entirely covered, except in the eye region, by a finely porous chitinous plate which extends over on the posterior ventral side; this feature was unfortunately overlooked in the original description (Marshall, 1930:247). In this plate are embedded two small irregularly crescent-shaped chitin pieces directly below the eyes, down about one-third of the body length; near the usual gland openings with accompanying hairs are flecks of chitin. Epimera IV show a pro-

* Publication of the complete record of these observations has been delayed. Unable to communicate with Ensign Berg for permission, the author has taken the liberty of including here this brief summary of his studies.

longed curved posterior inner outline. The male genital organ is cordate and nearly fills the space between the last pair of epimera. Below it lies the large inverted triangular area not covered by the extension of the dorsal shield. The female is unknown. In the palpus is to be noted the considerable size of the 1st segment, the concavity on the inner border of the 2nd, the position of the hairs (Fig. 20).

The species has been found in Wisconsin and Michigan.

This species belongs to the Subgenus *Scutohydrachna* (Viets, 1933:162) characterized by the development of a great unpaired plate covering the dorsal surface and part of the ventral, *H. dorsoscutata* of Brazil being described and designated as the type species. Lundblad (1934:16) in his review of the author's description of *H. crenulata* gave Viets' species as a synonym, although noting the somewhat longer and slimmer inner posterior border in epimera IV, these processes of either side being connected by a small strand of subcutaneous chitin. It should also be noted that the male genital organ is shorter and broader in the Brazilian form. Dr. Viets who examined the type specimen of *H. crenulata* stated (unpublished correspondence) that "*H. dorsoscutata* must be considered a variety of *H. crenulata*," differing only in the connecting chitinous line behind the genital area. However, in a later paper (Viets, 1940:193) he again lists it as a species. In the opinion of the present author it should probably be considered a variety, certainly not a synonym for *H. crenulata*.

Hydrachna rotunda Mar.

Pl. II, Fig. 21-23; Pl. III, Fig. 26

The body is almost circular, 1.10–1.12 mm. long, deep red. Over the entire dorsal surface, except around the eyes, is developed a finely porous chitinous plate which extends also over on the ventral side to cover most of the surface outside of the epimera, as in *H. crenulata*, but somewhat more extensively. This character was unfortunately not given in the original description of the species (Marshall, 1930:246). In this dorsal shield behind each eye capsule is a small irregularly curved piece of chitin together with gland openings and hairs very much as in the related species. In epimera IV there is a slender prolongation of the inner posterior border. The male genital organ is very large, broader than long, almost filling the area between the

posterior groups of epimera. The palpi are rather stout; the proportions of the segments and the disposition of the hairs are shown in Fig. 26.

The female is now known. The epimera are like those of the male but somewhat longer, the last pair having a similar but shorter prolongation of the medial posterior angle. The genital organ is very large, much broader than long, the anterior lateral border closely pressed upon epimera III and the anterior border of IV.

This species, like the preceeding, belongs to the Subgenus *Scutohydrachna*; it has been found in Wisconsin, Illinois and Tennessee.

GENUS *LIMNOCHARES*

Mites of this genus are large, red, soft bodied, papillose, wrinkled, changeable in form. The circular mouth lies at the end of a protruding rostrum. The eye capsules are close together on a ligulate plate in the medial dorsal line. The epimera are very small, in four groups, beset with long hairs: pair I, somewhat rectangular, meet in the anterior medial corners; II are triangular. The posterior groups are smaller, widely separated, elongated. The genital orifice is small, without plates, lying between the last pair of epimera and guarded by bristles; the sexes are much alike. The palpi are very small, especially the 5th segment. The legs are short with many bristles; in the Subgenus *Cyclothrix* they have swimming hairs.

The Superfamily *Limnocharae* is now limited to three families of which *Limnocharidae* is one, with few species. The genus *Limnochares* is represented in Wisconsin by two species.

Limnochares aquatica (L.)

Pl. III, Fig. 27-29

Under this species was first included (Marshall, 1931:312) all specimens of the genus; it was soon apparent that two species were present, of which *L. aquatica* was the less common. Lavers (1941) made a study of available material and clarified the matter. The body has a length up to 5.00 mm.; it is somewhat shouldered, tapering to the snout-like rostrum. Epimera III and IV are triangular. The legs are very short with many bristles but no swimming hairs. These mites are slow moving, often crawl-

ing on the bottom of shallow waters. Lundblad (1941c:155) uses the older specific name, *L. holosericea*.

This species is one of the first water mites to be described. It is widely distributed over Europe and now known for Siberia, Japan, and South America. In North America it has been found and reported in small numbers, sometimes in collections with the next species, in Washington by Lavers; and in Michigan, Indiana and Wisconsin (Vilas County) by the author where it appears to be usually a bog form. Lavers (p. 3, 5) is in error concerning certain previous records.

Limnochares americana Lund. (= *L. natans* Lav.)

Pl. III, Fig. 30-33

The body closely resembles that of *L. aquatica*; it measures up to 4 mm. in length. The ocular plates of the two species differ in some details, being here wider. Epimera III are elongated, while IV are boot-shaped. The legs, which are relatively slim, have swimming hairs as well as long bristles on all legs; the former are long and numerous on the middle segments of III and IV. In consequence it is an active swimmer and the body is very mobile. This places it in the Subgenus *Cyclothrix*.

The late C. H. Lavers made a detailed study of available *Limnochares* material in American collections in connection with his own material from the state of Washington. He wrote to several hydracarinologists in Europe requesting identified specimens of *L. aquatica* for comparison. Dr. Viets responded with several individuals from Germany. Lavers also studied the habits and development of his specimens. He gave the name *L. natans* to the heretofore recognized but undescribed species. His paper (1941), unfortunately delayed in printing, gave his principle findings; some of his unpublished notes contain other material. In the meantime Dr. Lundblad secured a small collection from Michigan and published a brief account, without drawings, of what appears to be Lavers' *L. natans* under the name *L. americana* (Lundblad, 1941c:155). Since this was published a few months before the earlier and more complete paper, *L. natans* must be considered a synonym.

L. americana is more common and widely distributed than the older species. It has been found in British Columbia, Ontario, Washington, Colorado, Illinois, Michigan, Nebraska,

Massachusetts, New Hampshire, New York; and in Wisconsin in waters near Green Lake, Green Bay, Waupaca, Cable, in Storr Lake and a pool near Lake Winnebago.

GENUS *EYLAIS*

Mites of this genus may attain a length of 5 mm. The skin is soft, red, smooth or showing wavy lines. The two eyes of each side are enclosed in a capsule; with rare exceptions the latter are connected by a bridge of very variable outline. The maxillary organ encloses the circular, hair-fringed mouth. The epimera are elongated and lie in the anterior half of the posterior surface, pairs I and II of each side approximated, III and IV joined only in the median line. The genital orifice lies between the medial ends of the anterior epimera; the sexes are difficult to distinguish. The palpi are slender with many bristles; the 4th segment is the longest, the 2nd and 3rd not completely chitimized. Legs I-III have swimming hairs.

The genus is now placed, with the small genus *Piersigia*, in the Family *Eylaidae* of the Superfamily *Limnocharae*. These mites are common in quiet shallow waters of all continents. Over 100 species have been described but many of these should probably be regarded as varieties. Descriptions are based almost entirely on the characters of the small ocular plate and this is very variable. Four species and two varieties, three of them new, have been determined for Wisconsin.

Eylais desecta Koen.

Pl. IV, Fig. 39-41

In spite of some variation, the shape of the ocular capsules and of the intercapsular bridge is fairly constant (Koenike, 1912:283). On the latter are two anterior rounded projections each bearing a large bristle but they do not project beyond the capsules; between and below them is a rounded process. The bay below the bridge is deep and of varying width, reaching at least as far as the middle of the capsules. A specimen reported by the author from Winnipeg (Marshall, 1929:62), then unidentified, is now referred to this species.

E. desecta is probably widely distributed, since it has been identified in Ontario, Manitoba, North Carolina, Tennessee and Michigan as well as several places in Wisconsin.

Eylais rimosa Piers.

Pl. IV, Fig. 48

This is a species closely resembling *E. desecta*, but the two anterior projections on the short intercapsular bridge are more pronounced with a deep incision between them, while the bay posterior to the bridge is somewhat larger. It is "eine sehr variable Form" (Viets, 1936:89) described under several names. It has been found throughout Europe and North Africa, reported also from Siberia and India.

In Wisconsin a few specimens have been found in Fox and Boulder Lakes.

Eylais infundibulifera bakeri n. var.

Pl. IV, Fig. 37, 38

The species *E. infundibulifera* Koen. is widely distributed over Europe and reported also from Turkestan and Siberia; several varieties are recognized. It is also known for Ontario.

The intercapsular bridge in the main species is short and very broad with a large, more or less, irregular anterior central projection and a shallow posterior bay. In the new variety, *E. bakeri*, the bridge is longer so that the eye capsules are farther separated, the anterior projection is shorter and more irregular; the posterior bay is deeper, the sides showing a more or less conspicuous bulge midway on either side. The palpi are rather stout; the distal inner process on the 3rd segment is small and only sparingly provided with short bristles. The body is 3.50–4.00 mm. long.

Specimens were found in Findley and South Turtle Lakes, Vilas County, and in Lake Winnebago; the latter collection was made by Dr. F. C. Baker, for whom this variety is named.

Eylais gibberipons hirsutipalpis n. var.

Pl. IV, Fig. 42, 43

In *Eylais gibberipons* (Viets), of central Europe, and this new variety the intercapsular bridge has an anterior-posterior measurement about twice as great as the distance between the eye capsules, an anterior projection with an indentation, while the posterior bay is relatively small. The variety, *E. hirsutipalpis*, conforms to this general plan of the ocular plate, but the palpi differ from the stem species, the 4th segment being longer and the 4th and 5th having many more short bristles.

Only one specimen has been identified; this came from Boulder Lake, Vilas County.

Eylais robusta n. sp.

Pl. IV, Fig. 44-46

The average length of the three specimens identified is about 3.00 mm. The eye capsules are broadly reniform. The intercapsular bridge is short, with a large rounded anterior process, which may be somewhat irregular and indented (as in Fig. 45), projecting beyond the capsules; between the attachment of the two bristles is a large irregularly oblong surface. Posterior to the bridge is a deep narrow bay, nearly the same width throughout, more than half the length of the capsules or contracted a little by processes from the capsules. The palpi are long, especially the 4th segment which bears but a few bristles; the 3rd segment bears distally a small area of weak bristles on the concave side, with more and stouter bristles on the outside; the 2nd segment has a large bristle on the inner distal corner. In the form of the intercapsular bridge with its anterior process the new species resembles *E. infundibulifera*; but the posterior bay is much deeper and narrower.

The specimens came from Trout and Boulder Lakes.

Eylais falcata Koen.

Pl. IV, Fig. 47

Characterized by Koenike (1912) as a species which "appears to vary strikingly, particularly in the form of the eye plate," yet several individuals are here assigned to it on the basis of the fairly constant and unusual features. The eye capsules are very broad, oval or slightly reniform, sometimes broadest anteriorly, the bases of the two large bristles on the capsules rather than on the intercapsular bridge. The latter is short and narrow, set well back from the anterior end of the capsules; it has an indentation on the anterior margin, the posterior side more or less projecting. The palpi agree well with Koenike's Fig. 3.

The original material was found near Ottawa, Canada. In a paper by the present author (Marshall, 1929:61) a specimen from Manitoba (Fig. 17) was described but the name withheld; it is now assigned to this species. In Wisconsin specimens have been found near Green Lake and Madison.

GENUS CALONYX

This genus is a group of soft bodied, papillose red mites without chitin plates. The maxillary organ has a rostrum; the palpi are chelate. The epimera are in four groups, well separated, the posterior in about the center of the under surface. The genital orifice lies between the medial ends of epimera III, shorter in the male, with slightly chitinized valves surrounded by numerous stalked acetabula. The legs are short, without swimming hairs, and end in scoop-shaped toothed claws.

This genus with the closely related Genus *Protzia* and four other genera is now placed in the Family *Protziidae* in the Superfamily *Limnocharae*; they are bottom forms, more common in alpine waters.

Calonyx ovata (Mar.) (= *Protzia ovata*)

Pl. V, Fig. 59-62

The body is obovate; largest specimens are 1.20 mm. long. The large genital organ occupies most of the area between the epimeral groups, the orifice in the male with a cluster of fine hairs; it is surrounded by about thirty acetabula, irregularly placed, the posterior with longer stalks.

This species has been found as an alpine form in California (Marshall, 1943a:322); in Wisconsin it is known only for Green Lake.

GENUS HYDRYPHANTES

The body of this genus is of moderate size, somewhat compressed dorsally, papillose and red. Between the eye capsules is a chitinized plate in which lies the frontal organ. The maxillary structure has a rostrum. The epimera are in three groups, the last pair somewhat triangular. The genital organ has elongated laterally hinged plates, each with three or more acetabula. The palpi are cheliform. The legs are long, pairs II-IV with swimming hairs. The genus is very large, with many species, active mites living in small bodies of shallow water in many parts of the world.

The Superfamily *Hydryphantae*, Family *Hydryphantidae*, includes this genus; under it are three subgenera, distinguished chiefly by the number of genital acetabula. Specific descriptions are based largely on the form of the dorsal plate; three species have been found in Wisconsin.

Hydryphantes ruber (de Geer)

Pl. V, Fig. 52, 53

The body may reach a length of 2.00 mm. in the female. The dorsal plate is large, very variable in form but compact, the anterior end convex, and wider than the posterior which ends in two lateral prolongations. The palpi are stout. The genital plates have each three acetabula characteristic of the Subgenus *Hydryphantes*.

Viets (1939:75) questions the identity of the North American specimens with Old World forms (Marshall, 1930:247; 1931:315), and states that the figures for the dorsal plate place them nearer to *H. planus* Thon, and proposes *H. novus* nov. nom. for them. In view of the great variability of the plate as shown by various writers and the essential agreement of these specimens with them the author sees no justification for another name.

The species is found throughout Europe where also several varieties have been described, and in Kamtschatka; in Canada, Ohio, Michigan, Illinois, Wyoming and in several localities in Wisconsin.

Hydryphantes tenuabilis Mar.

Pl. V, Fig. 49-51

The body is ovate, largest specimens about 1.00 mm. long, the anterior slightly projecting. The dorsal plate is distinctive and quite constant in form: an anterior piece between and above the eye capsules with two diverging posterior limbs which bifurcate to end in thin pieces. The epimera are heavy, the groups close together, pair IV with a large median bulge on the posterior border so that it lies close to the genital organ; the latter is broader than in *H. ruber*, with three acetabula. Like the latter species it belongs to the Subgenus *Hydryphantes*.

Daday (1905:279) described a new species from Paraguay, *H. ramosus*, with a dorsal plate closely resembling that of *H. tenuabilis* (Marshall, 1926:33). Lundblad (1938:7) described another Paraguayan species, *H. schadei* (without figures) with a similar dorsal plate, pointing out also differences in the palpi between the new species and "der von Marshall abgebildeten Form von *H. ramosus*"! Later the same author (Lundblad, 1941a:56) made *H. schadei* a variety of *H. ramosus* (giving fig-

ures) and again referred to Marshall's finding of the latter species omitting the name given by her, *H. tenuabilis*. In private correspondence (1941) Lundblad stated that he regarded the two species as identical. It is difficult to decide the matter from Daday's account; until the South American form can be studied more fully the author will continue to use the present name. It is possible that it should be regarded as a variety of the older species.

This species has been found in several north-east central states and in many waters in Wisconsin.

Hydryphantes multiporus Mar.

Pl. V, Fig. 54, 55

The body is about 1.50 mm. long, orange red. The dorsal plate is large, the anterior part convex and reaching nearly to the eye capsules; it then narrows abruptly and passes over into two long large pieces which taper and thin out, a large rounded bay lying between them. The epimera are heavy, the groups close together. The anterior end of the genital organ lies close to the last epimera pair and is distinguished by the large number of acetabula, 14 to 18, on the outer border of each plate, variable in number even on the two sides. In the numph the number is smaller, the plates shorter. The palpi are very stout, the first three segments much shorter than broad on the concave side, the 5th very short. The legs are stout, IV about the length of the body; there are abundant bristles and numerous swimming hairs.

The large number of genital acetabula places this species in the Subgenus *Polyhydryphantes*. It has been found only in two small bodies of water in Adams County.

GENUS *DIPLODONTUS*

The body in this genus is soft, papillose, red, with no dorsal chitin plates nor frontal organ. The two eyes of each side are separated, not enclosed in a capsule. The maxillary organ has a rostrum and mouth disk. The epimera are in four groups. At its anterior end the genital organ lies between epimera IV; its ovate plates bear many small acetabula. The palpi are slim, chelate. The legs have swimming hairs.

This genus with the small African genus *Oxopsis* make up the Family *Diplodontidae* of the Superfamily *Hydryphantae*.

Few species have been found but the one to be described is cosmopolitan.

Diplodontus despiciens (Müll.)

Pl. V, Fig. 56-58.

The body is nearly circular, compressed, reaching a length of 2.00 mm., covered with small tapering papillae. The color is deep red with a large dark central scalloped area. The epimera are elongated, bordered with hairs, occupying a relatively small part of the ventral surface; pairs I and II are slightly attached medially. The sexes are difficult to distinguish except for the smaller size of the male. The palpi are small and slim; the 5th segment with a similar process from the 4th form a long delicate chela. The 1st and 2nd palpal segments have feathered bristles, the 3rd, two long coarse hairs.

One of the first water mites to be described, this species is perhaps the commonest of the water mites. It has been found in all continents (except Australia?), in about half of the states of the Union and in Wisconsin in practically all waters where collections have been made.

GENUS *SPERCHONOPSIS*

In this genus the skin is thick, papillose, with small paired dorsal chitin plates and large wart-like elevations, likewise papillose, near the skin gland openings. The maxillary organ has a slender rostrum. The epimera are in four groups, the last pair somewhat triangular. The genital organ has lateral elongated plates each with three acetabula on the inner margins. The palpi have on the 2nd and 4th segments a large hair-bearing peg on the concave side. The legs are without swimming hairs.

It is a small genus with one large species, next to be described. It belongs to the Family *Sperchonidae*, now placed in the Superfamily *Lebertiae*.

Sperchonopsis verrucosa (Protz) (= *Pseudosperchon verr.*)

Pl. III, Fig. 34-36

Largest females may reach a length of 1.00 mm.; males are smaller. The body is elliptical, yellow brown. The large wart-like elevations of the dorsal side are found also on the posterior ventral margin. The rostrum is long and slim. The medial anterior ends of epimera I project and bear each a tuft of hairs. The middle palpal segments are of about the same length, the peg on the 2nd and 4th conspicuous. The genital organ lies close to epimera IV; the two anterior acetabula are elongated, the last

rounded. A small plate of chitin lying above the orifice distinguishes the female.

This species is a bottom form and is cosmopolitan. It has been found in Wyoming and California; in Wisconsin only in Green Lake.

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PLATE I

1. *Hydrachna canadensis*, anterior dorsal structures
2. *Hydrachna canadensis*, left genital plate and epimera III, IV, nymph
3. *Hydrachna canadensis*, genital organ and right epimera III, IV, female
4. *Hydrachna canadensis*, right palpus, female
5. *Hydrachna miliaria*, anterior dorsal region, male
6. *Hydrachna miliaria*, genital organ and right epimera III, IV, male
7. *Hydrachna miliaria*, right genital plate and epimera III, IV, nymph
8. *Hydrachna miliaria*, right palpus, female
9. *Hydrachna magniscutata*, right palpus, female
10. *Hydrachna magniscutata*, genital organ and right epimera III, IV, female
11. *Hydrachna magniscutata*, anterior dorsal region, nymph
12. *Hydrachna magniscutata*, dorsal plate

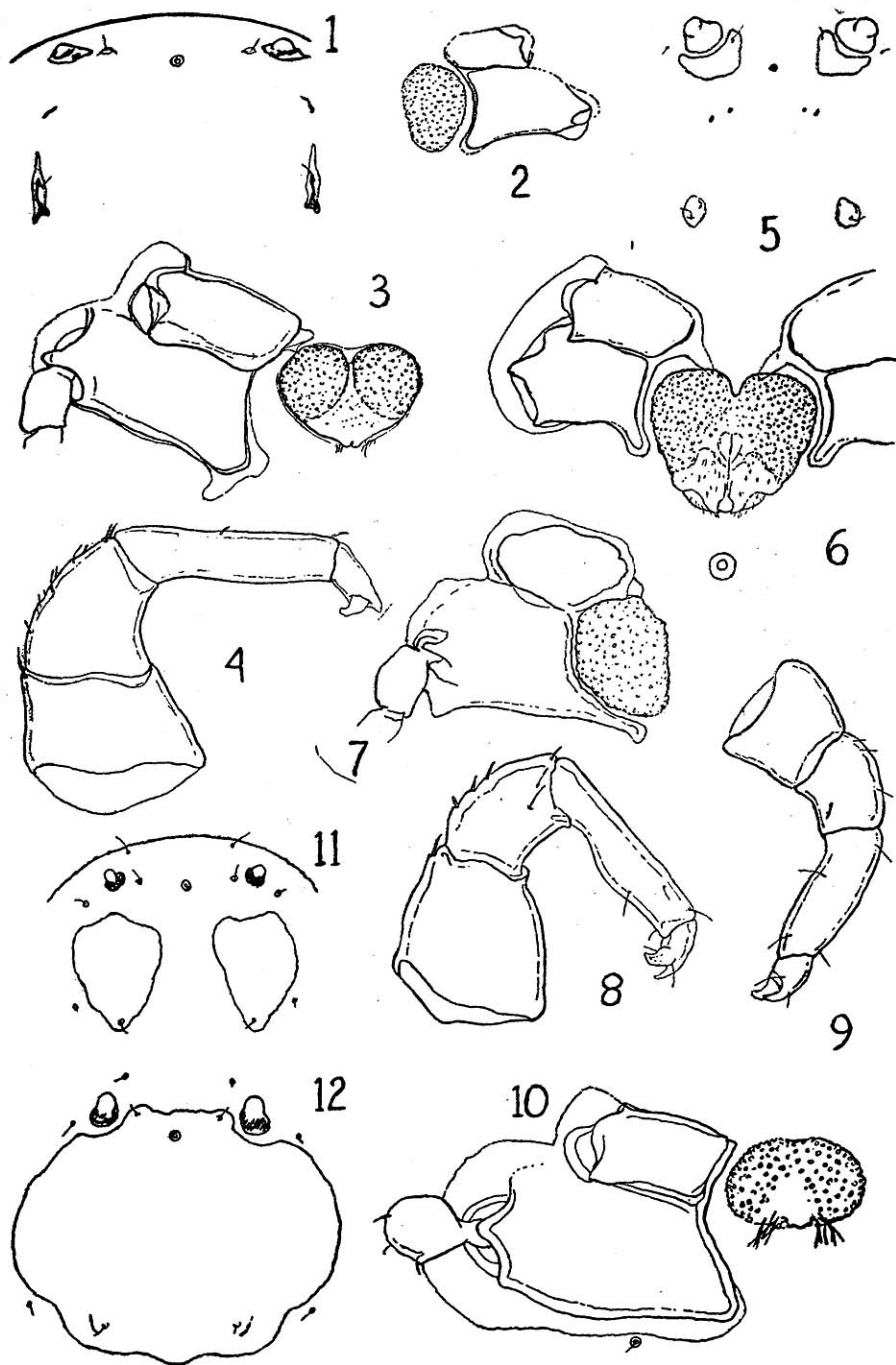


PLATE II

13. *Hydrachna cruenta*, dorsal plate
14. *Hydrachna cruenta*, genital organ and left epimera III, IV, female
15. *Hydrachna cruenta*, dorsal plates, nymph
16. *Hydrachna cruenta*, right palpus, female
17. *Hydrachna cruenta*, genital plates and epimera III, IV, nymph
18. *Hydrachna cruenta diminuta*, dorsal plate
19. *Hydrachna cruenta diminuta*, genital organ and right epimera III, IV, female
20. *Hydrachna crenulata*, left palpus
21. *Hydrachna rotunda*, lateral view
22. *Hydrachna rotunda*, genital organ and left epimera, female
23. *Hydrachna rotunda*, genital organ and left epimera III, IV, male

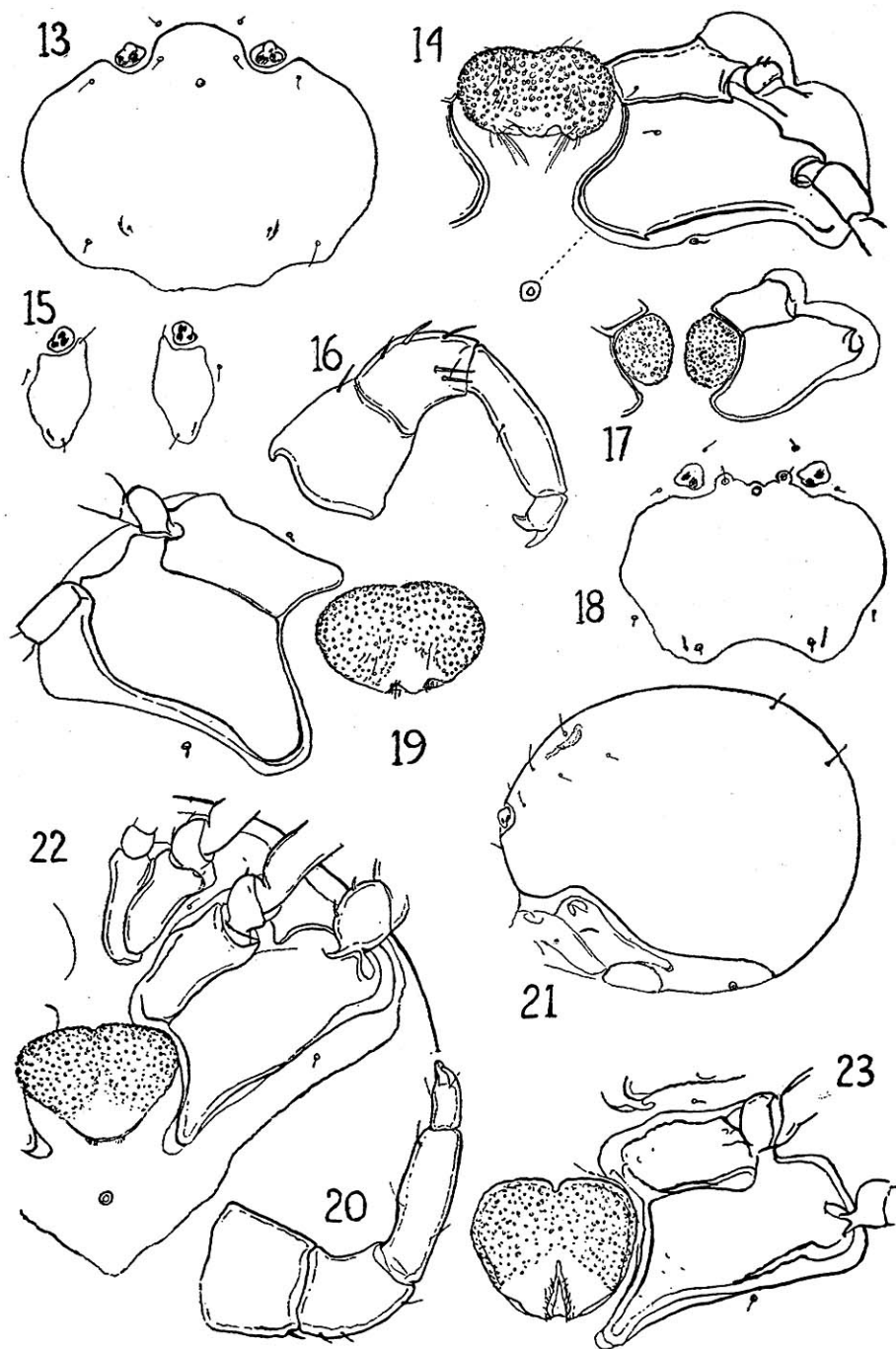


PLATE III

24. *Hydrachna crenulata*, genital organ and left epimera, male
25. *Hydrachna crenulata*, dorsal view
26. *Hydrachna rotunda*, left palpus, male
27. *Limnochares aquatica*, maxillary organ and palpus, lateral view
28. *Limnochares aquatica*, ocular plate
29. *Limnochares aquatica*, epimera III, IV and leg IV, left
30. *Limnochare americana*, ventral structures
31. *Limnochares americana*, ocular plate
32. *Limnochares americana*, leg IV, left
33. *Limnochares americana*, dorsal view
34. *Sperchonopsis verrucosa*, ventral view, male
35. *Sperchonopsis verrucosa*, right palpus
36. *Sperchonopsis verrucosa*, dorsal view

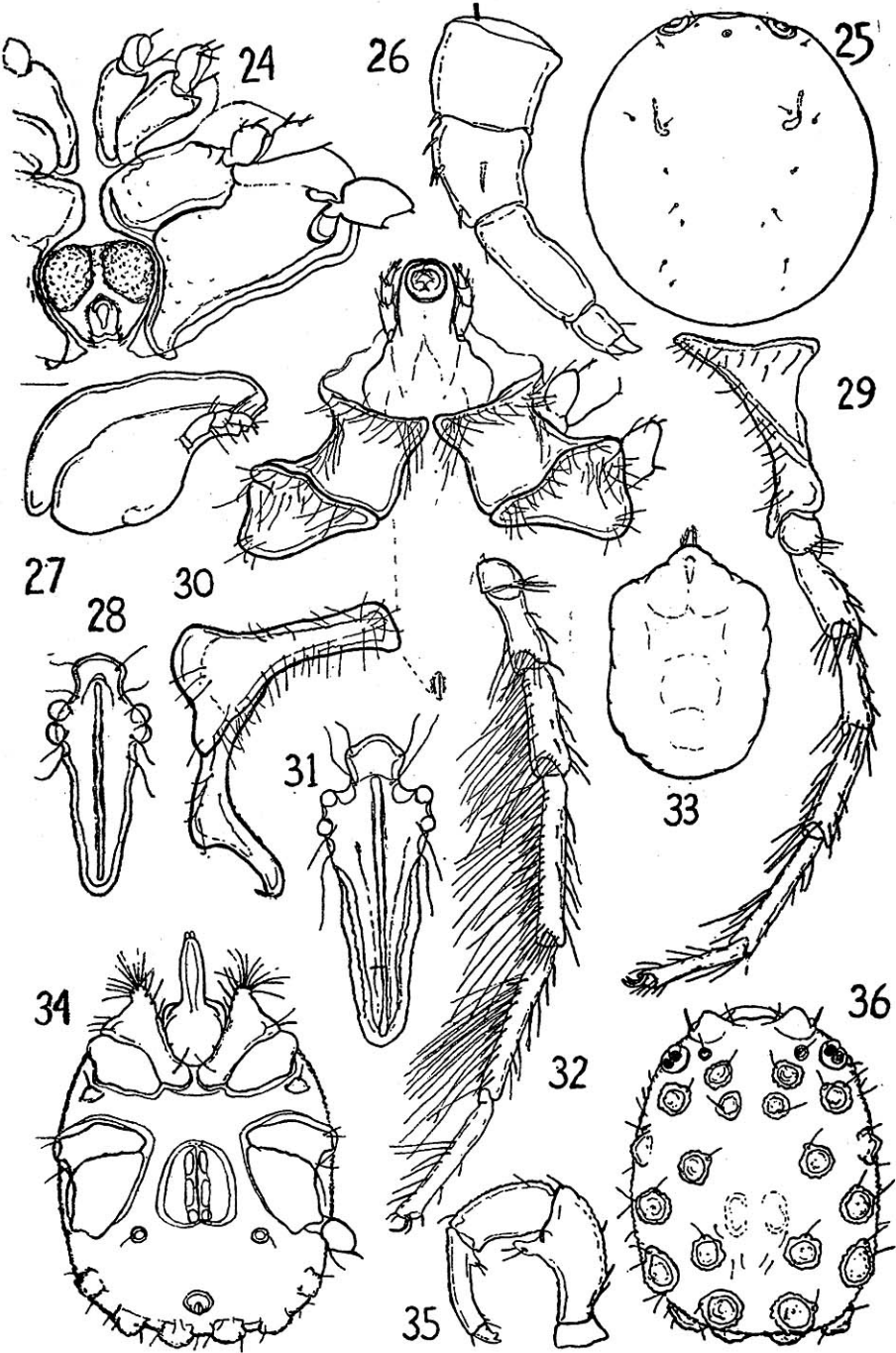


PLATE IV

37. *Eylais infundibulifera bakeri*, ocular plate
38. *Eylais infundibulifera bakeri*, left palpus
39. *Eylais desecta*, ocular plate, above
40. *Eylais desecta*, ocular plate, below
41. *Eylais desecta*, dorsal view
42. *Eylais gibberipons hirsutipalpis*, ocular plate
43. *Eylais gibberipons hirsutipalpis*, palpus
44. *Eylais robustus*, ocular plate
45. *Eylais robustus*, ocular plate, irregular form
46. *Eylais robustus*, left palpus
47. *Eylais falcata*, ocular plate
48. *Eylais rimosa*, ocular plate

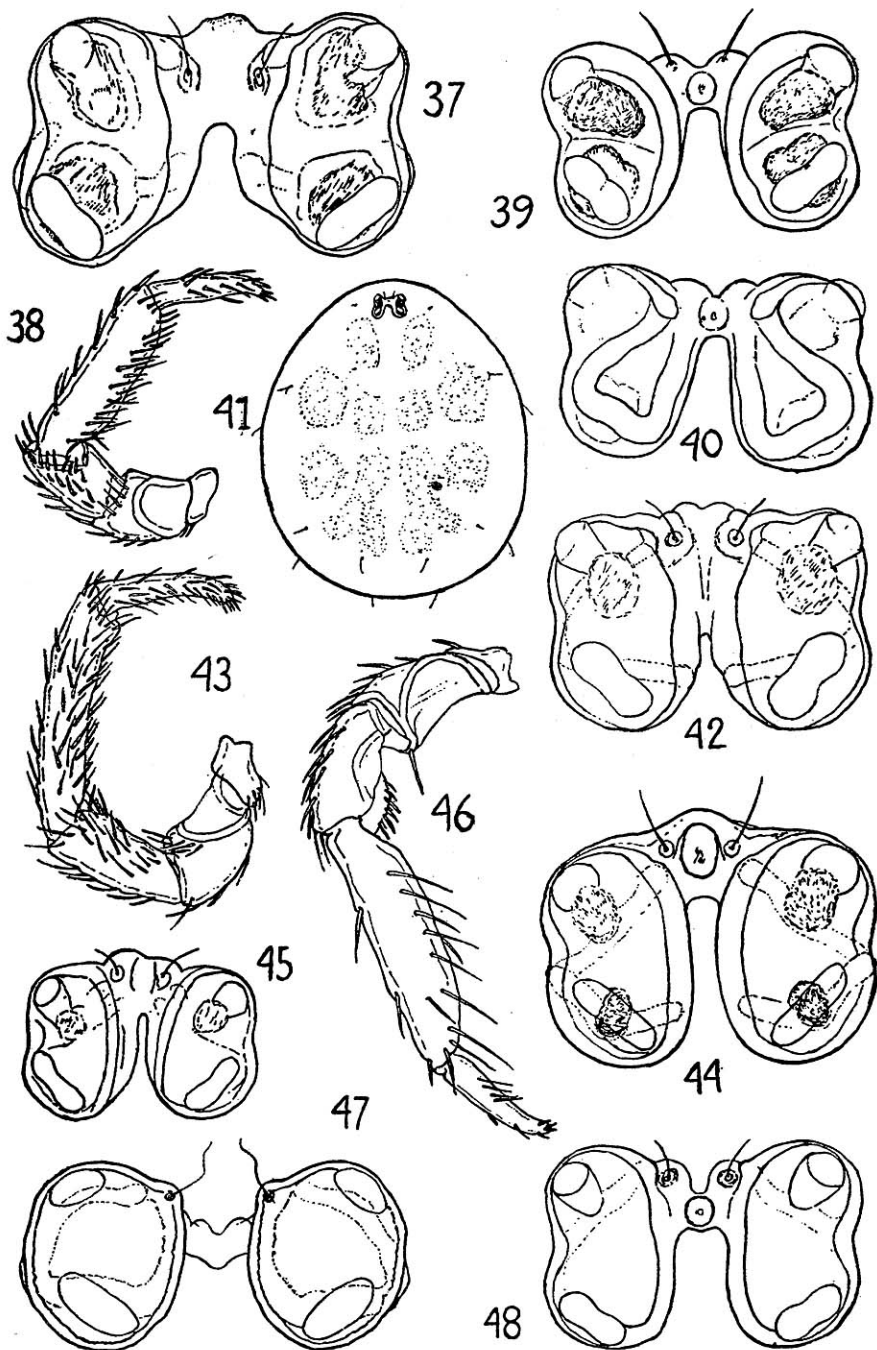


PLATE V

49. *Hydryphantes tenuabilis*, dorsal plate
50. *Hydryphantes tenuabilis*, palpus
51. *Hydryphantes tenuabilis*, rostrum, lateral view
52. *Hydryphantes ruber*, ventral view
53. *Hydryphantes ruber*, dorsal plate
54. *Hydryphantes multiporus*, genital organ
55. *Hydryphantes multiporus*, dorsal plate
56. *Diplodontus despiciens*, ventral plates
57. *Diplodontus despiciens*, dorsal view
58. *Diplodontus despiciens*, left palpus
59. *Calonyx ovalis*, leg IV, 6
60. *Calonyx ovalis*, ventral view, male
61. *Calonyx ovalis*, maxillary organ and palpus
62. *Calonyx ovalis*, genital organ, female

