

Notes on Northwestern *Berosus* (Coleoptera: Hydrophilidae),  
with Two New Species<sup>1</sup>

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**Abstract** *Berosus oregonensis* and *B. hatchi* are described as new. The identity of *B. striatus* (Say), *B. styliifer* Horn, and *B. fraternus* LeC. is discussed, and a new character given for identification of females of *B. striatus* (Say). A key is given for the species of *Berosus* known from California, Oregon, Idaho, Washington, and British Columbia.

This paper presents results of the examination of the types of species of *Berosus* found in the Pacific Northwest, and provides descriptions of two new species in order to make the names available for use in the forthcoming Part V of Dr. M. H. Hatch's **Beetles of the Pacific Northwest**.<sup>3, 4</sup>

*Berosus striatus* (Say)

*Hydrophilus striatus* Say 1825: 188–189.

*Berosus striatus*, LeC., 1855: 365. d'Orchymont, 1946: 11–13. Leech and Chandler, 1956: 342.

There is no Say type, so the identity of the species is here based on the work of d'Orchymont (1946). Males are easily identified by either the elbowed hind margin of the hind femora (Leech and Chandler, 1956: 342) or by the genitalia (Figs. 9, 10), but females are not always easy to differentiate from other closely related species. I have found that the female of *striatus* (and also that of **oregonensis** Miller, new species, described below) has the apex of each elytron very slightly emarginate (Fig. 1). This emargination is due to the prolongation of the supporting ridge under the elytron beside the suture and its turning slightly towards the suture, so that it projects slightly

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<sup>3</sup> The abbreviations in parentheses are those used after the locality listings for the type specimens to indicate the site of deposition of the material, which is generally equivalent to the original source from which it was borrowed (the author's collection is referred to as [DM]).

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Dr. P. J. Darlington, Mus. Comp. Zool., Harvard Univ. and Mr. J. A. G. Rehn, Phil. Acad. Sci., have been most kind in allowing me to examine types. Mr. Leech and Dr. David Wooldridge, Southern Illinois Univ., have been kind enough to read the manuscript. Dr. Hatch has aided in many ways during the portions of this work completed while at the Univ. of Wash. The drawings are by the author.

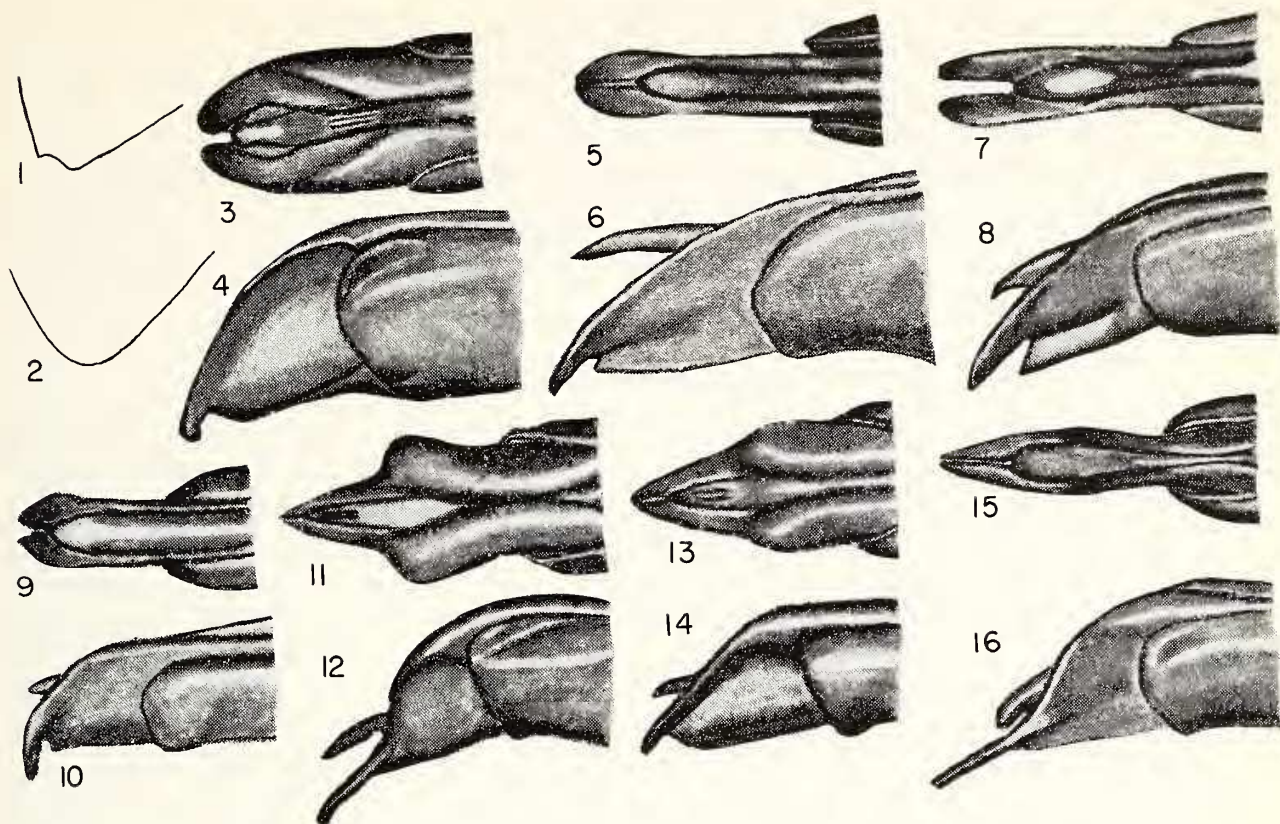


FIG. 1. *Berosus striatus* (Say), ♀, apex of elytron. FIG. 2. *Berosus fraternus* LeC., ♀, apex of elytron. FIG. 3. *Berosus styliifer* Horn, aedeagus, dorsal view. FIG. 4. *Berosus styliifer* Horn, aedeagus, lateral view. FIG. 5. *Berosus oregonensis* Miller, n. sp., aedeagus, dorsal view. FIG. 6. *Berosus oregonensis* Miller, n. sp., aedeagus, lateral view. FIG. 7. *Berosus hatchi* Miller, n. sp., aedeagus, dorsal view. FIG. 8. *Berosus hatchi* Miller, n. sp., aedeagus, lateral view. FIG. 9. *Berosus striatus* (Say), aedeagus, dorsal view. FIG. 10. *Berosus striatus* (Say), aedeagus, lateral view. FIG. 11. *Berosus ingeminatus* d'Orch., aedeagus, dorsal view. FIG. 12. *Berosus ingeminatus* d'Orch., aedeagus, lateral view. FIG. 13. *Berosus infuscatus* LeC., aedeagus, dorsal view. FIG. 14. *Berosus infuscatus* LeC., aedeagus, lateral view. FIG. 15. *Berosus fraternus* LeC., aedeagus, dorsal view. FIG. 16. *Berosus fraternus* LeC., aedeagus, lateral view.

medially and apically, giving the entire apex the appearance of being slightly emarginate. This character is somewhat variable and sometimes not obvious, but a practiced eye can invariably detect it.

D'Orchymont stated that the females have the pronotum alutaceous or smooth, but I have always found it alutaceous. It is possible that he had some females of another species (possibly *fraternus* LeC.) in his series.

#### *Berosus styliifer* Horn

*Berosus styliiferus* Horn, 1873: 121. Leech and Chandler, 1956: 342.

*B. styliifer* d'Orchymont, 1946: 11.

The type, a female at the Philadelphia Academy of Sciences, has been examined and agrees with material from the Pacific Northwest. An illustration of the male genitalia is presented here (Figs. 3, 4) to aid in identification, although both sexes can easily be identified by the large size of the tooth on the mesosternal lamella.

*Berosus fraternus* LeC.

*Berosus fraternus* LeC., 1855: 364–365. d'Orchymont, 1946: 16–18. Leech and Chandler, 1956: 342.

The type, in the Museum of Comparative Zoology, Harvard, is a female, but it agrees with material from the Pacific Northwest of the species considered to be *fraternus* by d'Orchymont (1946). The male genitalia are illustrated here (Figs. 15, 16).

*Berosus oregonensis* Miller, new species

MALE. Length 4.3–5.5 mm; head black, coarsely and strongly punctate; pronotum light brown with two dark streaks, shaped like parentheses, on the disc, punctation fairly evenly spaced and of about medium thickness and strength, each puncture marked by a dark brown spot; elytral striation and punctation of about medium strength, the odd-numbered intervals, except the first, with a few larger seta-bearing punctures scattered among the smaller ones, each puncture marked by a dark brown spot, with dark streaks at the humerus, in intervals 3 and 5 before the middle (these three streaks form an oblique series) and in the same two intervals behind the middle; scutellum black, strongly punctate; head, pronotum, and elytra smooth between the punctures; venter black with the palpi, legs, and antennae pale; mesosternal lamella with a small blunt tooth anteriorly; teeth in the emargination of the fifth sternite small and set close together, the sternite with a hairy bump projecting backwards towards the teeth; first and second protarsal segments greatly enlarged and bearing a tuft of hairs ventrally; aedeagus in dorsal view with the outer edges of the parameres flaring at the tips and curving towards each other to give the parameres taken together a bluntly rounded tip much like that of *B. striatus* (Say) (Fig. 5), in lateral view the dorsal margin curving smoothly downward to the tip (Fig. 6).

FEMALE. Externally identical to the male except for the following: protarsus not enlarged, and no bump on the fifth abdominal sternite; elytral apex slightly emarginate, the median edge of the emargination forming a small tooth as in *B. striatus* (Say); pronotum and elytra alutaceous between the punctures in some specimens.

HOLOTYPE. Male, 10 miles NW of Klamath Falls, Oregon, in swamp, June 16, 1952, V. Roth (OSU).

ALLOTYPE. Female, same data as holotype (OSU).

PARATYPES. Alberta: 3 ♂♂, 2 ♀♀, Medicine Hat (CAS). Colorado: 22 ♂♂, 15 ♀♀, Ward (31 CAS, 3 UW, 3 DM). Oregon: 2 ♀♀, Klamath Falls (1 UW, 1 DM).

One Colorado male, one Colorado female, and one Alberta male, all from the California Academy of Sciences collection, had been compared with the type of *B. fraternus* LeC. by K. F. Chamberlin, and are labeled "near, not same?" There is considerable variation in the elytral pattern of dark spots. The humeral spot is frequently missing, and there are often extra spots between the ones noted in the description so that there is a more complete oblique series formed anteriorly.

*Berosus hatchi* Miller, new species

MALE. Length 4.3–5.6 mm; head black, coarsely and strongly punctate; pronotum and elytra dark brown, their punctures marked with darker brown or black; scutellum black;

pronotum with two dark streaks, shaped like parentheses, on the disc, punctation of medium strength and thickness, fairly evenly spaced; scutellum punctate as strongly as the pronotum; elytra with the striation and punctation of medium strength, dark streaks on intervals 3-5 before the middle forming an oblique series slanting towards the posterior near the suture, a humeral spot anterior to this series, streaks in intervals 2-5 behind the middle forming an irregular transverse series, and streaks posterior to this latter series in intervals 3 and 5, and with a few larger seta-bearing punctures scattered between the smaller ones on the odd-numbered intervals except the first one; head, pronotum, and elytra all smooth between the punctures; venter black with the legs, antennae, and palpi paler; first and second segments of the protarsus greatly enlarged and bearing a ventral brush of hairs which, except for those around the edges, are expanded into tiny suction discs at their tips; tooth at the anterior of the mesosternal lamella short and blunt; teeth in the emargination of the fifth sternite small and set close together, the sternite bearing a hairy bump which projects backwards and may obscure the teeth; aedeagus in dorsal view with the paramere tips broad and spatulate, bluntly rounded at the end, and parallel sided (Fig. 7) and in lateral view with the dorsal margin sweeping downward in a smooth curve (Fig. 8).

FEMALE. Externally identical to the male except for the following: no protarsal segments enlarged and no bump on the fifth sternite; elytra smoothly rounded at their tips but each bearing a definite sharp spine on its inner margin just anterior to the tip; elytra and pronotum alutaceous between the punctures.

HOLOTYPE. Male, Dry Falls, Grand Coulee, Wash., V-8-1938, E. Dailey (UW).

ALLOTYPE. Female, same data as holotype but V-7-1938 (UW).

PARATYPES. Saskatchewan. 1 ♂, Regina (CAS). Ontario. 1 ♂, Prince Edward Co. (CAS). Manitoba. 3 ♂♂, 2 ♀♀, Winnipeg (AMNH). British Columbia. 7 ♂♂, 4 ♀♀, Kamloops (including Lac du Bois) (4 UW, 4 CAS, 2 CNC, 1 UBC); 1 ♀, Oliver (CNC); 1 ♂, 150-Mile House (CAS); 1 ♂, Paxton Valley (CAS); 1 ♂, Riske Cr. (UBC); 22 ♂♂, 23 ♀♀, Salmon Arm (41 CAS, 2 UW, 2 DM); 1 ♀, Summerland (CAS); 3 ♂♂, 2 ♀♀, Vernon (3 CAS, 1 CNC, 1 UW). Washington. 1 ♂, 2 ♀♀, no further data (AMNH); 5 ♂♂, 4 ♀♀, Grand Coulee (Dry Falls) (UW). Idaho. 1 ♀, Little Malad River, 5 miles W Malad City (DM). Oregon. 8 ♂♂, 5 ♀♀, Burns (5 CNHM, 7 UW, 1 DM).

As in the previous species there is considerable variability in the development of the pattern of dark streaks on the elytra. The spine on the inner margin of the elytron of the female is much larger and more evident than the corresponding bump in *B. striatus* (Say) and *B. oregonensis* Miller, new species.

I take great pleasure in naming this species in honor of Dr. M. H. Hatch, who collected two of the Dry Falls, Washington paratypes and who has aided me greatly throughout my work on the Hydrophilidae of the Pacific Northwest.

#### PARTIAL KEY TO WEST COAST SPECIES OF BEROSUS

If the following key is inserted to take the place of dichotomies 6-8 in the key by Leech and Chandler (1956: 342-343), that key will be usable for all

named species of *Berosus* from California, Oregon, Washington, Idaho, and British Columbia.

6. Front tarsi four-segmented, the basal segment enlarged; elytra never alutaceous between the striae and always entire at the tips (males) ..... 7
- 6<sup>1</sup>. Front tarsi five-segmented, the first segment very small, no segment enlarged (females) ..... 12
7. Metafemora elbowed at the hind margin; basal segment of the front tarsus enlarged only slightly, the ventral surface hairy only in the apical half; head never alutaceous between the punctures but the pronotum occasionally so; generally the punctation larger and deeper and the striation deeper than in the other species (Figs. 9, 10). B.C., Wash., Idaho, Ore., Calif. .... *striatus* (Say)
- 7<sup>1</sup>. Metafemora with the hind margin evenly curved; basal segment of the front tarsus greatly enlarged, roughly triangular, the ventral surface hairy in its apical  $\frac{4}{5}$  or so; punctation and striation variable but generally more shallow than in *striatus* ..... 8
8. Aedeagus with the parameres swollen just back of the tips in dorsal view ..... 9
- 8<sup>1</sup>. Aedeagus with the parameres not swollen in dorsal view ..... 10
9. Aedeagus with the parameres strongly swollen in dorsal view (Fig. 11), in lateral view the dorsal margin of the parameres curving sharply downward before the tip, the tip then extending apically (Fig. 12). Calif. .... *ingeminatus* d'Orch.
- 9<sup>1</sup>. Aedeagus with the parameres only slightly swollen in dorsal view (Fig. 13), in lateral view the dorsal margin of the parameres sloping gradually downward in a straight line (Fig. 14). Calif. .... *infuscatus* LeC.
10. Aedeagus with the dorsal margin of the parameres in lateral view curving sharply downward before the tip, the tip then extending apically (Fig. 16), in dorsal view the tips long and pointed (Fig. 15). B.C., Wash., Idaho, Ore., Calif. .... *fraternus* LeC.
- 10<sup>1</sup>. Aedeagus with the parameres in lateral view bent downward in a smooth curve (Figs. 6, 8) ..... 11
11. Aedeagus with the parameres in dorsal view elongate, but wide and blunt (Fig. 7). Hairs (except the marginal ones) on the ventral side of the enlarged first protarsal segment expanded at their tips into small discs. B. C., Wash., Ore. .... *hatchi* Miller, new species
- 11<sup>1</sup>. Aedeagus with the parameres in dorsal view with the tips rounded, their outer edges bent towards each other much as in *striatus* (Say) (Fig. 5). Ore. .... *oregonensis* Miller, new species
12. Apex of the elytron slightly emarginate (Fig. 1) or with a spine on its inner margin ..... 13
- 12<sup>1</sup>. Apex of the elytron a simple smooth curve (Fig. 2) ..... 15
13. Apex of the elytron slightly emarginate (Fig. 1) ..... 14
- 13<sup>1</sup>. Apex of the elytron with a definite spine on its inner margin; elytra alutaceous between the punctures ..... *hatchi*
14. Pronotum alutaceous between the punctures, the elytra smooth; punctures of the pronotum and the striation of the elytra generally larger and deeper than in the other species ..... *striatus*
- 14<sup>1</sup>. Elytra smooth or alutaceous between the punctures; pronotum smooth if elytra smooth, if elytra alutaceous pronotum either smooth or alutaceous; punctation of pronotum and striation of elytra moderate ..... *oregonensis*
15. Head smooth between the punctures; elytra smooth or alutaceous; pronotum smooth if elytra smooth, if elytra alutaceous pronotum either smooth or alutaceous; punctation of pronotum and striation of elytra variable, but not generally extremely heavy

or extremely light ..... *fraternus*  
 15<sup>1</sup>. Head, pronotum, and elytra all alutaceous between the punctures; pronotal puncta-  
 tion light and small ..... *infuscatus, ingeminatus*

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## Undescribed Species of Crane-Flies from the Himalaya Mountains (Diptera: Tipulidae), X<sup>1</sup>

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**Abstract** Six new species from Kumaon, Nepal, and Sikkim, all belonging to the Eriopterine genus *Ormosia* Rondani, are described. These are *Ormosia* (*Oreophila*) **stenostyla**, and five species belonging to a new subgenus **Parormosia**, *O. (P.) leucoplagia*, *O. (P.) leucostictula*, *O. (P.) mahabharatae*, *O. (P.) peramata*, and *O. (P.) perdiffusa*.

Part IX under this title was published in the **Journal of the New York Entomological Society**, **72**: 168–173, 1964. The species described herewith belong to the extensive genus *Ormosia* Rondani, well represented throughout the Holarctic Region and including numerous species in the Himalayas and in western China. Most of the materials were included in the rich collections taken by Dr. Fernand Schmid during the 1950's, as discussed in many earlier papers. A single species was collected by Dr. Edward I. Coher in Nepal. I am deeply indebted to the collectors for the privilege of retaining the types of these novelties in my personal collection.

*Ormosia* (*Oreophila*) **stenostyla** n. sp.

Size medium (wing of male to 5.5 mm); general coloration grayish brown; antennae elongate; femora brownish yellow with a narrow nearly terminal brown ring; wings

<sup>1</sup> Contribution from the Entomological Laboratory, University of Massachusetts.