

## II. CYPHODERRIS, A GENUS OF KATYDID OF SOUTHWESTERN CANADA AND THE NORTHWESTERN UNITED STATES

This remarkable genus, confined to the southwestern section of Canada and the northwestern United States, was described in 1864<sup>3</sup> at which time a single species, *monstrosus*, was proposed. Since then it has been reported from the northwest a number of times.

In 1904 Caudell described *piperi* as a variety<sup>4</sup> and in 1923<sup>5</sup> Buckell discussed *monstrosa* very fully, giving much information as to the individual variation occurring in material from British Columbia and questioning the validity of *piperi*. In 1924<sup>6</sup> Buckell recognized that two species were present in British Columbia, differing widely in the male genitalia but with females apparently indistinguishable; he considered one of these to be *monstrosus*, the other *piperi*. Study of the original description of *monstrosus* and the series now before us shows the last conclusion to be incorrect. Actually *piperi* is an absolute synonym of *monstrosa*, and the species with less highly specialized male genitalia is undescribed. To the latter we here give the name *buckelli*.

**Cyphoderris buckelli** new species (Pl. XXII, figs. 9, 10 and 12)

1904. *Cyphoderris monstrosa* Caudell (in part not of Uhler, 1864), Jour. N. Y. Ent. Soc., XII, p. 48. [♂; Pullman, Washington.]

1923. *Cyphoderris monstrosa* Buckell (in part not of Uhler, 1864), Canadian Ent., LV, p. 225. [British Columbian localities here recorded.]

1924. *Cyphoderris piperi* Buckell (not of Caudell, 1904), Proc. Ent. Soc. British Columbia, No. 21, p. 9. [British Columbia.]

This species was also confused with *monstrosa* by Buckell in 1921 and 1922. It differs not only in the very different male genitalia but also in averaging smaller in size. In the male the cerci are not flattened, the subgenital plate between them is bulbous instead of lamellate and cleft and that plate at its apex is not produced in a remarkable process directed ventro-cephalad.

*Type*.—♂; Pullman, Washington. May, 1895. (C. V. Piper.)  
[Hebard Collection, Type No. 1237.]

<sup>3</sup> Proc. Ent. Soc. Phila., II, p. 561.

<sup>4</sup> Jour. N. Y. Ent. Soc., XII, p. 53.

<sup>5</sup> Canadian Ent., LV, p. 225.

<sup>6</sup> Proc. Ent. Soc. British Columbia, No. 21, p. 9.

Agrees very closely with *monstrosa* in general form and coloration, size averaging smaller. Eighth tergite (concealed by seventh dorso-laterad) produced mesad in a very strongly transverse narrow projection, the distal margin of which is straight, transverse, terminating on each side in a very small tooth. Ninth tergite completely concealed by the eighth dorso-mesad. Tenth tergite narrowly projecting in dorsal portion, there with a very deep median sulcation, which projects ventrad as a small triangle, the dorsal surface on each side of the median sulcation with a large rounded node. Paired chitinous plates between cerci produced dorsad, adjacent, the dorso-external angles of each more produced than their dorso-internal angles, conical, surmounted by a minute tooth. Cerci not flattened. Ultimate sternite with a short stout slightly incurved style dorsad on each side, between these produced in a rounded lobe with surface covered with minute short teeth.

A female, bearing the same data as the type, taken May 21, 1903, belonging to the National Museum, is here selected allotype. From the majority of the females of *monstrosa* before us this specimen differs only in its smaller size.<sup>7</sup> In this sex the pronotum shows no expansion or inflation caudad. Mere vestiges of tegmina and wings are visible laterad, which do not even touch each other. The ovipositor is minute, composed of four valves which taper to their blunt apices and are scarcely longer than the styles. The subgenital plate is triangularly produced but no longer than the ovipositor.

The present series, like that of *monstrosa*, is buffy brown strikingly marked with almost coppery brown and shining dark brown. In males the pronotum is usually very dark cephalad, this extending caudad on the lateral lobes and mesad and rarely flooding the mesonotum as well. The limbs are longitudinally marked with light and dark brown. The tegmina are uniform brown with veins slightly darker, occasionally paling toward the costal margins. The occiput may be solidly dark or show weakly to very prominently three to five narrow pale longitudinal lines.

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<sup>7</sup> Buckell wrote us in 1928 "The female of a pair which I took in coitu is the only one I have ever been able to associate definitely with one or the other of the two species."

It is probable that part of the females here recorded by us as *monstrosa* from the Chilcotin District and Nicola Lake, British Columbia, actually represent *buckelli*.

	Length of body	Length of pronotum	Caudal width of pronotum	Exposed length of tegmen	Length of caudal femur
♂					
Pullman, Wash. (5) . . .	19-22	8.5-9.5	7.9 <sup>a</sup> -9.	7.1-7.8	9.7-9.8
Lumby, B.C. (10) . . . .	19-25 <sup>b</sup>	8.1-8.7	6.8 <sup>a</sup> -8.7	7.2-7.4	9-10.3
				Length of ovipositor	
♀					
Pullman, Wash. . . . .	23.8	7.3	7.1	2.3	9.3

*Specimens Examined:* 53; 51 males, 1 female and 1 immature individual.

BRITISH COLUMBIA: Chilcotin District, V, 26, 1920 and VII, 23, 1922, (E. R. Buckell), 1 ♂, [Canadian Nat. and Hebard Clns.]. Cranbrook, V, 12, 1926, (E. R. Buckell), 1 ♂. Yahk, VI, 10, 1926, (A. A. Dennys), 1 ♂, *paratype*. Lumby, V, 3, 1925 and V, 13, 1927, (E. R. Buckell), 10 ♂, *paratypes*. Kelowna, V, 18, 1921, (R. C. Treherne), 1 ♂, *paratype*. Okanagan Falls, V, 6, 1913, (E. M. Anderson), 1 ♂, *paratype*, [U. S. N. M.]. Rock Creek, VI, 9, 1923, (E. R. Buckell), 1 ♂, *paratype*, [U. S. N. M.]. Nicola Lake, V, 20 and 21, 1922, (E. R. Buckell), 14 ♂, *paratypes*, [Canadian Nat., U. S. N. M. and Hebard Cln.]. Aspen Grove, V, 26 to VI, 15, 1922, (P. N. Vroom), 4 ♂, *paratypes*, [U. S. N. M.].

WASHINGTON: Pullman, IV, 5, 1902, (C. V. Piper), 1 juv. ♂, [U. S. N. M.]; (J. L. Webb), 1 ♂, *paratype*; V, 10 to 30, 1895 to 1903, (C. V. Piper), 8 ♂, 1 ♀, *type*, *allotype* and *paratypes*, [U. S. N. M. and Hebard Cln.].

IDAHO: Moscow, VII, 28, 1910, (J. M. Aldrich), 1 ♂, *paratype*, [U. S. N. M.]; near base of Moscow Mountain, 3000 feet, VI, 11, 1933, (P. L. Rice; singing at night on shrubs in sparsely timbered area), 7 ♂, *paratypes*, [Hebard Collection].

**Cyphoderris monstrosa** Uhler (Pl. XXII, figs. 7, 8 and 11)

1864. *C[yphoderris] monstrosus* Uhler, Proc. Ent. Soc. Phila., II, p. 551. [♂, Oregon.]

1904. *Cyphoderris monstrosa* var. *piperi* Caudell, Jour. N. Y. Ent. Soc., XII, p. 53, [♂, ♀; Paradise Valley at 6000 feet, Mount Rainier, Washington].

1924. *Cyphoderris monstrosa* Buckell, Proc. Ent. Soc. British Columbia, No. 21, p. 9. [British Columbia.]

The male genitalia are fortunately sufficiently discussed in Uhler's diagnosis to enable us to recognize *monstrosa* beyond query. In Caudell's 1904 treatment of the genus his figure 1 is poorly drawn and represents a male in the instar preceding maturity, not a female as was indicated. Comparison of the original series of *piperi* with our other series shows that recogni-

<sup>a</sup> Abdomen extruded.

<sup>b</sup> Pronotum, as is occasionally the case in most series, very much less inflated caudad than is normal.

tion of a race is not warranted, as was suggested by Buckell in 1923. Caudell gave only the larger size, more definite dorso-lateral pronotal sulcation, greater pronotal inflation caudad and more extensive dark marking of the pronotum to separate his variety *piperi* from typical *monstrosa* and it is now clear that all these features must be attributed to individual variation. The pronotal coloration is particularly variable and the dark portion includes only the meso-dorsal portion of the lateral lobes (many females and all immatures, sometimes weak in the latter), or spreads to form a transverse band cephalad (many males, few females) or includes all the pronotum except its ventral margin or the cephalic portion of that margin (very few males).

Compared with the male genitalia under *piperi*, those of *monstrosa* are further shown in the accompanying figures.

The distribution of *monstrosa* is now known to extend north to the Saskatchewan River below the junction of the North Fork, Saskatchewan (Rehn, 1908); Banff, Alberta, and Field to the head of Moose River and the Chilcotin District of British Columbia: east to the first locality here given; Thompson Falls, Montana; Wind River, Wyoming, and Pearl in extreme northern central Colorado: south to the latter; Centerville, Idaho, and the upper Rogue River in southwestern Oregon.

In addition to a number of specimens before us which have been previously correctly recorded, we here record 105 specimens; 56 males, 36 females and 13 immature individuals.

ALBERTA: Banff, VI, 10 to VIII, 8, 1902 to 1927, (Sanson; Bryant), 2 ♂, 1 ♀, 1 large juv. ♀, 1 juv. ♀, [Canadian Nat. and U. S. N. M.]. Lake Louise, VIII, 20, 1927, (L. A. Stephenson), 1 juv. ♀, [Hebard Cln.].

COLORADO: Vicinity of Pearl, North Park, 8800 feet, VIII, 17, 1932, (G. Alexander), 1 ♂, [Hebard Cln.].

IDAHO: Kellog, VI, 25, 1926, (R. E. Hutchins), 1 ♂, [Hebard Cln.]. Coeur d'Alene Lake, 1 juv. ♀, [Hebard Cln.]. Centerville, 5000 feet, (Webb), 1 ♀, [U. S. N. M.].

BRITISH COLUMBIA: Field, VII, 15, 1927, (T. Ulke), 1 ♂, [U. S. N. M.]. Head of Moose River, VII, 17, 1911, (N. Hollister), 1 ♂, 1 juv., [U. S. N. M.]. Vavenby, VI, 1, 1924, (T. A. Moilliet), 1 ♂, [U. S. N. M.]. Salmon Arm, VI, 10, 1924, (E. R. Buckell), 10 ♂, 2 ♀. Lumby, V, 3, 1925, (E. R. Buckell), 3 ♂, 1 ♀, (pair taken in coitu), [Hebard Cln.]. Peachland, VII, 1907, 1 ♂, [Canadian Nat. Cln.]. Nicola Lake, V, 20 to VIII, 20, 1922, (E. R. Buckell), 15 ♂, 12 ♀, [Canadian Nat., U. S. N. M., Univ. of Idaho and Hebard Clns.]. Lilloet, VII, 2, 1920, (A. B. Baird), 3 ♂, [Canadian Nat. and Hebard Cln.].

Chilcotin District, IV, 11, 1923, 1 juv. ♂; V, 24 to VII, 14, 1920 to 1922, (E. R. Buckell), 10 ♂, 16 ♀, 1 juv. ♀, [Canadian Nat., Acad. Nat. Sci. Phila., and Hebard Clns.]. Gold River, 7000 feet, VII, 29, 1926, (Heacock; nocturnal), 1 ♂, [Acad. Nat. Sci. Phila.].

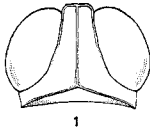
WASHINGTON: Stampede, 2800 feet, VIII, 5 and 6, 1909, (Rehn and Hebard; on steep slopes under stones and in fir forest), 2 ♂, 2 ♀, 4 juvs. [Hebard Cln. and Acad. Nat. Sci. Phila.]. Yakima, 1 ♂, [Hebard Cln.]. Klikitat Valley, VII, 10, 1882, (S. Henshaw), 1 large juv. ♂, [Mus. Comp. Zool.]. Paradise Valley, Mt. Rainier, 5850 feet, VII, 9, 1911, (J. R. Slevin), 1 ♀; VII, (A. N. Caudell), 1 ♂, [U. S. N. M.]; VII, 19 to 29, 1905, (M. W. Lyon Jr.), 1 large juv. ♂, 2 large juv. ♀; VIII, 25, 1905, (H. G. Barber; singing in fir trees just below timber line after dark), 2 ♂, [U. S. N. M.].

At Stampede, Washington, a male was found under a stone while clearing a camp site in the fir forest during the afternoon. It was sound asleep, would not jump and when laid on its back remained in that position. Other specimens were also found under stones the following day. When disturbed they would often give a clumsy jump, alight on their backs or sides and with legs tucked up closely would remain motionless. When in such position the pinkish white undersurfaces of body and limbs perfectly resembled the pallid growing shoots of plants under the stones which had been overturned.

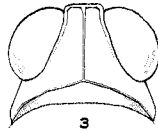
Immediately after sunset the males began to sing, a faint elusive note repeated much like that of *Scudderia* but far less harsh and of a decidedly higher pitch, in timbre suggesting that of *Oecanthus*. This song continued only until the evening chill (decided in this environment) commenced. So ventriloquistic was the song and so numerous the singers that individuals were exceedingly difficult to locate and but one specimen was taken at that time, stridulating on the ground and becoming silent when approached, but not moving except to draw up its legs closely and roll over. The telegraph operator at Stampede said that these insects often come indoors at night and hop about rather actively.

## EXPLANATION OF PLATE XXII

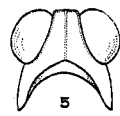
- Fig. 1.—*Psychomastax psylla psylla* Rehn and Hebard. Male, *type*. Strawberry Valley, San Jacinto Mountains, California. Dorsal outline of head. (Greatly enlarged.)
- Fig. 2.—*Psychomastax psylla psylla* Rehn and Hebard. Female, *allotype*. Strawberry Valley, San Jacinto Mountains, California. Dorsal outline of head. (Same scale.)
- Fig. 3.—*Psychomastax psylla robusta* new subspecies. Male, *paratype*. Lee Canyon, Spring Mountain Range, Nevada, at 8000 to 8500 feet. Dorsal outline of head. (Same scale.)
- Fig. 4.—*Psychomastax psylla robusta* new subspecies. Female, *paratype*. Lee Canyon, Spring Mountain Range, Nevada, at 8600 feet. Dorsal outline of head. (Same scale.)
- Fig. 5.—*Psychomastax psylla deserticola* new subspecies. Male, *type*. Cushenbury Ranch, at 4100 feet, San Bernardino County, California. Dorsal outline of head. (Same scale.)
- Fig. 6.—*Psychomastax psylla deserticola* new subspecies. Female, *allotype*. Cushenbury Ranch at 4100 feet, San Bernardino County, California. Dorsal outline of head. (Same scale.)
- Fig. 7.—*Cyphoderris monstrosa* Uhler. Male. Cloud Cap Inn, Mount Hood, Oregon. Lateral view of distal portion of male abdomen. (Greatly enlarged.)
- Fig. 8.—*Cyphoderris monstrosa* Uhler. Male. Cloud Cap Inn, Mount Hood, Oregon. Ventral view of distal portion of male abdomen. (Same scale.)
- Fig. 9.—*Cyphoderris buckelli* new species. Male, *type*. Pullman, Washington. Lateral view of distal portion of male abdomen. (Same scale.)
- Fig. 10.—*Cyphoderris buckelli* new species. Male, *type*. Pullman, Washington. Ventral view of distal portion of male abdomen. (Same scale.)
- Fig. 11.—*Cyphoderris monstrosa* Uhler. Male. Cloud Cap Inn, Mount Hood, Washington. Lateral view of entire insect. ( $\times 1$ )
- Fig. 12.—*Cyphoderris buckelli* new species. Male, *type*. Pullman, Washington. Lateral view of entire insect. (Same scale.)



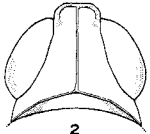
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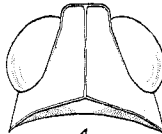
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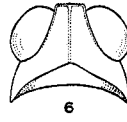
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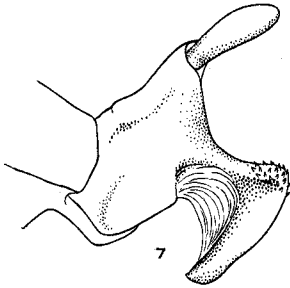
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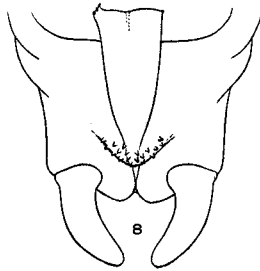
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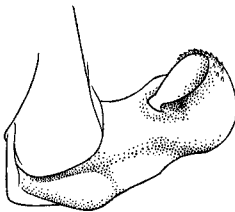
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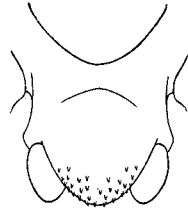
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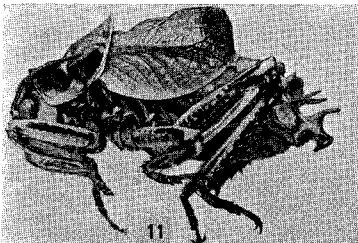
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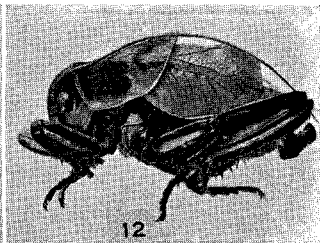
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