

***Taeniopteryx* of Western North America
(Plecoptera: Taeniopterygidae)**

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Abstract.—Of the 11 valid North American species of *Taeniopteryx*, 3 have distributions including western North America: *T. burksi* Ricker and Ross, *T. nivalis* (Pictet), and *T. parvula* (Banks). *Taeniopteryx pecos* Baumann and Jacobi is considered conspecific with *T. parvula*. Keys to the adults and nymphs are presented for the above species.

There are presently twelve species of *Taeniopteryx* recognized from North America (Stark et al., 1986); of these, only four have been recorded from western North America: *T. burksi* Ricker and Ross, *T. nivalis* (Fitch), *T. parvula* Banks, and *T. pecos* Baumann and Jacobi. Additionally, Canton et al., (1981) reported on several populations of an unidentified species of *Taeniopteryx* occurring in northcentral Colorado. Adults of these and others from the North Platte River drainage in Wyoming were successfully reared by us. In order to identify these specimens a study of the *Taeniopteryx* species that occur west of the Mississippi River was necessary. Previously, only *T. nivalis* was recognized from the Rocky Mountains by Baumann, et al., (1977).

The following institutions or individuals made specimens available for study: S. P. Canton, Littleton, Colorado; J. F. Flannagan, Freshwater Institute, Winnipeg, Manitoba; O. S. Flint, Jr., Smithsonian Institution, Washington, D.C.; G. R. Fiala, Gresham, Oregon; D. Funk, Avondale Pennsylvania; W. J. Hanson, Utah State University; P. P. Harper, University of Montreal, Montreal, Quebec; S. G. Jewett, Jr., West Linn, Oregon; R. F. Kirchner, Huntington, West Virginia; J. Z. Jacobi, New Mexico Highlands University; A. V. Nebeker, Corvallis, Oregon; N. D. Penny, California Academy of Sciences; S. D. Smith and R. N. Vinyard, Central Washington State University; G. B. Wiggins, Royal Ontario Museum, Toronto; B. Wisseman, Oregon State University; and R. S. Zack and W. L. Turner, Washington State University.

***Taeniopteryx burksi* Ricker and Ross**

Taeniopteryx burksi Ricker and Ross 1968: 1425 (description of adults).

Taeniopteryx burksi, Harper and Hynes 1971: 943; Fullington and Stewart 1980: 244 (description of nymph).

The male of this species is very similar to the eastern *T. maura* (Pictet) and the transcontinental *T. nivalis*, all three species having straight, bluntly pointed paraprocts (Fig. 3), and a vesicle. Males of *T. burksi* may be distinguished from its western relative, *T. nivalis* most reliably by the vesicle being 3–5 times as long as wide and by the distinctive extruded aedeagus having both dorso- and ventrolateral lobes long (Fig. 5). Females as similar to *T. parvula*, but the V-shaped notch of the 8th sternum is usually uniformly sclerotized in older individuals.

Taeniopteryx burksi is a common and widely distributed species east of the Rocky Mountains (Ricker and Ross, 1968; Kondratieff and Ward, 1987). The presence of this species in a few streams of the Great Plains of eastern Colorado is no doubt the result of western dispersal from the East during glacial periods (Stewart et. al., 1974).

Western records examined: COLORADO: Yuma Co., Chief Cr., 31 I 1986, B. C. Kondratieff & J. V. Ward, 15♂, 11♀, 1 N; N Fork Republican R., Wray, 31 I 1986, B. C. Kondratieff and J. V. Ward 18♂, 17♀, 20 N; Kit Carson Co., S Fork Republican R., Rt. 385, 31 I 1986, B. C. Kondratieff & J. V. Ward, 2 N.

***Taeniopteryx nivalis* (Fitch)**

Nemoura nivalis Fitch 1847: 279.

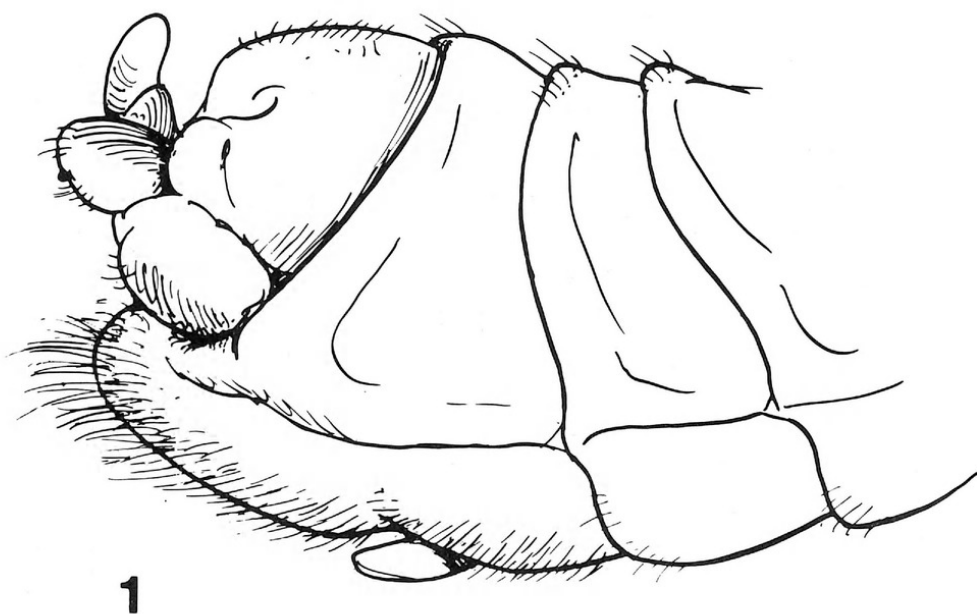
Taeniopteryx nivalis, Ricker and Ross, 1968: 1434; Dosdall and Lehmkuhl, 1979:22 (description of adults).

Taeniopteryx nivalis, Harper and Hynes 1971: 945; Fullington and Stewart 1980: 253 (description of nymph).

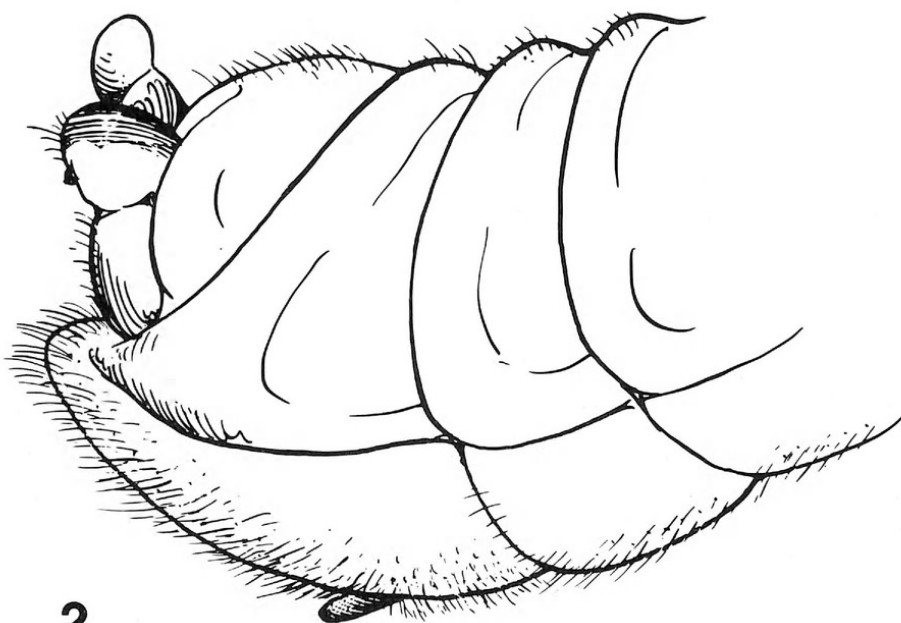
The male of *T. nivalis* can only be confused with *T. burksi* in the West. The short vesicle (Fig. 2) (2–3 times as long as wide) and the extruded aedeagus with only short ventrolateral lobes easily distinguishes this species (Fig. 6). Previously, in other existing keys to the North American species (Ricker and Ross, 1968; Hitchcock, 1974), the character "hairs of the hind margin of the 9th sternite pointing downward and forward, usually much shorter than those situated more anteriorly on the sternite" is used to separate *T. nivalis* from *T. burksi* (and *T. maura*). However, for many western specimens of *T. nivalis*, this character is difficult to use, with specimens appearing intermediate or not definite. Western specimens of *T. nivalis* examined are similar in all respects to eastern specimens examined in vesicle and aedeagal characteristics. Females of *T. nivalis* are distinguished by the U-shaped notch of the 8th sternum with strongly sclerotized shoulders.

The distribution of *T. nivalis* in the West has been discussed by Ricker (1964). He suggested that there was a postglacial or interglacial dispersal across the northern plains, and southward down the chain of the Rocky Mountains followed by extinction(s) in northcentral North America.

Western records examined: CANADA, Manitoba, Little Ochre R., 4 IV 1984, J. F. & P. M. Flannagan, 23♂, 3♀; Roseau River, 25 III 1977, J. F. Flannagan, 4 N; CALIFORNIA: Plumas Co., Middle Fork Feather, R., Hwy 70, above Portola, 14 II



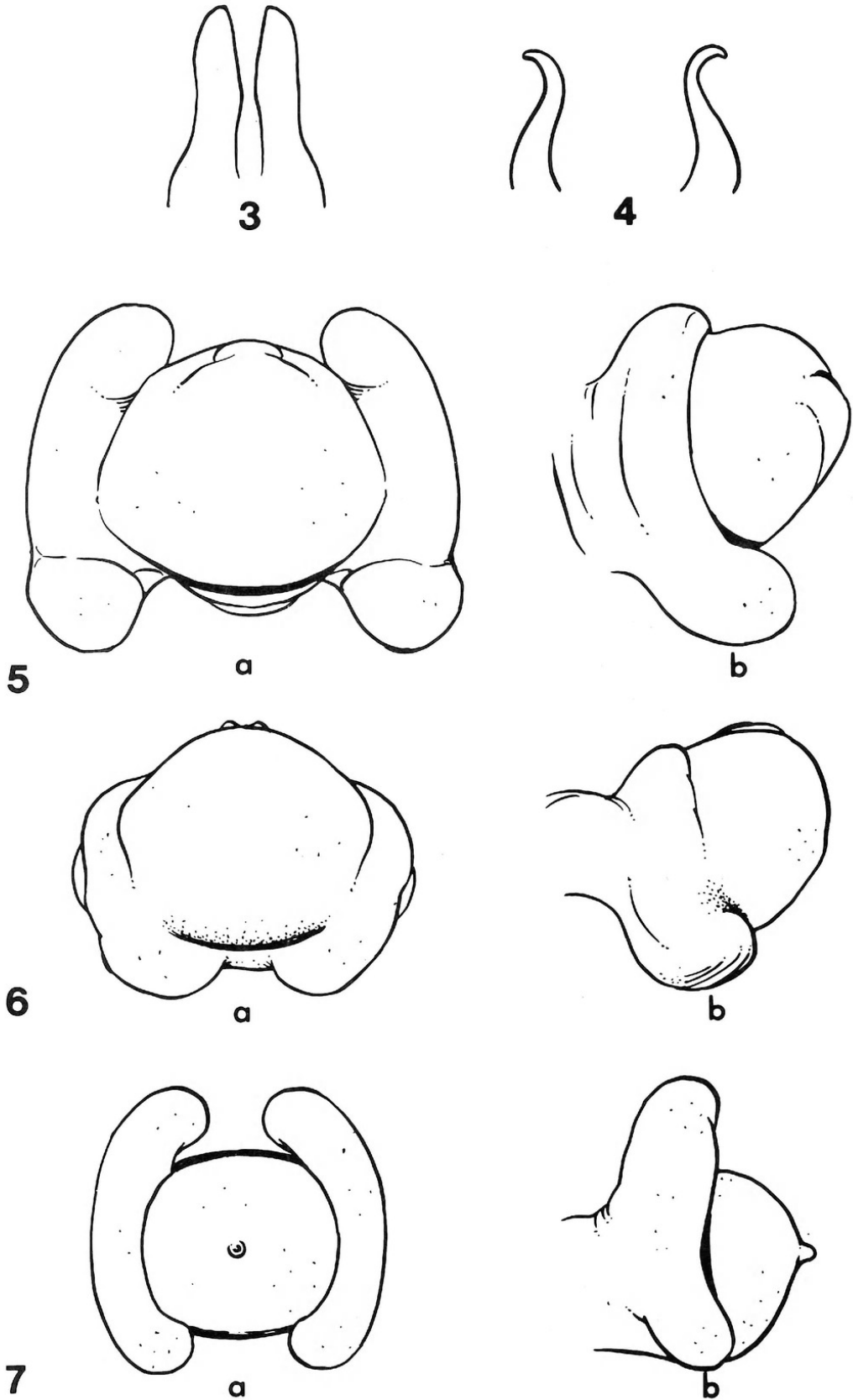
1



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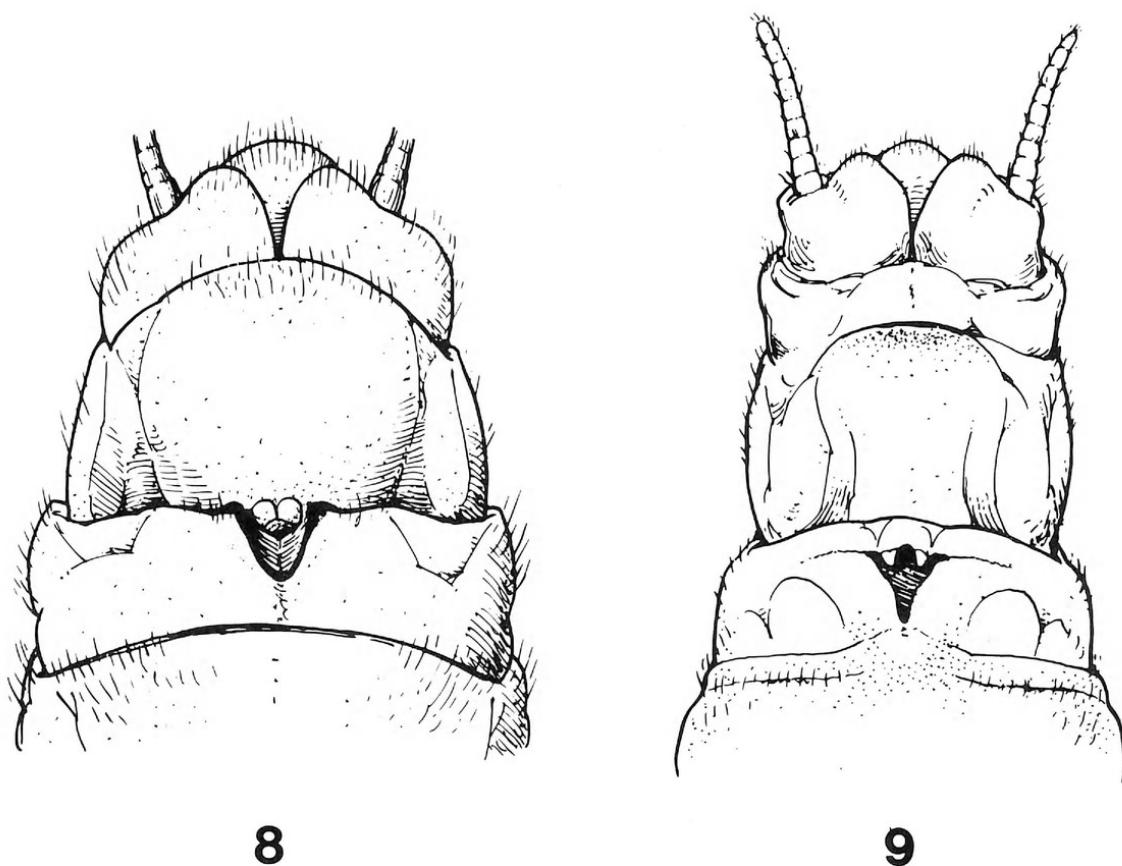
Figures 1–2. Male terminalia, lateral view. 1. *Taeniopteryx burksi*, 2. *Taeniopteryx nivalis*.

1985, R. W. Baumann & C. R. Nelson, 21 N; Siskiyou Co., Shasta R., N of Yreka, 25 II 1968, S. G. Jewett, 1♂, 1♀; IDAHO: Adams Co., Mud Cr., Hwy 95, 3 mi. W of New Meadows, 24 III 1965, A. V. Nebeker, 2♂; Benewah Co., Fernwood, 5 III 1952, R. S. Vail, 1♀; Latah Co., Big Bear Cr., nr. Kendrick, 8 III 1984, G. R. Fiala, 2♂, 1♀; Potlatch R., ca. 3 mi. S Helmer nr. Little Boulder Campgrd, 26 III 1986, R. S. Zack, 3♂, 11♀; Potlatch R., jct. Hog Meadow Cr., 26 IV 1985, R. W. Baumann, & C. R. Nelson, 1♂, 7♀; OREGON: Baker Co., Powder R., Hwy 86, jct.



Figures 3–4. Paraprocts. 3. *T. burksi*, 4. *T. parvula*.

Figures 5–7. Extruded aedeagus, a. from behind; b. lateral. 5. *T. burksi*, 6. *T. nivalis*, 7. *T. parvula*.



Figures 8–9. Female terminalia, ventral. 8. *T. nivalis*, 9. *T. parvula*.

Spring Cr., 24 IV 1985, R. W. Baumann & C. R. Nelson, 1♂; Spring Cr., Hwy 86, jct. Powder R., 3 III 1984, R. W. Baumann & C. R. Nelson, 3♀; Benton Co., Muddy Cr. 17 II 1985, G. R. Fiala, 1♀; UTAH, Box Elder Co., Raft R., Upper Narrows, 15 II 1979, R. W. Baumann & G. M. Webb, 1 N; same location, 28 III 1979, R. W. Baumann & G. M. Webb, 7♂, 5♀; WASHINGTON, Kittitas Co., Ellensburg, CWU Campus, 10 III 1981, M. Rush, 1♀; Lewis Co., N Fork Newaukum R., 16 II 1987, G. R. Fiala, 1♀; Scatter Cr., 9 mi N Centralia, 10 III 1964, S. G. Jewett, Jr., 1♀; Whitman Co., S Fork Palouse R., nr. Albion, 7 III 1984, G. R. Fiala, 1♀; Lyle Grove, 8 mi SW Pullman, 3 III 1973, M. C. Hunter, 8♂.

***Taeniopteryx parvula* Banks**

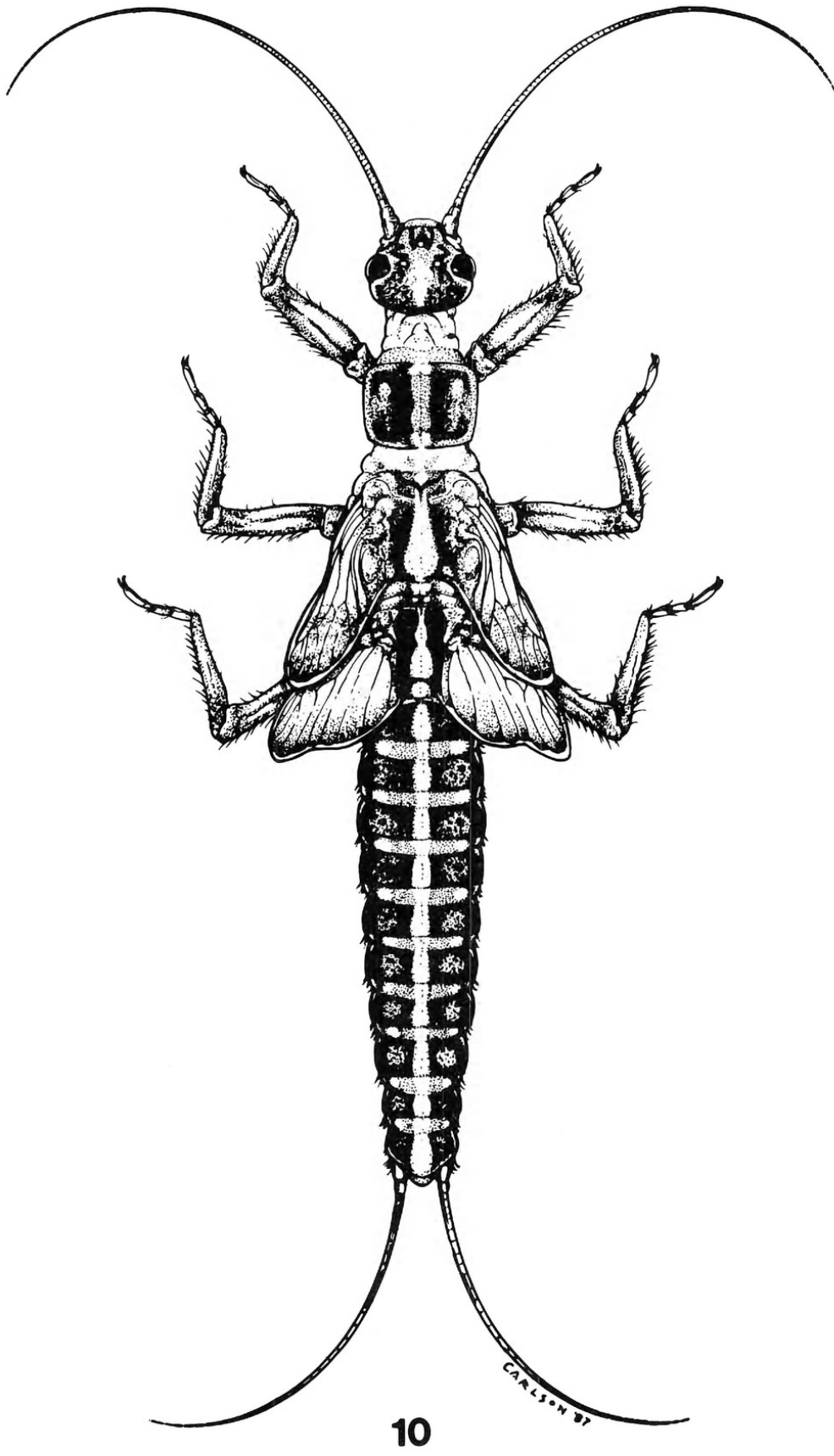
Taeniopteryx parvula Banks 1918: 7.

Taeniopteryx parvula, Ricker and Ross 1968: 1436 (description of adults).

Taeniopteryx parvula, Harper and Hynes 1971: 946; Fullington and Stewart 1980: 254 (description of nymph).

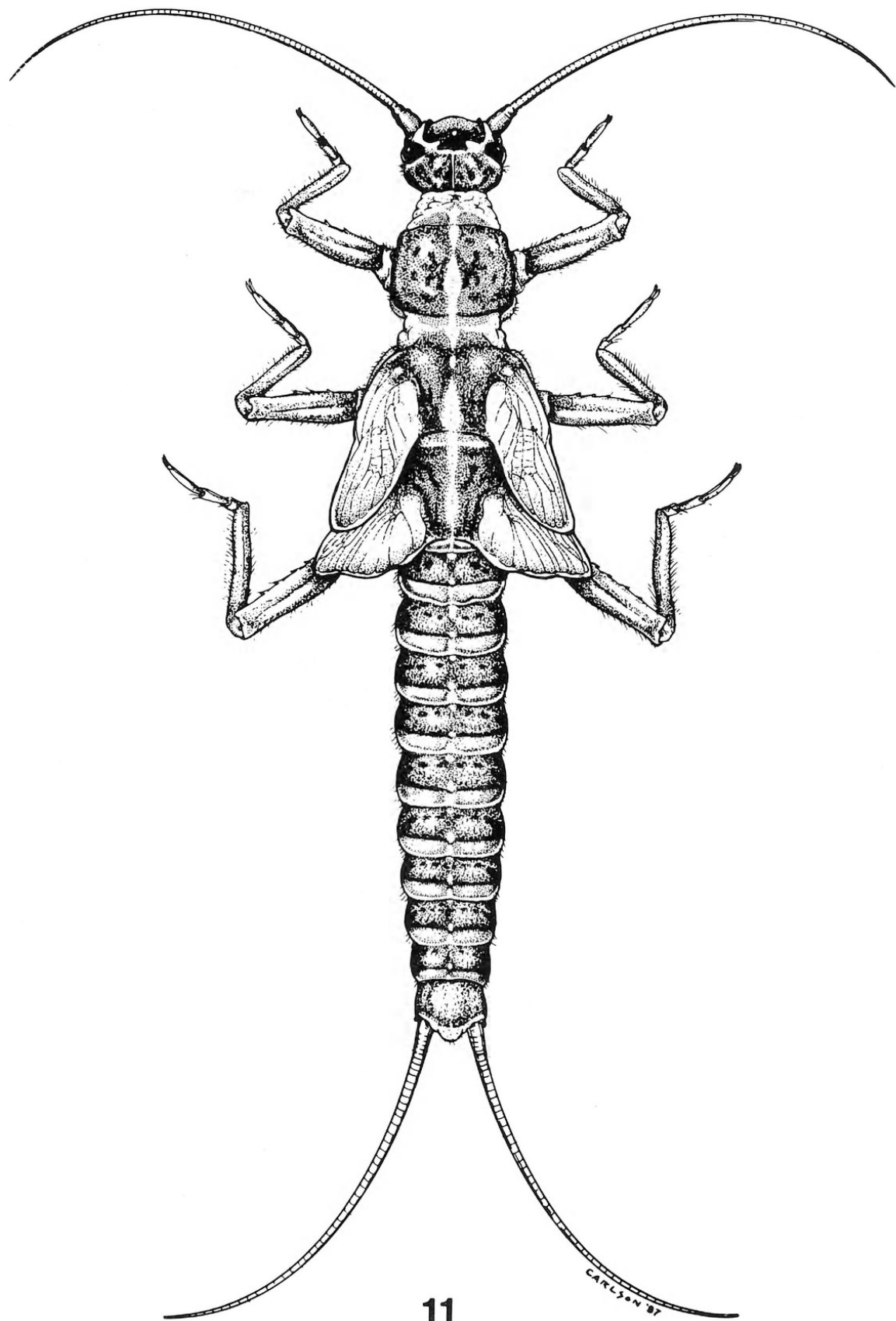
Taeniopteryx pecos Baumann and Jacobi 1984: 147. *New Synonym*

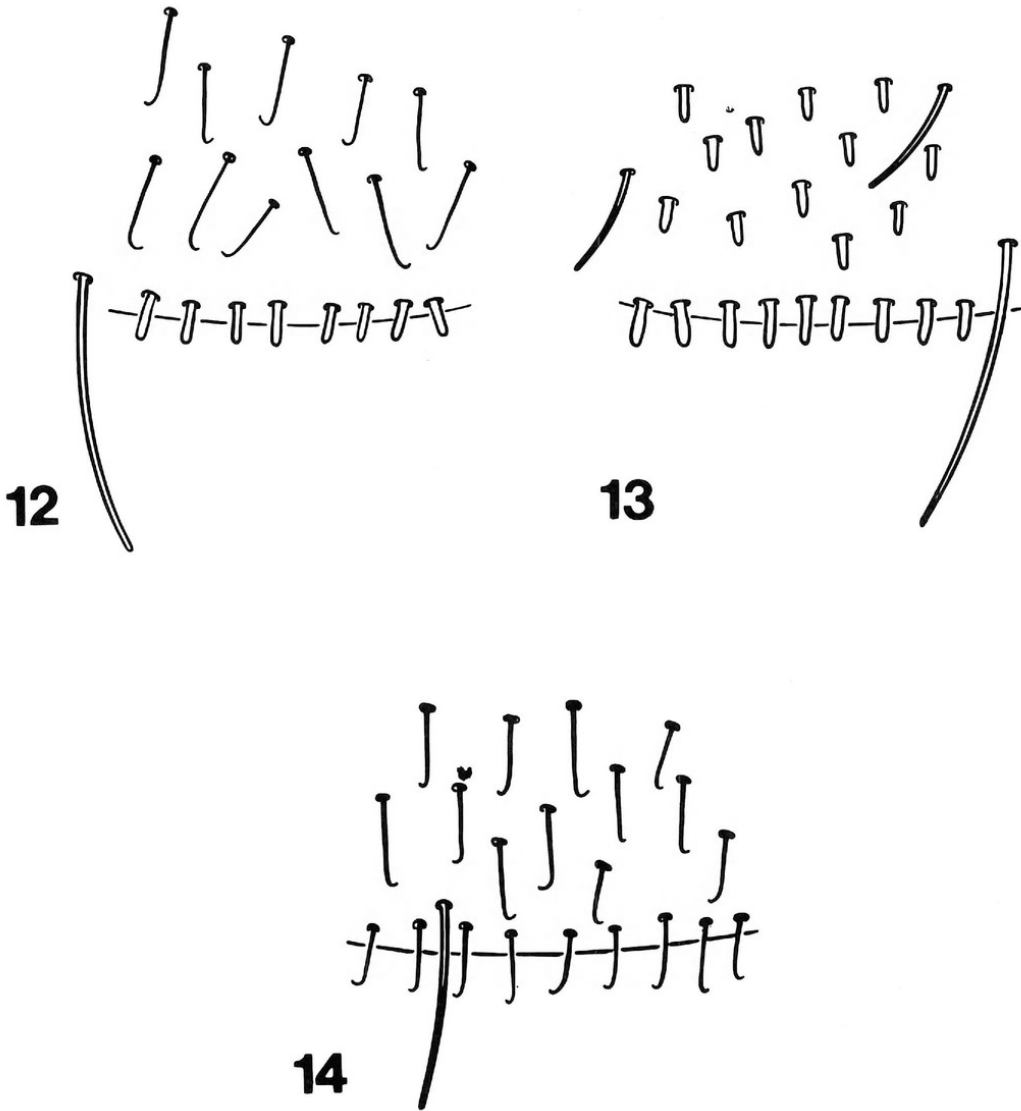
Baumann and Jacobi (1984) described *T. pecos* from a series of specimens from the Pecos River, San Miguel Co., New Mexico. They indicated that this species was “very close to *T. parvula*.” The characters used to separate *T. pecos* from *T. parvula*,



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Figures 10–11. Nymphal habitus, dorsal. 10. *T. burksi*, 11. *T. parvula*.





Figures 12–14. Nymphal eighth abdominal tergum. 12. *T. burski*, 13. *T. nivalis*, 14. *T. parvula*.

size and curvature of the paraproctal hooks and size of the epiproct are relative and agree with specimens from Colorado and Wyoming and typical *T. parvula* from eastern North America. The aedeagus (Fig. 7) of *T. parvula* is very distinctive and was first illustrated by Frison (1942: Fig. 7). Males of *T. parvula* are easily separated from all western *Taeniopteryx* by the lack of a vesicle, and the distally hooked paraprocts (Fig. 4). Females can be distinguished by the pale medial portion of the 8th sternum and notch shape (Fig. 9).

The nymphs of *T. parvula*, as with *T. nivalis*, have two forms, striped (at least with a partial stripe) (Fig. 11) or lacking a middorsal stripe. Fullington and Stewart (1980) only treated *T. parvula* as being the latter. In the series of nymphs examined from Colorado and Wyoming, individuals varied from lacking a middorsal stripe to having at least a partial stripe. This same condition has been observed by Kirchner (personal communication) in populations from West Virginia.

The occurrence of *T. parvula* in the Rocky Mountains is probably also the result of postglacial and interglacial dispersal across the northern plains. The emergence of this species in isolated areas of the northcentral Rockies in March and often under ice, may account for the rarity of specimens in collections.

Western records examined: COLORADO, Jackson Co., Grizzly Cr., Rt 14, 14 III 1987, B. C. Kondratieff, 10♂, 3♀, 15 N; Roaring Fork, 1 mi. above jct. N. Platte R., 22 X 1987, D. Rees, 1 N; NEW MEXICO, San Miguel Co., Pecos R. Hwy. 119, Tecolotito, 27 II 1979, G. Z. Jacobi, 4♂, 2♀ (paratypes); Guadalupe Co., Pecos R., Hwy. 119, Anton Chico, 5 I 1980, G. Z. Jacobi, 9 N; WYOMING, Carbon, Co., N Platte R. 2 mi. above jct. Big Cr., 24 X 1987, D. Rees, 1 N; same location 15 III 1988, 1♂, 1♀.

Key to the males of western North American *Taeniopteryx*

1. Ninth sternum with a vesicle; paraprocts straight and bluntly pointed (Fig. 3) . 2
Vesicle absent; tips of paraprocts hooked (Fig. 4) *parvula*
2. Aedeagus with short dorsolateral lobes (Fig. 6); vesicle short, 2–3 times as long as wide *nivalis*
Aedeagus with long dorso- and ventrolateral lobes (Fig. 5); vesicle long, 3–5 times as long as wide *burksi*

Key to the females of western North American *Taeniopteryx*

1. Middle portion of 8th sternum somewhat pale, not as heavily pigmented as central plate (Fig. 9) *parvula*
Middle portion of 8th sternum as darkly pigmented as central plate 2
2. Notch with strongly sclerotized shoulders (Fig. 8) *nivalis*
Notch without strongly sclerotized shoulders *burksi*

Key to the Nymphs of western North American *Taeniopteryx*

1. Thorax and abdomen without middorsal pale stripe 2
Thorax and abdomen with at least a partial pale middorsal stripe (Figs. 10 & 11) 3
2. Posterior margins of abdominal terga with short blunt setae (Fig. 13) ... *nivalis*
Posterior margins of abdominal terga with long setae, apically curved and an occasional long hair (Fig. 14) *parvula*
3. Abdominal terga with mostly short blunt bristles, posterior margins with short blunt setae (Fig. 13) *nivalis*
Abdominal terga with long bristles, many apically curved, posterior margins with long setae curved apically or short blunt setae (Figs. 12 & 14) 4
4. Posterior margins of abdominal terga with long setae curved and an occasional hair (Fig. 14) *parvula*
Posterior margins of abdominal terga with short blunt setae (Fig. 12) ... *burksi*

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