

STUDIES ON UTAH STONEFLIES (PLECOPTERA)

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ABSTRACT.— Questionable Utah distribution records are reviewed and new state records are given. The female of *Capnia cygna* Jewett is described and figured and an allotype ♀ designated. Detailed synonymies and nomenclatural notes are provided for *Capnia vernalis* (Newport), *Utacapnia poda* (Nebeker and Gaufin) and *Oemopteryx fosketti* (Ricker). Descriptions are given of the female, nymph, and egg of *Isogenoides zionensis* Hanson and an allotype ♀ designated. The male, nymph, and egg of *Pictetiella expansa* (Banks) are described and an allotype ♂ designated. *Sweltsa gaufini*, sp. nov., is described for the male, female, and egg stages and a holotype ♂ designated. Descriptions are either supported with original figures or reference is made to acceptable figures in the literature. Besides line drawings and halftones, useful photographic figures are provided which were prepared by using a scanning electron microscope.

An annotated list of Utah species is given following the revised nomenclature of Illies (1966) and Zwick (1973).

The publication of a monograph on the stoneflies of Utah (Gaufin, Nebeker, and Sessions, 1966) contributed greatly to the knowledge of intermountain Plecoptera. Since this time, however, additions and corrections have been discovered. This study contains this information and includes an annotated list of Utah species.

Detailed synonymies are given for recent nomenclatural changes and where special clarification is necessary. The listing of type specimens and their depositories indicates that they were studied. For further information and complete taxonomic treatment, see Illies (1966) and Zwick (1973).

Malenka flexura (Claassen)

Nemoura flexura Claassen (1923:284). Boulder, Colorado.

This species was recorded by Gaufin et al. (1966) as occurring in Utah. The record was based on one female in the collection of Dr. William E. Ricker, which was collected at Huntsville, Weber Co. The specimen was examined as part of this study and found to belong to *Malenka californica* (Claassen). This does not preclude the possibility that *M. flexura* might be found in the future, but no confirmed records are presently available.

Podmosta decepta (Frison)

Nemoura decepta Frison (1942:13). Estes Park, Colorado.

This species is found in most of the Intermountain states. It was first collected in Utah at the following locality in the Uinta Mountains: small creek 7 miles N Mirror Lake, Hwy. 150, Summit Co.. 21-VII-1967, R. W. Baumann, 1 ♂ (NMNH).

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Podmosta delicatula (Claassen)

Nemoura delicatula Claassen (1923:285). Boulder, Colorado.

Specimens of this species were collected by the author during a survey of the stoneflies of the Wasatch Mountains. Since the species was fairly common in small creeks at high altitudes, a closer study was made of the collection at the University of Utah. This resulted in the discovery of other Utah specimens previously included with *Prostoia besametsa* (Ricker). The confirmed records are as follows: DAVIS Co., Farmington Canyon Creek, 23-VIII-1965, R. W. Baumann, 8 ♀ ♀ (UU). DUCHESNE Co., Mirror Lake, 12-VII-1947, L. T. Nielsen, 5 ♀ ♀ (UU). RICH Co., Allen Canyon, 19-VI-1972, G. F. Knowlton, 1 ♀ (NMNH). SALT LAKE Co., Big Cottonwood Creek, Brighton, 16-VII-1952, A. R. Gaufin, 6 ♂ ♂, 3 ♀ ♀; 16-VIII-1962, 1 ♂; 6-VIII-1965, R. W. Baumann, 1 ♀; 14-VII-1966, 1 ♀; 29-VII-1967, 1 ♂ (UU) (NMNH). SUMMIT Co., Beaver Creek, Beaver Creek Campground, 1-VII-1959, A. R. Gaufin, 11 ♂ ♂, 29 ♀ ♀ (NMNH); Hoop Lake, 30-VI-1958, D. B. Cahill, 1 ♀ (USU); Provo River, below Trial Lake, 5-VIII-1947, A. R. Gaufin, 1 ♀; 6-VIII-1962, 1 ♂ (UU); Smith Morehouse Creek, South Fork Guard Station, 19-VII-1961, A. R. Gaufin, 4 ♂ ♂, 3 ♀ ♀ (UU); Weber River, junction Smith-Morehouse Creek, 30-VI-1959, A. R. Gaufin, 12 ♂ ♂, 29 ♀ ♀ (NMNH). WASATCH Co., Provo River, Soapstone, 21-VII-1947, A. R. Gaufin, 2 ♀ ♀; 6-VII-1959, 9 ♂ ♂, 15 ♀ ♀ (UU) (NMNH).

Zapada frigida (Claassen)

Nemoura frigida Claassen (1923:285). Sitka, Alaska.

Zapada frigida is never abundant but has a scattered distribution throughout most of the western states. A single male from the Manti-La Sal National Forest is the first Utah record: Johnson Creek, 19 miles N Blanding, Abajo Mountains, San Juan Co., 18-VI-1946, S. B. Muliak (NMNH).

Zapada oregonensis (Claassen)

Nemoura oregonensis Claassen (1923:288). Blitzen Valley. Harney Co., Oregon.

This species was recorded from Utah by Ricker (1952), Gaufin (1955, 1964), Gaufin et al. (1966), and Baumann and Gaufin (1971). The author examined all available specimens of *Z. oregonensis* while studying the Rocky Mountain Nemouridae and found them all to be *Zapada haysi* (Ricker). The species has been confirmed from Idaho, Wyoming, and Colorado, so it is possibly also present in Utah.

Capnia cygna Jewett

Capnia cygna Jewett (1954:546). Washington (?).

The type locality of *C. cygna* is believed to be Washington. Nebeker and Gaufin (1966a) recorded it from Idaho and gave a brief

description and drawing of a female dissected from a mature nymph. Mature females have since been collected, including a single specimen from Mueller Park, Davis Co., Utah, 25-II-1949, R. B. Selander, which is here designated as the allotype ♀ (NMNH). A detailed description and new drawing are included because of the teneral condition of the specimen studied earlier.

FEMALE.— Macropterous. Length of forewings 8-10 mm; length of body 8-10 mm. Body and appendages dark brown almost black, broad membranous dorsal stripe on abdominal tergites 1-8. Wings hyaline; venation typical of genus, with 1-3 crossveins between R_1 and R_2 beyond cord. Eighth sternite with subgenital plate quite simple, heavier sclerotization on both median margins, posterior median margin produced but not extending beyond distal margin of segment, produced portion broadly rounded or slightly angular (Figure 2).

Capnia elongata Claassen

Capnia elongata Claassen (1924:56). Caribou, Plumas Co., California.

The confirmed distribution of this species is along the Pacific Coast, so it probably does not occur in Utah. The specimens that contributed to the Utah records by Knowlton and Harmston (1938), Gaufin (1955), and Gaufin et al. (1966) were found to be *Capnia gracilaria* Claassen.

Capnia vernalis (Newport)

Capnia vernalis Newport (1851:451). Lectotype, male; Albany River. Ontario. Canada (BMNH).

Capnia limata Frison (1944:155). Holotype, male; South Platte River, Littleton, Colorado (INHS).

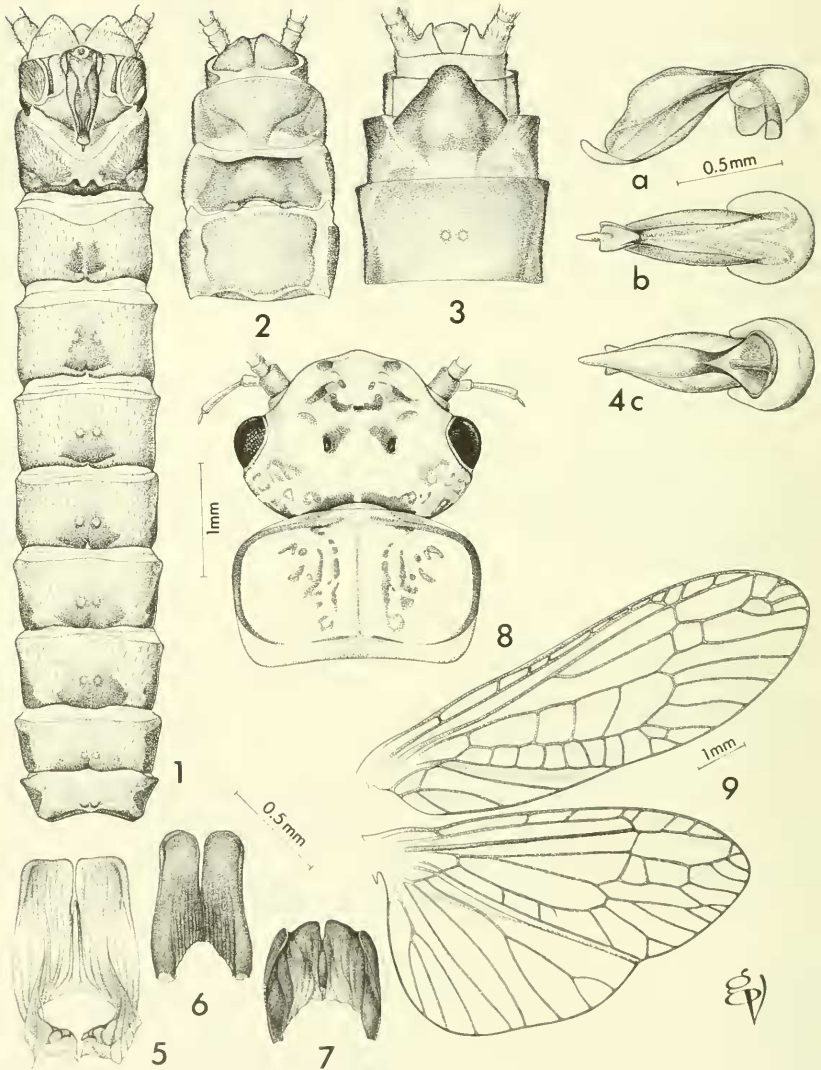
Capnia vernalis: Zwick (1973: ?).

The name *Capnia limata* has been given to specimens from the western United States, while the name *Capnia vernalis* is used in Canada and the northeastern United States. After I examined both type specimens, it was apparent that a single, widely distributed species was involved. This synonymy is recorded in Zwick (1973).

Isocapnia hyalita Ricker

Isocapnia hyalita Ricker (1959:648). Hyalite Creek, Gallatin Co., Montana.

The discovery of this species in Utah is a large range extension, since all previous records are from Montana. It appears to be quite common if sought in the correct habitat at the right time. All records to date are from mountain streams during the months of April and May. The new Utah records are: UTAH Co., American Fork Creek, near Timpanogos Cave National Monument, 8-IV-1967, C. D. Bjork and B. R. Oblad, 2 long-winged ♂♂, 1 ♀; 10-IV-1967, 2 long-winged ♂♂, 2 short-winged ♂♂, 2 ♀♀; 12-IV-1967, 1 short-winged ♂, 1 ♀ (NMNH). TOOELE Co., South Willow Creek, Upper



Figs. 1, 3-5, 8. *Sweltsa gausfina*, n. sp.: 1, male abdomen, dorsal view; 3, female terminalia, ventral view; 4, epiproct, a. lateral, b. dorsal, c. ventral; 5, leaflike structure on aedeagus; 8, head and pronotum. Fig. 2. *Capnia cygna* Jewett: Female terminalia, ventral view. Fig. 6. *Sweltsa albertensis* (Needham and Claassen): Leaflike structure on aedeagus. Fig. 7. *Sweltsa lambda* (Needham and Claassen): Leaflike structure on aedeagus. Fig. 9. *Pictetiella expansa* (Banks): Right wings of male.

Narrows, 15-V-1967, R. W. Baumann and B. R. Oblad, 5 long-winged ♂♂, 6 short-winged ♂♂, 3 ♀♀ (NMNH).

Utacapnia poda (Nebeker and Gaufin)

Capnia poda Nebeker and Gaufin (1965:475). Holotype, male; Gunnison River, Colorado (UU).

Capnia (Utacapnia) poda Nebeker and Gaufin (1967:226).

Utacapnia poda: Zwick (1973:?).

This species is widely distributed in Colorado, and the collection of a specimen in Utah near the border is not too surprising: Green River, Jensen, Uintah Co., 24-II-1968, R. W. Baumann, 1 ♀ (NMNH).

Oemopteryx fosketti (Ricker)

Brachyptera fosketti Ricker (1965:475). Holotype, male; South Saskatchewan River, Clarksboro, Saskatchewan, Canada (CNC).

Brachyptera zelona Ricker (1965:477). Holotype, male; Myton, Utah (INHS).

Oemopteryx fosketti: Zwick (1973:?).

Oemopteryx zelona was described from one male collected at the Duchesne River in Myton, Utah, which Ricker (1965) erroneously listed as the Green River. Since the holotype was a single male, a special effort was made to collect additional specimens. The examination of several males from Utah led to the synonymy of *O. zelona* under *O. fosketti* included in Zwick (1973). The following records have become available since the original description: DUCHESNE Co., Duchesne River, Myton, 24-II-1968, R. W. Baumann, 1 ♀ (NMNH); Duchesne River, near Randlett, 24-II-1968, R. W. Baumann, 1 ♂ (NMNH). UINTAH Co., Uinta River, Hwy. 40, near Roosevelt, 5-III-1963, A. R. Gaufin, 1 ♀ (UU); Green River, Dinosaur National Monument, 25-III-1967, S. L. Jensen, 3 ♀♀ (NMNH); Green River, Jensen, 24-II-1968, R. W. Baumann, 9 ♂♂, 48 ♀♀ (NMNH); Green River, Ouray, 24-II-1968, R. W. Baumann and G. Z. Jacobi, 9 ♂♂, 8 ♀♀ (NMNH).

Isogenoides zionensis Hanson

Isogenoides zionensis Hanson (1949:109). Holotype, male; Zion National Park, Utah (UMA).

FEMALE.— Macropterous. Length of forewings 21-23 mm; length of body 20-22 mm. Body dark brown dorsally, yellow ventrally; legs brown. Pronotum brown, with broad yellow median stripe. Subgenital plate large, extending $\frac{1}{3}$ length of eighth sternite, posterior margin mostly straight, sometimes with small, rounded median projection, lateral corners slightly rounded, forming nearly right angles.

NYMPH.— Length of mature ♂ 22-25 mm; mature ♀ 26-29 mm; antennae 7-9 mm; cerci 10-12 mm; with single submental gills 6-7 times as long as wide. Body and legs light brown; occipital ridge

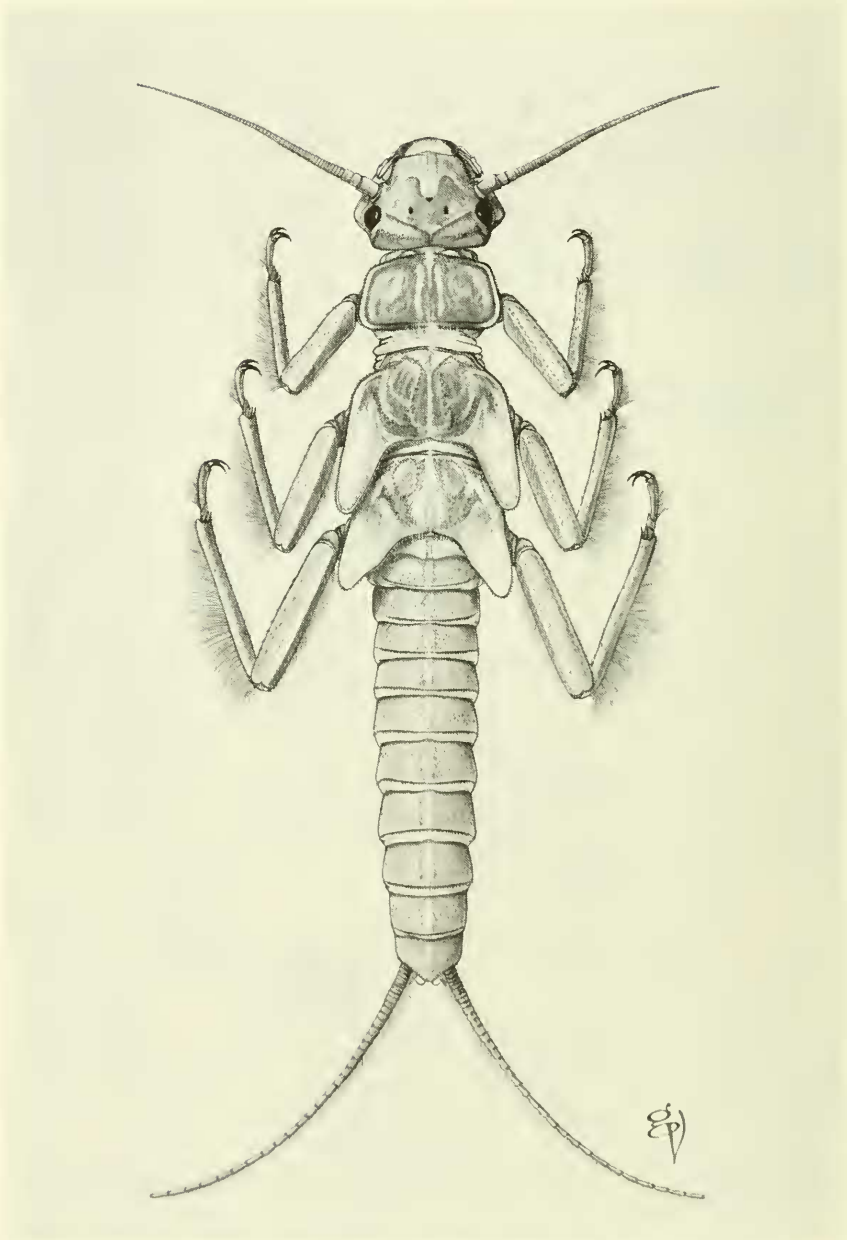


Fig. 10. *Isogenoides zionensis* (Hanson): Mature nymph.

heavy on lateral margins, becoming somewhat thinner towards median line; thin rows of long, light hairs along middorsal line of thorax and abdomen; faint color pattern with small setae on dorsal surface of head and thorax (Figure 10). Mouthparts similar to *I. elongatus* (Hagen). Labium typical in shape for genus, paraglossae covered with long, dense hairs. Maxillae elongate; lacinia with two short teeth, one apical and one subapical, inner margin with sparse row of thin spinules; galea long and narrow; tip rounded and bearing tuft of short spines on ventral half (Figure 13O), extending to base of subapical tooth; palpus five-segmented (Figure 13P). Mandibles rather similar, with two apical and one subapical tooth on each cusp, ventral basal margin of outer cusp with row of stout denticles, narrow patch of fine hairs extending from denticles to base of mandible (Figure 14Q,R), basal margin of inner cusp with dense tuft of long, thin hairs, dorsal surface with rectangular patch of hairs at base of teeth (Figure 14S,T).

EGG.— Average width 350 μ , average length 550 μ . Oval and somewhat elongate, triangular in cross-section, sides equilateral. Collar located at one end, round in shape, with three stabilizing ribs, one at each angle, with broadly rounded, membranous anchor plate when fresh. Microstructure of surface composed of numerous rounded knobs of almost equal size. Micropiles situated at midline in rows of 4-6 running perpendicular to long axis, present on all three sides (Figure 12A,B,C,D).

Isogenoides zionensis was described from five males collected at the Virgin River in Zion National Park. Gaufin et al. (1966) gave figures of a σ abdominal tip, ♀ subgenital plate, and nymphal mouth parts but did not include descriptions. They also gave excellent figures of the male genitalia, which were mislabeled as being those of *Isogenus elongatus*. Their figure of the mandible fails to show the denticles on the basal margin of the outer cusp. The labium is shown as bare without the conspicuous covering of dense hairs. The egg is figured in Knight et al. (1965).

The nymph is almost indistinguishable from *I. elongatus* (Hagen) and keys out as such in Ricker (1952), the only known difference being the very light brown almost yellow color of *I. zionensis* as compared to the darker brown of *I. elongatus*. Nymphs are very common throughout the Virgin River drainage of southwestern Utah, but few adults have been collected. The author, after many attempts, was finally able to obtain 2 σ σ and 4 ♀ ♀ from a culvert at the following locality: East Fork Virgin River, Hwy. 89, near Glendale, Kane Co., 23-V-1970, R. W. Baumann (UU) (NMNH). One of the females is here designated as the allotype ♀ (NMNH).

Pictetiella expansa (Banks)

Perla expansa Banks (1920:317). Holotype, female; Grant, Colorado (MCZ), 10,816.

Perla expansa: Needham and Claassen (1925:81, 313, 325) description of δ and ♀ ; figures of wings, δ and ♀ genitalia (δ incorrectly associated).

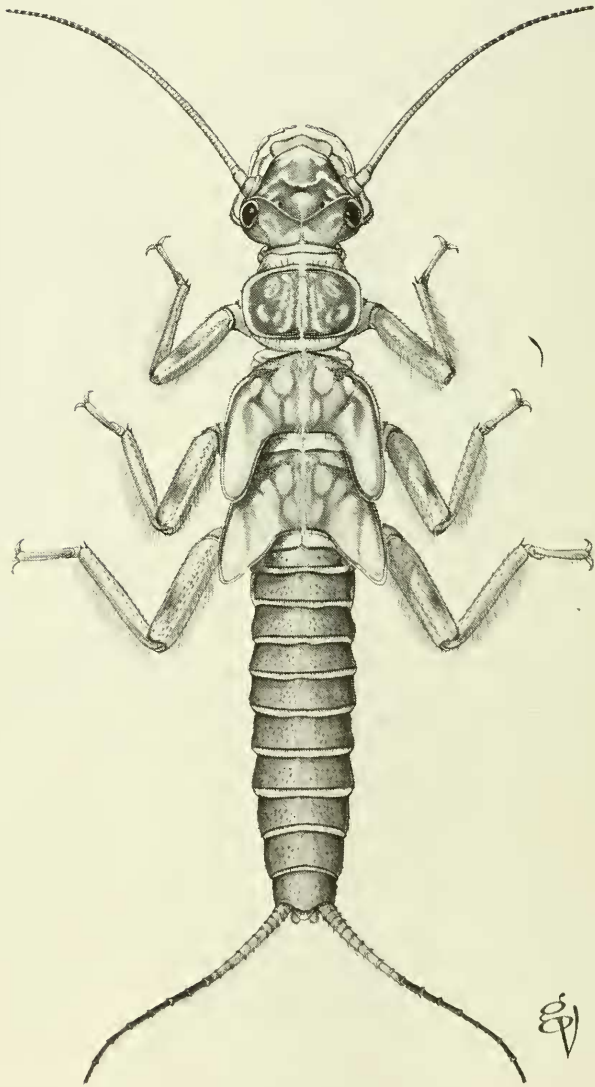


Fig. 11. *Pictetiella expansa* (Banks): Mature nymph.

Perla expansa: Claassen (1931:55) description of nymph (incorrect nymphal association).

Isogenus (Pictetia) expansus: Ricker (1952:120-122) description of ♂ and nymph; figures of nymphal maxilla and ♂ genitalia.

Pictetiella expansella: Illies (1966:375) (incorrect specific name).

Isogenus (Pictetia) expansus: Gaufin, Nebeker, and Sessions (1966:62, 64) figures of ♂ and ♀ genitalia.

MALE.— Slightly brachypterous. Length of forewings 9-12 mm; length of body 13-16 mm. Body dark brown, last two abdominal segments yellow dorsally; legs yellowish brown; antennae brown; cerci yellow. Head as broad as prothorax, ocellar triangle equilateral, posterior ocelli slightly closer to eyes than to each other, anterior area light yellow, dark brown U-shaped bands connecting lateral ocelli to anterior ocellus, bands extending forward beyond anterior ocellus and laterally from lateral ocelli to form rocking "H," posterior median area yellow, lateral posterior corners brown, palpi brown. Pronotum slightly wider than long, brown with broad yellow median stripe, rugosities rather coarse and restricted to inner $\frac{2}{3}$, marginal groove present only at anterior and posterior margins, forming broad anterior and posterior bands. Wings hyaline, with small infuscated area near cord, veins brown, venation slightly aberrant (Figure 9). Abdominal segments normal to ninth, which is narrowed dorsally and greatly extended ventrally at apical margin, ventral extended margin broadly rounded and clothed with fine brown hairs; tenth tergite nearly bisected by deep, sclerotized groove which shields epiproct when not extended. Hemitergites set off from remainder of tergite by angular membranous areas, anterior half of hemitergites covered with long, fine hairs. Epiproct long and narrow with pointed apex, mostly membranous with thin, sclerotized areas visible on dorsal and ventral median areas, patches of small setae on dorsolateral margins.

NYMPH.— Length of mature ♂ 15-16 mm; mature ♀ 17-21 mm; antennae 8-9 mm; cerci 7-8 mm; with single submental gills 3-4 times as long as wide. General color brown, but quite strikingly patterned; legs mostly yellow; antennae slightly darker at apex; apical half of cerci very dark brown almost black. Head as wide as pronotum; maxillae barely visible from above; hind ocelli closer to eyes than to each other; occipital ridge as few sparse hairs near lateral margins. Thin rows of hairs running along middorsal line of thorax and abdomen. Head pattern light on dark background: bulb-shaped structure in ocellar triangle, M-line, front of head, lateral tubercles and elongate spot near each eye. Pronotum transversely oval, almost twice as wide as long, outer borders with narrow, dark band fringed with long setae, marginal groove complete but dark along anterior and posterior margins, with distinct light reticulations on dark background. Wing pads on mesonotum and metanotum well developed, outer margins running slightly convergent to body axis, with distinct patches of dark spines along lateral anterior borders, light reticulate markings medially. Abdominal segments fringed with row of dark hairs on posterior margins; faint, narrow, dark

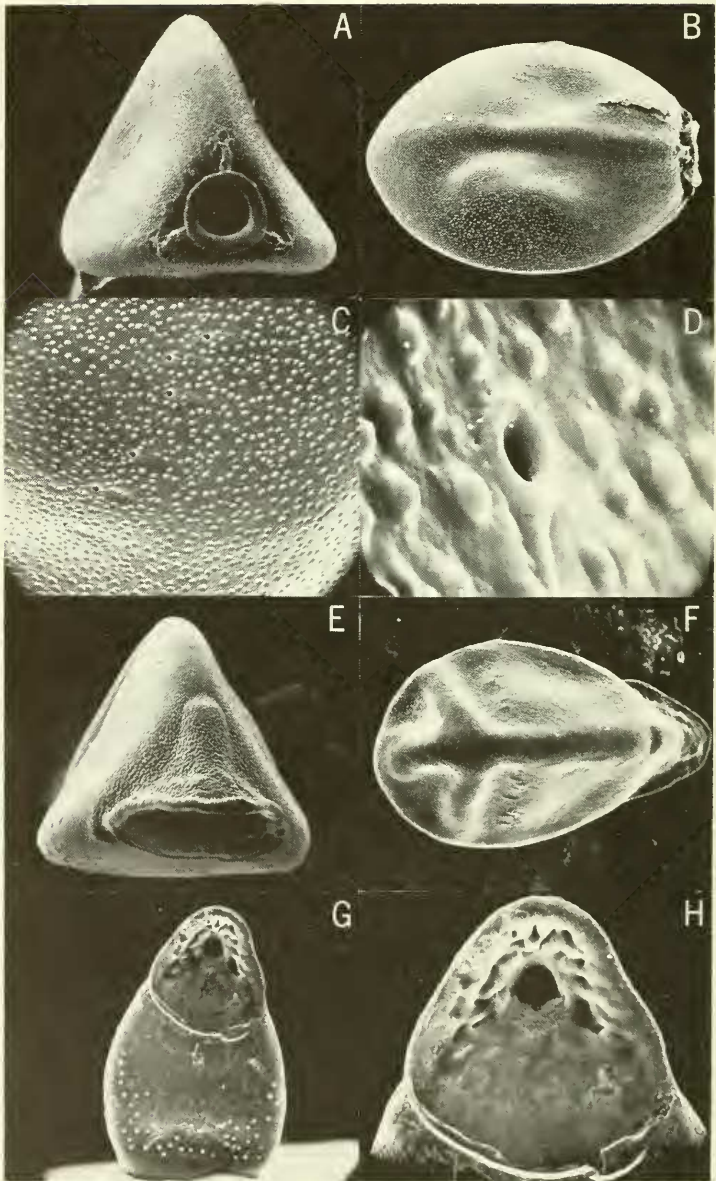


Fig. 12. Eggs. A-D, *Isogenoides zionensis* Hanson: A, collar, end view (240X); B, lateral view (200X); C, micropiles (620X); D, micropile, closeup (6,000X). E-H, *Pictetiella expansa* (Banks): E, collar, end view (270X); F, dorsal view (195X); G, ventral view (180X); H, collar opening, closeup (385X).

bands on anterior margins which are interrupted medially and almost fade out on terminal segments. Cerci with fringes of short hairs at apex of each segment, fringe of long hairs running dorsally throughout entire length (Figure 11). Mouthparts quite distinctive. Labium typical of family Perlodidae, paraglossae covered with long dense hairs. Maxillae elongate; lacinia with two long, narrow teeth, one apical and one subapical, inner margin with few long thin spinules; galea short but elongate, tip pointed and bearing tuft of short spines on ventral half (Figure 13L), extending to base of subapical tooth, palpus five-segmented (Figure 13M,N). Mandibles rather similar, with one subapical and two apical teeth on each cusp, middle teeth with serrated margins, ventral basal margins of outer cusp smooth and bare except for large patch of fine hairs at base of cusp (Figure 14U,V), basal margin of inner cusp with dense tuft of long, thin hairs, dorsal surface with rounded patch of hairs at base of teeth (Figure 14W,X).

Egg.— Average width 300μ , average length 550μ . Dorsal aspect nearly oval, axillary lateral ridges extending from median ridge at broadly rounded end to form skewed, cross-like structure, collar end enlarged and rounded. Triangular in cross-section, almost equilateral, but ventral side longest. Collar modified as flat, hood-like structure, convex dorsally, nearly flat ventrally with large opening, anchor plate large, flat, and covering entire ventral surface. Microstructure of surface composed of numerous rounded knobs of almost equal size, knobs arranged in loose, almost circular, designs. Micropiles situated near midline in rows of 5-7 running perpendicular to long axis, those on ventral surface not as obvious. Surface of uncleaned egg covered with small puffball-like structures which, according to Brinck (1949), are special adhesive bodies (Figure 12E,F, G,H).

Pictetiella expansa was named from Colorado from a single female. Since the time of the original description, much confusion has existed as to the identity of this species in both the adult and nymphal stages. Most specimens previously assigned to this species were examined as part of this study, and four genera were represented. This indicated a need for the detailed descriptions of the male, nymph, and egg which are included here. Ricker's (1952) description of a nymph and of teneral male genitalia seem to be correctly associated but are rather general. The figures of the male and female genitalia by Nebeker (Gaufin et al., 1966) were done from specimens used in this study and are excellent. Saether (1970) figures a nymphal maxilla labeled *Isogenus (Pictetia) expansus* which does not appear to belong in the genus *Pictetiella*.

The genus *Pictetiella* was monotypic and recorded as nearctic until the recent description of *Pictetiella asiatica* from Siberia by Zwick et al. (1972). Records of *P. expansa* have been confirmed from Colorado, Montana, Utah, and Wyoming. The Utah localities are: SALT LAKE CO., Parley's Creek above Mountain Dell Reservoir, 5-IV-1963, A. V. Nebeker, nymph (UU); Lambs Canyon Creek.

19-VI-1966, R. W. Baumann, nymphs; 18-VIII-1966, exuviae (UU); Mill Creek, Aug. and Sept. 1965, R. W. Baumann, 12 ♂♂, 15 ♀♀, nymphs; July and Aug. 1966, 7 ♂♂, 8 ♀♀ nymphs (UU) (NMNH); Big Cottonwood Creek, Cardiff Fork, 12-VIII-1966, R. W. Baumann, 2 ♂♂, nymphs (NMNH). UTAH Co., Deer Creek, American Fork Canyon, 11-VIII-1966, R. W. Baumann, 1 ♂, 1 ♀. One of the males from Mill Creek Canyon is designated as the allotype ♂ (NMNH).

Alloperla delicata Frison

Alloperla delicata Frison (1935:334). Oak Creek, Corvallis, Oregon.

Alloperla delicata is restricted to the Pacific Northwest in the Coast, Cascade, and Sierra Nevada mountains. The record in Gaufin et al. (1966) from Box Elder Co., Utah, proves to be the common *Alloperla severa*.

Sweltsa gaufini, sp. nov.

MALE.— Macropterous. Length of forewings 8-9 mm; length of body 8-10 mm. General color yellow with brown markings; legs yellow; antennae yellow at base and light brown towards apex; cerci yellow. Head slightly narrower than prothorax, ocellar triangle equilateral, posterior ocelli the same distance from each other as from eyes, dark reticulated markings around ocelli which continue to anterior margin and also appear at lateral basal margins (Figure 8). Pronotum wider than long, completely encircled by brown border which is fainter along anterior and posterior margins, median stripe faint, lateral rugosities quite distinctive, posterior border very broad (Figure 8). Wings hyaline, venation typical for genus. Abdomen with broad dark dorsal stripe; ninth tergite with sclerotized, V-shaped process at anterior margin, deeply excavated at posterior margin, ninth sternite greatly expanded and forming ventral plate; tenth tergite completely bisected, bearing lateral sclerotized bars; epiproct mostly membranous: dorsal aspect long and narrow, carina narrower than body with constriction near apex which grades downward to pointed ventral tip; lateral aspect with narrow constriction near broad base, which has lateral discoid appendages, anterior portion becoming very broad just behind apex which bears the pointed tip, basal area with narrow sclerotized ventral projection which is quite broad in lateral view (Figure 4A,B,C). Aedeagus with sclerotized, leaf-like appendage, rectangular in shape, with deep median incision, lateral basal extensions with pointed processes (Figure 5).

FEMALE.— Macropterous. Length of forewings 9-10 mm; length of body 9-11 mm. Color and general morphology similar to male. Subgenital plate formed from posterior median portion of seventh sternite, broad at base, tapering to broadly rounded tip, usually with definite lateral undulations, extending over complete width of eighth sternite, covered with numerous fine hairs, especially apparent at apex (Figure 3).

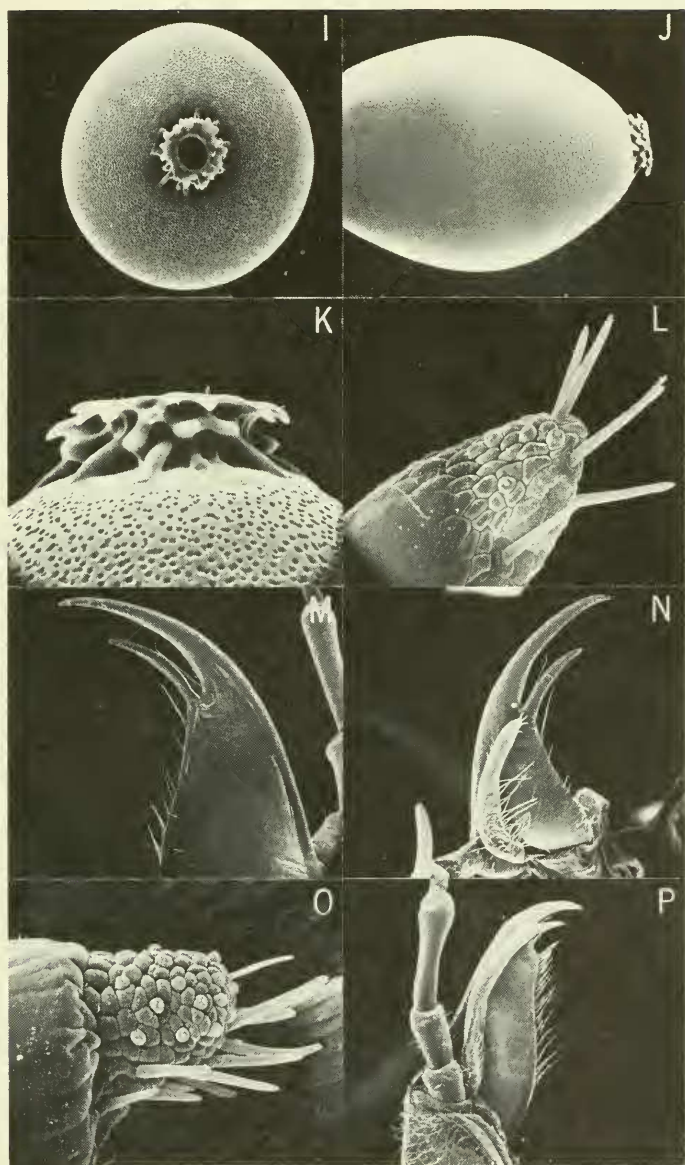


Fig. 13. I-K. *Sweltsa gaufini* n. sp.: I, egg collar, end view (330X); J, egg, lateral view (310X); K, collar, closeup (1,170X). L-N, *Pictetiella expansa* (Banks): L, galea, tip (1,100X); M, left maxilla, ventral (110X); N, left maxilla, dorsal (70X). O and P, *Isogenoides zionensis* Hanson: O, galea, tip (1,100X); P, left maxilla, dorsal (60X).

EGG.— Average width 250 μ , average length 400 μ . Oval and slightly elongate, round in cross-section. Collar terminal, highly modified into many ridges and projections (Figure 13K), covered with round, membranous anchor plate when fresh. Microstructure of surface generally smooth with many small rounded pits, shallow near midline and deeper near poles. Micropiles located below midline on end opposite the collar, occurring as complete, uneven ring (Figure 13L,J).

Sweltsa gaufini is most similar to *S. albertensis* and *S. lamba*. Males can be most easily separated by comparing the leaflike appendage on the aedeagus. The appendage is large, rectangular, and lightly sclerotized in *S. gaufini* (Figure 5); smaller, elongate, and darkly sclerotized in *S. albertensis* (Figure 6); short, broad, and darkly sclerotized in *S. lamba* (Figure 7). Females are presently difficult to separate.

This species is known only from the type locality: holotype σ , allotype ♀ , and 19 σ σ and 20 ♀ ♀ paratypes, Ricks Spring, Logan Canyon, Cache Co., Utah, 29-VIII-1964, A. V. Nebeker (UU) (NMNH). Holotype σ No. 72484 and allotype ♀ deposited at the United States National Museum of Natural History, Washington, D.C.

Sweltsa gaufini is named for Dr. Arden R. Gaufin of the University of Utah. Dr. Gaufin introduced me to the Plecoptera and provided direction in my beginning years. It is a pleasure to name a species in the family Chloroperlidae in his honor.

UTAH LIST

The following is a checklist of the 75 Plecoptera species known to occur in Utah using the taxonomic arrangement of Illies (1966) and Zwick (1973).

Nemouridae

| | |
|--|----------------------------------|
| <i>Amphinemura banksi</i> Baumann and Gaufin | <i>Podmosta decepta</i> (Frison) |
| <i>A. mogollonica</i> Baumann and Gaufin | <i>P. delicatula</i> (Claassen) |
| <i>Malenka californica</i> (Claassen) | <i>Zapada cinctipes</i> (Banks) |
| <i>M. coloradensis</i> (Banks) | <i>Z. columbiana</i> (Claassen) |
| <i>Prostoia besametsa</i> (Ricker) | <i>Z. frigida</i> (Claassen) |
| | <i>Z. haysi</i> (Ricker) |

Capniidae

| | |
|---|--|
| <i>Capnia confusa</i> Claassen | Claassen) |
| <i>C. cygna</i> Jewett | <i>I. grandis</i> (Banks) |
| <i>C. gracilaria</i> Claassen | <i>I. hyalita</i> Ricker |
| <i>C. nana wasatchae</i> Nebeker and Gaufin | <i>I. missouri</i> Ricker |
| <i>C. uintahi</i> Gaufin | <i>I. vedderensis</i> (Ricker) |
| <i>C. utahensis</i> Gaufin and Jewett | <i>Mesocapnia frisoni</i> (Baumann and Gaufin) |
| <i>C. vernalis</i> Newport | <i>Utacapnia logana</i> (Nebeker and Gaufin) |
| <i>C. wanica</i> Frison | |
| <i>Eucapnopsis brevicauda</i> (Claassen) | <i>U. lemoniana</i> (Nebeker and Gaufin) |
| <i>Isocapnia crinita</i> (Needham and | <i>U. poda</i> (Nebeker and Gaufin) |

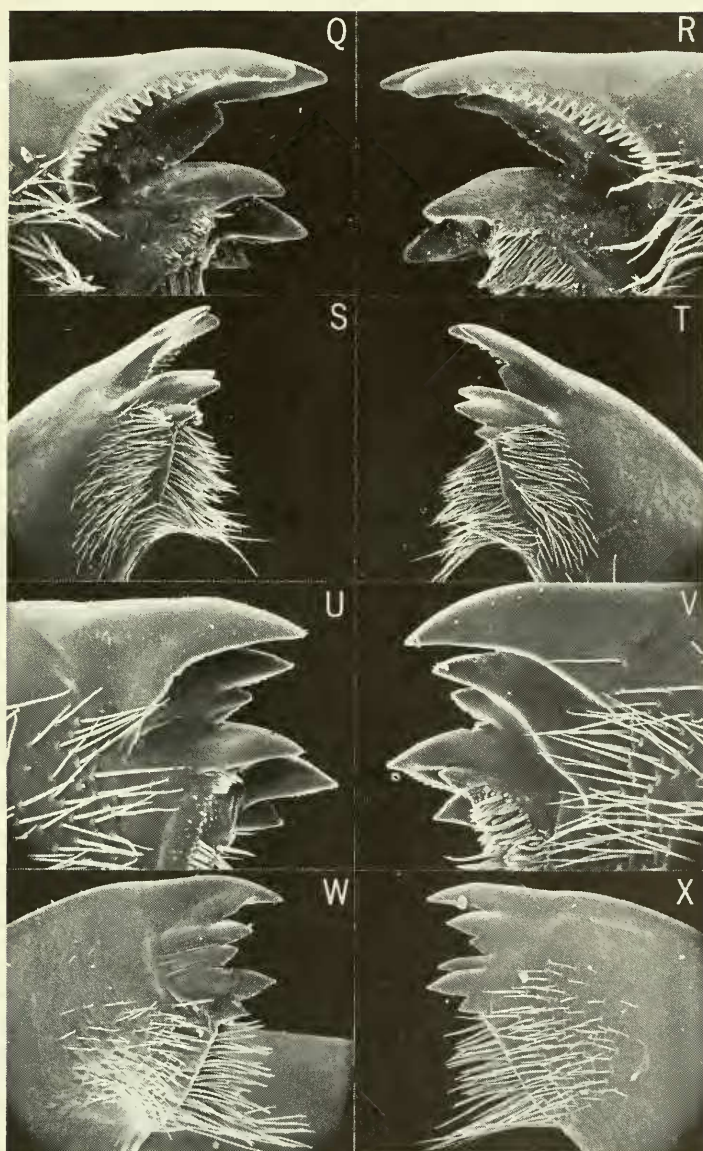


Fig. 14. Q-T, *Isogenoides zionensis* Hanson: Q, right mandible, ventral (200X); R, left mandible, ventral (200X); S, left mandible, dorsal (95X); T, right mandible, dorsal (100X). U-X, *Pictetiella expansa* (Banks): U, right mandible, ventral (260X); V, left mandible, ventral (260X); W, left mandible, dorsal (130X); X, right mandible, dorsal (130X).

Taeniopterygidae

| | |
|---------------------------------------|----------------------------|
| <i>Doddsia occidentalis</i> (Banks) | <i>T. pacifica</i> (Banks) |
| <i>Oemopteryx fosketti</i> (Ricker) | <i>T. pallida</i> (Banks) |
| <i>Taenionema nigripennis</i> (Banks) | |

Leuctridae

| | |
|---|---|
| <i>Paraleuctra jewetti</i> Nebeker and Gaufin | <i>P. sara</i> (Claassen) |
| <i>P. occidentalis</i> (Banks) | <i>Perlomyia utahensis</i> Needham and Claassen |
| <i>P. rickeri</i> Nebeker and Gaufin | |

Pteronarcidae

| | |
|--|--------------------------|
| <i>Pteronarcella badia</i> (Hagen) | <i>P. princeps</i> Banks |
| <i>Pteronarcys californica</i> Newport | |

Perlodidae

| | |
|---|---|
| <i>Megarcys signata</i> (Hagen) | <i>Diura knowltoni</i> (Frison) |
| <i>Skwala parallela</i> (Frison) | <i>Isoperla ebria</i> (Hagen) |
| <i>Cultus aestivalis</i> (Needham and Claassen) | <i>I. fulva</i> Claassen |
| <i>Isogenoides colubrinus</i> (Hagen) | <i>I. longiseta</i> Banks |
| <i>I. elongatus</i> (Hagen) | <i>I. mormona</i> Banks |
| <i>I. zionensis</i> Hanson | <i>I. patricia</i> Frison |
| <i>Kogotus modestus</i> (Banks) | <i>I. petersoni</i> Needham and Christensen |
| <i>Pictetiella expansa</i> (Banks) | <i>I. pinta</i> Frison |
| | <i>I. quinquepunctata</i> (Banks) |

Chloroperlidae

| | |
|-----------------------------------|--|
| <i>Paraperla frontalis</i> Banks | <i>S. fidelis</i> (Banks) |
| <i>Utaperla sopladora</i> Ricker | <i>S. gaufini</i> Baumann |
| <i>Alloperla severa</i> Hagen | <i>S. lamba</i> (Needham and Claassen) |
| <i>Suwallia pallidula</i> (Banks) | <i>Triznaka diversa</i> (Frison) |
| <i>Sweltsa borealis</i> (Banks) | <i>T. pintada</i> (Ricker) |
| <i>S. coloradensis</i> (Banks) | <i>T. signata</i> (Banks) |

Perlidae

| | |
|---|--------------------------------------|
| <i>Doronuria californica</i> (Banks) | <i>Hesperoperla pacifica</i> (Banks) |
| <i>D. theodora</i> (Needham and Claassen) | <i>Claassenia sabulosa</i> (Banks) |

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