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NEW BRITISH COLUMBIAN EPHEMEROPTERA\*

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During the first week of August, 1938, my assistant in British Columbia, Mr. J. K. Jacob, was fortunate in being able to join a party which was penetrating into the little known and rather inaccessible mountain region west of Lytton and the Fraser river. A start was made at the junction of Kwieek Creek and the Fraser river, near the railway station of Boston Bar, about 10 miles south of Lytton; from here the route followed up the creek to Blue Lake situated at an altitude of 7000 feet, at the base of Antimony Mt., where the main camp was pitched.

The number of Ephemerids collected was relatively few on account of high winds and rather unfavorable collecting conditions. It is surprising, therefore, that amongst such scanty material four species, apparently new to science, were discovered; these are described as follows.

***Ephemerella jacobi* n. sp.**

*Male.* Head deep brown; eyes (dried) blackish with slight reddish tinge. Pronotum deep brown, the lateral edges pale yellowish; mesonotum deep brown, shaded with paler laterally and posteriorly, latero-anterior edge deep blackish;

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\*Contribution from the Division of Entomology (Systematic Entomology), Department of Agriculture, Ottawa.

scutellum long, narrow, with palish area at base and the thin ends of the axillary cords projecting caudad beyond its apex for a considerable length (as in *tibialis* and *hystrix*). Pleura and sternum blackish, shaded with paler around bases of legs and with a large pale yellowish area cephalad of wing-base, crossed by a black line. Metathorax and abdomen blackish, the posterior edges of abdomen paler brown, giving a slight ringed appearance. Forelegs with femora and tibiae pale smoky, the tibia long and almost twice the length of femur; tarsi dull ochreous, paler than the preceding joints. Mid and hindlegs dull ochreous, the femora considerably shaded with smoky. Wings narrow, hyaline, with entirely pale and inconspicuous crossveins; longitudinal veins fine and pale brownish in costal half of wing. Tails unfortunately broken. Length of forewing, 10 mm.

*Female.* Head light clay-brown, somewhat deeper in color just behind the ocelli; two small median depressions filled with black and posterior to these two further short black transverse streaks. Thorax rather paler than in male but similarly marked. Abdomen deep clay-brown on terminal segments; ventral plate short, broad, apical margin gently and evenly concave, tails blackish at base, paling towards apices, faintly dark-ringed, *the median one considerably longer than the two outer ones.* Other characters as in male.

*Holotype*—♂, Kwieck Cr. near Lytton, B. C. (alt. 2500 ft.), August 7, 1938, (J. K. Jacob); No. 4442 in the Canadian National Collection, Ottawa.

*Allotype*—♀, same data.

*Paratype*—1 ♀, same data.

Evidently belongs in a group with *heterocaudata* McD. and *hystrix* Trav. (of this latter species, described from a nymph, we now have series of bred adults); it is a more slender and smaller species than *hystrix* and lacks the bright yellowish banding found in this species on the posterior portions of the abdominal sternites; in the genitalia the penes (fig. 1), among other things, are much shorter and broader.

I have much pleasure in naming the species after the collector, Mr. J. K. Jacob, who has been instrumental in the past two years in securing much interesting material from British Columbia.

#### ***Ameletus connectina* n. sp.**

*Male.* Head and thorax blackish, the pleura marked with clay-brown anterior to wing-bases and at bases of legs. Abdomen dorsally with the anterior two-thirds of segments dull dirty whitish, veined with darker and with traces of two broken subdorsal lines; posterior third of segments dull black-brown. Ventrally dirty semihyaline white on anterior segments, the rear segments being more of an alabaster-white and showing a median dark ganglionic spot. Forelegs blackish, fading into deep smoky brown on tarsi; mid and hindlegs pale dull smoky amber with blackish shadings on the femora. Wings hyaline with veins and fine crossveins dark except in costo-basal area. Forewing length, 10 mm.

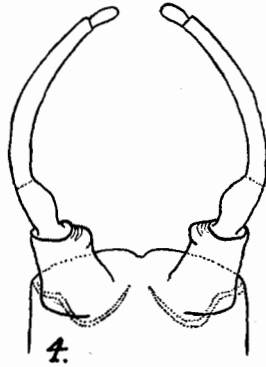
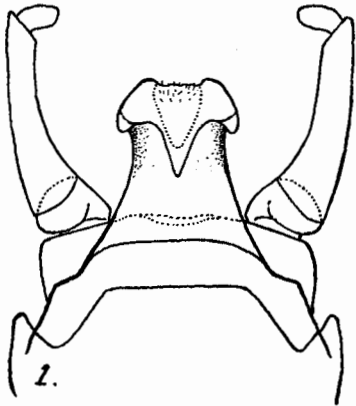
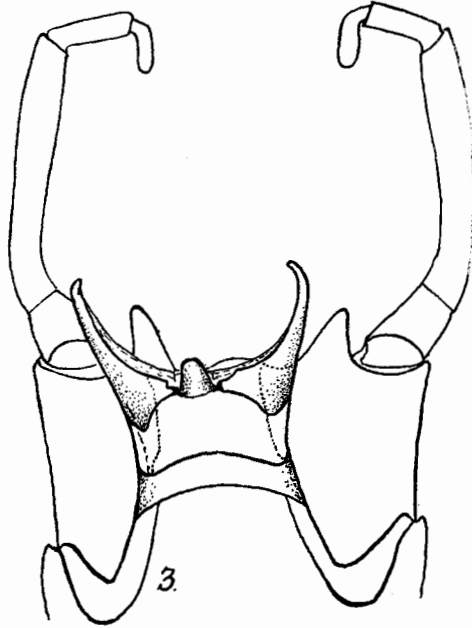
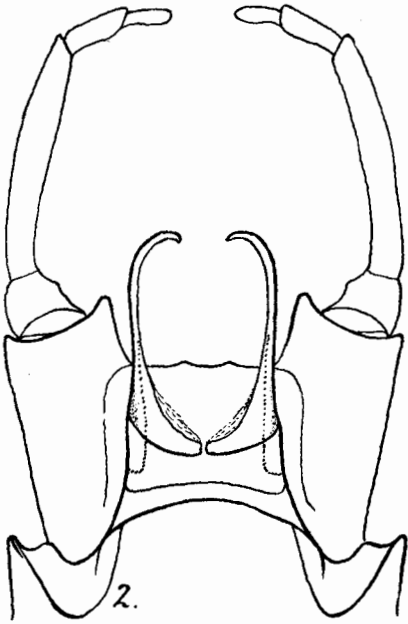
*Holotype*—♂, Blue Lake, W. of Lytton, B. C., 7000 ft. August 6, 1938, (J. K. Jacob); No. 4443 in the Canadian National Collection, Ottawa.

According to genitalia (fig. 2) the species is very close to *connectus* McD., the penes being rather more incurved apically and the genital plate more elongate as compared with its width than in this species. It is considerably smaller than *connectus* and the presence of ganglionic spots on the abdomen ventrally and posteriorly would seem to separate it easily from its close relative.

#### ***Ameletus tuberculatus* n. sp.**

*Male.* Head and thorax shiny black, the latter with slight brown shading at base of scutellum on both meso- and meta-thorax; pleura shaded with deep clay-brown on the more membranous sections. Abdomen with anterior two-thirds of segments light smoky, semihyaline, strongly veined with darker; posterior third deep brown in color; traces of two submedian dark lines, not attaining

PLATE 15



Male Genitalia of 1. *Ephemerella jacobii* n. sp. 2. *Ameletus connectina* n. sp. 3. *Ameletus tuberculatus* n. sp. 4. *Baetis persecuta* n. sp.

anterior margins of segments. Ventrally pale dirty white with median row of black ganglionic marks. Forelegs blackish, mid and hindlegs dull smoky, about the same color as the abdomen dorsally. Wings hyaline, longitudinal veins brown, crossveins fine, inconspicuous and only faintly shaded with darker color. Forewing length 10 mm.

*Holotype*—♂, Blue Lake, W. of Lytton, B. C., 7000 ft., August 4, 1938, (J. K. Jacob); No. 4444 in the Canadian National Collection, Ottawa.

The male genitalia (fig 3) are of the same general type as those of the preceding species but the penes are shorter and between their bases is a very characteristic large tubercle, a feature not heretofore found in any of our *Ameletus* species. A single female, captured on Antimony Mt. on the same date, would appear to belong to this species as it shows the same dull color of abdomen with ganglionic marks. It is, however, considerably larger than the male and I have, therefore, not made it the allotype.

#### **Baetis porsecata** n. sp.

*Male*. Head black, antennae smoky, turbinate portion of eyes (dried) small, oval, blackish with ruddy edges. Thorax deep blackish, the edges of the metathorax, laterad of the scutellum, pale ochre-brown; membranous portions of pleura paler with a light ochre streak anterior to wing-base. Abdomen with the *first six segments hyaline whitish* with a faint smoky tinge, posterior segments light wood-brown. Legs whitish with a slight suffusion of smoky, most prominent on fore femora. Wings hyaline with pale venation; intercalaries in first interspace of forewing very weak; hindwing rather long, with upper and lower margins subparallel (as is usual in this group) and costal projection well-developed; vein 3 very weak, scarcely traceable, close to margin and ending before middle of same; no definite intercalaries (on one wing trace of a very short one between veins 2 and 3). Genitalia (fig. 4) of the *moffati* type, with second joint of the forceps cylindrical; the inner apical edge of the first joint is rather more bulging than usual in the group, but scarcely tuberculate. The posterior margin of the segment shows a narrow median excavation. Length of wing 6 mm.

*Female*. Head deep chocolate-brown. Thorax and abdomen brown, the latter paler ventrally. Legs light smoky amber. Forewings with crossveins tinged with brown; hindwings with vein 3 obsolete.

*Holotype*—♂, Kwieek Cr., near Lytton, B. C., alt. 2500 ft., August 7, 1938, (J. K. Jacob); No. 4445 in the Canadian National Collection, Ottawa.

*Allotype*—♀, same data.

To my knowledge this is the first species among the western members of the *moffati* group in which the male has whitish anterior abdominal segments; in all the others these segments are tinged, generally very decidedly, with some shade of brown. The size is small as compared with *jesmondensis* and *moffati*, and the turbinate eyes of the male are quite small.

#### **Genus Tricorythodes**

I have already pointed out (1931, Canadian Entomologist, LXIII, 267) that in the *explicatus* group there exists a complex of forms, extending over a wide range of territory, concerning the status of which workers have been in considerable doubt. The differences between these various forms consist largely in size and intensity of markings and color; there appear to be no definite genitalic differences nor can one point to anything very distinctive in the maculation pattern which could be construed as representing a specific character. In consequence, in my above mentioned treatment of the group, I lumped the forms under the one name, *explicatus* Eaton, and contented myself for the time being with noting such slight points of variation as existed. Later Dr. Traver (1935, Biology of Mayflies, 634) limited the name *explicatus* to the large dark species occurring in Texas and the adjoining regions and proposed (and I believe cor-

rectly so) the name *fallax* for a somewhat paler species from California; her remarks following this description show that she was still puzzled as to where to place the smaller forms from Wyoming, Alberta, Saskatchewan and the East, mentioned by me in my earlier article, and they were very tentatively included under *fallax*. I have recently had the opportunity of examining a long series of specimens (both dried and in alcohol) in excellent condition from Williams Lake, B. C., captured by G. S. Walley. These are all very uniform in size and correspond in this respect with my Alberta series and also with specimens from Washington and Oregon; under such circumstances I believe a name to be justified and propose the following one for this smaller more northerly species.

***Triorythodes fallacina* n. sp.**

*Male.* (dried) Head and prothorax dull black, faintly shagreened, the two lateral ocelli black, the median one shiny white; antennae whitish, smoky toward base. Mesothorax shiny blackish, paling somewhat towards the lateral posterior portions; membranous portions of pleura smoky olive-brown. Abdomen blackish with a slight silky sheen, posterior edges of segments faintly ringed with light olive-brown, lateral portions of median segments only slightly paler than dorsum; ventrally uniformly deep smoky, somewhat paler than dorsally. Forceps with basal joints whitish, terminal ones suffused with smoky. Setae whitish, tinged basally with smoky and with faint, fine, dark intersegmental rings. Legs deep smoky, the tibiae and tarsi paler than the femora; these latter, especially on the mid and hindlegs, show the upper and lower edges narrowly black. Wings hyaline with the two longitudinal veins below costa, as usual, strongly defined in deep smoky. Length of wing,  $3\frac{1}{2}$ –4 mm.

From an alcohol specimen the following more detailed description has been drawn up.

*Head.* Deep brown with posterior edge narrowly blackish; ocelli white with blackish basal rings; antennae pale with dark second joint.

*Thorax.* Prothorax dorsally largely deep dull smoky brown with paler tinges laterally and posteriorly; ventral area, between and around first pair of legs, pale. Meso- and meta-thorax deep shiny pitch black; pleura and sterna similarly dark with membranous lateral portions pale brownish.

*Abdomen.* Dorsally deep brown, heavily sprinkled with blackish; segments I, II, VIII and IX entirely covered by this black sprinkling; other segments broadly blackish dorsally, the dark color extending laterally fully half the distance between mediodorsal line and lateral edge, leaving a comparatively small lateral area free from this sprinkling. Lateral edge paler than rest of body; at times traces of paler median line. No distinct pale transverse banding but in fully distended specimens the paler visible intersegmental membrane gives a faint appearance of such banding. Segment IX with posterior margin distinctly dull whitish; X lighter brown with postero-lateral portions and entire rear end whitish, the posterior plate darker brown. Ventrally deep brown with the usual minute pale lateral streak and pair of median dots on each segment; posterior third of segment IX, genital-plate and forceps whitish, the pale color extending forward on IX in a V-shaped median area, attaining anterior margin. Posterior edge of genital-plate and second joint of forceps tinged with smoky; penes largely smoky. Genitalia as in *explicatus*. Setae pale, tinged with blackish on basal segments, faintly dark-ringed.

*Forelegs.* Trochanter deep smoky; femur pale whitish on inner side with exception of ventral edge, dorsal edge at base, apical margin and an apical longitudinal short streak, which are smoky brown; outer side with pale area reduced to a longitudinal streak and a curved streak arising near base and extending narrowly along dorsal margin, the dark areas comprising the basal third

dorsally, the entire ventral margin except at extreme base and a long spindle-shaped patch, occupying most of the remaining two-thirds. Tibia with distinct narrow blackish ring at base, pale dull whitish, tinged fairly strongly with brown in basal one-half. Tarsi whitish with very faint brown ring at base and tinges of brown on claw-segment.

*Mid and Hindlegs.* Coxae and trochanters deep brown. Femora dull whitish with blackish dorsal and ventral edges and a narrow dark longitudinal central streak extending entire length of joint. Tibiae pale, narrowly blackish at base, this color extending shortly along ventral edge and more extendedly along dorsal edge. Tarsi pale, faintly brown-tinged. Hind tibiae tinged with brown in apical half dorsad of dark streak.

*Holotype*—♂, Williams Lake, B. C., July 12, 1938, (G. S. Walley); No. 4446 in the Canadian National Collection, Ottawa.

*Paratypes*—23 ♂ (dried) and a vial of alcohol material, same data.