

***EPHEMERA COMPAR*: AN OBSCURE COLORADO BURROWING MAYFLY (EPHEMEROPTERA: EPHEMERIDAE)^{1,2}**

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ABSTRACT: *Ephemera compar* Hagen is known only from the adult type specimen. The occurrence of this unique specimen and species in Colorado is discussed. Burrowing mayflies in the South Platte drainage area require investigation, and new collections are needed.

Adults of the burrowing mayfly genus *Ephemera* are conspicuous because of their large size and distinctive darkly speckled or spotted wings. Despite this, *Ephemera compar* Hagen (1875: 578) remains known only from a single specimen collected by Lt. W.L. Carpenter during the U.S. survey of Colorado Territory in 1873. The type locality is "Foot-hills, Colorado." No knowledge has been added since the original description. The objective of this paper is to stimulate interest in locating a population of this handsome, obscure mayfly in an effort to clarify the status of this species.

The widespread species *Ephemera simulans* Walker is the only other *Ephemera* known as far west as Colorado, and because Traver (1935) remarked on the similarity of *E. compar* with *E. simulans*, one might suspect that the two names are synonymous. Hagen, however, regarded *E. compar* as the American counterpart of the European *Ephemera lineata* Eaton rather than a close relative of the American *E. simulans*. We have examined the type of *E. compar* at the Museum of Comparative Zoology, Cambridge, Massachusetts; its striped abdominal segment color pattern resembles that of *Ephemera varia* Eaton of eastern North America, *E. lineata*, and several Asian species rather than the blotched segmental pattern of *E. simulans*. *Ephemera compar* is most assuredly not synonymous with *E. simulans*.

We regard *Ephemera* as one of the many North American mayfly genera that have a primary eastern and plains-prairie distribution (McCafferty 1975). *Ephemera simulans* extends into Wyoming, northwestern Colorado, northeastern Utah, Idaho, Washington and Montana. It occurs in rivers and lakes, and in Idaho and Montana it provides an important hatch for fly fishermen. *Ephemera traverae* Spieth occurs in

¹Received May 7, 1984. Accepted July 10, 1984.

²Purdue Ag. Exp. Stat. J. No. 9866.

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Oklahoma (the third and only other species of *Ephemera* known west of the Mississippi River), its male genitalia differ markedly from *E. compar* and *E. simulans*, and its abdominal color pattern is distinctly different than that of *E. compar*.

We are unable to find a precise Colorado locality of "Foot-hills" or other evidence of the exact collection locality of *E. compar*. The survey area extended along the Front Range of the Colorado Rockies west to the Park Range (average limit 106° 31') and from 39° 30' to 40° 20' latitude (the south edge of greater Denver north to Loveland). Lieutenant Carpenter spent much of his collecting time above 12,000 foot elevations, but "foothills" is in contrast to this. Besides *E. compar*, Hagen described two species of stoneflies, *Isogenoides elongatus* (Hagen) and *Megarcys signata* (Hagen), from the same locality; both stoneflies range widely and over considerable elevation so they offer no clues in narrowing the type locality.

Hagen mentioned a number of other insects from "Foot-hills, Colorado," "foot-hills, Colorado" and "foothills of Colorado." In one case he used the terms "foot-hills, Colorado" and "foothills of Colorado" interchangeably. Evidence from several other insects suggests that the foothills collections were made in September.

Rumors persist of people collecting larvae of burrowing mayflies in the Front Range area of Colorado (South Platte River drainage), but as yet we have seen no specimens. Professor Robert W. Pennak (in letter) remembers collecting burrowing mayflies in about 1950 well east of the foothills in a spring and seep-fed billabong along the South Platte River. This site is on the south bank of the river about ¼ mile east of Colorado Highway 39 (about 15 miles northwest of Fort Morgan). The specimens no longer exist, and the exact genus was not determined. Subsequent collections by Pennak and his students at this site have not yielded additional burrowing mayflies. We have seen many specimens of *E. simulans* from the Yampa River in Colorado but no *E. compar*. *Hexagenia limbata*, another widespread North American ephemeropterid, was reported by Spieth (1941) from Clear Creek, in the survey area. *Ephoron album* (a burrower in the family Polymitarcyidae) occurs in the Green River in extreme northwestern Colorado, in southern Wyoming and in Nebraska just east of the Colorado border.

We are currently reviewing the genus *Ephemera* and believe that we would be able to recognize the unknown larvae of *E. compar* without rearing. In our attempt to locate *E. compar*, all burrowing mayflies from the South Platte drainage of Colorado are of particular interest to us. Discussions with Colorado aquatic entomologists indicate that burrowing mayflies are present but rare in the *Ephemera compar* "type area." Thus, any burrowing mayfly records will help focus our search.

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