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YALÇIN ŞAHİN

NAİME ARSLAN

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## Epoche in Chironomidae (Diptera) Larvae in the Streams Beşik and Çamlıca, a Part of the Southern Sakarya River System

Yalçın ŞAHİN, Naime P. ARSLAN  
Biology Department of Science Faculty Osmangazi University, Eskişehir-TURKEY

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**Abstract:** On *Ephemera* nymphs, in the streams Beşik and Çamlıca, a part of the Sakarya river system, *Chironomidae* larvae were found to live epochally. These are *Epoicocladus flavens* on *Ecdyonurus venosus* and *Synorthocladus semiverens* on *Ephemera danica*. In the literature, information on *Ephemera Chironomidae* epoche patterns is focused mostly on *Epoicocladus ephemera* and *Symbiocladus rhitrogena*.

Thus, our findings are new records for Turkey.

**Key Words:** *Ephemeroptera*, *Chironomidae*, *Epoche*, Larva.

### Sakarya Nehir Sistemi Güneyinde, Çamlıca ve Beşik Derelerinde Chironomidae (Diptera) Larvalarındaki Epoki

**Özet:** Sakarya Nehir Sistemi'nde yer alan Beşik ve Çamlıca derelerindeki *Ephemera* nimfleri üzerinde epok yaşayan *Chironomidae* larvalarına rastlanılmıştır. Bunlar; *Ecdyonurus venosus* üzerinde *Epoicocladus flavens* ve *Ephemera danica* üzerinde *Synorthocladus semiverens*'dir. Literatür bilgi *Ephemera*, *Chironomidae* epokisine örnek olarak daha çok *Epoicocladus ephemera* ve *Symbiocladus rhitrogena* üzerinde yoğunlaşmıştır. Bu nedenle bulgularımız Türkiye için yeni kayıttır.

**Anahtar Sözcükler:** *Ephemeroptera*, *Chironomidae*, *Epoki*, Larva

#### Introduction

In the literature there is information on some species living epochally on *Epheromeroptera nymphs* of *Chironomidae* (particularly *Epoicocladus ephemera*, *Symbiocladus rhitrogena*) (1). In the studies conducted on *Epheromeroptera* fauna of the Sakarya river system, the discovery of some other *Chironomidae* larvae on *Epheromeroptera nymphs* led to the possibility of augmenting this epoche pattern. Therefore, it seems necessary to conduct research into the possible existence of some other epoche behaviors in *Epheromeroptera* and *Chironomidae* obtained from the Sakarya river system.

#### Materials and Method

The specimens from the streams, Beşik and Çamlıca (Fig. 1), a part of the Sakarya river system were collected using special nets and a 3 step sifting system. Considering some species of *Epheromeroptera* members on rocks in the river bed, samples were collected from the rocks by means of tweezers and were immersed in a fixative consisting of 500 ml. alcohol of 70%, 10 ml. formaldehyde and 5 ml. glycerine (2). *Chironomidae* larvae found on only two *Epheromeroptera* species were fixed in formaldehyde of 4%. With the establishment,

*Chironomidae* larvae (3, 4) and *Epheromeroptera* nymphs were identified (2, 5).

#### Discussion and Conclusion

Sulc was the first to discover that *Epoicocladus ephemera* larvae live epochally on *Ephemera vulgata* and *Ephemera danica* (6). These larvae living epochally on the legs and hairs of *Ephemera* feed on algae and diatoms clinging to the hairs and branchiae on the body surface of the host. Thus the *Ephemera*'s outer surface is kept clean.

When reaching the end of its life, the larva forms a cocoon among the animal's sternites and develops into a pupa and leaves *Ephemera*. When developed into adults, larvae with developed into adults, larvae with an average length of 4-5 mm. leave *Ephemera*, which occurs due to a water flow formed by the host.

Johenson classified the *Spaniotoma (Smittia)* sp., living in North America in the *Epoicocladus* group (7). Zavrel classified, *Chironomidae* larvae, that the found on the legs and branchiae of *Ephemera* larvae (*Hexagenia recurvata*) in the *Epoicocladus* group (1). These larvae present different characteristics from the larvae that the gave for Europe (8). Both larvae (*Spaniotoma (Smittia)* and *Epoicocladus*) have close kniship and ecological

similarities with each other and they have a relationship with *Ephemeroptera* larvae.

The most interesting epoche can be observed in *symbiocladius rhitrogena* of *Orthoclaadiinae* larvae. After an extensive scanning of the literature, this larva was introduced to the science world, in detail, by Codreanu (9).

Classen introduced the larvae he had collected in America as *Trissocladius aquitans* under the title of some other species; *Trissocladius* larvae and their pupae live clinging to reverse faces of the wings of the nymphs of *Rhitrogena*, an *Ephemeridae*.

Komerak found similar larvae in Bohemia and defined them as *Ecdyonurus fluminum*. Similarly, Stepan named this *Rhitrogena semicolarata semicolarata* (10).

All these European forms are identical so can be classified under a specific species. *Symbiocladius rhitrogena* is a species, which is certain to have been found in Bohemia, Romania and the Alps.

As a result, *Epoicocladius flavens* living under the wings of *Ecdyonurus venosus* and *Synorthocladus semiverens* living under the wings of *Ephemera danica* are to be included in *Chironomidae* species living on *Ephemera* larvae. The specimens in our study were not included in the above mentioned information. As a result research, our specimens with an epochal relation taking place between *Chironomidae* and *Ephemeroptera* have increased more. On the other hand, any similar case of epoche related with *Paratrithocladus rufiventris* living in the water in which *Synorthocladus semiverens* exist and *Eukiefferiella brevicar* living in the water in which *Epoicocladius flavens* exist, was not observed.

### Acknowledgement

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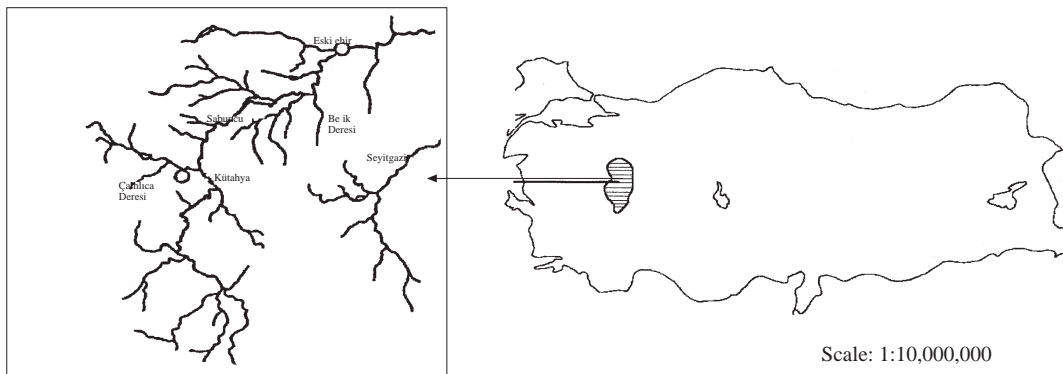


Figure 1. Sampling stations

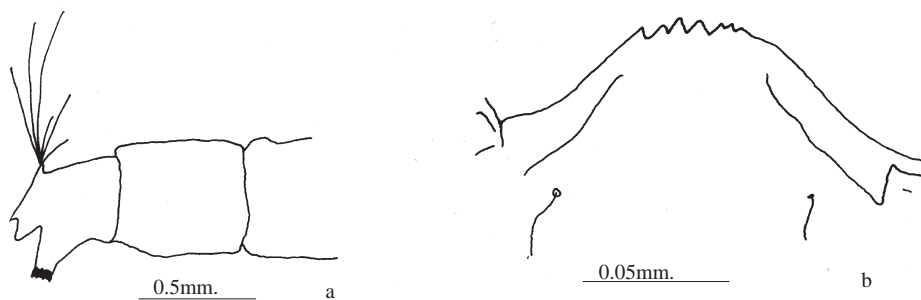


Figure 2. *Epoicocladius flavens*, a-end of body, b-labium

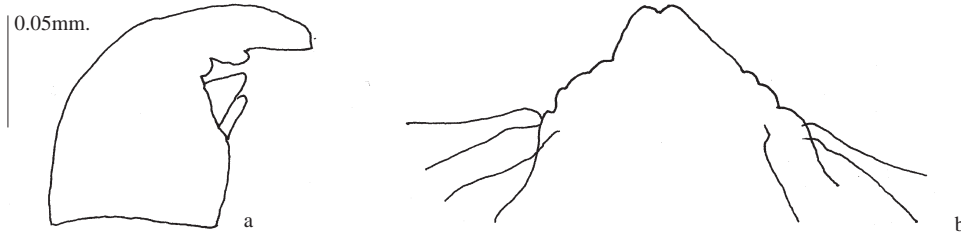


Figure 3. *Synorthocladius semiverens*. a- mandible, b- labium.

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