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A New Chironomid Genus from Gerede (Bolu, Turkey); *Phaenopsectra* Kieffer, 1921 (Diptera, Chironomidae)

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ABSTRACT

The genus *Phaenopsectra* Kieffer, 1921 found in Turkey is new based of larva stage of *Phaenopsectra flavipes* (Meigen, 1818) was found for the first time in Keçi Lake (Gerede - Bolu, Turkey). The morphological, biological and ecological properties and distribution of the larva are explained in the article.

Key words: Larva morphology, lake, *Phaenopsectra flavipes*, Chironomidae.

INTRODUCTION

Chironomidae family is more than 120 million years old (Cranston, 1995) and has undergone extensive adaptive radiation to occupy a wider range of microhabitats at present than any other aquatic insect group (Jacobsen, 2008). Although many species live in coastal, marine, and terrestrial environments, the Chironomidae are most abundant and diverse in freshwater habitats. Chironomid midges typically represent about one-third of the insect species in most lakes and streams (Jacobsen, 2008).

The genus *Phaenopsectra* belongs to Chironomini has at least three species in the Palaearctic region but it has nine species in the Nearctic region with some species in common (Pinder and Reiss, 1983). The general distribution of the genus *Phaenopsectra* is known as North America, Portugal, Romania, United Kingdom and Western Europe (Pinder and Reiss, 1983; Grodhaus, 1976). The most common species *P. flavipes* and *P. punctipes* has been collected almost throughout Europe (Saether and Spies, 2004). And also *Phaenopsectra kizakiensis* (Tokunaga, 1940) is known from Asia (Sasa and Suzuki, 1998). However, there were no records from Turkey.

In this paper, we report that the genus *Phaenopsectra* Kieffer, 1921 found in Turkey is new based of larva stage of *Phaenopsectra flavipes* (Meigen, 1818) which is found for the first time and also new to the Turkish fauna.

MATERIAL AND METHODS

Sampling was carried out in April 2011 at the Keçi Lake (Gerede-Bolu) which is a shallow lake located at 1217 m (Fig. 1) in Western Black Sea region of Turkey. Samples of chironomid larvae were separated from the macrophytes and the sediment by using sieves with mesh size 250 m. All the larvae samples were immediately fixed in 70 % ethyl alcohol in the field. The larvae samples were sorted based on their systematics by using the stereo microscope before the permanent preparation in the laboratory. Three *Phaenopsectra* larvae in fourth instar compatible with the genus which has been illustrated by Pinder and Reiss (1983) were analysed for the identification. Epler (2001) was applied for preparation the larvae. The material examined was mounted on slides in Euparal®. The general terminology and abbreviations follow Sæther (1980) with regard to larvae. All measurements are in micrometers and the mean value of the three larvae was taken in account for the length measurements. Chironomid identification manuals were followed as Pinder and Reiss (1983), Epler (2001), Klink and Moller Pilot (2003), Moller Pilot (1978, 1984), Grodhaus (1976, 1987), Peter and Schmid (1986). Other typical parameters which are considered such as water chemistry and water properties were also taken in situ.

RESULTS

Biology and Ecology: *Phaenopsectra* can be found in lentic and lotic water bodies, in a range of sediment types and has been associated with macrophytes and hard substrata (Pinder and Reiss, 1983). Larvae of *Phaenopsectra* occur in sandy and muddy sediments of small standing waters and flowing waters. They are also viable in “aufwuchs” of submerged water plants and hard substrata (Pinder and Reiss, 1983). This genus has been also reported from acidified lakes (Raddum and Saether, 1981; Henrikson *et al*., 1982; Brodin, 1986), altough Pinder and Morley (1995) found *P. flavipes* to be most abundant in non-acidic lakes (Brooks *et al*., 2007). The larvae display a preference for stems and leaves of plants and are found only scarcely on stones and sandy bottoms (Brundin, 1949; Lehmann, 1971; Mol *et al*., 1982; Becker, 1995; Moller Pillot, 2009). The larvae found in lakes only in the littoral zone (Brundin, 1949; Mundie, 1957; Moller Pillot, 2009). Brundin (1949) found *Phaenopsectra* to be common and sometimes abundant in oligotrophic lakes, but not in most eutrophic lakes (quoted from Moller Pillot, 2009). Wilson and Ruse (2005) also considered the genus to be pollution intolerant. However, Moller Pillot and Buskens (1990) supposed that the genus is about equally abundant in organical polluted and unpolluted water. The physico-chemical parameters of the Keçi Lake were obtained as; temperature 9.19 °C, pH 7.82, dissolved Oxygen 10.36 mg\l, conductivity 563.00 µs\cm, total dissolved solids (TDS) 0.366 mg\l and salinity 0.27 ‰.

Larva Morphology: The mean size value of the three larvae is measured as 8.78 mm long. The colour of the larvae was reddish yellow and with 2 pairs of separate eyes. Anterior margin of frontoclypeal apotome convex. The mean size of the head length is 530 µm and the width is 310 µm long. The gula pale, rarely with weak pigmentation.

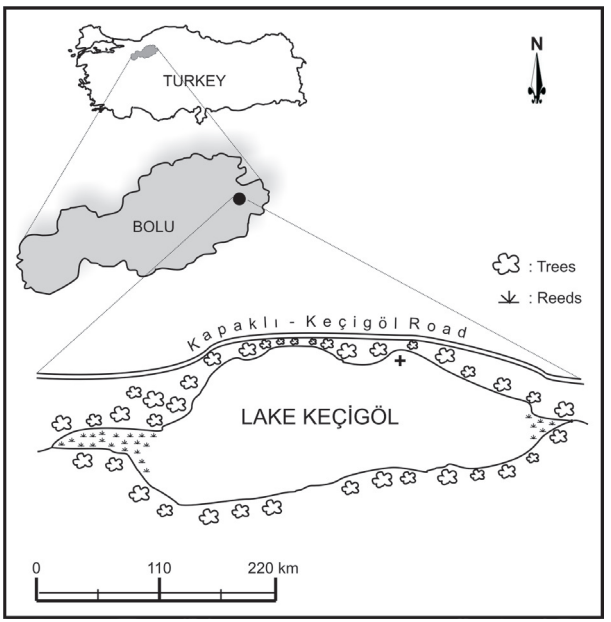

Fig. 1. Map of the sampling area. "+" sign indicates the location of *P. flavipes* has been found.

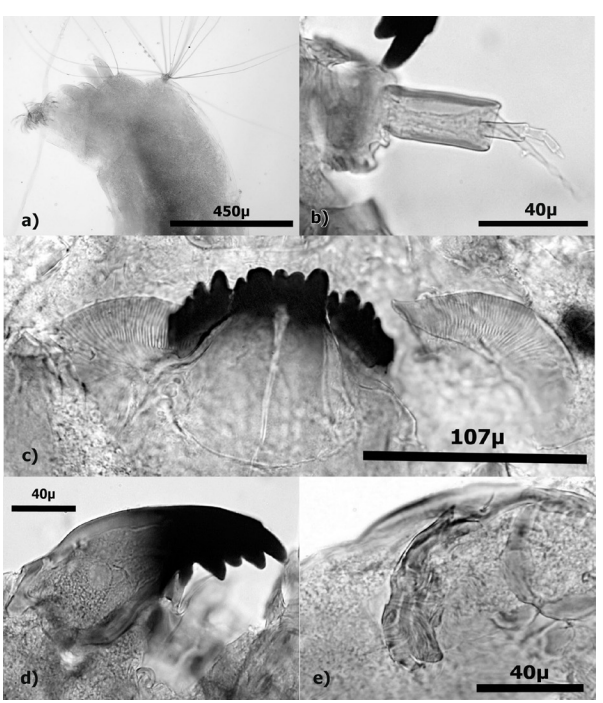

Fig. 2. *P. flavipes* a) anal segment, b) antenna, c) labrum, d) mandible, e) mentum.

Antenna with 5 segments. The ring organ situated in proximal 1/4 of basal segment. The AR is > 0.8 and accessory blade moderately long. Lauterborn organs opposite. Style seated on segment 2 and moderately longer than segment 3. Second antennal segment moderately longer than segment 3 and 4. SI (15 µm) and SII (27 µm) plumose on both sides of the labrum. Seta praemandibularis simple with 10 µm long. Pecten epipharyngis consists 3 separate and distally serrated platelets. Premandible with 3 teeth and the basal tooth is half length compared to the other teeth. Premandibular brush present. All teeth are dark on the mandible. Dorsal tooth present on the mandible and relatively short. Three inner teeth present and the mid one moderately shorter than basal and distal inner tooth. A deep notch present on proximal to basal inner tooth. Molar area proximal to notch is dark. Seta subdentalis moderately long and curved. The length and width ratio of the maxillary palp is > 1.2. The mean size of the mentum is 117 µm. All teeth are black (dark). Four median teeth longer than other six pairs of lateral teeth. Outer pairs of median teeth two times longer and 1.5 times wider than central pairs. First lateral tooth shorter than outer median and second lateral tooth. Third lateral tooth subequal to first lateral tooth. Fourth lateral tooth small and distinctly shorter than third lateral. Fifth pair very strongly reduced and truncate. The mean size of the ventromental plates 107 µm. Ventromental plates moderately curved and with continous striae and separated medially by 0.4 the width of mentum, about as wide as mentum.

DISCUSSION

The most common species in Europe are known ad *Phaenopsectra flavipes* (Meigen, 1818) and *P. punctipes* (Wiedemann, 1817). *P. flavipes* distinguishes from *P. punctipes* throughout a moderately deep notch on mandible, and mentum with the lateral area moderately slumping away. However, the mandible of *P. punctipes* with an extremely deep notch and mentum with lateral area extremely slumping away. The seta subdentalis and the deep notch of *P. flavipes* are not narrow as much as in *P. pilicellata* (Grodhaus, 1976) which is from the Nearctic region.

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