

A STUDY ON THE DETERMINATION OF THE CHIRONOMIDAE (INSECTA) FAMILY OF İLKE STREAM (MANİSA)


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ABSTRACT. Sampling was carried out from 5 stations from İlke Stream in May 2019. At the end of the examination of the samples; A total of 13 taxa were identified, 7 taxa from Orthoclaadiinae subfamily and 3 each from Tanypodinae and Chironominae subfamily.

Keywords: *Chironomidae, İlke Stream, freshwater, Manisa*

INTRODUCTION

İlke Stream starts flowing from the upper part of the village of Satılmış. It joins the Gediz River by passing through Selmanhacılar and Turpçu. The stream carries the spring and rain waters of the mountains during the winter months. In the summer, it decreases considerably. One of the important reasons for the decrease in the water flow is that the surrounding agricultural areas such as Selendi Stream use the water here.

When we look at the life cycle of Chironomidae, we see that the longest time is in the larval stage. Chironomidae larvae contribute significantly to the base biomass. In addition, due to the high tolerance ranges, it can be found in many aquatic environments [1, 16].

Freshwater ecosystem has distinctive ecological characters compared to sea and land. The first studies on river ecology started in the 1800s. During this period, researchers worked especially on plankton. In the 1920s, studies on classification were made. More specific research on the role of ecological factors began in the 1930s and 1940s.

The Chironomidae family is one of the important ecological groups of aquatic organisms and has a worldwide distribution [14]. For the last ten years, Chironomidae individuals have been used to characterize the state of the river system [4, 6].

MATERIALS AND METHODS

Benthic samples were taken from 5 stations determined on the İlke Stream in May 2019 **Figure 1**. The samples were passed through 30, 60 and 80 mesh sieves, then labeled and placed in glass jars containing 70% alcohol.

In order to increase the storage time of the samples brought to the laboratory, the alcohols were changed and reintroduced into 70% alcohol. Samples taken from jars to petri dishes were sorted under a Nikon brand binocular microscope and placed in 5 ml plastic tubes containing 80% alcohol. At the same time, samples belonging to other invertebrate groups were also sorted and labeled.

The samples cleaned from benthic mud were taken to the preparation stage and were examined between the head capsules and the rest of the body with glycerin dripped on a slide and a coverslip, and their diagnosis was made.

In the identification of species; Cranston (1982), Fittkau and Roback (1983), Hirvenoja (1973), Klink and Moller Pillot (2003), Şahin (1980, 1987, 1991, 1998), Wiederholm (1983) were used [7, 11, 12, 13, 21, 22, 23, 24, 27].

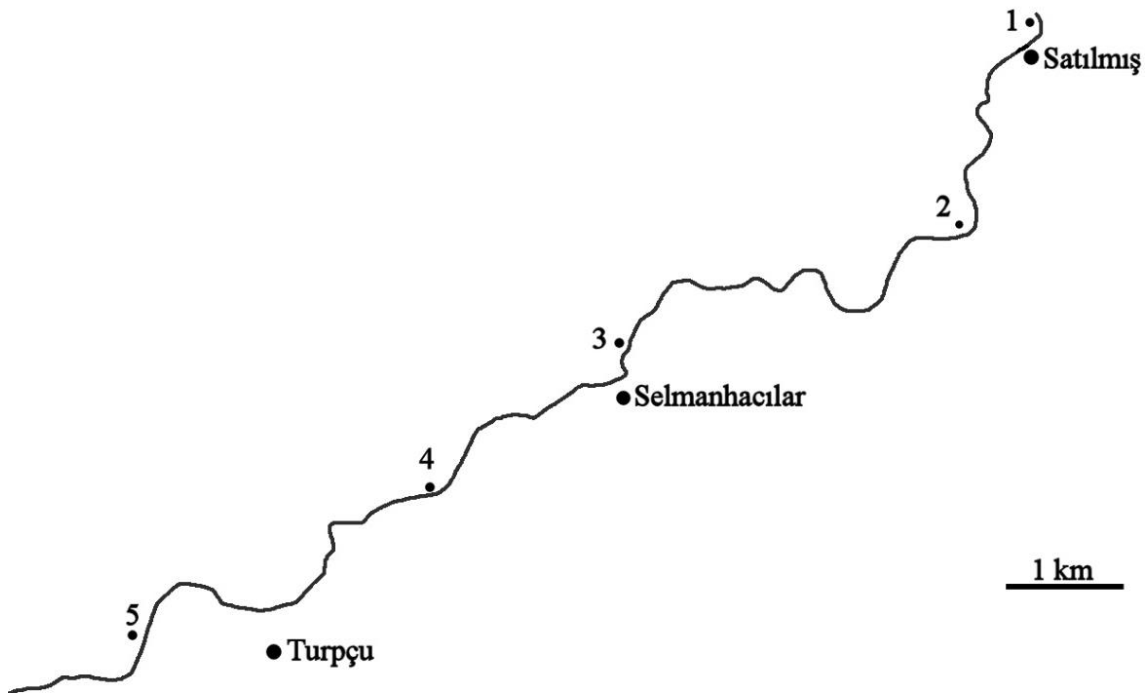


Fig. 1. Study area and stations.

RESULTS AND DISCUSSION

As a result of the study, 13 taxa were identified. The systematic distribution of these taxa according to the stations is given in **Table 1**.

Orthoclaadiinae was the most common subfamily with 7 taxa. This is followed by Tanypodinae and Chironominae subfamilies with 3 taxa each. *Chaetocladius sp.* and *Chironomus rolli* species. The least common species are; detected only at station 1, *Procladius sp.* and *Zavrelimyia sp.* has been. When we examine the stations, there are at least 5 stations with 4 taxa. The highest number of taxa is station 3 with 10 taxa.

Chironomidae species, which are among the important groups in determining water quality, also play a key role for other benthic invertebrates.

Chironomidae species are among the most common benthic invertebrates in all months of the year [16].

Although *Cricotopus (C.) albiforceps* and *Cricotopus (C.) bicinctus* were seen only in 2 stations, they were the most detected species in terms of number of individuals. In addition, *Apesctrotanypus trifascipennis* was detected in small numbers and only in two stations. The least number of individuals is *Zavrelimyia sp.* and *Procladius sp.* Only 3 individuals from *Zavrelimyia sp.*, which were detected in station 1, and 5 individuals from *Procladius sp.* were encountered.

Table 1. Distribution of taxa belonging to Chironomidae at stations.

Taxa	Stations
<u>Tanypodinae</u>	
<i>Apesctrotanypus trifascipennis</i>	1, 2
<i>Procladius sp.</i>	1
<i>Zavrelimyia sp.</i>	1
<u>Orthoclaadiinae</u>	
<i>Acricotopus lucens</i>	1, 2, 3
<i>Chaetocladius sp.</i>	1, 2, 3, 4
<i>Cricotopus (C.) albiforceps</i>	2, 3
<i>Cricotopus (C.) bicinctus</i>	2, 3
<i>Cricotopus (C.) trifascia</i>	2, 3, 4
<i>Eukiefferilla discoloripes</i>	3, 4, 5
<i>Paracladius conversus</i>	3, 4
<u>Chironominae</u>	
<i>Chironomus thummi</i>	2, 3, 5
<i>Chironomus rolli</i>	2, 3, 4, 5
<i>Polypedilum scalaenum</i>	2, 3, 5

Streams are very important in terms of flow rate and substrate composition. For this reason, it offers various habitat environments to aquatic creatures [26]. The living population is affected by factors such as the stream bed [8], the physicochemical properties of the water and biological interactions [9, 17, 18, 20]. This situation shows us that; The topography of the land gains importance. For this reason, it was beneficial to examine the elevations that will affect the land structure and current speed and a 3-dimensional elevation map was created. **Figure 2.**

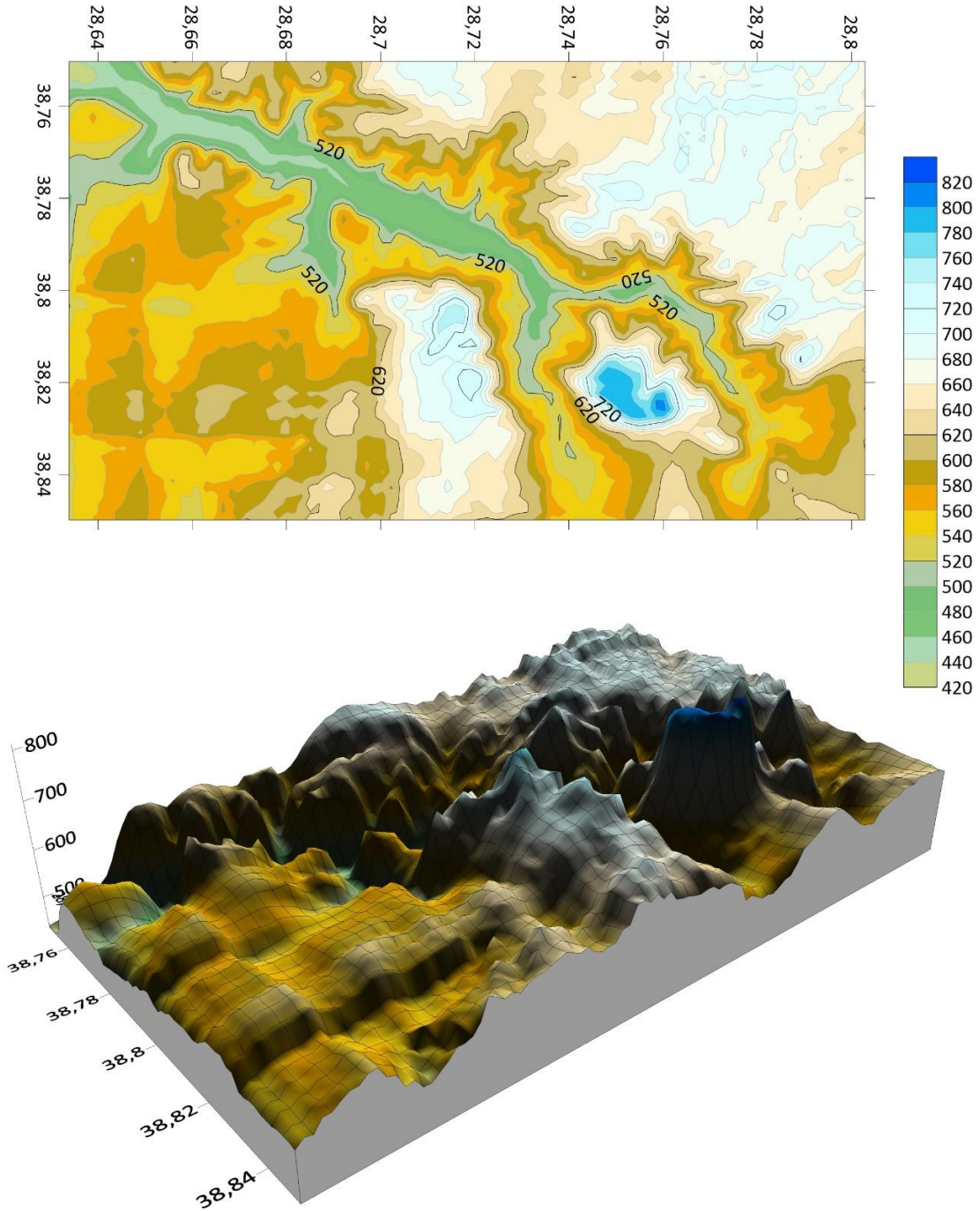


Fig. 2. 2 and 3 dimensional topographic structure of İlke Stream.

CONCLUSION

Freshwater ecosystem has distinctive ecological characters compared to sea and land. The first studies on river ecology started in the 1800s. During this period, researchers worked especially on plankton. In the 1920s, studies on classification were made. More specific research on the role of ecological factors began in the 1930s and 1940s [3, 5].

However, over time, opinions about the important factors that determine the boundaries of the river have begun to change. Thus, dissolved oxygen (O₂) content, oxidation-reduction, microhabitat factors (substrate, current, etc.) and global features (climate, geology) have become more important [15, 25].

The Chironomidae family is one of the important ecological groups of aquatic organisms and has a worldwide distribution [14]. For the last ten years, Chironomidae individuals have been used to characterize the state of the river system [6].

The Chironomidae family are found in different habitats throughout the stream system, where their distribution is affected by different factors such as substrate properties (organic or inorganic), and water flow rate. Physical factors such as food quality and fitness are also associated with the distribution and structure of Chironomidae individuals [18]; In addition, it has been stated that these taxa are closely related to their habitats and feeding patterns [10, 19].

The majority of Chironomidae larvae are detritivores or feed on algae and bacteria growing on stone surfaces and plant leaves. In general, Chironomidae larvae have adapted to six feeding strategies: predatory, scraping, filtering, accumulating, degrading, or a combination of these [2].

Orthoclaadiinae larvae are generally green in color because they feed on algae. They prefer areas where there is vegetation or sand and gravel in streams and lakes as their habitat. In general, they have little tolerance for low oxygen concentrations. Therefore, they are predominantly found in oligotrophic lakes or cool streams. However, they are also dominant in eutrophic lakes where plants are concentrated.

Although the İlke Stream continues up to the Gediz River, sampling could only be carried out below the Turpçu Village due to limited time and opportunities.

With this study, we tried to reveal the chironomidae species diversity in the İlke Stream. However, due to the decrease in the water flow rate depending on the season, a complete sampling could not be made. For this reason, we think that the diversity will be determined more comprehensively with the samples to be taken monthly.

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