

[Short Communication]

First report on Freshwater crab species (*Potamon bilobatum*) in the altitudes of Guilan (Lakan area)

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ABSTRACT

Guilan province is located in south and south-west of the Caspian Sea. Guilan is one of the richest and the most humid region in the country due to suitable climate, ample rainfall and many water sources (springs, rivers, creeks,..). Despite the prevailing favorable conditions, limnological studies, especially in the mountainous regions of this province are limited. A limnological study was conducted in the Lakan area from March to June in 2008. Macrobenthos were sampled from the freshwater stream that were mostly composed of freshwater crabs. The samples were transported to the Natural History Museum in Frankfurt, Germany, and the crab species was identified as *Potamon bilobatum* belonging to Family Potamidae. The physico-chemical characteristics of water and the study area have been recorded.

Keywords: Freshwater crab, *Potamon bilobatum*, Guilan Province, limnology.

INTRODUCTION

Potamoniden is an advanced group of decapods, which most probably migrated to continents during the Oligocene era. There are two different families of freshwater crabs in Iran i.e., Gecarcinucidae and Potamidae whose ancestor probably originated from the sea independently (Pretzmann, 1962). Many species of the Potamidae family migrated to different geographically isolated regions and they well adapted themselves with prevailing conditions (Bott, 1970; Pretzmann, 1976). This type of freshwater crab in the Euro-Asian area has been extended from the Mediterranean region (Krupp *et.al.*, 1987) to east-Himalaya (Bott, 1966).

Potamidae family has three sub-genera in Iran: Pontipotamon, Centropotamon, and Oriantopotamon.

The sub-genus, Pontipotamon is dominated in south and south-west Caspian region, Centropotamon is dominant in the south Caspian Sea region in the centre and south of Iran while Oriantopotamon has been reported in the east Caspian Sea and south-east Iran (Pretzmann, 1962). However, the first freshwater crab in Iran was identified

and reported by Oliver in 1804. Thereafter, other European researchers reported and collected many samples of freshwater crabs from Iran (Khatami and Valinassab, 2003). Samples of *Potamon* (*Centropotamon persicum elbursi*) (Pretzmann, 1976) were collected from Sefidrud River in Roudbar region, while the samples *Potamon* (*Pontipotamon ibericum tauricum*) were found in the mouth of the Sefidroud connected to the Caspian Sea (Pretzmann, 1976). Specimens of *Potamon* (*Pontipotamon ibericum ibericum*) were also reported from the coastal region of the Guilan province (Pretzmann, 1965).

MATERIALS AND METHODS

Samples were collected between March and June of 2008. Five stations were considered located 100 m apart from each other in the stream. Specimens were captured using a scoop-net of 2 mm diameter mesh size, fixed in 80% alcohol and transported to the Faculty of Natural Resources of University of Guilan. In the study area, some measurements were done in terms of the biological and chemical characteristics. Five male and female specimens were selected

from the samples collected, placed in a special container covered with cotton soaked in 80% of alcohol. The container was put in a box and sent to the Natural Historical Museum of Frankfurt, Germany.

Physico - chemical characteristics were measured by different methods e.g. temperature and dissolved oxygen were measured by WTW Oxical- system. Conductivity, salinity and pH were measured by TD5 Meter Model (47. Portable). Concentrations of ammonium, nitrate, iron

and total hardness were measured by Mahery - Nagl (visocolor).

Geographical specification of the area was done by the GPS - Garmin (Model, Vista).

Study area

Lakan is located 25 Km away from the city of Rasht, the center of the Guilan province surrounded by a thick forest. The geographical situation of the area is 37°, 12' latitude and 49°, 36' longitude and 109 m NN.



Fig 1. Limnocrenen Springs

There were two types of springs in this region. One was ditch type and salty in taste called limnocrenen (Fig.1). The walls of this ditch were formed by weak lime and belonged to the Cretaceous period (Darveshzadeh, 1992).

The second type of the spring was running water like a stream. The width of the stream was about 70 cm and its maximum depth was 4 cm called Helocrenen (Fig.2). Stream bed was made of volcanic stone, which was probably formed by Tuff and Andesite (Nazari and Omrani, 2004). The substratum of stream is orange because of iron oxide and ferric hydroxide.

RESULTS

The physico-chemical parameters recorded in the stream are presented in Table 1. The



Fig 2. Helocrenen Springs

average temperature of the stream was 16-18 °C during the study period. Total ammonium (NH_4^+) was very low in the stream due to lack of organic matter. The nitrate (NO_3^-) concentration in stream was almost in the normal range which is usually between 0.4 and 8 mg/l in running water (Hütter, 1994).

Data on the freshwater crabs sampled (Helocrenen) is indicative that the male crabs sampled in all stations were larger than females (Table 2). The maximum size of male crab (carapace width) was 12 cm while the maximum carapace size of female crab was 9 cm (Fig. 2a, 2b). The margins of carapace were seriated with pointed teeth. On the mid- part of the carapace is a V shaped deepening. The deepening is surrounded by eight prominent swellings.



Fig 2. a- *Potamon bilobatum*
Carapace dorsal view



Fig 2. b- *Potamon bilobatum*
Carapace anterior view

Both sexes were light brown. The cheliped of male was found to be larger than that of females. Sex was identified by abdominal features such as broader abdominal segments in female and segregated telson.

Abdominal segments were narrow in male with an attached telson. The major characteristic of freshwater crab is the absence of pedal on the fifth walking leg.

Table 1. Average values of physical-chemical parameters of stream during months of March to June 2008 in Lakan stream

Parameters	March	April	May	June
Temperature °C	16±2	16±1	17±1	18±1
Dissolved oxygen mg/l	7.5±0.4	6.8±0.4	5.9±0.3	4.6±0.3
Ammonium mg/l	0.2±0.03	0.23±0.03	0.25±0.06	0.26±0.06
Nitrate mg/l	4±0.34	5±0.34	6±0.07	7±0.07
Iron mg/l	0.2±0.01	0.2±0.03	0.22±0.06	0.22±0.06
Salinity mg/l	338±6	328±7	338±7	433±7
Conductivity µs/cm	616±5	613±4	616±5	723±4
Total Hardness °d	14±2	12±2	14±1	16±1
pH	7.6	7.7	7.6	7

1°d = 10mg/l CaO = 17/8 mg/l CaCO₃

Table 2. The number of freshwater crabs *Potamon bilobatum* obtained from different stations of the stream (Helocrenen)

Station	number	
	Female	Male
1	3	1
2	4	2
3	7	4
4	6	2
5	5	3

Discussion

This survey is the base line for further research on the freshwater crab, *Potamon bilobatum* described for the first time from the North of Alborz Mountain in the Guilan province. Lakan area has no connection to the Caspian Sea and it is also not related to any water shed or river. The Guilan plain is located between the Caspian Sea and Alborz Mountains and humidity is very high in this region (Ehler, 1980). That is why the aquatic organisms are much limited in this region. The limited species of this area must adapt themselves to low oxygen, low temperature and food scarcity. The presence of Gammarus sp. in large numbers indicated that this amphipod might be the main food source of freshwater crabs since most crabs have a

carnivorous diet. Total ammonium (NH₄⁺) was very low in running water of stream. Iron was extremely high in ditches leaving gelatinous orange deposits on the walls. The same was observed on the banks of streams (Gammons, Christopher et al., 2004). There are several reports about freshwater crabs in different regions of the Guilan province (Löffler, 1956; Pretzmann, 1976; Nasrollahzadeh, 1999). Pretzmann (1976) reported the presence of *Persicum elbursi* from Sefidroud region up to the mouth of the Caspian Sea. The author also observed *Centropotamon* and *Pontipotamon* in downstream and upstream, respectively of the Sefidroud River. The only report on *Potamon bilobatum* (the species in mind in the present study) is related to an investigation in the Alborz region (south of Khuramadad) (Brandis et al., 2000).

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اولین گزارش از گونه های خرچنگ آب شیرین (*Potamon bilobatum*) در ارتفاعات گیلان (منطقه لاکان)

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چکیده

استان گیلان در جنوب و جنوب غربی دریای خزر واقع شده است. گیلان به علت آب و هوای مناسب، بارش فراوان و بسیاری از منابع آب (چشمه ها، رودخانه ها، نهرها...) یکی از غنی ترین و مرطوب ترین منطقه در کشور محسوب می شود. با وجود شرایط مطلوب، مطالعات لیمنولوژیکی، به ویژه در مناطق کوهستانی استان گیلان بسیار کم صورت گرفته است. یک مطالعه لیمنولوژیکی از مارس تا ژوئن سال ۲۰۰۸ در منطقه لاکان انجام شده است. از ماکروبنتوزها جریان آب شیرین نمونه برداری شد. بسیاری از نمونه های جمع آوری شده متعلق به خرچنگ آب شیرین است. نمونه ها برای شناسایی به موزه تاریخ طبیعی فرانکفورت در آلمان فدرال فرستاده شدند. گونه های خرچنگ به عنوان *Potamon bilobatum* متعلق به خانواده Potamidae شناخته شدند. خصوصیات فیزیکی- شیمیایی آب منطقه مورد مطالعه نیز ثبت گردید.