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# ON THE DIVERSITY OF LEECHES (ANNELIDA: HIRUDINA) IN THE FRESH WATERS OF KURDISTAN PROVINCE, IRAN

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*Abstract* - Lotic and lentic environments, including basins, throughout Kurdistan province, Iran, were surveyed for the presence of leeches from June 2009 until June 2010. In view of the geographical location of Iran, a very rich fauna of leeches should be expected. For each of the species collected, the new locality records are given, followed by the global pattern of distribution. In addition, taxonomic notes are provided for some species. In total seven species of leeches were found in this region. All species repeated in the present paper are new and found in the fresh water fauna of Kurdistan, Iran.

*Key words*: Leeches, Hirudina, fresh water, Kurdistan, Iran

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## INTRODUCTION

Watersheds in Iran belong to at least three different regions. Rivers in northern Iran are inhabited by typical Ponteo-Caspian leech species, the fauna of which is well studied in the neighboring territories (Gussev, 1987; Lukin, 1976). Rivers in central Iran drain their waters into salt lakes and, in addition to the endemic leech species, several species exist in the lotic and lentic environments of these waters. Data on leech fauna from the eastern regions of Iran, which are influenced by the Indian faunal region, have been presented in only 2 papers (Blanchard, 1896) who repeated *Hirudo asiatica* (R. Blanchard) in Afghanistan on the Persian boundary while Plotnikoff (1907) introduced a species *Limnatis turkestanica* in Turkistan and eastern Persia. There are approximately 40 species found in the fresh waters of Iran, however limited data are available on the ecology (Gholami, 2005; Nasrabadi et al., 2009; Mirzaie et al., 2008; Grosser and Pesic, 2006; Grosser and Pesic, 2008 and Jalali et al., 2009). No data are available on the leech fauna in the fresh waters in the Kurdistan province, Iran. This study presents the first survey data on the fresh waters of Kurdistan province of Iran.


**Fig. 1.** Map of the study area shown by arrow

## MATERIALS AND METHODS

Lotic and lentic localities in Kurdistan province, Iran were surveyed for leeches during June 2009 until June 2010. The leeches were collected by hand or with pincers from the underside of roots and stones in the water, as well as on the banks. The collected leeches were first transferred into 10% ethanol, after which they were washed to remove the mucus and preserved in formalin 10%. The material is deposited in the authors' collections. The longitude and latitude of the collection sites were recorded with GPS.

For each of the species collected the new locality records are given followed by the global pattern of distribution. Furthermore, the biodiversity of species found in Kurdistan province at the place where part of the Tigris water system originates is presented. Identification of leech specimens was carried out in accordance with the keys presented by Lukin (1976), Grosser (1987) and Timrm (1999).

## RESULTS

### Glossiphoniidae Vailant, 1890

*1. Helobdella stagnalis (Linnaeus, 1758)*

Material examined: Kurdistan Province, Dehgolan to Ghorveh Road, River Sangh siah (ca. 12 km after Dehgolan 35°10'N 47°26'E), ca 1820 m a.s.l., 01.09.2009, leg. B. Salimi seven specimens; River (Chame khan) near city Saqez (ca. 36°13'N 46°15'E), ca 1460 m a.s.l., 12.09.2009, leg. B. Salimi, five specimens; River near city Baneh (ca. 36°1'N 45°56'E) ca. 1600 m a.s.l., 22.09.2009, leg. B. Salimi, four specimens; River (Sonateh) between Saqez to Divandareh road (ca. 36°09'N 46°33'E) ca. 1470 m a.s.l., 30.09.2009, leg. B. Salimi, nine specimens; River (Tarkhan abad) near the city of Marivan (ca. 35°31'N 46°13'E) ca. 1320 m a.s.l., 10.10.2009, leg. B. Salimi, four specimens; Divandareh to Sannandaj Road, River Ghezelavzan (ca. 25km after Divandareh 35°47'N 47°03'E), ca 1800 m a.s.l., 21.04.2009, leg. B. Salimi five specimens.

*2. Placobdella costata (Fr. Müller, 1846)*

Material examined: Kurdistan Province, Dehgolan to Ghorveh Road, River Sangh siah (ca. 12 km after Dehgolan 35°10'N 47°26'E), ca 1820 m a.s.l., 01.09.2009, leg. B. Salimi five specimens; River (Sonateh) between Saqez to Divandareh road (ca. 36°09'N 46°33'E) ca. 1470 m a.s.l., 30.09.2009, leg. B. Salimi, six specimen; River (Tharkhan abad) near city Marivan (ca. 35°31'N 46°13'E), ca 1320 m a.s.l.,10.10.2009, leg. B. Salimi, two specimens.

*3. Hemiclepsis marginata (O. F. Müller, 1774)*

Material examined: Kurdistan Province, Dehgolan to Ghorveh Road, River Sangh siah (ca. 12km after Dehgolan 35°10'N 47°26'E), ca 1820 m a.s.l.,01.09.2009, leg. B. Salimi four specimens; River (Sonateh) between Saqez to Divandareh road (ca. 36°09'N 46°33'E) ca. 1470 m a.s.l., 30.09.2009,leg. B. Salimi, four specimens;

### Erpobdellidae R. Blanchard, 1894

*4. Erpobdella lineata (O.F.Müiler)*

Material examined: Kurdistan Province, River (Sonateh) between Saqez to Divandareh road (ca. 36°09'N 46°33'E), ca. 1470 m a.s.l., 30.09.2009, leg. B. Salimi, ten specimens; Sannandaj to Kamyaran road, River Gheshlagh (ca. 14km after Sannandaj, 35°09'N 46°57'E), ca. 1320 m a.s.l., 25.09.2009, leg. B. Salimi, four specimens, Sannandaj to Kamyaran road, River near city Kamyaran (ca. 34°48'N 46°56'E), ca 1470 m a.s.l., 10.10.2009, leg. B. Salimi, four specimens. Divandareh to Sannandaj Road, River Ghezelavzan (ca. 25 km after Divandareh 35°47'N 47°03'E), ca 1800 m a.s.l., 21.04.2009, leg. B. Salimi, two specimens.

*5. Erpobdella octoculata (Linnaeus, 1758)*

Material examined: Kurdistan Province, Sannandaj to Kamyaran road, River Gheshlagh near Kavana (ca. 25km after Sannandaj 34°58'N 46°59'E) ) ca. 1420 m a.s.l. 11.10.2009,leg. B. Salimi, four speci-

mens. Sannandaj to Kamyaran road, River near city Kamyaran (ca. 34°48'N 46°56'E), ca 1470 m a.s.l., 10.10.2009, leg. B. Salimi, four specimens. Sannandaj to Saqez road, River (Gheshlagh) near Gheshlagh dam (ca. 5 km after Sannandaj 35°22'N 47°01'E), ca. 1430 m a.s.l., 12.10.2009, leg. B. Salimi, five specimens.

*6. Dina lineate lineate (O. F. Müller 1774)*

Material examined Kurdistan Province, Sannandaj to Kamyaran road, River near city Kamyaran (ca. 34°48'N 46°56'E), ca 1470 m a.s.l., 10.10.2009, leg. B. Salimi, two specimens. Sannandaj to Kamyaran road, River (Gheshlagh) near Kavana (ca. 25km after Sannandaj 34°58'N 46°59'E) ca. 1420 m a.s.l. 11.10.2009, leg. B. Salimi, three specimens.

Hirudo (Linnaeus, 1758)

*6. Hirudo medicinalis (Linnaeus, 1758)*

Material examined: Sannandaj to Kamyaran road, River Gheshlagh (ca. 14 km after Sannandaj 35°09'N 46°57'E), ca. 1320 m a.s.l., 25.09.2009, leg. B. Salimi, two specimens.

## DISCUSSION

These new data are based on a rather small collection of leeches, but they provide an interesting insight into the leech fauna of the study area. The Iranian leech fauna belongs to the Palaearctic region and is characterized by the presence of European species (Sawyer, 1986). Most of the species found in Kurdistan province on these expeditions are also recorded in another province of Iran by Grosser and Pešić in 2003 and 2005 and are also recorded in Europe, but these data are new for Kurdistan province of Iran.

According to Sawyer's statement in 1999 that *Helobdella stagnalis* has a global distribution, the results of this study also show this species exists in Kurdistan province and has the highest percentage distribution in this region.

Previous investigations in Iran have shown that these species were found: *Hellobdella stagnalis, Haemopis sanguisuga, Theromyzon affinis, and Dina lineata* (Bennike, 1940). *Piscicola* in the Caspian sea basin (Mokhyer, 1989), Genius *Trachelobdella* in the Zayendehrood basin (Mokhyer,1998), *Cystobranchus* in the Zayendehrood river (Zakhikhani, 1996), *Acipenserobdella* in Mazandaran province (Jalali, 1994); species: *Codonobdella truncata Paracantobdella livanowi, piscicola geometra, Trachelobdella torquata* found in Mohabad dam (Abdi, 2001); Species: *Hirudo medicinalis, Limnatis nilotica, Haemopis sanguisuga, Placobdella costata, Glossiphonia concolor, Helobdella stagnalis, Dina lineate lineate, Dina stschegolewi* recorded from the Caspian Sea basin (Gholami, 2005). Species: *Helobdella stagnalis, Hemiclepsis marginata, Placobdella costata,Haemopis sanguisuga,Hirudo sp., Limnatis nilotica, Erpobdellidae sp., Dina blanchard, Erpobdella octoculata, Dina sp., Dina lineata lineata, Dina lineata concolor, Dina stschegolewi sensu* Nesemann found in other provinces of Iran (Grosser and Pesic, 2006).

Sawyer (1986) subdivided the Palaearctic region into two zoogeographical zones: the Boreal subregion and the Ponto-Mediterranean subregion. The Ponto-Mediterranean subregion is characterized by the following species: *Limnatis nilotica*, *Batracobdella algira* and *Dina sp.* (Moquin-Tandon, 1846)**.** *Helobdella stagnalis* is a very common genus in Kurdistan province of Iran and was dominant in the material collected during these expeditions (Table 1).

Our work on Kurdistan province leeches demonstrates the presence of an interesting fauna, but one that is still incompletely documented. In future, we can expect that faunistic inventories of stagnant and running waters in selected areas all over Iran and the Middle East region will yield a considerable increase in knowledge about the diversity of the leeches and their significance as ecological indicators of water quality. Naturally, such studies should include taxonomical research with the application of molecular genetic techniques.

**Table 1.** Dominance of leeches in material collected during June 2009 until June 2010 in Kurdistan province of Iran.

| Taxa | Number of individuals | Abundance |
|---|---|---|
| ***Glossiphoniidae*** | 55 | 56.7 |
| ***Helobdella stagnalis*** | 34 | 35 |
| ***Placobdella costata*** | 13 | 13.4 |
| ***Hemiclepsis marginata*** | 8 | 8.3 |
| ***Hirudinidae*** | 2 | 2.06 |
| ***Hirudo medicinalis*** | 2 | 2.06 |
| ***Erpobdellidae*** | 35 | 36.1 |
| ***Erpobdella lineata*** | 22 | 22.7 |
| ***Erpobdella octoculata*** | 13 | 13.4 |
| ***Dina lineata*** | 5 | 5.14 |
| | ∑□□ | ∑̃ı |

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