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ORIGINAL ARTICLE

NEW RECORD OF MALACOPHAGOUS LEECH OF THE GENUS *ALBOGLOSSIPHONIA* LUKIN, 1976 FROM FERGANA VALLEY, UZBEKISTAN



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ABSTRACT

In the present study, the malacophagous leech *Alboglossiphonia weberi* (Blandchard, 1897) (Annelida, Hirudinida, Glossiphoniidae) was recorded for the first time in the freshwaters of the Fergana Valley in the eastern part of Uzbekistan during 2020-2022. This species of leech is a new species for the hirudofauna of Uzbekistan and Central Asia. The article describes its morphological and ecological characteristics and presents a distribution map and photographic pictures of the species.

Keywords: Ecological characteristics, Fergana Valley, Glossiphoniidae, Leech, Uzbekistan.

INTRODUCTION

Leeches are invertebrates belonging to the class Clitellata, distributed mainly in freshwater and marine, some on terrestrial life (Sket and Trontelj, 2008). The order Hirudinida is usually divided according to their type of feeding: vertebrate bloodsuckers (hematophagy), invertebrate hemolymph suckers (liquidomatophagy) and predators (macrophagy) (Lynggaard, 2022). Currently, more than 900 species of leeches have been identified in the world, and about 240 of them belong to the Glossiphoniidae family. There are 25 genera in the Glossiphoniidae family and one of the genera identified in recent years is *Alboglossiphonia* Lukin, 1976 (Magalhães *et al.*, 2021; Bolotov *et al.*, 2022; Solijonov and Umarov, 2022).

The genus *Alboglossiphonia* Lukin, 1976 was originally separated from the genus *Glossiphonia* as a subgenus (Lukin, 1976). It is now recognized as an independent genus of *Alboglossiphonia*. Specific characteristics of this genus: first pair of eyes closer together than succeeding two pairs, eyes arranged in triangular pattern; no papillae; male and female ducts open into a common gonopore; little pigmentation; generally amber-colored (Govedich *et al.*, 2019). *Alboglossiphonia* includes the species: *A. heteroclita* (Linnaeus, 1761) - Holarctic; *A. hyalina* (O.F. Müller, 1774), *A. striata* (Apáthy, 1888) and *A. lata* (Oka, 1910) - Palaearctic;

New record of malacophagous leech

A. pallida (Verrill, 1872) - Nearctic; *A. australiensis* (Goddard, 1908), *A. inflexa* (Goddard, 1908), *A. intermedia* (Goddard, 1909), *A. tasmaniensis* (Ingram, 1957), *A. masoni* (Mason, 1974) and *A. multistriata* (Mason, 1974) - Australasian; *A. polypompholyx* Oosthuizen *et al.*, 1988, *A. iberica* Jueg, 2008 and *A. levis* Gouda, 2010 - Afrotropical; *A. annandalei* (Oka, 1922), *A. pahariensis* Neesemann *et al.*, 2007, *A. kashiensis* Neesemann *et al.*, 2007 and *A. bharnoensis* Bolotov *et al.*, 2022 - Oriental (Blanchard, 1897; Goddard, 1908; Oka, 1910, 1922; Ingram, 1957; Mason, 1974; Lukin, 1976; Oosthuizen *et al.*, 1988; Neesemann and Neubert, 1999; Neesemann *et al.*, 2007; Jueg, 2008; Gouda, 2010; Bolotov *et al.*, 2022; Moser *et al.*, 2022).

The data were analyzed and it was found that the first researches on the study of leeches in Uzbekistan began in the 19th century. In 1872, the naturalist-tourist scientist I. Skornyakov noted that he collected specimens of medicinal leech - *Hirudo medicinalis* Linnaeus, 1758 and *Erpobdella octoculata* (Linnaeus, 1758) from Balikchi District (Plotnikov, 1907). Later, in 1912, the Russian hirudologist G. Shchegolev identified a total of 9 species in Uzbekistan and neighboring regions. They include *Theromyzon tessulatum* (O.F. Müller, 1773), *Helobdella stagnalis* (L., 1758), *Alboglossiphonia heteroclita* (L., 1761), *Glossiphonia complanata* (L., 1758), *Haemopsis sanguisuga* (L., 1758), *H. medicinalis*, *Limnatis turkestanica* Plotnikov, 1907, *E. octoculata* and *Trachelobdella turkestanica* (Shchegolev, 1912).

There are many parasitologists Scriabin (1913), Dogel and Bykhovskiy (1934), Pavlovskiy (1934) and ichthyologists, Yankovskaya (1948) and Osmanov (1971) that observed parasitic leeches *Piscicola geometra* L., 1761, *L. turkestanica* and *Hemiclepsis marginata* (O.F. Müller, 1773) in fishes: *Schizothorax intermedius* McClelland, 1842 and *Cyprinus carpio* Linnaeus, 1758 in their studies. However, up to now the leeches of Uzbekistan have not been systematically studied and the data is insufficient. Therefore, this paper aimed to study the fauna and ecology of leeches of Uzbekistan and analyze their distribution.

MATERIALS AND METHODS

The species *Alboglossiphonia weberi* is distributed in different regions of the world, including Indonesia (Blanchard, 1897), India (Kaburaki, 1921; Harding and Moore, 1927; Neesemann *et al.*, 2007), Ethiopia (Lukin, 1976), Pakistan and Nepal (Chandra, 1983), Myanmar (Chandra, 1991), Egypt (El-Shimy and Davies, 1991), Thailand and Malaysia (Paul *et al.*, 2021) (Map 1. A).

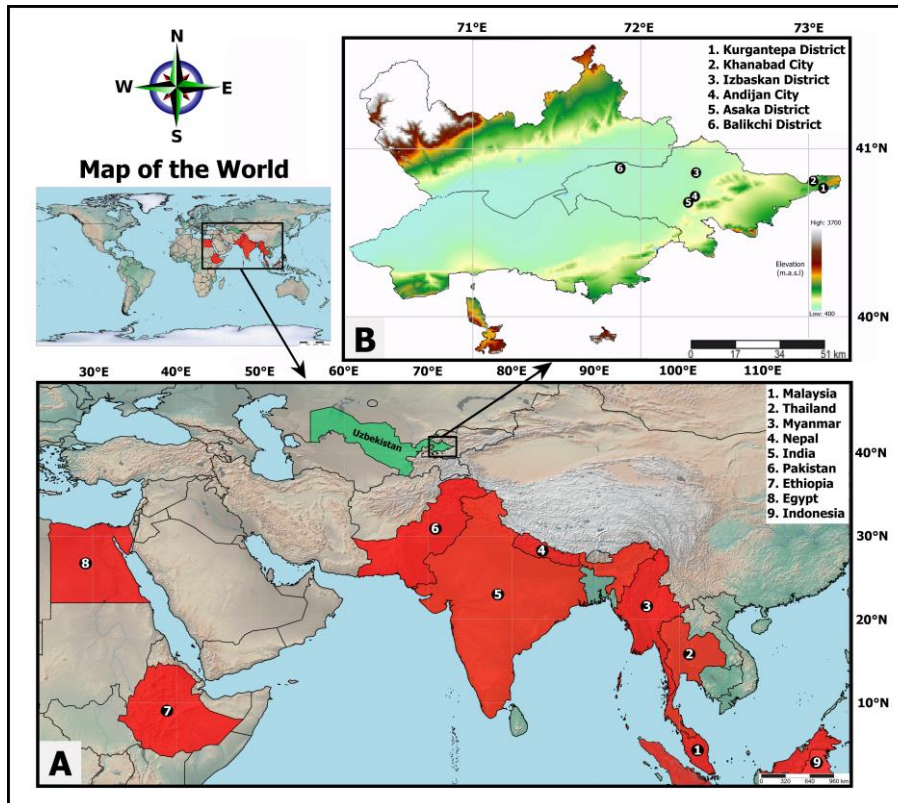
For the first time, the authors collected more than 100 (young 40 % and adult 60 %) samples of previously unrecorded malacophagous leech from the regions of the Fergana Valley in 2020-2022 (Tab. 1, Map 1 B). A biological research microscope (model XPS-500E) was used to study the morphology of this species and it was determined that this species is *A. weberi*, belonged to Glossiphoniidae family (Blanchard, 1897; Lukin, 1976; Bolotov *et al.*, 2022). Leech specimens were first preserved in 10% ethanol for 15–30 min and then fixed in 96% ethanol (Jovanović *et al.*, 2021).

Solijonov *et al.*

Table (1): Distribution areas of a new record of the leech *A. weberi* in the Fergana Valley.

No	Collecting biotope	Locality (District, Region)	Coordinates	Date	Above sea level (m)	Number of Leeches
1	Kara Darya River	Kurgantepa District, Andijan Region	40°46'30.1" N 73°03'12.6" E	23.III.2020	802	18
2	Fazilman ota spring	Khanabad City, Andijan Region	40°48'50.9" N 72°59'42.2" E	10.VI.2021	761	20
3	Kara Darya River	Izbaskan District, Andijan Region	40°51'32.8" N 72°19'10.9" E	19.VIII.2022	458	34
4	Stream	Andijan City, Andijan Region	40°43'52.0" N 72°18'51.8" E	9.IV.2020	484	28
5	Stream	Asaka District, Andijan Region	40°41'57.7" N 72°16'35.1" E	22.IX.2020	483	22
6	Kaynarbulak spring	Balikchi District, Andijan Region	40°53'32.3" N 71°51'16.8" E	30.V.2021	415	36
Mean					567	26

New record of malacophagous leech



Map (1): Geographic distribution of *A. weberi*; (A) Literature records, (B) New records.

RESULTS AND DISCUSSION

Taxonomical part

Phylum: Annelida Lamarck, 1809

Class: Clitellata Michaelsen, 1919

Subclass: Hirudinea Lamarck, 1818

Order: Hirudinida Siddall *et al.*, 2001

Suborder: Glossiphoniiformes Tessler and de Carle, 2018

Family: Glossiphoniidae Vaillant, 1890

Genus: *Alboglossiphonia* Lukin, 1976

Species: *Alboglossiphonia weberi* (Blanchard, 1897)

Note: the classification position according to Lukin (1976), Borda and Siddall (2004) and Tessler *et al.* (2018).

Description (Pl. 1): Body length 2-4mm in young leeches, width about 1-2 mm; average in adults 5-12 mm and width about 3-8 mm. The body in a calm state has an elongated oval shape, like other representatives of the family Glossiphoniidae. However, its difference in body form from other glossifoniid leeches can be seen after feeding, that is, body width

Solijonov *et al.*

almost equal to length and remains round. Dorsal surface of body not smooth; it has more than a hundred conical papillae with seven rows of black spots (Lukin, 1976). Larger in middle - medial (single row), near the edges of body - paramarginal (four rows) and at edge of body - marginal (two rows), medial rows separated, but the rest combined (Pl. 1 A). Color body mostly white, almost transparent. Therefore, after feeding the digestive organs can be seen with eye. Crop caeca divided into 6 pairs, first pair smaller, 2-5 pairs larger in length, and last branched into 5 rows (Pl. 1 A). Eyes divided into three pairs; the first one smaller and closer to each other. The next 2 pairs of eyes bigger; distance between eyes larger (Pl. 1 C). Like other glossifonides, they have a proboscis in front of their body to feed. Posterior sucker small; a small part of sucker protrudes below abdominal cavity of body and adheres very tightly to substrate (Pl. 1 D). Somites with triannulate; genital pores joined and open in a common pore in furrow XII al/a2 (Nesemann *et al.*, 2007). Some of the collected specimens contained more than 50 cocoons on their ventral side. Leeches were fed in the laboratory for 20 days. About 50 young individuals are then formed from the eggs inside the cocoons, initially fed clinging to its mother's ventral side, and then fed independently.

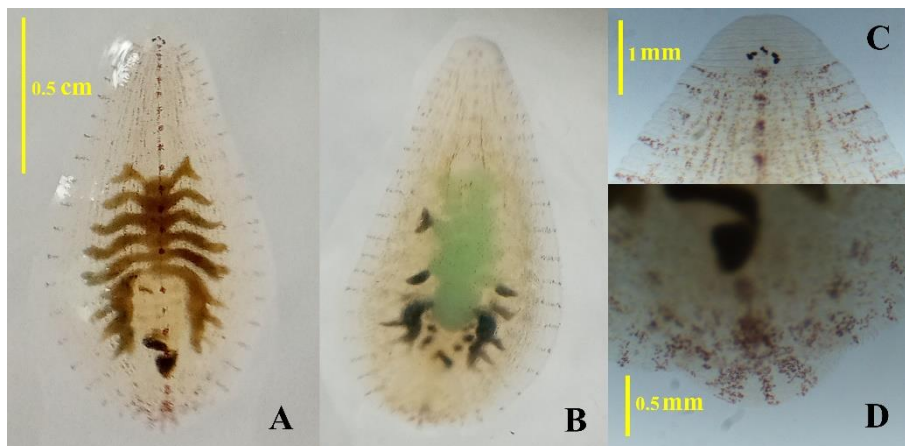


Plate (1): Morphology of *A. weberi*; (A) Dorsal side and 6 pairs of crop caeca, (B) Ventral side with cocoons, (C) Head part with three pairs of eyes, (D) Posterior sucker. (Photo by Khayrulla Solijonov).

Ecological habitats: *A. weberi* is a potamal species that lives in flowing water bodies with an average annual temperature not lower than 20 °C, and it can be found in non-turbid biotopes with a temperature of 20-24 °C and a depth of 20-90 cm. This species is widespread in warm basin (a thermophilic benthic organism). It mainly uses underwater rock and other solid objects (bricks, solid household waste) as a substrate. Algae (*Myriophyllum verticillatum* Linnaeus, 1753), fish [*Schizothorax intermedius* McClelland, 1842, *Triplophysa strauchii* (Kessler, 1874)], marsh frogs namely *Pelophylax ridibundus* (Pallas, 1771), aquatic molluscs [*Lymnaea subdisjuncta* (Nevill, 1878), *L. truncatula* (O.F. Müller, 1774), *Physella acuta* (Draparnaud, 1805), *Gyraulus acronicus* (J.B. Férussac, 1807)] (Pazilov and Umarov, 2021); and crustaceans, insect larvae were also found in the biotopes where this species lives. *A. weberi* participates in biotic relationships with other species in the biocenosis in the form of

New record of malacophagous leech

“predator-prey”, in particular, it attacks and feeds on the internal fluids and soft tissues of small water molluscs such as *L. subdisjuncta*, *L. truncatula*, *Ph. acuta* and *G. acronicus*.

CONCLUSIONS

In conclusion, it can be said that *Alboglossihoni weberi* is distributed in the territory of Uzbekistan. This species feeds on gastropods, an intermediate host of helminthic parasites infecting livestock. As a result, the spread of helminthic diseases is prevented. Aquatic ecosystems can be monitored by studying the fauna, distribution, and ecology of leeches. It is especially useful in preserving biodiversity.

CONFLICT OF INTEREST STATEMENT

The results of the current study are part of the requirements of Ph. D thesis in Ecology, Department of Ecology and Botany/Andijan State University for the first author. We declare that there is no conflict of interest between the authors. We confirm that all the pictures in the manuscript belong to us. We note, in this study, that there is no conflict of interest regarding the use of the laboratory of Andijan State University.

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New record of malacophagous leech

Bull. Iraq nat. Hist. Mus.
(2023) 17 (3): 459-468.

تسجل جديد لعلق اكالات القواقع من جنس *Alboglossiphonia* Lukin, 1976 من وادي فيرجانا، أوزبكستان

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الخلاصة

سجل في هذه الدراسة العلق (*Alboglossiphonia weberi* (Blandchard, 1897) (Annelida, Hirudinida, Glossiphoniidae)، لأول مرة في المياه العذبة بوادي فرغانة في الجزء الشرقي من أوزبكستان خلال الفترة 2020-2022. هذا النوع من العلق جديد لفونا العلقيات في أوزبكستان وآسيا الوسطى؛ اعطى البحث الخصائص المظهرية والبيئية مع خريطة توزيع و صور فوتوغرافية للنوع.