

UDC 595.143(261.28)

## FIRST RECORD OF THE BOREAL-ARCTIC MARINE LEECH *MYSIDOBDELLA BOREALIS* (HIRUDINIDA, PISCICOLIDAE) FROM THE SOUTHERN BAY OF BISCAY

S. Yu. Utevsky<sup>1</sup>, J. C. Sorbe<sup>2</sup>

<sup>1</sup> V. N. Karazin Kharkiv National University,  
pl. Svobody, 4, Kharkiv, 61077 Ukraine  
E-mail: sutevsk@univer.kharkov.ua

<sup>2</sup> Laboratoire d'Océanographie Biologique,  
UMR 5805 (CNRS/UBI), 2 rue Jolyet, 33120 Arcachon, France  
E-mail: jc.sorbe@epoc.u-bordeaux1.fr

Received 3 October 2011

Accepted 10 November 2011

**First Record of the Boreal-Arctic Marine Leech *Mysidobdella borealis* (Hirudinida, Piscicolidae) from the Southern Bay of Biscay.** Utevsky S. Yu., Sorbe J. C. — Four individuals of the marine fish leech *Mysidobdella borealis* (Johansson, 1898) were sampled from the mysids *Schistomysis parkeri* Norman, 1892 from the swash zone of Hendaye beach, France. This is the only known so far boreal-arctic piscicolid species occurring from the southern Bay of Biscay to the Kara Sea.

**Key words:** leeches, mysids, *Mysidobdella borealis*, Hendaye, parasitism, biogeography.

**Первая находка бореально-арктической морской пиявки *Mysidobdella borealis* (Hirudinida, Piscicolidae) в южной части Бискайского залива.** Утевский С. Ю., Сорбе Ж. К. — Четыре особи морской рыбьей пиявки *Mysidobdella borealis* (Johansson, 1898) были собраны с мизид *Schistomysis parkeri* Norman, 1892 из зоны наката пляжа города Андай, Франция. Это единственный известный в настоящее время бореально-арктический вид рыбьих пиявок, встречающийся от южной части Бискайского залива до Карского моря.

**Ключевые слова:** пиявки, мизиды, *Mysidobdella borealis*, Андай, паразитизм, биогеография.

*Mysidobdella borealis* (Johansson, 1898) is one of very few fish leeches, which feed on body fluids of their arthropod hosts (Burreson, Allen, 1978). Most of piscicolids associated with arthropods (mainly crustaceans and sometimes pycnogonids) utilize them for transportation (phoresy) and as a hard surface to which leeches can attach their cocoons. The species name of *M. borealis* implies a boreal-arctic occurrence. The leech was recorded from Spitsbergen by Johansson (1898) who described this species under the name *Ichthyobdella borealis*. Later on Selensky (1927) established the genus *Mysidobdella* for leeches collected from *Mysis oculata* (Fabricius, 1780) in the White Sea and described the species *Mysidobdella oculata*. Further records were provided by Epshtein (1961) from Greenland and by Vasilyev (1939) from the Kara Sea and the Aleutian Islands. Epshtein (1961, 1967) synonymized *Mysidobdella oculata* and *Ichthyobdella borealis*, but retained *M. oculata* as the name even though *I. borealis* had priority. Burreson and Allen (1978) corroborated the synonymy and established the correct designation for this leech *Mysidobdella borealis* (Johansson, 1898) because *Ichthyobdella* had been no longer a valid generic appellation. *Mysidobdella borealis* has been recorded along the eastern coast of Canada (New Brunswick) and the United States as far south as southern New Jersey (Burreson, Allen, 1978; Appy, Dadswell, 1981; Allen, Allen, 1981).

In spite of many records and the long history of studies, it has been unknown how far the range of *M. borealis* extends southwards in the north-eastern Atlantic. Our research makes up the deficiency by finding this species in the southern Bay of Biscay on the mysid *Schistomysis parkeri* Norman, 1892.

### Material and methods

The mysids *Schistomysis parkeri* examined in this study were sampled from the swash zone of Hendaye beach near the outlet of the Bidasoa river (43°22'46.56" N, 1°46'56.00" E) on August 2, 2001, December 4,

2001 and July 7, 2002. Leeches were taken from their mysid hosts and fixed in 3% formalin solution, preserved in 96% ethanol, examined using a stereoscopic microscope and photographed. The main dimensions of the leeches were measured with an eyepiece micrometer. The specimens are stored in the invertebrate collection of the Department of Zoology and Animal Ecology, V. N. Karazin Kharkiv National University. The systematic position of *M. borealis* conforms with classifications suggested by Sawyer (1986) and Siddall et al. (2001).

## Results

Four leech specimens were found on the mysids *Schistomysis parkeri*. All of them were identified as *Mysidobdella borealis*. Their external characters largely conform with the species redescription by Burrenson and Allen (1978). The specimens possess major distinguishing features of the species (fig. 1). The body is cylindrical, elongated, and indistinctly divided into the trachelosome and the urosome. Individual leeches are small. The entire length, including suckers, does not exceed 6 mm (2.4, 3.6 and 5.3 mm). The body surface is smooth, lacking papillae, tubercles gills and pulsatile vesicles. The oral sucker is deeply cupped, bell-shaped, attached by a very characteristic nuchal constriction, which is shortened in these specimens due to fixation. The annular membrane on the inner surface the oral sucker is present. Mid-body segments are 3-annulate. No further subdivision of annuli can be traced. The gonopores and the seminal receptacle are indiscernible. The caudal sucker is subterminal. One pair of eyes is located on the nuchal constriction. Segmental ocelli are not preserved. The coloration is whitish flesh-colored; longitudinal black flecks of pigment are scattered on the body surface, being less developed on the venter.

## Discussion

Morphological features of the studied specimens of *M. borealis* were in agreement with the previous descriptions (see Burrenson, Allen, 1978). The differences in the col-



Fig. 1. A preserved specimen of *Mysidobdella borealis* with the distinguishing features: bell-shaped oral sucker, nuchal constriction and terminal caudal sucker. Scale bar 1 mm.

Рис. 1. Зафиксированный экземпляр *Mysidobdella borealis* характерными признаками: колоколообразная передняя присоска, шейное сужение и терминальная задняя присоска. Масштабная линейка 1 мм.

oration and the apparent lack of the seminal receptacle can be addressed to alterations due to fixation, preservation and the juvenility of the individuals. The size of the leeches did not reach the range for adults (7–15 mm) (Burreson, Allen, 1978), suggesting that they were immature.

Some of boreal piscicolid species, e. g. *Heptacyclus scorpii* (Malm, 1863) and *Oxytonostoma typica* Malm, 1863, have pronounced asymmetrical ranges with their western portions extended much southerly in comparison with the eastern (i. e. European) extremities (see Epshtein, 1967; Appy, Dadswell, 1981). The new record of *M. borealis* collected from the mysids *S. parkeri* in the southern Bay of Biscay challenged that generalization. The range of this species appears rather symmetrical with the western portion reaching southern New Jersey. *Mysidobdella borealis* is the only boreal-arctic fish leech occurring as far south as Hendaye and as far north as the Kara Sea. Six piscicolid species have been recorded from the English Channel and the Bay of Biscay: *Branchellion borealis* Leigh-Sharpe, 1933; *B. torpedinis* Savigny, 1822; *Calliobdella lophii* Beneden et Hesse, 1863; *C. punctata* Beneden et Hesse, 1863; *Hemibdella soleae* Beneden et Hesse, 1863, and *Pontobdella vosmaeri* Apathy, 1888 (Sawyer, 1986; Landa et al., 2005). None of them occurs far northeast in contrast to *M. borealis* recorded from the Kara Sea.

The majority of piscicolids does not feed on their crustacean hosts but reside and lay cocoons on their hard coverings. Such associations have been shown for *Myzobdella lugubris* Leidy, 1851 and the blue crab *Callinectes sapidus* Rathbun, 1896 by Daniels and Sawyer (1975), *Notostomum cyclosotomum* Johansson, 1898 and the red king crab *Paralithodes camtschaticus* (Tilesius, 1815) and other crab species by Epshtein (1982) and Sloan et al. (1984), *Crangonobdella fabricii* (Malm, 1863) and the shrimp *Sclerocrangon boreas* (Phipps, 1774) by Epshtein (1982), *Crangonobdella maculosa* S. Yu. Utevsky, 2005 and various crabs by Utevsky (2005), *Johanssonia arctica* (Johansson, 1898) and the tanner crab *Chionoecetes opilio* (O. Fabricius, 1788) and the spider crab *Hyas coarctatus* Leach, 1815 by Khan (1982). Burreson and Allen (1978) provided convincing data on obligate parasitism of *M. borealis* on the mysid species *Neomysis americana* (S. I. Smith, 1873) and *Mysis stenolepis* S. I. Smith, 1873. Only two other piscicolid species are known to feed on their crustacean hosts: the Baikal leech *Baicalobdella torquata* (Grube, 1871) parasitizes gammarids (Epshtein, 1959) and the Antarctic leech *Glyptonotobdella antarctica* Sawyer and White, 1969 feeds on the haemolymph of the isopod *Glyptonotus antarcticus* (see Janssen, 1993). *Mysidobdella borealis* shows a high degree of host specificity: the leech has been recorded only from the two mysid species in the western part of its range and it does not attach to any other mysid hosts (Burreson, Allen, 1978). The same can be concluded for the eastern population of *M. borealis*. The leech was collected solely from *S. parkeri* though seven other mysid species have been recorded from Hendaye beach (San Vicente, Sorbe, 2001).

Our sincere thanks go to M. Elizalde, I. Frutos, E. Garnacho, M. Bertrand, M. Martinez, J. Peca, Z. Sorbe and C. San Vicente for their help during field samplings. This research was supported in part by State Foundation of Fundamental Research of Ukraine (DFFD) grant F40/85–2011.

- Allen D. M., Allen W. B. Seasonal dynamics of a leech-mysid shrimp interaction in a temperate salt marsh // Biological Bulletin. Marine Biological Laboratory, Woods Hole. — 1981. — **160**. — P. 1–10.
- Appy R. G., Dadswell M. J. Marine and estuarine piscicolid leeches (Hirudinea) of the Bay of Fundy and adjacent waters with a key to species // Canadian J. Zoology. — 1981. — **59**. — P. 183–192
- Burreson E. M., Allen D. M. Morphology and Biology of *Mysidobdella borealis* (Johansson) comb. n. (Hirudinea: Piscicolidae), from Mysids in the Western North Atlantic // J. Parasitology. — 1976. — **64**. — P. 1082–1091
- Daniels B. A., Sawyer R. T. The Biology of the Leech *Myzobdella lugubris* Infesting Blue Crabs and Catfish // Biological Bulletin. — 1975. — **148**. — P. 193–198.

- Epshtein V. M.* On the systematic position, way of life and origin of the endemic Baikal leech *Trachelobdella torquata* (Grube) // *Doklady AN SSSR*. — 1959. — **125**, N 4. — P. 935–937. — Russian : *Эпштейн В. М.* О систематическом положении, образе жизни и происхождении эндемичной байкальской пиявки *Trachelobdella torquata* (Grube) // *Доклады АН СССР*.
- Epshtein V. M.* Review of the fish leeches (Hirudinea, Piscicolidae) of the northern seas of the USSR // *Doklady Akademii Nauk SSSR*. — 1961. — **141**. — P. 1508–1511. — Russian : *Эпштейн В. М.* Обзор рыбьих пиявок (Hirudinea, Piscicolidae) северных морей СССР.
- Epshtein V. M.* On relations and geographic distribution of fish leeches (Hirudinea, Piscicolidae) of the genus *Carcinobdella* Oka, 1910] // *Zoologicheskii Zhurnal*. — 1967. — **46**. — P. 1648–1654. — Russian : *Эпштейн В. М.* О родственных связях и географическом распространении рыбьих пиявок (Hirudinea, Piscicolidae) из рода *Carcinobdella* Oka, 1910.
- Epshtein V. M.* On numbers of leeches in ecosystems of the north-eastern part of the Pacific Ocean // *Gidrobiologicheskii zhurnal* — 1982. — **18**, N 3. — P. 103. — Russian : *Эпштейн В. М.* О численности пиявок в экосистемах северо-западной части Тихого океана.
- Janssen H. H.* Morphology, egg cocoons, and transmission paths of the Antarctic leech *Glyptonotobdella antarctica* Sawyer and White, 1969 (Hirudinea: Rhynchobdelliformes: Piscicolidae) // *Polar Biology*. — 1993. — **13**. — P. 347–354.
- Johansson L.* Die Ichthyobdelliden im Zoologischen Reichsmuseum im Stockholm. — Stockholm : Öfversigt af Kongl. Vetenskaps-Akademiens Forhandlingar. — 1898. — Vol. 55. — P. 665–687.
- Khan R. A.* Biology of the marine pisciolid leech *Johanssonia arctica* (Johansson) from Newfoundland // *Proceedings of the Helminthological Society of Washington*. — 1982. — **49**. — P. 266–278.
- Landa J., Arronte J. C., Abaunza P., Farica A. C.* *Calliobdella lophii* (Hirudinea: Piscicolidae) parasitizing white anglerfish *Lophius piscatorius* off the north of Spain // *J. Marine Biological Association of the United Kingdom*. — 2005. — **85**. — P. 1297–1300.
- San Vicente C., Sorbe J. C.* Temporal changes in the structure of the suprabenthic community from Hendaya beach (southern Bay of Biscay): A comparison with a northwestern Mediterranean beach community // *Boletín del Instituto Español de Oceanografía*. — 2001. — **17**. — P. 107–120.
- Sawyer R. T.* Leech biology and behaviour : In 3 vol. — Oxford : Clarendon Press, 1986.
- Selensky W. D.* On a new Ichthyobdellidae (*Mysidobdella oculata* n. gen. n. sp.) a parasite on Crustacea. — *Proc. 2nd Cong. of Zoologists, Anatomists, and Histologists of USSR*. — 1927. — Vol. 2. — P. 32–33. — Russian : *Зеленский В. Д.* О новой ихтиобделлиде, паразитирующей на мизидах (*Mysidobdella oculata* n. gen. n. sp.).
- Siddall M. E., Apakupakul K., Burreson E. M. et al.* Validating Livanow: molecular data agree that leeches, Branchiobdellidans, and *Acanthobdella peledina* form a monophyletic group of oligochaetes // *Molecular Phylogenetics and Evolution*. — 2001. — **21**. — P. 346–351.
- Sloan N. A., Bower S. M., Robinson S. M. C.* Cocoon deposition on three crab species and fish parasitism by the leech *Notostomum cyclostoma* from deep fjords in northern British Columbia // *Marine Ecology — Progress Ser.* — 1984. — **20**. — P. 51–58.
- Utevsky S. Yu.* A New Species of Marine Fish Leeches *Crangonobdella maculosa* sp. n. (Hirudinea, Piscicolidae) from the Tatar Strait and Coastal Waters of the Kuril Islands // *Vestnik zoologii*. — 2005. — **39**, N 2. — P. 15–22. — Russian : *Утевский С. Ю.* Новый вид морских рыбьих пиявок *Crangonobdella maculosa* sp. n. (Hirudinea, Piscicolidae) из Татарского пролива и прибрежных вод Курильских островов.
- Vasilyev E. A.* The Ichthyobdellidae of the Far East // *Trudy Karel'skogo Gosudarstvennogo Pedagogicheskogo Instituta, Seriya Biologicheskaya*. — 1939. — **1**. — P. 25–66. — Russian : *Васильев Е. А.* Материалы по дальневосточным Ichthyobdellidae.