

First Record of *Branchiobdella* Odier, 1823 (Annelida: Clitellata) in Albania and an Overview of the Geographic Distribution of *Branchiobdella hexodonta* Gruber, 1882 in Europe

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Abstract: Six mature *Branchiobdella hexodonta* GRUBER 1883 were found in the gill chamber of a male *Austropotamobius torrentium* (SCHRANCK 1803) from Albania (Pukë county, Fushë Arrëz, Lumi i Fani i Madh), a sample collected by Z. Eröss, Z. Fehér, J. Kontschán, D. Murányi and deposited in the Natural History Museum in Budapest, Hungary. This is the first report on a member of genus *Branchiobdella* in Albania. An overview on the distribution of *B. hexodonta* in its area and, in particular, on Balkan Peninsula is also presented.

Key words: Branchiobdellida, *Branchiobdella hexodonta*, Albania, distribution

Almost all members of order Branchiobdellida are epibionts on crayfishes (Astacidae) inhabiting either the host's external surface or, more rarely, its gill chambers. They occur in the Nearctic and Palaearctic realms. The European area of distribution of native branchiobdellidans extends from France to European Russia and Ukraine and from Northern Italy and Balkan Peninsula to Sweden, Finland, Baltic Republics and northern part of European Russia (GELDER 1999).

Balkan Peninsula is one of the most well studied regions in Europe with regards to branchiobdellidans and they were found in almost all of the countries fully located within the peninsula: Bosnia and Herzegovina (KARAMAN 1967, 1970, SUBCHEV, GELDER 2010), Bulgaria (KOZAROV *et al.* 1972, SUBCHEV, STANIMIROVA 1986, 1998), Greece (NESEMAN, NEUBERT 1999, SUBCHEV *et al.* 2007, SUBCHEV 2009, SUBCHEV, GELDER 2010), FYRMacedonia (KARAMAN 1967, 1970; SUBCHEV 2007, SUBCHEV, GELDER 2010) and Montenegro (GELDER 1999, SUBCHEV 2008,

2009) as well in the countries significantly located there: Croatia (KLOBUČAR *et al.* 2006, SUBCHEV 2009; SUBCHEV, GELDER 2010) and Slovenia (KARAMAN 1967, 1970; SUBCHEV, GELDER 2010). Recently branchiobdellidans were reported also from the European (Balkan Peninsula) part of Turkey (SUBCHEV, GELDER 2010). Previous reports of *Branchiobdella* spp. in Serbia are now located in Kosovo. Therefore the only Balkan countries where branchiobdellidans have not yet been reported are Serbia and Albania.

Here we report the first evidence on the occurrence of Branchiobdellida in Albania. During our examination of the crayfish collection in the Natural History Museum in Budapest, Hungary, we found a sample of a crayfish, collected in 2003 in Albania and labelled as *Astacus astacus* L. Actually it turned out to be a male *Austropotamobius torrentium* (SCHRANCK 1803) with a body length of 61 mm. There were no branchiobdellidans in the debris of the jar. However, six well preserved mature *Branchiobdella hexodon-*

ta GRUBER 1883 were found in the gill chambers of the crayfish. The rest of the label stated:

Albania, Pukë county, Fushë Arrëz, Lumi i Fani i Madh, 6 km E of the city, 615m, N42°04.990' E20°03.606', 24.06.2003, leg. Z. Eröss, Z. Fehér, J. Kontschán, D. Murányi

Pukë is not a county but a district of Schkodër county located in the northern part of Albania. The river Fan i Madh (The Great Fan) together with Fan i Vogël (The Little Fan) join together and flow into the river Mat.

Branchiobdella hexodonta, after its recent finding in Albania, is already known from all Balkan countries with the exception of Serbia. (Table 1). But its occurrence in Serbia is almost certain bearing in mind that the species was reported from all neighbouring countries. *B. hexodonta* is one of the most widely distributed *Branchiobdella* species in Europe

(Table 1) with a quite well defined distribution. Its area spreads from France-Germany to Bulgaria-Romania-Poland, and from Italy-Albania-Greece to Germany-Poland. The Northern European countries are as a whole well studied but *B. hexodonta* was not found in Sweden and Finland (SUBCHEV 2009), Lithuania (MAŽYLIS 1973, MAŽEYKA *et al.* 1999) and Estonia (JÄRVEKÜLG 1957). SVETLOV (1926) stated that he has found *B. hexodonta* in Perm county (Russia) '... on the surface of the armor of *P. leptodactylus* ESCH.' However this is the only report of *B. hexodonta* in this part of Europe although branchiobdellidans are quite well studied in the regions west of Perm in Russia (BOSHKO 2010, CHEKANOVSKAYA 1962) and Ukraine where the most distributed branchiobdellid species is *B. kozarovi* (BOSHKO 1983, 2010, KOLESNYKOVA 2007, KOLESNYKOVA *et al.* 2008). Our assumption is that what SVETLOV (1926) had found

Table 1. Geographic distribution of *B. hexodonta*.

Country	References
Balkan countries	
Bosna and Herzegovina	GEORGÉVITCH 1957*; MOSZYŃSKI 1937; KARAMAN 1967; SUBCHEV & GELDER 2010
Bulgaria	KOZAROV <i>et al.</i> 1972; SUBCHEV & STANIMIROVA 1986, 1998
Croatia	KLOBUČAR <i>et al.</i> 2006; SUBCHEV 2009; SUBCHEV & GELDER 2010
Greece	NESEMANN & NEUBERT 1999; SUBCHEV <i>et al.</i> 2007; SUBCHEV 2008; SUBCHEV 2009; SUBCHEV & GELDER 2010
Kosovo	KARAMAN 1967
Macedonia	KARAMAN 1967; SUBCHEV 2007
Montenegro	GELDER 1999; SUBCHEV 2009
Slovenia	KARAMAN 1967
Other European countries	
Austria	NESEMANN 1994; NESEMANN & HEUTER 2002; FÜREDER <i>et al.</i> 2009; SUBCHEV & GELDER 2010
Czech Republic	ĐURIŠ <i>et al.</i> 2006; STRAŠKRABA 1956; SUBCHEV & GELDER 2010
France	SUBCHEV 2008
Germany	VOIGT 1885a, 1885b, 1886; SCHMIDT 1907; PIERANTONI 1912; SUBCHEV 2007, 2009
Hungary	SUBCHEV 1984; KOVASZ & JUHÁSZ 2007
Italy	GELDER <i>et al.</i> 1994, GELDER 1999; OBERKOFER <i>et al.</i> 2002; GHERARDI <i>et al.</i> 2002; QUAGLIO <i>et al.</i> 2006; FÜREDER <i>et al.</i> 2009
Poland	WOJTAS 1964 ; GRABDA, WIERZBICKA 1969 ; KAHL & WOJTAS 1974; KASPRZAK 1981; ŚMIETANA & WIERZBICKA 1999; WIERZBICKA & ŚMIETANA 1999
Romania	POP 1965
Russia	SVETLOV 1926**
Slovakia	HALGOŚ 1972
Switzerland	SUBCHEV 2007

*reported as *B. pentadonta* (KOZAROV *et al.* 1972)

**doubtful – see the text

was *B. kozarovi* and not *B. hexodonta*; *B. kozarovi* is similar to *B. hexodonta* in size and body form, and in a case of careless examination the two species could be mixed up. Also, *B. kozarovi* is well distributed in this region (see SUBCHEV, GELDER 2010) and is usually surface dwelling (as found by SVETLOV) and not a gill-dwelling species like *B. hexodonta*. As a matter of fact SVETLOV (1926) stated in his paper that he was not sure that both species found in Perm were identical with *B. astaci* and *B. hexodonta* respectively or '... these are new species only close to the latter ones'.

B. hexodonta has been found on four European native crayfishes: *Astacus astacus*, *A. leptodactylus*

ESCHOLTZ 1823, *Austorpotamobius torrentium* (SUBCHEV, STANIMIROVA 1998; KLOBUČAR *et al.* 2006) and *A. pallipes* (LEREBoullet 1858) (OBERKOFER *et al.* 2002). No data are available of an occurrence of branchiobdellidans on the fifth European crayfish species, *Astacus pachypus* RATHKE, 1837. However, *B. hexodonta* was found on the invasive crayfish *Orconectes limosus* in Czech republic (ĐURIŠ *et al.* 2006).

Recently *B. hexodonta* was reported also in Iran on *A. leptodactylus* '...in the rearing environment of Sefidrood fishery research station, Astaneh-Guilan province' (ASGHARNIA 2008).

References

- ASGHARNIA 2008. A survey to parasitic infection of freshwater crayfish *Astacus leptodactylus* in the rearing environment of Sefidrood fishery research station, Astaneh-Guilan province. – In: Pajonhesh & Sazandegi, **78**: 58-69.
- BOSHKO E. 1983. Oligochaets inhabiting freshwater crayfishes in some waters in Ukraine. Report I. Branchiobdellidae. – *Vestnik zoologii*, **2**: 13-20. (In Russian).
- BOSHKO E. 2010. The parasites and commensals of crayfishes of Russian and Ukrainian water bodies. *Izv. Penz. Gos. Pedagog. Univ. im. V. G. Belinskogo*, **17** (21): 39-44.
- ĐURIŠ Z., I. HORKÁ, J. KRISTIAN, P. KOZÁK 2006. Some cases of macro-epibiosis on the invasive crayfish *Orconectes limosus* in the Czech Republic. – *Bull. Fr. Pêche Piscis.*, **380-381**: 1325-1337.
- FÜREDER L., M. SUMMERER & A. BRANDSTÄTTER 2009. Phylogeny and species composition of five European species of *Branchiobdella* (Annelida: Branchiobdellida) reflect the biogeographic history of three endangered crayfish species. – *Journal of Zoology*, **279**: 164-172.
- GELDER S. R. 1999. Zoogeography of branchiobdellidans (Annelida) and temnocephalidans (Platyhelminthes) ectosymbiotic on freshwater crustaceans, and their reactions to one another *in vitro*. – *Hydrobiologia*, **406**: 21-31.
- GELDER S. R., G. B. DELMASTRO, M. FERRAGUTI. 1994. A report on branchiobdellidans (Annelida: Clitellata) and a taxonomic key to the species in Northern Italy, including the first record on *Cambaricola mesochoreus* on the introduced American red swamp crayfish. – *Boll. Zool.*, **61**: 179-183.
- GEORGEVITCH J. 1957. Les Branchiobdellides de Jugoslavie. – *Bull. Acad. Serbe Sci. Math. Nat. N. S. 18 Sci. Nat.*, **5**: 5-24.
- GRABDA E., WIERZBICKA, J. 1969. The problem of parasitism of the species of the genus *Branchiobdella* odier, 1823. – *Polskie archiwum hydrobiologii*, **16**: 29, 93-104.
- HALGOŠ J. 1972. Beitrag zur Kenntnis der ektoparasitischen Würmer der Ordnung Branchiobdellida in der Slowakei (Annelida, Clitellata). – *Ac. Rer. Natur. Mus. Nat. Slov., Bratislava*, **18**: 1, 63-69. (In Slovakian).
- JÄRVEKÜLG A. 1957. Vahikaamide (perek *Branchiobdella* Odier) esinemisest joevahi (*Astacus astacus* L.) parasitidena ecstis. eesti NSN Teaduste Academia juures asma loodusuurijate seltsi aastaraamat, **50**: 249-256. (In Estonian).
- KAHL K., F. WOJTAŠ 1974. Übersicht der in Polen vorkommenden Branchiobdelliden. – *Zeszyty nauk. Univ. Łódzkiej. Nauki Matematyczno-Przyrodnicze*, ser. II, **56**: 3-12.
- KARAMAN S. M. 1967. Branchiobdellidae Jugoslavije. – *Buletin i Punimeve Shkencore të Fakulteti Filozofik të Prishtinës*, **IV**: 39-64.
- KARAMAN S. M. 1970. Beitrag zur Kenntnis der europaischen Branchiobdelliden (Clitellata, Branchiobdelloidea). – *Jnt. Rev. gesamt. Hydrobiol.*, **55**: 3, 325-333.
- KLOBUČAR G., I. MAGUIRE, S. GOTSTEIN-MATOČEC, S. GELDER 2006. Occurrence of Branchiobdellida (Annelida: Clitellata) on freshwater crayfish in Croatia. *Ann. Limn. – Int. J. Limn.*, **42**: 4, 251-260.
- KOLESNYKOVA M. YU. 2007. New information on branchiobdellidans (Clitellata: Branchiobdellida) distribution in pools of Kharkiv region. *Visnik Harkivskogo nacional'nogo universitetu imeni V. N. Karazina. Serija: biologija*, **6**, 788: 97-103.
- KOLESNIKOVA, M. A. UTEVSKY, S. UTEVSKY. 2008. First record on *Branchiobdella kozarovi* (Clitellata: Branchiobdellida) from Eastern Ukraine. – *Lauterbornia*, **65**: 77-81.
- KOVÁCS T., P. JUHÁSZ 2007. Data to the distribution of crayfish worms (Branchiobdellidae) in Hungary. – *Folia Hist. Nat. Mus. Matraensis.*, **31**: 77-79.
- KOZAROV G., P. MICHAILOVA, M. SUBCHEV 1972. Studies on Branchiobdellidae (Oligochaeta, Annelida) in Bulgaria. – *Ann. Univ. Sofia*, **64**: 1, 77-89. (In Bulgarian).
- MAŽEIKA V., L. MICKĖNIENĖ & G. MACKEVIČIENĖ 1999. Branchiobdellids on the bodies and eggs of cultured noble crayfish *Astacus astacus* (L.) in Lithuania. – *Freshwater Crayfish*, **12**: 343-348.
- MOSZYŃSKI A. 1937. Oligochetes parasites de l'ecrevisse (*Potamobius astacus*) de la Yougoslavie. *Glasnik (Bull.) Soc. Sci. Scopye*, **18**: 6, 69-75.
- NESEMANN H., E. NEUBERT 1999. Süßwasserfauna von Mitteleuropa. Bd. 6 Annelida. 2. Clitellata: Branchiobdellida, Acanthobdellea, Hirudinea. Spectrum Akademischer Verlag GmbH, Heidelberg, Berlin. Pp. 192.
- NESEMANN H., G. HUTTER 2002. Krebsigel (Branchiobdellidae: *Branchiobdella* ODIER, 1823) in Vorarlberg (Österreich) mit einer Neubeschreibung von *Branchiobdella papillosa*

- n. sp. – Vorarlberger Naturschau 11 – Forschen und Entdecken, 203-214, Dornbirn.
- NESEMANN H. 1994. Die krebsegel im gebiet der Oberen Donau (Osterreich, Deutschland) mit bestimmungsschlüssel zuden europaichen arten (Clitellata, Branchiobdellida). – *Lauterbornia*, **H. 19**: 79-93, Dinkelscheben.
- OBERKOFER B., F. QUAGLIO, L. FÜREDER, M. L. FIORAVANTI, S. GIANNETTO, C. MOROLLI, G. MINELLI 2002. Species of Branchiobdellidae (Annelida) on freshwater crayfishes in South Tyrol (Northern Italy). – *Bull. Fr. Pêche Piscis.*, **367**: 777-784.
- POP V. 1965. Systematische revision der europäischen Branchiobdellidae (Oligochaeta). – *Zool. Jb. Syst. Bd.*, **92**: 2-3, 219-238.
- QUAGLIO F., C. MOROLLI, R. GALUPPI, C. BONOLI, F. MARCHER, L. NOBILE, G. DE LUISE, M. P. TAPIERI 2006. Preliminary investigations of disease-causing organisms in the white-clawed crayfish *Austropotamobius pallipes* complex from streams of Northern Italy. – *Bull. Fr. Pêche Piscis.*, **380-381**: 1271-1290.
- SCHMIDT F. 1907. Über die Verbreitung des Fluskrebse der sogenannten krebsegel in der umgebung von Osnabrück. – *Jahres Ber. Natw. Ver. Osnabrück* 16 Anhang., 1-37.
- ŠMIETANA P., J. WIERZBICKA 1999. Species of *Branchiobdella* Odier, 1823 (Annelida: Clitellata) associated with the crayfish *Astacus astacus* and *Astacus leptodactylus* in Poland. – *Freshwater crayfish*, **12**: 349-355.
- STRAŠKRABA M. 1956. Komensálové v žaberni dutině *Astacus astacus* L. ze Slezka. – *Prirodoved. Sbor. Ostravskeho. Kraje*, **17**: 4, 593-596.
- SUBCHEV M. 2007. Branchiobdellidans (Annelida: Clitellata) found in the crayfish and annelid collections of the Natural History Museum of Humboldt University, Berlin, Germany. – *Acta zool. Bulg.*, **59**: 3, 275-282.
- SUBCHEV M. 2008. Branchiobdellida (Annelida: Clitellata) found in the crayfish and annelid collections of Paris National Museum of Natural History and on recently collected crayfishes from France. – *Acta zool. Bulg.*, **60**: 3, 233-237.
- SUBCHEV M. 2009. Branchiobdellida (Annelida: Clitellata) Found in the Crayfish Collection of the Swedish Museum of Natural History with Remarks on the Swedish Branchiobdellid Fauna. – *Acta zool. Bulg.*, **61**: 3, 284-292.
- SUBCHEV M. A. 1984. On Hungarian Branchiobdellids (Oligochaeta: Branchiobdellidae). – *Miscellanea Zoologica Hungarica*, **2**: 47-50.
- SUBCHEV M. A., L. S. STANIMIROVA 1986. The epibiont on crayfishes *Hystricosoma chappuisi* Michaelsen, 1926 (Oligochaeta, Aeolosomatidae) – new species for Bulgarian fauna. – *Acta zool. Bulg.*, **32**: 66-68. (In Bulgarian).
- SUBCHEV M. A., STUART, R. GELDER 2010. Branchiobdellida (Annelida: Clitellata) found in the crayfish collection of the Natural History Museum in Vienna, Austria, with a re-description of *Branchiobdella papillosa* NESEMANN & HUTTER, 2002. *Acta zool. Bulg.*
- SUBCHEV, M., 1978. A new branchiobdellid - *Branchiobdella kozarovi* sp. n. (Oligochaeta, Branchiobdellidae) from Bulgaria. – *Acta zool. Bulg.*, **9**: 78-80.
- SUBCHEV M., E. KOUTRAKIS, C. PERDIKARIS 2007. Crayfish epibionts *Branchiobdella* sp. and *Hystricosoma chappuisi* (Annelida: Clitellata) in Greece. – *Bull. Fr. Pêche Piscic.* **387**: 59-66.
- SUBCHEV M., L. STANIMIROVA. 1998. Distribution of freshwater crayfish (Crustacea: Astacidae) and the epibionts of the genus *Branchiobdella* (Annelida: Branchiobdellidae), *Hystricosoma chappuisi* Michaelsen, 1926 (Annelida: Oligochaeta) and *Nitocrella divaricata* (Crustacea: Copepoda) in Bulgaria. – *Hist. nat. bulg.*, **9**: 5-18. (In Bulgarian).
- SVETLOV P. G. 1926. Beobachtungen über die Oligochaeten des Gouv. Perm. III. Die Familien Tubificidae, Lumbriculidae und Discodrilidae. – *Izv. biol. nauchno-issled. inst. pri Permsk. gos. univ.*, **4**: 7, 343-346. (In Russian).
- VOIGT W. 1885a. Untersuchungen über die Varietätenbildung bei *Branchiobdella varians*. – *Arb. Zool.-Zootom. Inst. Würzburg*, **7**: 41-94.
- VOIGT W. 1885b. Ueber Ei- und Samenbildung bei *Branchiobdella*. – *Arb. Zool. Zootom. Inst. Würzburg*, **7**: 300-368.
- VOIGT W. 1886 (1888). Beiträge zur feineren Anatomie und Histologie von *Branchiobdella varians*. Arbeiten aus des Zoologischen -Zootom. – *Instituten zu Würzburg*, **8**: 102-128.
- WIERZBICKA J., P. ŠMIETANA 1999. The food of *Branchiobdella* Odier, 1823 (Annelida) dwelling on crayfish and occurrence of the fish parasite *Argulus Müller* 1785 (Crustacea) on the carapace of *Pontastacus leptodactylus* (Esch.). – *Acta ichtiologica et piscatoria*, **29**: 1, 93-98.
- WOJTAS F. 1964. Notes of the family Branchiobdellidae (Oligochaeta) of the river grabia. – *Przegl. Zool.*, **8**: 149-152.

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