

Petroleuciscus, a new genus for the *Leuciscus borysthenicus* species group (Teleostei: Cyprinidae)

N.G. Bogutskaya

Bogutskaya, N.G. 2002. *Petroleuciscus*, a new genus for the *Leuciscus borysthenicus* species group (Teleostei: Cyprinidae). *Zoosystematica Rossica*, 11(1): 235-237.

Petroleuciscus gen. n. (type species *Squalius borysthenicus* Kessler, 1859) is erected for 6 species from the former subgenus *Squalius* of the genus *Leuciscus* (= *Leuciscus cephalus* complex sensu Bianco, 1983). It is distinguished by the reduced number of vertebrae (total vertebrae modally 34-38), few sensory cephalic pores (7-10 in the supraorbital canal), relatively small supraethmoid-mesethmoid block, narrow infraorbitals, and deep neurocranium with a normally developed interorbital septum.

N.G. Bogutskaya, Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St.Petersburg 199034, Russia.

Introduction

The genus *Leuciscus* Cuvier, 1816 sensu lato is the central group for understanding the phylogeny and systematics of Leuciscinae and is apparently ancestral for many phylogenetic lineages within the subfamily (Bogutskaya, 1990a, 1990b). Species traditionally assigned to the genus are widely distributed throughout Eurasia, from the Iberian Peninsula to the Amur River and from the Kolyma River to the Tigris-Euphrates drainage area. They are about 40-50 in number (specific rank of some taxa is a matter of discussion): *Leuciscus agassizii* Valenciennes, 1844; *L. albus* Bonaparte, 1838; *L. ahipsi* Aleksandrov, 1927; *L. aradensis* Coelho, Bogutskaya, Rodrigues & Collares-Pereira, 1998; *L. bergi* Kashkarov, 1925; *L. borysthenicus* (Kessler, 1859); *L. brutius* Costa, 1838; *L. burdigalensis* Valenciennes, 1844; *L. cabeda* Risso, 1827; *L. carolitertii* Doadrio, 1988; *L. cephalus* (Linnaeus, 1758); *L. chuanchicus* (Kessler, 1876); *L. danilewskii* (Kessler, 1877); *L. dzungaricus* Koch & Paepke, 1998; *L. g. deranus* Günther, 1899; *L. idus* (Linnaeus, 1758); *L. illyricus* (Heckel & Kner, 1858); *L. keadicus* Stephanidis, 1971; *L. kurui* Bogutskaya, 1995; *L. laius* (Keyserling, 1861); *L. l. hmanni* Brandt, 1852; *L. lepidus* (Heckel, 1843); *L. leuciscus* (Linnaeus, 1758); *L. lindbergi* Zanin & Ereimejev, 1934; *L. lucumonis* Bianco, 1983; *L. merzbacheri* (Zugmayer, 1912); *L. microlepis* (Heckel, 1843); *L. mongolicus* (Kessler, 1876); *L. montenigrinus* Vuković, 1963; *L. muticellus* Bonaparte, 1837; *L.*

oshimae Fowler, 1958; *L. palaciosi* (Doadrio, 1980); *L. pamvoticus* Stephanidis, 1939; *L. persidis* (Coad, 1981); *L. pleurobipunctatus* (Stephanidis, 1939); *L. polylepis* (Steindachner, 1866); *L. pyrenaicus* Günther, 1868; *L. ruffoi* Bianco & Recchia, 1983; *L. schmidtii* (Herzenstein, 1896); *L. smyrnaeus* Boulenger, 1896; *L. spurius* (Heckel, 1843); *L. squaliusculus* (Kessler, 1872); *L. svallize* (Heckel & Kner, 1858); *L. torgalensis* Coelho, Bogutskaya, Rodrigues & Collares-Pereira, 1998; *L. tumensis* Mori, 1930; *L. turskyi* (Heckel, 1843); *L. ukliva* (Heckel, 1843); *L. ulanus* Günther, 1899; *L. waleckii* (Dybowski, 1869); *L. zрманjae* (Karaman, 1928).

According to Berg (1949) and Bănărescu (1964), species of *Leuciscus* s. l. are grouped into four subgenera: *Leuciscus* Cuvier, 1816 (type species *Cyprinus leuciscus*), *Squalius* Bonaparte, 1837 (type species *Leuciscus squalus* Bonaparte, 1837 = *Cyprinus cephalus*), *Idus* Heckel, 1843 (type species *Cyprinus idus*), and *Telestes* Bonaparte, 1837 (type species *Leuciscus muticellus*). Later on (Bianco, 1983, 1986; Bianco & Recchia, 1983; Bianco & Knežević, 1987), these subgenera were considered to be species complexes without an exact taxonomic status: *L. leuciscus*, *L. cephalus*, *L. idus* and *L. souffia* species complexes, respectively. Species of the *L. cephalus* complex, characterised by serrated pharyngeal teeth in two rows (2.5-5.2) and the anal fin margin distinctly to slightly convex, were studied subsequently (Bogutskaya, 1994, 1996; Bogutskaya & Zupančić, 1999) with special emphasis to the sensory canal structure and osteology, and

it was shown that the *L. cephalus* complex sensu Bianco, 1983 represents two distinct groups of species called "*L. cephalus*-*L. lepidus* species group" (Bogutskaya, 1994) and "*L. borysthenticus* species group" (Bogutskaya, 1996).

Dynamic development of genetic methods in cyprinid systematics resulted in upgrading of some species groups to the generic level. Thus, the genus *Telestes* was rehabilitated for the species of the former *L. souffia* complex (*L. muticellus*, *L. souffia*, *L. montenigrinus*, *L. pleurobipunctatus*) (Ketmaier et al., 1998). *Squalius* was used as a generic name by Doadrio (2001) for some species from the Pyrenean Peninsula, viz. *L. carolitertii*, *L. cephalus*, *L. palaciosi* and *L. pyrenaicus*.

To avoid inaccuracies with using the generic name *Squalius* for those members of the former *L. cephalus* complex sensu Bianco, 1983, which actually represent the *L. borysthenticus* species group sensu Bogutskaya, 1996, the latter group is described here as a distinct genus. A new generic name is given, since, according to the data from the wide literature summarized (see, for example, Eschmeyer, 2002), there are no generic names typified by any species of the *L. borysthenticus* group. The list of synonyms of *Leuciscus* s. l. (besides the three mentioned above) includes the following names: *Aspiopsis* Zugmayer, 1912 (type species *Aspiopsis merzbacheri*), *Bathystoma* Fitzinger, 1873 (type species *Squalius microlepis*), *Cephalopsis* Fitzinger, 1873 (type species *Squalius svallize*), *Genghis* Howes, 1984 (type species *Squalius mongolicus*), *Habrolepis* Fitzinger, 1873 (type species *Squalius ukliwa*), *Iberocypris* Doadrio, 1980 (type species *Iberocypris palaciosi*), and *Microlepis* Bonaparte, 1846 (type species *Squalius microlepis*).

Examined are specimens of 40 species from *Leuciscus* s. l., among them *L. smyrnaeus* (35), *L. persidis* (126 incl. holotype NMC 79-0154A, and 4 paratypes NMC 79-0499), *L. borysthenticus* (277), *L. ulanus* (14, including syntypes of *ulanus* BMNH 1984.10.10:1-2 and syntypes of *gaderanus* BMNH 1899.9.30:113-115), *L. kurui* (holotype ZMH 7361 and 3 paratypes ZMH 8413), *L. squaliusculus* (38, incl. 6 syntypes ZISP 2075). For detailed information see earlier publications (Bogutskaya, 1994, 1995, 1996; Bogutskaya & Poznyak, 1994; Coelho et al., 1998; Bogutskaya & Zupančić, 1999). Abbreviations: BMNH – Museum of Natural History, London; NMC – Museum of Nature, Ottawa; ZISP – Zoological Institute, St. Petersburg; ZMH – Zoological Museum of Hamburg University.

Petroleuciscus gen. n.

Type species *Squalius borysthenticus* Kessler, 1859.

Diagnosis. Small size in adults, reduced number of vertebrae (total vertebrae 34-38, rarely 39 or 40, abdominal vertebrae usually 18-21, caudal vertebrae 16-18), few sensory cephalic pores (7-10 in the supraorbital, 12-19 in the infraorbital, and 12-17 in the preoperculo-mandibular canal), relatively small supraethmoid-mesethmoid block, narrow infraorbitals, and deep neurocranium with a normally developed interorbital septum.

Species composition. Besides the type species, *L. kurui*, *L. persidis*, *L. smyrnaeus*, *L. squaliusculus* and *L. ulanus*.

Distribution. Basins of the Aegean, Black, Caspian and Aral seas, also the upper Tigris River and Rezaieh Lake.

Etymology. From *Petr*, the first name of famous freshwater ichthyologist Petru Bănărescu and of my son Petr Naseka, and *Leuciscus*, a related genus. Gender: masculine.

Remarks. Species assigned here to *Petroleuciscus* gen. n. have been commonly referred to the subgenus *Squalius* (Berg, 1949; Bănărescu, 1964) or the *L. cephalus* complex (Bianco, 1983 and others) together with *L. cephalus* and some other species. *L. aradensis*, *L. cabeda*, *L. carolitertii*, *L. cephalus*, *L. chuanchicus*, *L. illyricus*, *L. keadicus*, *L. lepidus*, *L. merzbacheri*, *L. palaciosi*, *L. pamvoticus*, *L. pyrenaicus*, *L. spurius*, *L. svallize*, *L. torgalensis*, and *L. zрманjae* are assigned here to the genus *Squalius*, which is characterised by the numerous total vertebrae (commonly more than 40, up to 48), increased number of sensory cephalic pores (up to 12-20 in the supraorbital canal) in most species, often fused and very expanded fourth and fifth infraorbitals, and depressed neurocranium with a reduced interorbital septum (Bogutskaya, 1994; Coelho et al., 1998; Bogutskaya & Zupančić, 1999).

Acknowledgements

I am greatly indebted to H. Wilkens, B. Herzig, E. Mikschi, B. Coad, F. Krupp, P. Bănărescu, and P. Economidis for the opportunity to examine the fish collections in their institutions and providing me specimens for osteological preparations. The study was supported by grants from the Russian Foundation for Basic Research (nos. 98-04-48524 and 01-04-49552).

References

- Bănărescu, P. 1964. Pisces – Osteichthyes. *Fauna Republicii Populare Române*, 13: 1-962. București, Acad. Rep. Pop. Rom. (In Romanian).
- Berg, L.S. 1949. *Presnovodnye ryby SSSR i sopredel'nykh stran* [Freshwater fishes of the USSR and adjacent countries], 2-3: 467-1381. Moscow-Leningrad, Acad. Sci. USSR. (In Russian).

- Bianco, P.G.** 1983. *Leuciscus lucumonis* n. sp. from Italy (Pisces, Cyprinidae). *Senckenbergiana biol.*, **64**(1/3): 81-87.
- Bianco, P.G.** 1986. The zoogeographic units of Italy and Western Balkans based on cyprinid species ranges (Pisces). *Biologia gallo-hellenica*, **12**: 291-299.
- Bianco, P.G. & Knežević, B.** 1987. The *Leuciscus cephalus* complex (Pisces, Cyprinidae) in the western Balkanic area. *Proc. V Congr. Europ. Ichthyol., Stockholm, 1985*: 49-55.
- Bianco, P.G. & Recchia, F.** 1983. The Leuciscinae of the *Squalius* species complex in Italy (Pisces, Cyprinidae). *Boll. Zool.*, **50**: 15-19.
- Bogutskaya, N.G.** 1990a. Morphological fundamentals in classification of the subfamily Leuciscinae (Cyprinidae). Communication 1. *Vopr. Ikhtiol.*, **30**: 355-367. (In Russian; translated in *J. Ichthyol.*, **30**(3): 63-77).
- Bogutskaya, N.G.** 1990b. The morphological basis for the classification of cyprinid fishes (Leuciscinae, Cyprinidae). Communication 2. *Vopr. Ikhtiol.* **30**: 920-933. (In Russian; translated in *J. Ichthyol.*, **31**(1): 66-82).
- Bogutskaya, N.G.** 1994. A description of *Leuciscus lepidus* (Heckel, 1843) with comments on *Leuciscus* and leuciscine – aspinine relationships (Pisces: Cyprinidae). *Ann. naturhist. Mus. Wien*, **96B**: 599-620.
- Bogutskaya, N.G.** 1995. *Leuciscus kurui*, a new cyprinid fish from the upper Tigris (Dicle) system. *Mitt. Hamb. zool. Mus. Inst.*, **92**: 149-154.
- Bogutskaya, N.G.** 1996. Contribution to the knowledge of leuciscine fishes of Asia Minor. Part 1. Morphology and taxonomic relationships of *Leuciscus borysthenicus* (Kessler, 1859), *Leuciscus smyrnaeus* Boulenger, 1896 and *Ladigesocypris ghigii* (Gianferri, 1927) (Cyprinidae, Pisces). *Publ. Espec. Inst. Esp. Oceanogr.* **21**: 25-44.
- Bogutskaya, N.G. & Poznyak, V.G.** 1994. A re-description of *Leuciscus aphipsi* Aleksandrov (Leuciscinae, Cyprinidae). *Vopr. Ikhtiol.*, **34**: 308-315. (In Russian).
- Bogutskaya, N.G. & Zupančić, P.** 1999. A re-description of *Leuciscus zрманjae* (Karaman, 1928) and new data on the taxonomy of *Leuciscus illyricus*, *L. svalize* and *L. cephalus* (Pisces: Cyprinidae) in the West Balkans. *Ann. naturhist. Mus. Wien*, **101B**: 509-529.
- Coelho, M.M., Bogutskaya, N.G., Rodrigues, J.A. & Collares-Pereira, M.J.** 1998. *Leuciscus torgalensis* and *L. aradensis*, two new cyprinids for Portuguese fresh waters. *J. Fish Biol.*, **52**: 937-950.
- Doadrio, I. (ed.)**. 2001. *Atlas y libro rojo de los peces continentales de España*. 364 p. Madrid, Museo Nacional de Ciencias Naturales.
- Eschmeyer, W.** 2002. *The catalog of fishes on-line* (<http://www.calacademy.org/research/ichthyology/catalog>)
- Ketmaier, V., Cobolli, M., Matthaes, E. & Bianco, P.G.** 1998. Allozymic variability and biogeographic relationships in two *Leuciscus* species complexes (Cyprinidae) from southern Europe, with the rehabilitation of the genus *Telestes* Bonaparte. *Ital. J. Zool.*, **65**(suppl.): 41-48.

Received 13 November 2002