

## The valid names of some European species of the genus *Cobitis* (Teleostei, Cobitidae)

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**Abstract.** Three of the most widespread European loach fishes of the genus *Cobitis* have had a confusing nomenclature in recent times. The present paper aims to explain the different points of view of former authors, to add some new information and to evaluate the correct nomenclature of the species according to the International Code of Zoological Nomenclature (IV edition). Depending on whose description the identification is based, those species occurring in the Baltic area and European Russia with a chromosome number of  $2n = 48$  should be called *C. taenia* sensu Nalbant or sensu Vasileva. The valid name for the Danubian spined loach is *C. elongatoides* Băcescu et Maier, 1969, and that for the species in the north-west Black Sea area is *C. tanaitica* Băcescu et Maier, 1969.

**Key words:** spined loaches, nomenclature, International Code of Zoological Nomenclature

Numerous discussions held during the International Conference “Loaches of the Genus *Cobitis* and Related Genera”, Brno, 1999, touched on the problem of nomenclature of some European species of *Cobitis*. The correct usage of loach names is very important for fish biologists in order to avoid confusion in their study and conservation, as they are endangered in the most European countries (Kotusz 1996). Therefore we consider it important to elucidate the case of three species of the genus *Cobitis* to users of the names, and to comment on some aspects of this problem.

### • *Cobitis taenia* Linnaeus, 1758

*Cobitis taenia* was described by Linnaeus on the basis of three earlier accounts by Artedi (1738), Linnaeus (1746) and Gronovius (1754) (as specified in Kottelat 1997), with the type locality encompassing most of Europe. Kottelat (1997) restricted the type locality to Lake Mälaren (west of Stockholm), which was the only locality explicitly mentioned by Linnaeus (1754) and Artedi (1738). A possible syntype survived in Linnaeus' collection but it is in very bad condition for proper examination (Wheeler 1991). Nalbant (1993) examined “a number of lots of *taenia* from Sweden” and redescribed but did not rediagnose this species. Vasilev et al. (1989) described morphology, allozyme data and the characteristic karyotype of ‘*C. taenia*’ from Moscow. No recent author has examined specimens from the type locality and proved that populations out of Lake Mälaren are conspecific with *C. taenia*. As a result, the above-mentioned identifications have to be considered as preliminary. The populations under question should be referred to as *C. taenia* sensu Vasilev et al. (1989) or sensu Nalbant (1993), depending on whose

description the identification is based. In our opinion, *C. taenia* is in need of a redescription and a male, diploid neotype has to be named. It is important to include a study of the karyotype in this redescription, since this is an important diagnostic character in spined loach and it is not known if the population inhabiting the type locality includes diploid and polyploid specimens.

• *Cobitis elongatoides* Băcescu et Maier, 1969 vs. *Cobitis danubialis* Băcescu in Nalbant, 1993

The existence of a loach distinct from *C. taenia* in south-western Romania was mentioned by Băcescu (1962a) (p. 294, last paragraph), who used the infrasubspecific name *C. taenia* var. *elongatoides*. The text makes clear that Rumanian ichthyologists at this time were aware of its distinct status but did not consider it to be a separate species or subspecies.

According to the International Code of Zoological Nomenclature (ICZN) the infrasubspecific names used after 1960 are not available and are excluded from nomenclature (ICZN, art. 1.3.4 unless the name was subsequently deemed to be an available name under 45.6.4.1). Consequently, the name *elongatoides* is not available from Băcescu (1962a). Later, Băcescu & Maier (1969) used the same name at subspecific rank as *C. taenia elongatoides* (p. 56). They also fulfilled, apparently not intentionally, the requirements of ICZN for species description, such as type locality (Băcescu & Maier 1969, Fig. 3a: "Argeşul River, Danube basin"), type material (Băcescu & Maier 1969, Figs 3 and 7) and distinguishing characters (Băcescu & Maier 1969, p. 56 and Figs 3 and 7). This usage made the name *elongatoides* available according to ICZN Art. 10.2. A note in the legend to Fig. 3 ("*C. taenia elongatoides* Băc.") makes it clear that Băcescu considered himself author of the name, very probably based on the above 1962 paper. Careful comparison of the Russian original text of Băcescu & Maier (1969) in *Voprosy Ichtiologii* and its English translation in *Journal of Ichthyology* did not reveal any differences that could have affected the availability of the name and/or interpretation of the problem by different readers. Kottelat (1997) analysed this problem and correctly concluded that the name *elongatoides* was available from Băcescu & Maier (1969). Probably by proof editing, he referred to Băcescu (1962b) instead of Băcescu (1962a) as the first mention of *elongatoides* (Kottelat 1997, p. 88, 6.1.4 *Cobitis elongatoides*, last paragraph vs. p. 186 Literature cited).

The unavailability of the name *elongatoides* from Băcescu (1962a) was realised shortly after Băcescu & Maier (1969) publication by Bănăreşcu & Nalbant (Nalbant, pers. comm.). To the second usage of the name by Băcescu & Maier (1969), they applied the principle of homonymy. Following their argument, the name *elongatoides* could not be used anymore and the loach was in need of a new description under a different name. This is the reason why Băcescu wrote a second description of this loach as *C. taenia danubialis*. He gave the manuscript to Nalbant, who included it in his own manuscript (Nalbant 1993). Kottelat (1997) considered Nalbant as author of the name *danubialis* according ICZN art. 50.1, but he overlooked the note at the very end of the paper (Nalbant 1993, p. 110, last paragraph), which indicates that the author is Băcescu and not Nalbant.

However, Nalbant & Băcescu applied the principle of homonymy to the two mentions of the name *elongatoides*, but they overlooked that the principle of homonymy can be applied only to available names (ICZN Art 50.1). Since *C. taenia* var. *elongatoides*

Băcescu, 1962 was not available, its replacement by *C. taenia elongatoides* Băcescu et Maier, 1969 (available) was not a case of homonymy.

Therefore, Kottelat's conclusion about the priority of *elongatoides* over *danubialis* was correct, with the exception that the author of *danubialis* is not Nalbant, 1993 but Băcescu in Nalbant, 1993.

There are no studies about the karyotype of the type specimens of *C. elongatoides*, and it is not known if the population at the type locality includes diploid and polyploid specimens. If the material examined by Băcescu & Maier (1969) is rediscovered in future, a male, diploid lectotype has to be named. Only in the unlikely case that all type specimens are proved to be polyploid hybrids, will the name for the Danubian spined loach be available from Băcescu in Nalbant (1993) as *Cobitis danubialis* if the types of this species are diploid or their diploidy cannot be negated.

Consequently, the valid name for the Danubian spined loach is *Cobitis elongatoides* Băcescu et Maier, 1969.

• ***Cobitis tanaitica* Băcescu et Maier, 1969 vs. *Cobitis rossomeridionalis* Vasileva et Vasilev, 1998**

The spined loach from the lower River Don below Rostov was described as *Cobitis taenia tanaitica* by Băcescu et Maier, 1969. Recently, Vasileva & Vasilev (1998) studied spined loaches of the same region as well as from the northern influents of the Black Sea and declared that the populations included both diploid and polyploid hybrid individuals. The diploid specimens were described as *C. rossomeridionalis* Vasileva et Vasilev, 1998. Vasileva & Vasilev (1998) considered "the name *C. tanaitica* to be *nomen nudum* and unfit for the species under description, despite the fact that the Don is included in its habitat, and the drawings of the two individuals cited by the authors (Băcescu & Maier 1969, Fig 1), according to the pattern of pigmentation, undoubtedly correspond to the new species." (Vasileva & Vasilev 1998, p. 582). In another words, they concluded that name *tanaitica* for loaches of that region is not possible to use on the basis of the three main objections: 1) there are no deposited type specimens, 2) material was compared with an erroneously identified *C. taenia*, 3) the material described by Băcescu & Maier (1969) could have included hybrid polyploid individuals.

However, there are some problems with the argumentation of Vasileva & Vasilev (1998). According to ICZN, it was not necessary to fix a single type individual in 1969. Therefore, the specimens of *C. tanaitica* from which the Fig. 1 (p. 52) was drawn, plus the other specimens mentioned, have to be considered as syntypes. Further, Vasileva & Vasilev (1998) claimed that one of the spined loaches, to which Băcescu & Maier (1969) compared *C. tanaitica*, is erroneously identified as *C. taenia*. This might be true, but formally it is not necessary to prove the comparative material to be properly determined. Vasileva & Vasilev themselves and all other authors could not be certain that they had ever seen an actual *C. taenia* (see above).

The terminus '*nomen nudum*' can only be applied if the description or naming of a species does not fulfil the requirements of the ICZN. Băcescu & Maier (1969) fulfilled all of the requirements necessary to make a name available. They described the species extensively, and the diagnosis is not lacking but is scattered in the text. Although they wrote "the description has no indication of characteristics aimed for distinguishing this taxon", Vasileva & Vasilev (1998) were in fact able to identify *C. tanaitica* (according to

the pattern of pigmentation, see citation above), By doing so, the authors I) prove the description, i.e. figure, to be sufficient for identification of *C. tanaitica*, and II) positively identified the type, i.e. figured specimens of *C. tanaitica* as *C. rossomeridionalis*. As a result, the description of *C. tanaitica* fulfills all the necessary requirements and makes the name available.

Vasiļeva & Vasiļev (1998) also argued that *C. tanaitica* might be based on material of mixed ploidy. There are no studies about the karyotype of the type specimens of that loach, which is very likely still present in the Museum of Natural History 'Grigore Antipa', Bucharest (Nalbant, pers. comm.). In the case of *C. rossomeridionalis*, the "type individuals were fixed from the singular large genetically homogeneous sample from the Dori River below Rogozhkino." (Vasiļeva & Vasiļev 1998, p.582). Since the type locality of *C. tanaitica* is located only a few dozen kilometres away in the same river ("... from the Don below Rostov", Băcescu & Maier 1969, p. 52), the type specimens of *C. rossomeridionalis* may be even taken as locotypes of *C. tanaitica*. Moreover, by identifying the type specimens of *C. tanaitica* as conspecific with *C. rossomeridionalis* and by finding no polyploid specimens in the large sample from lower Don River, Vasiļeva & Vasiļev even lowered the probability of the type material of *C. tanaitica* being polyploid.

If the type material of *C. tanaitica* is rediscovered in future, a male, diploid lectotype has to be named (as best the male pictured in Fig. 3 of Băcescu & Maier 1969). Until it can be proved that all of the specimens from the type material (two males and four females) are hybrids, *C. tanaitica* is the valid name for the loach of the lower Don river and *C. rossomeridionalis* is a junior synonym to this species to *C. tanaitica* unless it will be demonstrated it represents another species. Anyhow, the study of Vasiļeva & Vasiļev (1998) provides a very clear, detailed analysis and redescription of *C. tanaitica*.

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#### LITERATURE

- ARTEDI, P., 1738: Ichthyologia sive opera omnia de piscibus scilicet: Bibliotheca ichthyologica. *Wishoff, Stockholm (in Latin)*.
- BĂCESCU, M., 1962a: Données nouvelles sur les loches (*Cobitis*) d'Europe, avec références spéciales sur les cagnettes de l'Italie du Nord. *Trav. Mus Hist. Nat. Gr. Antipa*, 3: 282–301.
- BĂCESCU, M., 1962b: Contribution à la systématique du genre *Cobitis*. Description d'une espèce nouvelle, *Cobitis calderoni*, provenant de l'Espagne. *Rev. Biol.*, 6: 435–448.
- BĂCESCU, M. & MAIER, R., 1969: K poznaniju schipovok (*Cobitis* Dona i Volgi [BĂCESCU, M. & MAIER, R., 1969: Cobitids of the Don and Volga]. *Vopr. Ichtiol.*, 9: 51–60 (in Russian); *J. Ichthyol.*, 9: 38–44 (English translation).
- GRONOVIVS, L. T., 1754: Museum ichthyologicum, sistens piscium indigenorum e quorundam exoticorum, qui in museo Laurentii Theodori Gronovii, adservantur, descriptiones, ordine systematico; accedunt nonnullorum exoticorum piscium icones, aeri incisae. *Haak, Lagduni Batavorum (Leiden)*, Vol. 1, 70 pp.
- INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, 1999: International code of zoological nomenclature. Fourth edition. *The International Trust for Zoological Nomenclature, London*, 305 pp.

- KOTTELAT, M., 1997: European freshwater fishes. *Biologia (Bratislava)*, 52, Supplement 5: 1–271.
- KOTUSZ, J., 1996: Species protection of loaches (Cobitoidea, Cypriniformes) in Poland in relation to their distribution and status in other European countries. *Zool. Pol.*, 41 (Suppl.): 147–155 (in Polish, with a summary in English).
- LINNAEUS, C., 1746: Fauna Suecica sistens animalia Sueciae regni. *Wishoff, Lagduni Batavorum*, 411 pp.
- LINNAEUS, C., 1754: Museum S. R. M. Adolphi Friderici Regis Suecorum. *Typographia regia, Stockholmia*, 133 pp.
- LINNAEUS, C., 1758: Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. 10. Ed., *Salvius, Holmiae* (in Latin).
- NALBANT, T.T., 1993: Some problems in the systematics of the genus *Cobitis* and its relatives (Pisces, Ostariophysi, Cobitidae). *Rev. Roum. Biol.–Biol. Anim.*, 38: 101–110.
- VASILEV, V. P., VASILEVA, K. D. & OSINOV, A. G., 1989. Evolution of a diploid-triploid-tetraploid complex in fishes of the genus *Cobitis* (Pisces, Cobitidae). In: Dawley, R. M. & Bogart, J. P. (eds.), Evolution and ecology of unisexual vertebrates. *Bull. 466, New York State Museum, Albany, New York*: 153–169.
- VASILEVA, E.D. & VASILEV, V.P., 1998: Vidy-dvojniki v rode *Cobitis* (Cobitidae). 1. Juzhnorussijskaja schipovka *Cobitis rossomeridionalis* [Sibling species in genus *Cobitis* (Cobitidae). 1. *Cobitis rossomeridionalis* sp. nova.] *Vopr. Ichthyol.*, 38: 604–614 (in Russian, English translation in *J. Ichthyol.*, 38: 580–590).
- WHEELER, A., 1991: The Linnean fish collection in the Zoological Museum of the University of Uppsala. *Zool. J. Linn. Soc.*, 103: 145–195.