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Notes on the taxonomy and nomenclature of some European freshwater fishes

Maurice Kottelat * and Jörg Freyhof **

Lethenteron zanandreae is placed in *Lampetra*. *Acipenser naccarii*, *A. oxyrinchus* and *Perca acerina* are declared nomina protecta. *Acipenser heckelii*, *Sturio accipenser*, *A. lichtensteinii* and *Perca tanaicensis* are declared nomina oblita. Neotypes are designated for *A. sturio* and *Cobitis albicoloris*. The only known extant museum specimen of the extinct *Coregonus bezola* is recorded. *Atherina lagunae* and *A. punctata* of Trabelsi et al. (2002) are unavailable names; *A. punctata* would anyway be a junior homonym of *A. punctata* Bennett, 1833. Lectotypes are designated for *A. boyeri*, *Salmo schiefermuelleri* and *Cobitis bulgarica*. The spelling of the family-group name Odontobutidae is clarified. Nomenclature of various species of *Scardinius*, *Salmo*, *Salvelinus* and *Coregonus* is discussed. The nomenclature and spelling of *Gymnocephalus acerina* and *G. cernua* are reviewed.

Introduction

While completing the text for our *Handbook of European Freshwater Fishes* (Kottelat & Freyhof, 2007), a number of unresolved taxonomic and nomenclatural problems showed up. This book was not be the place for detailed discussion of such technicalities, therefore the aim of the present note is to clear these problems and to explain some taxonomic and nomenclatural decisions.

Material and methods

Abbreviations: *Code*, International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature, 1999); CMK, Collection of first author; EAWAG, Forschungszentrum für Limnologie, Kastanienbaum; MNHN, Muséum National d'Histoire Naturelle, Paris; NMW, Naturhistorisches Museum, Wien; ZMB, Zoologisches Museum der Humboldt Universität, Berlin. FYROM refers to the Former Yugoslavian Republic of Macedonia.

Lampetra zanandreae

Placement of this species in the genus *Lethenteron* or *Lampetra* has been discussed by, among others, Hubbs & Potter (1971: 53), Vladykov & Kott (1979), and Bailey (1980). The argument centres on the middle endolateral tooth being bicuspid (vs. tricuspid) and the presence (vs. absence) of a posterial teeth row. Teeth terminology follows Hardisty (1986).

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The middle endolateral teeth is bicuspid in *Lethenteron* and tricuspid in *Lampetra*. In most individuals of *L. zanandreae* the middle endolaterals are bicuspid, but they are tricuspid on at least one side in 17 % of the specimens (Zanandrea, 1957; compiled by Bianco, 1986: 239). We interpret the bicuspid teeth as a reductive state of this character and the tricuspid teeth as the plesiomorphic state.

Posterial teeth are present in *Lethenteron* and absent in *Lampetra*. The posterials are described as present or absent in *L. zanandreaei*. When they are 'absent', it seems that they are in fact deeply embedded in the tissue of the disc (Zanandrea, 1958; Bailey, 1982). The absence of posterials clearly seems to be a derived character state.

While potentially useful to diagnose species, these two characters are reductive and therefore of little or no use in defining lineages. They may be significant for large, predatory species, but reduction of (or more appropriately non development of a complete) dentition is a character that is expected in non-predatory, small-size species in which the dentition is non-functional and in fact teeth reduction evolved in parallel in several lineages (see data in Hubbs & Potter, 1971; Vladykov & Kott, 1979; Holcik, 1986; Gills et al., 2003).

The generic position of *L. zanandreaei* has only been discussed in relation with *Lampetra* and *Lethenteron*, but never in relation with other genera. The hypothesis of a possible relationships with *Lampetra* seems legitimate as the genus is present in most of western Europe. On the other hand, the hypothesis of a relationship with *Lethenteron* is somehow surprising as this genus is otherwise including only species in the Arctic and Pacific basins (Hubbs & Potter, 1971; Vladykov & Kott, 1979).

The hypothesis of a relationship between *L. zanandreaei* and *Eudontomyzon*, would be tempting. *Eudontomyzon* includes mainly freshwater, non predatory species in the Ponto-Caspian area and its range parallels that of *Sabanejewia*, *Romanogobio* and *Knipowitschia*. Each of these genera has several Ponto-Caspian species plus one representative in the Adriatic drainages (*S. larvata*, *R. benacensis*, *K. panizzae*, *Eudontomyzon* + *L. zanandreaei*). *Eudontomyzon* is diagnosed from *Lampetra* and *Lethenteron* by the bicuspid middle endolateral (vs. tricuspid in *Lampetra*) and the presence of exolaterals.

The main difference between *L. zanandreaei* and *Eudontomyzon* species is that the middle endolateral is tricuspid in some individuals ([but bicuspid in most], vs. bicuspid) and the absence (vs. presence) of exolateral teeth. But we note that in some populations of *E. vladykovi*, exolaterals are less numerous than in others (Holcik, 1963) and Holcik & Soric (2004) report that exolateral teeth are villiform, very small, weakly developed and frequently absent in *E. stankokaramani*. The reduced number or absence of exolaterals is a reductive character and again of little or no use in defining lineages, as evidenced by the situation in *E. vladykovi* and *E. stankokaramani*.

Lampetra zanandreaei shares with *E. hellenicus* the low number of trunk myomeres (52-59 and 53-62, respectively). *Eudontomyzon stankokaramani* from Drin drainage (Adriatic basin) has 58-65 trunk myomeres (Karaman, 1974; Holcik & Soric, 2004). It is distinguished from *L. zanandreaei* by the presence of exolateral teeth (vs. absence).

The characters presently used to diagnose species and genera of European lampreys are difficult or impossible to apply to the small-sized, non-predatory lampreys of southern Europe. Many alternative hypotheses may reasonably be formulated regarding their taxonomy, relationships and zoogeography and they require testing. Meanwhile, we have decided to retain *L. zanandreaei* in the genus *Lampetra*.

***Acipenser naccarii* Bonaparte, 1836**

Acipenser naccarii Bonaparte (1836: fasc. 16-17 [p. 377], pl. 129 fig. 2) and *A. heckelii* Fitzinger (in Fitzinger & Heckel, 1836: 303, pl. 26 fig. 4, pl. 29 figs. 11-12) both appeared in 1836. In his account of *A. naccarii*, Bonaparte explicitly provides a full bibliographic reference to the description of *A. heckelii* in Fitzinger & Heckel (1836), and obviously the latter name has priority. As the species is endangered and listed in several national and international legal instruments, the conservation of the commonly accepted name seems justified.

To our knowledge, *A. heckelii* Fitzinger, 1836 has not been used as the name of a valid species after 1899. *Acipenser naccarii* has been used in at least 25 works published by at least 10 authors in the preceding 50 years (between 1958 and 2008) in a span of more than 10 years. *Acipenser heckelii*

is declared ***nomen oblitum*** under Code art. 23.9.2. *Acipenser naccarii* Bonaparte, 1836 is declared ***nomen protectum*** under Code art. 23.9.2. *Acipenser naccarii* now has precedence over *A. heckelii*.

List of 25 works, published by at least 10 authors, in the immediately preceding 50 years and encompassing a span of not less than 10 years (Code art. 23.9.2): Almaça & Elvira, 2000: 11; Almodovar et al., 2000: 17; Birstein, 1999: 275, 2000: 270; Birstein & Bemis, 1997: 160; Birstein & DeSalle, 1998: 144; Birstein & Doukakis, 2000: 69; Birstein et al., 1997: 430, 1998a: 97, 1998b: 766, 1999: 14; 2000: 81; Doukakis et al., 2000: 373; Economidis et al., 2000: 83; Elvira & Almodovar, 2000: 89; Gandolfi et al., 1991: 83; Holcik, 1986;

Ivanovic, 1973: 64; Kottelat & Freyhof, 2007: 52; Ludwig & Kirschbaum, 1998: 1289; Maitland, 2000: 73; Rakaj, 1995: 144; Rincón, 2000: 217; Ruiz-Rejon et al., 2000: 231; Tortonese, 1986: 284.

Acipenser sturio / *A. oxyrinchus*

We follow Ludwig et al. (2002) in recognising the Baltic sturgeon population as conspecific with the *A. oxyrinchus* of North American authors and different from the western and southern European population(s) usually called *A. sturio*. But these authors err when it comes to nomenclature. The syntypes of *A. sturio* surviving in NRM (NRM 94, NRM 21711) belong to the Baltic species (S. O. Kullander, pers. comm, 2004). Using them for a lectotype designation would ipso facto make *A. sturio* the valid name of the Baltic species and of the *A. oxyrinchus* of North American authors and the name *A. sturio* could not be used for the western and southern European species. The consequence is that both the western European and the North American species would have to be re-named, creating serious potential communication problems. This is certainly not desirable for a species of such conservation concern as the western European sturgeon, which is close to extinction. The following nomenclature acts are aimed at formally fixing *A. oxyrinchus* as the name of the Baltic and North American species and *A. sturio* as the name of the western and southern European species.

Neotype designation for *A. sturio*. The procedure followed here is the same as detailed by Kottelat & Persat (2005) for *Cyprinus gobio* Linnaeus, 1758 and by Freyhof & Schöter (2005) for *Salmo oxyrinchus* Linnaeus, 1758. The details are not repeated here.

Linnaeus' (1758: 237) original description of *Acipenser sturio* is based on specimens and literature accounts by Linnaeus (1746: 101, 1754: 54, pl. 18 fig. 2, 1751: 187), Artedi (1758: genera 65, synonymia 91) and Gronovius (1756: 42). The specimens include NRM 94 and NRM 21711 (S. O. Kullander, pers. comm.). BMNH 1853.11.12:210 is a specimen from Gronow's collection, but it is not clear whether it is a syntype or not (Wheeler, 1958: 296).

In turn, the account by Artedi is based on about 30 earlier literature accounts (some as early as Athenaeus, Pliny, Cicero, Luculus, etc.), themselves in turn referring to earlier works, etc. These accounts are based on material from Greece (Athenaeus), Italy (Pliny, Cicero, Ovid, Adrovandri, Salviani, etc.), Germany (Cuba, Schoenevelde, Jonston, Charleton, etc.), England (Willughby, Ray), France (Bellon, Rondelet) and include at least the southern European '*sturio*' and *A. naccarii* and possibly other species.

The specimen on which is based the figure of '*acipenser*' in Rondelet (1555: 410 [1558: 318, French translation]) is here designated as lectotype. The surviving syntypes (NRM 94, NRM 21711 and possibly BMNH 1853.11.12:210) become paralectotypes. The origin of the lectotype is not clear as Rondelet records his '*acipenser*' from Bordeaux, Provence and Languedoc but also mentions that the species occurs in Italy and this distribution includes the range or part of the range of several species of *Acipenser*. None of the fishes seen by Rondelet is known to have been preserved, and therefore the lectotype is lost. While it cannot objectively be said that the specimen figured by Rondelet effectively is today's *A. sturio*, at least the figure does not disagree with today's *A. sturio*. The identity of the nominal species *A. sturio* and its type locality can only be resolved by the designation of a neotype. To definitively link the name *A. sturio* to the species with which it is currently used, we designate MNHN 1962-1295 (Fig. 1) as neotype. The type locality is the Charente River at Saintes, France.

The holotype is 510 mm SL, 640 mm total length. It shows all the characters listed as diagnostic for *A. sturio* by Kottelat & Freyhof (2007): no fontanelle between frontal and parietal bones; dorsal scutes with tubercular radial structure; many rhombic denticles between dorsal and lateral scutes; about four plates along posterior



Fig. 1. *Acipenser sturio*, neotype, MNHN 1962-1295, 510 mm SL; France: Charente; **a**, lateral view; **b**, close up of dorsal scutes.

part of anal base; three plates along the lower edge of the caudal peduncle; first dorsal scute fused with head; 36 lateral scutes; 13 predorsal scutes; 11 prepelvic scutes; 4 scutes between pelvic and anal fins; base of barbels midway between mouth and tip of snout; barbels not fimbriate; lower lip interrupted in middle.

Reversal of precedence for *A. oxyrinchus*. If the Baltic sturgeon is conspecific with the North American *A. oxyrinchus* Mitchill, 1815, then the names *Sturio accipenser* Strøm, 1784 (type locality: Eger [in Boskerud District, south west of Oslo], Norway) and *A. lichtensteinii* Bloch, in Schneider, 1801 (type locality: "habitat in mari germanico") possibly have precedence. *Sturio accipenser* has apparently never been used as the name of a valid species since its original description. To our knowledge, *A. lichtensteinii* has not been used as the valid name of a species after 1899. As *A. oxyrinchus* has been widely used in the last 50 years, the prevailing usage can be maintained as the conditions of the Code art. 23.9.1 are satisfied.

Acipenser oxyrinchus Mitchill, 1815 is here declared **nomen protectum** under Code art. 23.9.2. It has been used in at least 25 works in the last 50 years, listed below [Code art. 23.9.1.2].

Sturio accipenser Strøm, 1784 is here declared **nomen oblitum** under Code art. 23.9.2, as it has not been used as a valid name since 1899 [Code art. 23.9.1.1], and *Acipenser oxyrinchus* Mitchill, 1815 has been used as valid name in at least 25 works in the last 50 years, listed below [Code art. 23.9.1.2]).

Acipenser lichtensteinii Bloch, in Schneider, 1801 is here declared **nomen oblitum** under Code art.

23.9.2, as it has not been used as a valid name since 1899 [Code art. 23.9.1.1], and *Acipenser oxyrinchus* Mitchill, 1815 has been used as valid name in at least 25 works in the last 50 years, listed below [Code art. 23.9.1.2]).

Acipenser oxyrinchus now has precedence over *Sturio accipenser* and *A. lichtensteinii*.

List of 26 works, published by more than 19 authors, in the immediately preceding 50 years and encompassing a span of not less than 10 years (Code art. 23.9.2): Almodovar et al., 2000: 18; Bain et al., 2000:

43; Birstein, 1993: 775, 1999: 28, 2000: 271; Birstein & Bemis, 1997: 157; Birstein & DeSalle, 1998: 142; Birstein & Doukakis, 2000: 61; Birstein et al., 1997: 431, 1998a: 98, 1998b: 768, 1999: 13; Brosse et al., 2000: 75; Holcik, 2000: 141; Holcik et al., 1989: 371; Jenkins & Burkhead, 1994: 187; Kirschbaum & Gessner, 2000: 155; Kottelat Freyhof, 2007: 53; Ludwig et al., 2000: 181, 2002; Mohler, 2000: 203; Nelson et al., 2004: 58; Ross, 2001: 73; Smith-Vaniz et al., 1999: 125; Sokolov, 1989: 204; Waldman, 2000: 237.

Examined material. *A. sturio*: MNHN 1962-1295, neotype, 510 mm SL; France: Charente River at Saintes. - MNHN 610, 2, 300-310 mm SL; France: Gironde; Abria, 1850. - MNHN 5159, 1 syntype of *A. laevis*, 156 mm SL; France: Gironde. - MNHN 3573, 1, 2740 mm SL; France: Vendée: Sables-d'Olonne.

***Gobio feraeensis* Stephanidis, 1973**

Banarescu (1999: 110) considered *G. feraeensis* as a subspecies of *G. gobio* diagnosed by the dorsal having usually 6½ branched rays, the caudal lobes crescent-shaped and converging towards the axis of the body. This taxon was known only from the fountain in Velestino; this habitat is a circular cistern about 30 m diameter, with concrete walls and sand bottom. The water comes from a spring located within the cistern. The outlet of the fountain is channelized and, after rains, was flowing to the now drained-out Lake Karla.

In 4 specimens obtained in the cistern in 1996, only one has 6½ branched dorsal rays and the others have 7½; the particular shape of the caudal figured by Stephanidis (1973) is exhibited by the two largest specimens (65.9 and 68.6 mm SL), the two smallest ones (42.6 and 47.8 mm SL) have the caudal shaped as in other *Gobio* species. Further, in the two largest specimens, the other fins also have various anomalous, curled shapes. Most fins show signs of damage and re-growth. The specimens look emaciated, as also do the *Barbus sperchiensis* obtained in this cistern.

We tentatively consider the population from Velestino spring as conspecific with that of the Pinios drainage and the name *G. feraeensis* is to be used for this species. We note, however, some small differences between the Velestino sample and the Pinios ones. Unfortunately, the cistern dried out completely a few years ago it is not clear whether this population still exists. The most obvious difference between *G. feraeensis* and *G. bulgaricus* which inhabits the next drainages to the North (Aliakmon, Axios) is the smaller distance between the anus and the anal-fin origin (greater than eye diameter, vs. smaller) and the smaller number of scales between them (3-4, vs. 5-6).

Examined material. *Gobio bulgaricus*: CMK 12930, 32; Greece: Gallikos drainage. - CMK 12934, 45; CMK 12946, 6; CMK 12955, 8; CMK 13431, 1; Greece: Axios drainage. - CMK 17393, 11; CMK 14415, 30; CMK 17837, 2; Macedonia: Vardar drainage. - CMK 17324, 3; CMK 17328, 5; Greece: Evros drainage. *G. feraeensis*: CMK 12974, 4; Greece: Velestino. - CMK 12978, 6; Greece: Pinios drainage.

***Scardinius hesperidicus* Bonaparte, 1845**

***Scardinius rhodophthalmus* Heckel, in Costa, 1845**

Scardinius hesperidicus is available from Bonaparte (1845a: 398) by indication to *Scardinius erythrophthalmus* of Bonaparte, 1840: [fasc. 28, pl. 115 fig. 2], 1840: [fasc. 30, pl. 116 fig. 2]. Bonaparte's (1845a) work is included in a volume of communications presented at a congress and it is preceded by the minutes of the meeting of the same day (Costa, 1845: 379-385). The minutes include a mention that Bonaparte read a letter by Heckel who commented that Italian *S. erythrophthalmus* received from Bonaparte (implied the species of the 1840 publication) is distinct from the Austrian *Scardinius* and proposed the name *S. rhodophthalmus*. The availability of *S. rhodophthalmus* is ambiguous, but we treat it as available. The names *S. rhodophthalmus* and *S. hesperidicus* are simultaneous synonyms and as first reviser we give precedence to *S. hesperidicus*.

Bonaparte (1845a) has also been published separately, together with his 1845b paper, in a single reprint with a common title (1845c).

Telestes souffia* / *T. muticellus

It has long been known that material identified as *T. souffia* from north and south of the Alps is morphologically very distinct. They have been discussed by Spillmann (1959, 1961, 1962, 1966, 1967; d'Aubenton et al., 1971) who reported an introgression zone between the northern Italian *T. muticellus* and the *T. souffia* in southern France. Material obtained in the Var and Bevera drainages (southeastern France) in 2002 shows that the Var population is morphologically undistinguishable from the Rhône populations while the Bevera population is

undistinguishable from *T. muticellus*. Genetic studies are congruent with these observations (Salzburger et al., 2003: 2383).

Kottelat (1997: 70) commented on a possible nomenclatural problem if the type locality of *T. souffia* is located within the introgression area between the two species. The clear identification (morphological and genetic) of the material from the Var and Bevera drainages as *T. souffia* and *T. muticellus*, respectively, eliminates this nomenclatural problem.

Kottelat & Freyhof (2007: 288) treated the *Telestes* from the Rhône, Rhine and Danube drainages as conspecific. They commented that if it were justified to consider them distinct species, the correct name for a Danube-Rhine species would be *T. ryselae* (Heckel, 1852) and not the frequently used *T. agassii* (Valenciennes, in Cuvier & Valenciennes, 1844). This last name has often been spelled *agassizii* on the assumption that *agassii* in Cuvier & Valenciennes (1844: 254) is an erroneous spelling. As explained by Kottelat (1997: 71), *agassii* is formed on a latinization of Agassiz into Agassius, which in the genitive becomes *agassii*. This spelling *agassii* has been used by several authors for a number of other animals and plants and is not erroneous. An additional problem overlooked by Kottelat (1997) and pointed to us by W. Eschmeyer is that Cuvier & Valenciennes (1844) also used the spelling *agassizii* on plate 495. The decision of the first reviser is decisive to decide which is the correct original spelling. The earliest reviser we found is Valenciennes in the index of the *Histoire naturelle des Poissons* (Cuvier & Valenciennes, 1849: Table générale p. 51) in which he retained *agassii* (Code art. 24.2.4).

Examined material. *Telestes muticellus*: CMK 17619, 35; France: Bevera drainage. - CMK 17856, 5, 5; CMK 17859, 8; CMK 17863, 12; CMK 17868, 5; Switzerland: Ticino. *T. souffia*: CMK 17647, 1; CMK 17649, 11; CMK 17652, 12; France: Var drainage. - CMK 16841, 1; CMK 16848, 6; CMK 18285, 1; France: Rhône drainage. - CMK 5406, 6; CMK 5438, 1; CMK 5506, 13; CMK 17847, 10; CMK 16889, 3; Switzerland: Rhône drainage.

***Cobitis albicollis* Chichkoff, 1932**

Kottelat (1997: 94) listed *C. albicollis* as a synonym of *Sabanejewia bulgarica* based on Drensky (1951). Ivanova & Dobrovolov (2002) considered *C. albicollis*, *C. strumicae*, *C. rhodopensis* and *C. peschevi* as synonyms. These authors did not provide much explanation to support this conclusion. They mention that material from the type locality of *C. albicollis* (Provadiiska River) are electrophoretically identical with populations of *C. strumicae* from other river drainages in Bulgaria. This however does not suffice to reach a nomenclatural conclusion.

It is not possible to objectively identify *C. albicollis* from the original description (Chichkoff, 1932). The figure (pl. 1 fig. 3) shows a discolored specimen with no clearly defined colour pattern. The shape, however, is suggestive of a species of *Sabanejewia*. The description (at least the French translation; pp. 374-376) does not help very much, but nevertheless provides some cues. Chichkoff indicates that the caudal fin has 14 rays. Comparison with other species described in the same paper indicates that Chichkoff's counts of caudal fin rays includes the principal simple rays and the branched rays. A count of 14 then means 12 branched rays and this agrees with *Sabanejewia*. The colour pattern described by Chichkoff (p. 375) also points to *Sabanejewia*. He describes a faint pattern, with 5 predorsal and 3 postdorsal saddles on dorsal mid-line, "so large that they extend for some distance on the flanks". In midlateral area, there are "10 vaguely marked large dark blotches, hardly distinct with the naked eye, formed excessively small and spread dots". None of this really agrees with *Cobitis* but agrees with *Sabanejewia*. Chichkoff also mentioned the crests on the caudal peduncle, which are also distinct on the figure.

Ivanova & Dobrovolov (pers. comm.) inform us that the holotype of *C. albicollis* is lost. Also, no species of *Sabanejewia* has been observed or recorded in the Provadiiska drainages where only *Cobitis strumicae* is present (JF, pers. obs.; Ivanova,



Fig. 2. *Sabanejewia bulgarica*, NRM 10432, lectotype, 72 mm SL; also neotype of *Cobitis albicoloris*; Bulgaria: Danube drainage.

pers. comm.). With these data it seems that *C. albicoloris* in fact is a species of *Sabanejewia* and that it is either very rare in Provadiiska drainage, or that the specimen was mislabelled. In any case, its identity and type locality can now only be cleared by the designation of a neotype.

The original description and figure of *C. albicoloris* do not allow to identify it accurately with any of the known species of *Sabanejewia*. At best, the data (especially the colour pattern) in Chichkoff are somehow reminiscent of *S. bulgarica*. We designate NRM 10432, 72 mm SL, as neotype (Fig. 2). This is one of two syntypes of *S. bulgarica* (Drensky, 1928) and were received from Drensky in 1933. This specimen is also designated as lectotype of *C. bulgarica*. This makes *C. albicoloris* an objective junior synonym of *S. bulgarica*. Drensky (1951) had already treated *C. albicoloris* as a synonym of *S. bulgarica*.

The species identified as *C. albicoloris* by Ivanova & Dobrovolov (2002) actually is *C. strumicae* Karaman, 1955.

***Coregonus bezola* Fatio, 1888**

Coregonus bezola is a species endemic to Lake Bourget, France, which is now extinct. We have examined what is presently the only known surviving specimen (EAWAG 420, 190 mm SL). The specimen was received by P. Steinmann as part of a gift of 'mixed' coregonids from NMW in the 1930s-40s, and it is possible that additional specimens still exist in NMW, but MK's requests for information remained unanswered. This specimen has about 32 gill rakers on the first arch and 79 lateral line scales.

Six specimens are present in the same jar. Four have labels attached, two have missing labels, the present specimen and a 245 mm SL specimen. There are two unattached labels on the bottom of the jar, one for the present specimen and one "*C. wartmanni* Bloch / Gmunden (Traunsee)". The 245 mm SL specimen has about 32 gill rakers on the first arch, 84 lateral line scales, and pelvic fins with black tips. It is *C. renke*.

***Coregonus duplex* Fatio, 1890**

The grundler of Lake Walenstadt is distinguished from all other *Coregonus* of the Limmat drainage by body shape (back arched), the blunt snout and number of gill rakers (24-28). Among the species from Lake Zürich, this number of gill rakers is only known from the description of *C. duplex* by Fatio (1890: 252). But Fatio's description does not completely agree, and the present identification will require confirmation.

***Salmo schiefermuelleri* Bloch, 1784**

Bloch (1784: 157, pl. 103) described *S. schiefermuelleri* on the basis of an unknown number of specimens from the shores of the Baltic Sea and a single specimen from "various lakes in Austria". The first ones refer to anadromous *Salmo trutta*, and the second one belongs to a lake trout locally known as 'mayforelle' [May trout, reference to its spawning season]. Kottelat (1997: 140) considered that Valenciennes (in Cuvier & Valenciennes, 1848) had restricted the type locality of *S. schiefermuelleri* to Austria and thus the name would have been available for the 'mayforelle'. This was erroneous. A type locality can only be restricted by the designation of a lectotype or a neotype. The name *S. schiefermuelleri* has often

been associated with large trouts of various lakes of Austria, and especially with the 'mayforelle' of Attersee described by Heckel (1851). The name has also been used for the Austrian species in Kottelat & Freyhof (2007), but, formally, the name is still not linked to this species. We could not trace any of the specimens (syntypes) mentioned by Bloch in ZMB. But, as we know there was a single specimen from 'Austrian lakes', we designate this single specimen as lectotype of *S. schiefermuelleri*, thus definitively restricting the name to the species from the lakes of Austria. As this lectotype is now lost, it might become desirable to designate a neotype. If this is done, we recommend that it be selected among the material described by Heckel (1851) and which is in NMW (we could not examine it).

***Salvelinus salvelinoinsularis* (Lönnerberg, 1900)**

Klemetsen et al. (1985) report the presence of two stocks of *Salvelinus* on Bear Island. Both are permanent freshwater residents and are distinguished by maximum size (170 mm SL, vs. 530), size at maturity (110 mm SL, vs. 280), number of pyloric caeca (30-42, vs. 39-52), number of gill rakers (22-26, vs. 24-27), and colour of mature individuals (belly drab bronze greyish, often with parr marks, vs. bright yellow to carmine, without parr marks). They are two species and we tentatively consider the large one as conspecific with *S. alpinus*.

Lönnerberg (1900) described *Salmo umbla salvelinoinsularis* on the basis of 3 specimens from Bear Island. The larger one was 375 mm SL and from the size alone seems to represent *S. alpinus*. The two smaller ones are a 116 mm SL female and a 140 mm SL male. From Lönnerberg's description, they seem to be sexually mature and thus represent the small species. The data in Lönnerberg do not include the characters listed as distinguishing the two species by Klemetsen et al. (1985) and the whereabouts of the specimens are not known. They are present neither in NRM (S. O. Kullander, pers. comm.) nor in Upsala where Lönnerberg was working at this time (S. O. Kullander, pers. comm.). We designate the 116 mm female from Lake Ella, Bear Island as lectotype in order to link the name *S. salvelinoinsularis* to the small size species. This specimen is apparently lost. Lake Ella is the locality at which most information in Klemetsen et al. (1985) was obtained.

***Salvelinus umbla* (Linnaeus, 1758)**

Salvelinus umbla is considered as distinct from *S. alpinus*. This is supported, among others, by the genetic data of Brunner et al. (1998, 2001). As shown by Kottelat (1997: 151), if the central European and northern European charrs are treated as conspecific as done now by numerous authors, the name *S. alpinus*, which is commonly used for them, is invalid and should be replaced by *S. umbla*. Both the names *Salmo alpinus* and *Salmo umbla* are available from Linnaeus (1758) and it is the first reviser's action that determines the priority between the two names. The first reviser is Agassiz (1835) who unambiguously gave priority to *S. umbla* and this cannot be reversed. The name *S. umbla* having been used as a valid name after 1900 (e.g., by Kottelat, 1997), *Code art.* 23.9 can not be invoked to ignore the name.

Atherina 'lagunae'

The name *Atherina 'lagunae'* was created by Trabelsi et al. (2002) for an atherinid species inhabiting lagoon habitats in the western Mediterranean. These populations and previous works by these authors had been discussed by Kottelat (1997: 158), who concluded that this lagoon-inhabiting species is *A. boyeri*, confirmed by an examination of the type material. Trabelsi et al. (2002) did not mention Kottelat's conclusions. The paper ends in a long list of codes, numbers and values (of which only the fin-ray, vertebrae, scales and gill-raker counts are intelligible to us) supposed to constitute diagnoses of three species, two of them considered as new, *A. 'lagunae'* and *A. 'punctata'*.

These two names are not available (thus are null and void for zoological nomenclature) as they do not satisfy the requirements of *Code arts.* 13.1.1 (they are not accompanied by a statement in words of characters purported to differentiate the taxon) and 72.3 (no name-bearing types designated).

Further, *A. 'lagunae'* shares the diagnostic characters of *A. boyeri* as defined by its name-bearing type material (see Kottelat, 1997: 160) and, if available, it would thus be a synonym of *A. boyeri*. The authors nowhere explain why they use the name *A. boyeri* for one of their marine species (which morphologically cannot be *A. boyeri* as defined by its name-bearing type series); they do

not explain why none of the many names already proposed for Mediterranean atherinids and listed in synonymies (e.g. Kottelat, 1997: 158) could not be an available name for one or the other of their supposedly new species.

Obviously, several species are masquerading under the names *A. boyeri*, *A. mochon*, etc., but without an analysis of the literature and without an understanding of nomenclature rules, this study does not justify to further speculate on who is what among these fishes.

MNHN 4342, 70.6 mm SL is here designated as lectotype of *A. boyeri* [the second specimen, 67.0 mm SL, originally sharing this number is now paralectotype]. It has 46 rows of scales in lateral row and 24 distinct gill rakers (some may be missing) (Kottelat, 1997: 160). This is matching with what can be extracted from the 'diagnosis' of *A. lagunae*. *Atherina risso* Valenciennes, in Cuvier & Valenciennes, 1835, *A. sarda* Valenciennes, in Cuvier & Valenciennes, 1835 and *A. riqueti* Roule, 1902 are other nominal species based on populations with low gill-raker counts (23-25 in the respective type material) known from coastal areas, lagoons and canals in the western Mediterranean and which should have been discussed before naming a 'new species'.

Further, if it were an available name, *A. 'punctata'* would nevertheless be a permanently invalid name because it would be a primary junior homonym of *A. punctata* Bennett, 1833.

***Gymnocephalus acerina* (Gmelin, 1789)**

When describing 'acerina' *Güldenstädt* (1775a) nowhere placed it as a species in any genus. The only mention of a possible genus-group name is in the title of the article "Acerina; piscis, ad *Percae* genus pertinens, descriptus" [Acerina: a fish belonging to the genus *Perca*, is described]. 'Pertinens' is the present participle of the Latin verb *pertineo*, which with the preposition 'ad' means 'to belong to'. Here it means 'near *Perca*' or 'belonging to *Perca*'. Apparently unnoticed by most nomenclators, the name 'acerina' also appears in an abstract of the paper, on p. 55 of the same volume, which also used "ad *Percae* genus pertinet" [belongs to the genus *Perca*].

In comparing with two other papers on fishes published by *Güldenstädt* (1772, 1773) as well as a paper on birds he published in the same volume immediately after the description of 'acerina' (*Güldenstädt*, 1775b), we note that in all he clearly used a binominal nomenclature, often with binominal names as the first words of the title. Binominal nomenclature is also used in the text in his other papers. The same format is used by other authors in the same volume (Pallas, p. 394, 418, 435; Koelreuter, p. 424; Lepechin, p. 476). In the 1775a paper, *Güldenstädt* also mentioned *Perca cernua*, as well as 'cernua' [a common name used by pre-Linnean authors]. In contrast he nowhere used the name '*Perca acerina*' and this is the only species for which he did not use a binominal name. For all species *Güldenstädt* described, the description proper starts with the binominal name in the heading; the only exception is 'acerina', which has the heading "descriptio acerinae" [description of acerina], which in fact is not even a real heading but the last two words of a sentence (see below).

In fact *Güldenstädt* merely described a fish called 'acerina' by earlier (classical) authors, without any intention to create a new name 'acerina', neither as a genus nor as a species. *Güldenstädt* explicitly starts his text by "Acerina, nomen proprium piscis alicuius a Plinio Medico usitatum ...", [approximative translation: "Acerina, the proper name of some fish used by doctor Pliny ..."]. *Artedi* (1738: Synonymia: 68) also lists the name *Acerina* used by Pliny.

When reading *Güldenstädt* (1775a) one gets the feeling that the reason why he did not use a binominal name for this species is because he did not know whether it was belonging to *Perca* or not. It is shown by his conclusion: "*Acerinae* icon nunc datur, individuum magnitudine naturali maxima sistens, ut pateat conferenti, in quo convenient iterumque in quo differant adfines hae ad *Percae* genus, ab *ill. Equ. aur. a* Linne et *Artedio* sancitum, pertinentes species; idemque ut eo magis eluceat additur descriptio acerinae." [rough translation: The figure of acerina now given, consisting of an individual of the largest natural size, to be exposed comparing, to the one, in what these similars match and, second in what they differ from the species of the genus *Perca*, which already established the illustrious Knight de Linné and *Artedi*; and, at the same time, to make it more evident, the description of acerina is added].

Güldenstädt (1775a) is often cited as published in 1774. The title page has the mention "volume for 1774" and "printed ... in 1775" so that the date of publication is unambiguously 1775. *Gülden-*

städt's name having being spelled variously in different languages, fonts and papers (Güldenstaedt, Gueldenstaedt, etc.), for consistency we retain in the present discussion the single spelling Güldenstädt.

If, as we understand, 'acerina' is not available as a species-group name from Güldenstädt (1775a), it is then first made available by Gmelin (1789: 1321) as *Perca acerina*, by indication to Güldenstädt (1775a). *Perca acerina* Gmelin, 1788 is a junior objective synonym of *P. tanaicensis* Güldenstädt, 1787. Contrary to the statement by Eschmeyer (1998: 1649), *P. tanaicensis* is not a nomen nudum but is clearly available by indication.

Güldenstädt died in 1781 and the account of his travels was published posthumously by Pallas. Güldenstädt (1787: 90) wrote, under the date of 28 September 1769: "Ich hatte heute im Don und in den daran gelegenen Seen fischen lassen und bekam *Cyprinus Brama*, *Rutilus* und *Ballerus*, Hechte und Grossbarsche; diese von allen am häufigsten und sehr gross; nebst diesen aber auch eine *Perca*, die mir unbestimmt zu seyn schien und die ich als *Perca tanaicensis* beschrieb (*). Der Fisch wird Baltschok genannt; *Cyprinus Ballerus* aber heisst hier Singa." [I had fishing done today in the Don and the lakes around and received *Cyprinus brama*, [C.] *rutilus* and [C.] *ballerus*, pikes and large-perches; these the most common of all and very big; besides these also a smaller *Perca*, which seemed to me to be unidentified and which I described as *Perca tanaicensis* (*). The fish is called baltschok; but *Cyprinus ballerus* is named singa here]. The footnote (*) reads: "S. Die Beschreibung dieses Fisches in den Nov. Comment Petrop. vol. XIX Tab. XI" [See the description of this fish in Nov. Comment. Petrop. vol. XIX Tab. XI]. This is a reference to the description of 'acerina' (Güldenstädt, 1775a: pl. 11) but the name *P. tanaicensis* is used neither in the 1775a paper, nor on the plate, nor anywhere in the volume. This footnote is likely to be by Pallas.

If the mention of *P. tanaicensis* in the 1787 book is by Güldenstädt himself and not by Pallas, this also supports our view that he had no intention to use 'acerina' as the scientific name of the species.

To our knowledge, *P. tanaicensis* Güldenstädt, 1787 has not been used as the name of a valid species after 1899. *Perca acerina* has been used in more than 25 works published by at least 10 authors in the preceding 50 years (between 1959 and 2009) in a span of more than 10 years. *Perca tanaicensis* is declared **nomen oblitum** under Code art. 23.9.2. *Perca acerina* Gmelin, 1788 is declared **nomen protectum** under Code art. 23.9.2. *Perca acerina* now has precedence over *P. tanaicensis*.

A sample of 28 works, published by at least 10 authors, in the immediately preceding 50 years, encompassing a span of not less than 10 years (Code art. 23.9.2) and in which *P. acerina* is used includes: Aleksandrova, 1976: 77; Baensch & Riehl, 1995: 730; Banarescu, 1964: 662, 1990: 151; Blanc et al., 1977: 337; Bogutskaya & Naseka, 2004: 205; Bogutskaya et al., 2001: 47; Collette, 1963: 615; Collette & Banarescu, 1977: 1453; Eschmeyer, 1998: 32; Holcik, 1989: 59; Holcik & Hensel, 1974: 473; Kottelat & Freyhof, 2007: 527; Kolesnik, Starko & Fomenko, 2007: 96; Kovac, 1994: 241, 1995: 173; Luzhnyak & Korneev, 2006; Maitland, 2000: 224; Reshetnikov, 1998: 117, 2002: 60; Reshetnikov et al., 1997a: 713, 1997b: 749; Robins, 1991: 98; Ryabov, 2002: 114; Scherbukha, 2004: 9; Vasileva, 2003: 354, 2004: 346; Zubej, 2003: 114.

The above discussion is based on our reading that by using 'acerina' Güldenstädt (1775a) did not name a taxa but referred to the 'acerina' of earlier, classical authors. *Acerina* has been used as a genus-group name, first available from Cuvier (1816: 283), which is a junior subjective synonym of *Gymnocephalus* Bloch, 1793: 24.

Acerina has been treated as "probably available" from Güldenstädt (1775a) by Eschmeyer (1998: 1825), with "*A. babir*" Güldenstädt, 1775 as type species. The mention of *babir* is at the end of a long enumeration of localities where the species had been observed or recorded and its local names at these localities. It ends by: "Incolis ad *Tanain* circa urbem *Woronesch* : *Birtschok* : circa urbem *Tscherkask* : *Baltschok*; et incolis ad *Borysthenem* : *Babir* russice salutatur *Acerina*. *Cernua* autem quae superius in iisdem fluviis frequentior est, ..." [The inhabitants at the Don [Tanais] near the city of Voronezh greeted the 'acerina' in Russian as 'birtschok', near the city of Tscherkask as 'baltschok'; and the inhabitants at the Dniepr [Borysthenes] as 'babir'. On the other hand 'cernua', which is more frequent in the same rivers, ...]. *Babir* clearly is not a scientific name but a vernacular name. If *Acerina* were a genus name available from Güldenstädt (1775a), then *Acerina* would have priority over *Gymnocephalus* Bloch, 1793.

The species-group name *acerina* is usually treated as an adjective and when placed in *Gym-*

nocephalus it becomes *G. acerinus*. This is erroneous. Gldenstdt (1775a) explicitly mentioned that 'acerina' is a noun ("Acerina, nomen proprium piscis alicuius a Plinio Medico usitatum ..." [approximative translation: Acerina, the proper name of some fish used by the doctor Pliny ...]). Whether the species-group name *acerina* is considered available from Gldenstdt (1775a) or Gmelin (1788), it is a noun in apposition, not an adjective and does not have to agree in gender with the generic name. Even if placed in *Gymnocephalus* it must remain as *G. acerina*.

***Gymnocephalus cernua* (Linnaeus, 1758)**

The species name is often spelled *G. cernuus* because *cernua* was considered as an adjective in the feminine case in *Perca cernua* Linnaeus, 1758 (p. 294).

In fact *cernua* is not an adjective but a noun mentioned by a number of earlier authors, before the start of the binominal nomenclature. For example, Belon (1553, 1555) already used *Cernua* as a noun for this fish; therefore it is a noun in apposition, and does not have to agree in gender with the generic name. This is also shown by Linnaeus using the name with a capitalized C as he did for other local vernacular nouns like *Schraetser* and *Cabrilla* on the same page, while he used lower case initial for adjectives like *argentea*, *lineata*, *striata*. Cuvier & Valenciennes (1829: 5) also comment that *cernua* is an even older name, already used by Gaza (around 1498, in a translation of Aristotle).

Odontobutidae

The family-group name *Odontobutidae* is based on *Odontobutis*. Hoese & Gill (1993: 434) used the original spelling *Odontobutidae*. Kottelat (2001a-b) and Chen et al. (2002: 233) considered that *Odontobutis* is based on a Greek word and that the family group name based on it should be *Odontobutididae*, not *Odontobutidae* (*Code art.* 29.3.1). While the prefix *odonto-* is a Greek word, the suffix *-butis* is not. *Butis* in *Odontobutis* is derived from the generic name *Butis*, itself derived from the specific name *Cheilodipterus butis* created by Hamilton (1822: 57). Hamilton did not explain the etymology of *butis*, but as he consistently used Bengali names as specific names for the species he described, *butis* is (or should be treated as) a Bengali name. Thus *Code art.* 29.3.1 does not apply for the formation of the family-group name; *Code art.* 29.3.3 applies and the correct family-group name is *Odontobutidae*.

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