



## ICZN rules—a farewell to Tubificidae (Annelida, Clitellata)

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### Monophyly, paraphyly, and classification

In contemporary systematics, there is a broad (but not unanimous) consensus that the hierarchy of taxonomic classification should be congruent with that of the phylogenetic tree, i.e., each taxon should constitute a monophyletic group, and paraphyletic taxa should be avoided (e.g., Ebach et al. 2006; Williams et al. 2007). Thus, although old vernacular names such as invertebrates, reptiles and turbellarians, are still in frequent use, few specialists today accept Invertebrata [excluding Vertebrata], Reptilia [excluding Aves and Mammalia] or Turbellaria [excluding the parasitic flatworms (Trematoda, Monogenea and Cestoda)] (Tyler et al. 2006) as formal taxonomic names. Moreover, no biologist would refer to Animalia as a taxon for all animals without man.

When DNA data confirmed that leeches (Hirudinea s. str.) and their close relatives, Branchiobdellida and *Acanthobdella*, are all derived oligochaetes (Martin 2001; Siddall et al. 2001), the traditional classification of Clitellata into two major taxa of the same rank—Oligochaeta and Hirudinea—was no longer appropriate; thus, the names Clitellata and Oligochaeta are synonymous. In this case, use of these two names becomes optional—they refer to a rank above the family-group level for which no priority rule applies. For family-group names, and names of lower rank, however, priority *does* apply; see Article 1.2.2, International Code of Zoological Nomenclature [the Code] (International Commission on Zoological Nomenclature [ICZN, the Commission] 1999).

### Case 3305, background and ICZN ruling

Both morphological (Erséus 1990; Brinkhurst 1994) and molecular characters (Christensen & Thiesen 1998; Erséus et al. 2000, 2002; Siddall et al. 2001; Erséus 2005; Sjölin et al. 2005; Envall et al. 2006) support the premise that all members of the former clitellate family Naididae are phylogenetically nested within the former family Tubificidae. For this reason, Erséus & Gustavsson (2002) had proposed that these taxa together should be regarded as a single family to avoid this paraphyly of Tubificidae, suggesting that all naidids be classified as members of Tubificidae—thus lowering their rank to subfamily, Naidinae, within this taxon. In this same paper, Erséus & Gustavsson also re-confirmed that Naididae is the older of the two (family-group) names, with the realization that the suggested action would violate the principle of priority as stipulated by the Code (ICZN 1999). Therefore, Erséus et al. (2005) submitted an application to the Commission, requesting it to use its power to give precedence to Tubificidae Vejdovsky, 1876 over Naididae Ehrenberg, 1828. In this way Tubificidae, which is the most inclusive of the two former families, would retain its name, and merely add the former naidids to it. One comment supporting the application of Erséus et al. (2005) was published (Timm 2006), but the members of the ICZN voted against it (18 negative, 10 affirmative votes), stating that the use of the former name [Tubificidae] was not so great as to justify reversal of procedure and that no confusion would result from adherence to priority (ICZN 2007: opinion 2167 [case 3305]).

### Consequences

The present paper is a plea to clitellate researchers to accept this decision by the ICZN, and to apply the consequences of this ruling in nomenclature of oligochaete worms belonging to the groups historically considered as Tubificidae and/or Naididae. It should be noted that the ICZN decision deals specifically with the use of names, expressing no opinion whether or not these two names are synonyms. It neither affirms nor rejects any hypothesis of phylogenetic rela-

tionships among the taxa involved, and it is neither against nor in favor of the principle of monophyly in classification. Nevertheless, the application of this decision is that—whenever the former naidids and tubificids together are treated as a single family (as we recommend)—the name of this family is Naididae Ehrenberg, 1828, with Tubificidae Vejdovský, 1876 as its junior synonym (both names now placed on the Official List of Family-Group Names in Zoology; see ICZN 2007). Of course, the subfamily taxon, Tubificinae Vejdovský, 1876, is still acceptable for a part of the family that contains the type genus *Tubifex* Lamarck, 1816, and the nomenclature of the other former tubificid subfamilies are not directly affected by this new situation. However, there is already substantial DNA evidence suggesting that Rhyacodrilinae Hrabě, 1963 is not a monophyletic group and the genera constituting the former Naididae are polyphyletic, i.e., *Pristina* Ehrenberg, 1828, appears to be phylogenetically well separated from all other former naidid genera (Erséus et al. 2002; Sjölin et al. 2005; Envall et al. 2006). Therefore, in acceptance of the ruling, Naididae now includes the following subfamilies: Naidinae Ehrenberg, 1828, Pristininae Lastočkin, 1921 (with only *Pristina*), Tubificinae, Telmatodrilinae Eisen, 1879, Rhyacodrilinae Hrabě, 1963, Phalloodrilinae Brinkhurst, 1971, and Limnodriloidinae Erséus, 1982.

Note here that Sperber (1948), Envall et al. (2006), and others in the literature erroneously referred Pristininae to Lastočkin, 1924, while in fact the taxon had been established three years earlier (Lastočkin, 1921; T. Timm, personal communication; see also Čekanovskaja 1962). Further, Telmatodrilinae has sometimes been ascribed to Eisen, 1885 (e.g., by Erséus & Gustavsson 2002), but in a preliminary report of the same study, Eisen (1879) had already established a Latinized family-group name (Telmatodrilini) using the stem of *Telmatodrilus* Eisen, 1879. The reason for the confusion is that both papers by Eisen treat *Telmatodrilus* and Telmatodrilini as new taxon names, but Eisen (1885, p. 879) evidently regarded his first contribution (1879) as an unpublished report. Finally, Rhyacodrilinae, as currently circumscribed, must be considered as an interim group, pending a more resolved phylogenetic hypothesis and taxonomic revision of all its constituent genera. For instance, one former rhyacodriline genus, *Heterodrilus* Pierantoni, 1902, may be better placed in Phalloodrilinae (Sjölin et al. 2005).

The new definition of the taxon Naididae will cause taxonomic confusion for some time. It will be difficult to avoid using the long established vernacular name, tubificids, for those Naididae that are not naidids in the old sense—analogueous to the way we still use invertebrates for all Metazoa that are not vertebrates (Vertebrata). In a broader perspective, however, systematics would be better served if we treat vernacular names with the same stringency as we do with the scientific taxon names to which they refer. One could perhaps now claim that ‘tubificids’ refers to a paraphyletic group that used to be called Tubificidae. However, it would be difficult to judge whether a similar concept of naidids refers to Naididae in the old sense or in the new, broader sense. Should one need to refer to the old concept of Tubificidae (e.g., when discussing an old faunal list of this group) it might be possible to use the term tubificoid Naididae.

## Summary

Morphological and molecular characters support that the former clitellate family Naididae Ehrenberg, 1828 is nested within another family, Tubificidae Vejdovský, 1876. To avoid parphyly of the latter, it has been suggested that the two should be regarded as a single taxon. A recent decision by the International Commission of Zoological Nomenclature [2007; opinion 2167 (Case 3305)] ruled against a proposed reversal of the nomenclatural priority of Naididae over Tubificidae, with the consequence that all former tubificids should now be regarded as members of the Naididae whenever these two names are regarded as synonyms. The paper is a plea to clitellate researchers to conform to this ruling.

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