

Reversal of Precedence for Lineidae McIntosh, 1874 over Its Senior Synonyms Borlasiidae Diesing, 1862 and Nemertidae Ehrenberg, 1831 (Nemertea: Heteronemertea)

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The three heteronemertean nominal species *Ascaris longissima* Gunnerus, 1770, *Borlasia angliae* Oken, 1815, and *Nemertes borlasii* Cuvier, 1816 have been considered as synonymous, denoting the same species to which the valid name *Lineus longissimus* (Gunnerus, 1770) has been applied. These three nominal species are the type species of the genus-group names *Lineus* Sowerby, 1806, *Borlasia* Oken, 1815, and *Nemertes* Cuvier, 1816, respectively, which are in turn the type genera of the family-group names Lineidae McIntosh, 1874, Borlasiidae Diesing, 1862, and Nemertidae Ehrenberg, 1831. Therefore, *Lineus* Sowerby, 1806 (currently in use) is a senior subjective synonym of *Borlasia* Oken, 1815 and *Nemertes* Cuvier, 1816 (both currently not in use), while Lineidae McIntosh, 1874 (currently in use) is a junior subjective synonym of Borlasiidae Diesing, 1862 and Nemertidae Ehrenberg, 1831 (both currently not in use); in addition, Micruridae Ehrenberg, 1831 (not in use) is also a senior synonym of Lineidae McIntosh, 1874. Borlasiidae Diesing, 1862 and Nemertidae Ehrenberg, 1831 have not been used as valid after 1899, while Lineidae McIntosh, 1874 has been used in at least 216 works published by 437 authors since 1971 until 2021, thus satisfying the conditions stipulated in Article 23.9.1 of the International Code of Zoological Nomenclature. Borlasiidae Diesing, 1862 and Nemertidae Ehrenberg, 1831 are herein declared nomina oblita with respect to Lineidae McIntosh, 1874, the latter being regarded as a nomen protectum under Article 23.9.2 of the International Code of Zoological Nomenclature. However, reversed precedence of Lineidae McIntosh, 1874 over its senior synonym Micruridae Ehrenberg, 1831 requires a ruling by the International Commission on Zoological Nomenclature, as the latter name was used as valid between 1998 and 2009

Key Words: bootlace worm, nomenclature, Pilidiophora, prevailing usage, ribbon worm.

Notation

In this article, ‘ICZN’ refers to the International Commission on Zoological Nomenclature; ‘Article(s)’ refer(s) to those in the International Code of Zoological Nomenclature (ICZN 1999).

Nomenclatural History and Notes

Lineus longissimus (Gunnerus, 1770)

From the coast of Norway, Gunnerus (1770: 173) described the heteronemertean *Ascaris longissima* Gunnerus, 1770, for which Sowerby (1806: 15) subsequently established the genus *Lineus* Sowerby, 1806. *Lineus longissimus* (Gunnerus, 1770) is the oldest valid species name in the phylum Nemertea (Gibson 1995; Kajihara 2021a; see also Cedhagen and Sundberg 1986). Since at least the 20th century, this taxon has been commonly regarded by nemertean researchers (e.g., Bürger 1904: 93; Gibson 1995: 299) as containing the following eight nominal species that are nomenclaturally available: *Ascaris longissima* Gunnerus, 1770; *Borlasia angliae* Oken, 1815; *Borlasia striata* Rathke, 1843

[not Quoy and Gaimard, 1833]; *Gordius marinus* Montagu, 1804; *Gordius maximus* Dalyell, 1853; *Lineus fasciatus* Johnston, 1865; *Nemertes borlasii* Cuvier, 1816; and *Nemertes quatrefagii* Beneden, 1861 [not Rochebrune, 1882]. The two names *Borlasia nigra* Byerley, 1854 [a nomen nudum] and *Lineus lineatus* Montagu, “1808” [contained in an unpublished manuscript], also listed as synonymous with *L. longissimus* by Bürger (1904: 93) and Gibson (1995: 299), are nomenclaturally unavailable under Article 11. The names *Nemertes* and *borlasii* were established by Cuvier (1816 [1817 imprint]: 37) in the fourth volume (pertaining to zoophytes) of his *Le règne animal*, which, according to Sherborn (1922: xli), was published in 1817, while the first volume (pertaining to mammals and birds) was in 1816. However, according to Roux (1976), all the four volumes of *Le règne animal* seem to have been published before December 1816; the year of publication of *Nemertes* and *borlasii* is cited as 1816 in the present article.

Among the eight available nominal species contained in the currently accepted taxon concept of *L. longissimus*, the following three are tagged with the respective three family-group names: *Ascaris longissima* Gunnerus, 1770 with Lineidae McIntosh, 1874 (type genus *Lineus* Sowerby, 1806); *Borlasia angliae* Oken, 1815 with Borlasiidae Diesing, 1862

(type genus *Borlasia* Oken, 1815) (Oken 1815: 365); and *Nemertes borlasii* Cuvier, 1816 with Nemertidae Ehrenberg, 1831 (type genus *Nemertes* Cuvier, 1816). Therefore, these three family-group names are subjectively synonymous whenever the three nominal species *Ascaris longissima* Gunnerus, 1770, *Borlasia angliae* Oken, 1815, and *Nemertes borlasii* Cuvier, 1816 are considered as belonging to the same family-group taxon, let alone referring to the same species.

Micruridae Ehrenberg, 1831 and Nemertidae Ehrenberg, 1831

Certain family-group names established by Ehrenberg (1828–1831) appear to have been either misunderstood or unaccepted among subsequent zoologists. Ehrenberg's (1828–1831) unpaginated book contains a chapter titled “Phytozoa Turbellaria...”, commonly regarded as taking page numbers from 53 to 67 (e.g., Gibson 1995: 545). The text, published in 1831, contains explanations for two plates (pls IV and V) deemed to have been published in 1828 (e.g., Neave 1939: 916 [for *Leptoplana* Ehrenberg, 1828]; Gibson 1995: 545). In the text, Ehrenberg (1828–1831) introduced the following nine names of various worms at the rank of “Familia” (conventional page numbers in parentheses): Chilophorina (p. 58), Gordiea (p. 57), Gyratricina (p. 61), Leptoplanea (p. 56), Micruraea (p. 57), Naidina (p. 59), Nemertina (p. 64), Planariea (p. 54), and Vorticina (p. 55). Of these, Chilophorina seems to be unavailable under Article 11.7.1.1, because there is no such genus-group name as ‘*Chilophorus*’, ‘*Chilophora*’, or ‘*Chilophorum*’, which could have been the type genus for this potential family-group name. The remaining eight are available family-group names under Article 11.7.1.1, taking 1831 as the publication date according to Article 21.5. Under Articles 29.2, 32.5.3.1, and 33.2.2, the justified emendation of the above mentioned incorrect original spellings are Gordiidae Ehrenberg, 1831; Gyratricidae Ehrenberg, 1831; Leptoplanidae Ehrenberg, 1831; Micruridae Ehrenberg, 1831; Naididae Ehrenberg, 1831; Nemertidae Ehrenberg, 1831; Planariidae Ehrenberg, 1831; and Vorticidae Ehrenberg, 1831. Of these eight family-group taxa, Micruridae and Nemertidae exclusively consisted of what are now interpreted as nemerteans, while Gyratricidae was a mixture of what are now regarded as tubellarians and nemerteans; the type genus *Gyratrix* Ehrenberg, 1831 is now regarded as a valid genus of polycystid kalyptorhynchian in the order Rhabdocoela (e.g., Willems et al. 2017; Diez et al. 2018). *Micrura* Ehrenberg, 1828 (type species *Micrura fasciolata* Ehrenberg, 1828) is the type genus of Micruridae Ehrenberg, 1831. This genus-group name was made available under Articles 12.2.5 and 12.2.7, along with other eight genus-group and nine species-group names appearing on the plates themselves. These names take the publication date 1828 under Article 21.5.

It may be worth mentioning that the author—in the sense of Article 50—of the family-group name Gordiidae has been incorrectly ascribed to May (1919) in the nematomorphan literature (e.g., Bleidorn et al. 2002: 357; Son et al. 2009: 348); the author of the family-group name Gyratricidae (as the subfamily Gyratricinae) has been incorrectly ascribed

to Graff (1905) in the kalyptorhynch turbellarian literature (e.g., Artois and Schockaert 2001: 64, 80; Schockaert et al. 2017: 72); the author of the family-group name Leptoplanidae has been incorrectly ascribed to Stimpson (1857) for the family Leptoplanidae and to Faubel (1984) for the superfamily Leptoplanioidea in the polyclad turbellarian literature (e.g., Gammoudi et al. 2012: 47; Pérez-García et al. 2019: 1789); the year of publication of Naididae has been incorrectly ascribed to 1828 in the oligochaete literature (e.g., Erséus et al. 2005: 226; Erséus et al. 2008: 66) and even on the Official List of Family-Group Names in Zoology (ICZN 2007: 71); and the author of the family-group name Planariidae seems to be incorrectly ascribed to Stimpson (1857) in the triclad turbellarian literature for the family Planariidae (e.g., Dong et al. 2017: 263; Sluys and Riutort 2018: 10; Yang et al. 2018: 3, table 1) or for the superfamily Planarioidea (e.g., Sluys et al. 2009: 1769; Riutort et al. 2012: 11, table 2).

Borlasiidae Diesing, 1862

Diesing (1862) recognized 12 “Familia[e]” within the Rhynchocoela (= mostly nemerteans). Of the 12 names, 10 were newly introduced by Diesing (1862), whereas his Gyratricinea (Diesing 1862: 245) and Micruraea (Diesing 1862: 258) correspond to Gyratricina (with slight modification of the ending) and Micruraea (same spelling) earlier established by Ehrenberg (1828–1831). Of the 10, the following five are unavailable because they were not formed from any generic name, and thus do not meet Article 11.7.1.1: Acrololoba, Eunemertinea, Hypoloba, Ommatophora, and Typhlonemertinea (Kajihara 2021b: 172). The rest of the five are nomenclaturally available: Borlasiidae Diesing, 1862 [originally Borlasiea (Diesing 1862: 199); type genus *Borlasia* Oken, 1815, a junior subjective synonym of the heteronemertean *Lineus* Sowerby, 1806 (Gibson 1995: 306)]; Loxorrhochmidae Diesing, 1862 [originally Loxorrhochmidea (Diesing 1862: 203); type genus *Loxorrhochma* Schmarda, 1859, a junior subjective synonym of *Tetrastemma* Ehrenberg, 1828 (Gibson 1995: 405)], a nomen oblitum with respect to the nomen protectum Tetrastemmatidae Hubrecht, 1879 (Kajihara 2021b: 174); Prorhynchidae Diesing, 1862 [originally Prorhynchidea (Diesing 1862: 202); type genus *Prorhynchus* Schultze, 1851, a fresh-water turbellarian taxon]; Rhynchoscolecidae Diesing, 1862 [originally Rhynchoscolecidea (Diesing 1862: 198); type genus *Rhynchoscolex* Leidy, 1850, a nomen dubium (Gibson 1995: 504)]; and Emeidae Diesing, 1862 [originally Emeidea (Diesing 1862: 270); type genus *Emea* Leidy, 1850], a senior subjective synonym of Prostomatidae Bürger, 1904 whenever the two genera *Prostoma* Dugès, 1828 and *Emea* Leidy, 1850 are regarded as belonging to the same family-group taxon (Kajihara 2021b: 172), whereas the two are indeed regarded as synonymous (e.g., Bürger 1904: 53; Gibson 1995: 362).

Nemertinae McIntosh, 1874

In his monograph of British nemerteans, McIntosh (1873–1874) used the subfamily name Nemertinae in a way that did not contain the type species of the type genus. Namely, *Nemertes borlasii* Cuvier, 1816 (type species of *Ne-*

mertes Cuvier, 1816) was placed in a synonymy of *Lineus marinus* (= *Lineus longissimus*) (McIntosh 1873–1874: 182) within the Anopla—one of the then-valid two higher taxa within the Nemertea, the other being the Enopla, both having been recently rejected by Strand et al. (2019)—, whereas McIntosh's Nemertinae consisted of *Nemertes carcinophila* Kölliker, 1845 (now *Carcinonemertes carcinophila*), *Nemertes gracilis* Johnston, 1837 (now *Emplectonema gracile*), and *Nemertes neesii* Örsted, 1843 (now *Emplectonema neesii* or *Neesia neesii*) within the Enopla (McIntosh 1873–1874: 176–181). As McIntosh's (1873–1874) usage of Nemertinae can be regarded as establishment of a new family-group name, and if so, as it pertains to Article 65.2.1, a Case (Kajihara et al. 2021) has been submitted to the ICZN to place Nemertinae McIntosh, 1874 in the Official Index of Rejected and Invalid Family-Group Names in Zoology as a junior homonym of Nemertidae Ehrenberg, 1831.

Lineidae McIntosh, 1874

When established by McIntosh (1873–1874), Lineidae contained five genera including *Borlasia* Oken, 1815 and *Micrura* Ehrenberg, 1828 in addition to the type genus *Lineus* Sowerby, 1806. McIntosh's (1873–1874) work was published in two parts, with pp. 1–96 and pls I–X being issued in 1873, and pp. 97–214 and pls XI–XXIII in 1874. The family name appeared in a diagram on p. 132 and as a taxonomic heading on p. 181, with a formal diagnosis on p. 136, and thus the publication date of McIntosh's Lineidae is 1874 under Article 21.5. Because McIntosh (1873–1874) used the name *Borlasia* differently from Oken's (1815) original taxon concept, Vaillant (1890: 616) subsequently proposed *Euborlasia* Vaillant, 1890 for *Borlasia sensu* McIntosh (1873–1874). Meanwhile, *Micrura* Ehrenberg, 1828 is the type genus of Micruridae Ehrenberg, 1831. Therefore, based on priority, McIntosh (1873–1874) should have used either Micruridae or Nemertidae, if not Borlasiidae, to refer to what he called Lineidae. In other words, Lineidae McIntosh, 1874 has three senior subjective synonyms, Borlasiidae Diesing, 1862, Micruridae Ehrenberg, 1831, and Nemertidae Ehrenberg, 1831, whenever the four genera *Borlasia* Oken, 1815, *Lineus* Sowerby, 1806, *Micrura* Ehrenberg, 1828, and *Nemertes* Cuvier, 1816 are regarded as belonging to the same family-group taxon.

Lineidae McIntosh, 1874 is currently in prevailing usage, as shown in the list of 216 publications (of which 90 works pertain to systematics; at least 25 works required) in the immediately preceding 50 years (since 1971) by 437 authors (including >30 nemertean experts except the present author; at least 10 authors required) encompassing a span of 49 years (not less than 10 years required) (see Appendix); it thus satisfies the condition stipulated in Article 23.9.1.2. Because Micruridae Ehrenberg, 1831—a senior homonym of the coral-snake family-group name Micruridae Dunn, 1931—was used after 1899 to refer to nemerteans (Bürger 1897–1907: 403, 451; Bürger 1904: 103; Wijnhoff 1912: 422; Small et al. 1998: 18; Adey 2006: 309; Adey and Kangas 2009: 289), it does not satisfy Article 23.9.1.1 and thus cannot be declared nomen oblitum with respect to Lineidae

McIntosh, 1874. To suppress Micruridae Ehrenberg, 1831 with respect to Lineidae McIntosh, 1874, a Case (Kajihara and Smith 2021) was recently submitted to the ICZN. Under Article 82.1, the prevailing usage of Lineidae McIntosh, 1874 is to be maintained until the ruling of the ICZN is published.

Conclusion

Borlasiidae Diesing, 1862 and Nemertidae Ehrenberg, 1831 are herein declared nomina oblita with respect to Lineidae McIntosh, 1874, the latter being regarded as a nomen protectum under Article 23.9.2. So far as I am aware, the senior synonyms Borlasiidae Diesing, 1862 and Nemertidae Ehrenberg, 1831 (not Nemertinae McIntosh, 1874) have not been used as valid names after 1899, satisfying the condition stipulated in Article 29.1.1.1.

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