

Priority vs. tradition—*Tracheliastes polycolpus* von Nordmann, 1832 (Copepoda: Lernaepodidae) revisited!

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ABSTRACT

This paper represents a rare case in parasitology where a reversal of the Principle of Priority of the International Code of Zoological Nomenclature (ICZN) would be beneficial to all users, including not only scientists but also the general public. In some rare cases, a long-established name turns out to be a junior synonym when an older, less-known name claims the priority. Unfortunately, such situations have the potential to disrupt intergenerational continuity of parasitological nomenclature. After 193 years, one of the best-known European fish parasites could have lost its well-established name in favor of its senior synonym, long forgotten by history and predating the now junior synonym by 49 years. The parasite under scrutiny is *Tracheliastes polycolpus* von Nordmann, 1832. In the interest of nomenclatural stability, however, we propose to maintain prevailing usage by reversal of precedence under Article 23.9 of the Code. Our paper, in addition to its taxonomic aspects, may have a profound effect on the use of this name in parasitology, zoology, and the study of fish diseases.

1. Introduction

A common parasitic copepod known under the name “*Tracheliastes polycolpus*” infects freshwater fishes in Eurasia, including the British Isles. It represents the family Lernaepodidae, where many species are assumed to have narrow host specificity. In this particular case, however, more than a single fish species has been reported as the host. In Europe, this copepod has been found mostly on fishes representing the genus *Leuciscus*. Alexander von Nordmann, the describer of the species, found it on the dorsal and caudal fins of ide, *Leuciscus idus* (Linnaeus, 1758) (“*Cyprinus Jeses*”) without specifying the collection site, although it was most probably Berlin. Ide has been considered the principal host while the parasite has also been reported from other cyprinids such as the common dace, *Leuciscus leuciscus* (Linnaeus, 1758), chub, *Squalius cephalus* (Linnaeus, 1758), rostrum dace, *Leuciscus burdigalensis* Valenciennes, 1844, and *Phoxinus phoxinus* (Linnaeus, 1758). Based mostly on Soviet sources, Markevich (1956) stated that *Tracheliastes polycolpus* has also been found on *Rutilus rutilus* (Linnaeus, 1758), *Leuciscus waleckii* (Dybowski, 1869), *Chondrostoma nasus* (Linnaeus, 1758), *Barbus barbus* (Linnaeus, 1758), *Barbus meridionalis* Risso, 1827, *Abramis brama* (Linnaeus, 1758), *Capoeta capoeta* (Güldenstädt, 1773), *Rhodeus sericeus* (Pallas, 1776), *Gobio gobio* (Linnaeus, 1758), *Gobio soldatovi* Berg, 1914,

and *Pseudaspius* sp. Within the last two centuries, *Tracheliastes polycolpus* has been mentioned in more than 260 sources (Supplementary material 1), including original papers, theses, review papers, and in the majority of textbooks on fish diseases, while its morphology and biology have been studied only occasionally. Markevich (1937) and Yamaguti (1940) described the male, and Kabata (1979) provided a detailed redescription of the species.

We have recently discovered a published record predating von Nordmann’s description by about half a century. The newly found record contains not only a description and the host name, but also an illustration of the parasite. Both the text and the figure are convincing enough to lead us to conclude that we are dealing with the same species that von Nordmann described in 1832. We believe that addressing this issue is important for nomenclatural stability in parasitology, zoology, and veterinary science.

Stable nomenclature in parasitology and fish diseases is crucial for clear, universal communication and accurate data retrieval. It ensures that scientists, veterinarians, and other professionals can reliably identify and discuss specific parasites and diseases, regardless of location or language, and is essential for tracking the spread of diseases, managing infections, and coordinating research and treatment efforts. Without stable names, it becomes difficult to understand historical data, compare

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research findings, and manage health issues in both wild and farmed fish populations effectively.

2. Materials and methods

The analysis was based on two papers: Hermann (1783) and von Nordmann (1832). The results were interpreted based on ICZN (1999). The literature search was performed, with the use of various databases, including Web of Science and Google Scholar. The majority of full-text sources listed in Supplementary material 1 are now available in the author's personal collections of papers.

For the purpose of scanning electron microscope (SEM) studies, adult females of *Tracheliastes polycopus* were collected from the fins of ide, *Leuciscus idus*, in May 2024. The fish was caught in Lake Dąbie, Szczecin, Poland. The parasites were rinsed in 75 % ethanol and dehydrated through a graded acetone series (30 %, 50 %, 75 %, 90 %, and 100 %). Final drying was performed using a CO₂ critical point dryer Polaron E3000 (Quorum Technologies, Laughton, East Sussex, UK). Dried specimens were coated with Au-Pd alloy using a thermal evaporator JEOL JEE-4X (JEOL, Tokyo, Japan). Scanning Electron Microscopy (SEM) observations were performed using a field emission microscope Hitachi SU-70 (Hitachi, Naka, Japan) at an accelerating voltage of 1.5 kV. Specimen preparation and SEM observations were carried out at the Faculty of Mechanical Engineering and Mechatronics, West Pomeranian University of Technology (ZUT) in Szczecin, Poland. Individual micrographs were merged into a single composite image using PhotoLine v. 23/51.

3. Results

3.1. Historical nomenclature analysis

While verifying nominal names of taxa against their respective original publications, during our editorial duties in World Register of Marine Species (www.marinespecies.org), we focused our attention on a “provisional name” – *Lernaea squamicola* – provided in 1783 by Johann Hermann a famous naturalist from Strasbourg, in his paper published in *Der Naturforscher, Halle* (Hermann, 1783). The author stated “Man kann den Wurm einstweilen *Lernae squamicola* nennen”. [For the time being, the worm can be called *Lernaea squamicola*.] Professor Hermann reported that the infected fish were common dace, *Leuciscus leuciscus* (Linnaeus, 1758) [*Cyprinus Leuciscus*] and they were captured by local fishermen in the Ill River. The infection rate was up to four specimens per host fish. The Ill is a 217 km-long river in Alsace, presently in north-eastern France, and a left-bank tributary of the Rhine. Before the publication of his results, Hermann consulted with Carl Linne, sending him his enlarged drawings and concluding that the lack of response was probably caused by the illness of the famous scientist. Indeed, Linne had died in 1778. The narrative style of Hermann's paper printed in old German Gothic font resembles a personal letter to a friend.

3.2. Taxonomic and morphological justification

The paper of Hermann (1783) includes a single copper plate, and *Lernaea squamicola* is depicted on four images labelled 7 a, 7 b, 7 h, and 7 k (reproduced here as Fig. 1). The plate parts 7a and 7 h show two separate specimens of the parasite at natural size. Part 7 b is the largest, and it is a magnification of part 7a. Part 7 k is only a slightly enlarged version of part 7 h. Letters c, d, e, f, and g mark individual body parts of the parasite.

According to Damkaer (2002), Wilson (1917) stated that *Lernaea squamicola* cannot be a lernaeid. We were not able to reconfirm this: Wilson (1917) indeed mentioned *Lernaea squamicola* but only as a note below Hermann's bibliographic entry. Kabata (1979) considered *Lernaea squamicola* a species inquirenda within the genus *Lernaea*.

Looking at Hermann's figures, we had no problem determining that

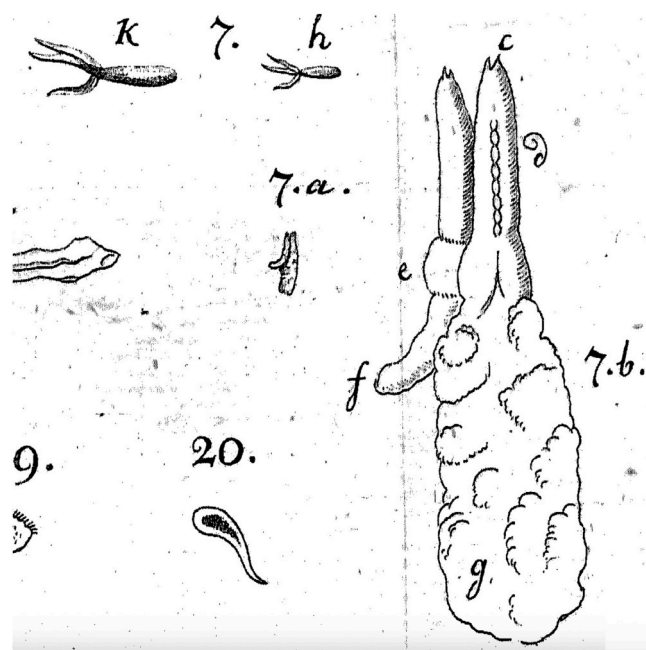


Fig. 1. Female of “*Lernaea squamicola*” as illustrated by Hermann (1783). This is a part of the original figure plate featuring original figures: Number 7 pertains to “*Lernaea squamicola*”, whereas individual lower-case letters denote either separate images (a, b, k, h) or female body parts (c, d, e, f, g).

the specimens depicted were partly damaged female lernaeopodid copepods. They were probably forcibly detached from the host fish, so the bulla has been dislodged from the maxillae and is missing. Furthermore, it is evident that the collection procedure probably further stressed the animal, resulting in shrinkage of the body. The relatively elongate proportions of the trunk-like cephalothorax, arms (paired maxillae), and genital trunk suggest that this is a representative of the genus *Tracheliastes* von Nordmann (1832). This genus in Europe is represented by two species:

Tracheliastes polycopus von Nordmann (1832) and *Tracheliastes maculatus* Kollar (1835).

The former is most commonly found on fishes of the genus *Leuciscus*, while the latter is confined to the common bream, *Abramis brama*. The overall shape of the latter species is decisively slimmer and more elongate than the former (Kollar, 1835; Piasecki et al., 2025).

Taking into account the body proportions and the host species, we can say without hesitation that the Hermann's specimen described as *Lernaea squamicola* most closely resembles *Tracheliastes polycopus* von Nordmann (1832). Alexander von Nordmann's drawings were of much better quality (reproduced here as Fig. 2).

The conclusion of our findings is that *Tracheliastes polycopus* von Nordmann (1832) and *Lernaea squamicola* Hermann, 1783 are synonyms. Employing the priority principle of the International Code of Zoological Nomenclature would indicate that *Tracheliastes polycopus*, after almost 200 years, should become a junior synonym. However, in the interest of nomenclatural stability, we propose to maintain prevailing usage by reversal of precedence under Article 23.9 of the Code.

4. Discussion

Unfortunately, any detailed morphological comparison of 18th-century drawings of *Lernaea squamicola* and 19th-century images of *Tracheliastes polycopus* by modern standards would be virtually impossible. Moreover, those authors did not provide descriptions/illustrations of body parts used at present for species discrimination. “*Lernaea squamicola*” does not represent the genus *Lernaea* nor the family Lernaeidae. It is clearly a representative of the family Lernaeopodidae. Its overall

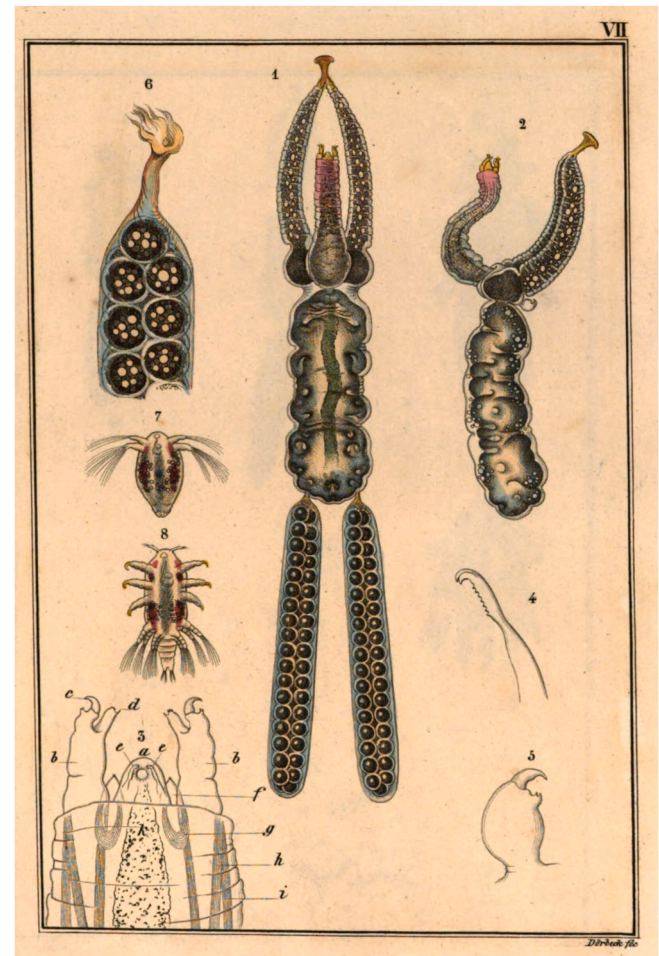


Fig. 2. Female of *Tracheliastes polycolpus* illustrated by von Nordmann (1832). This is the original figure plate featuring original figures: 1 = female in dorsal view, 2 = female in lateral view, 3 = a closeup of mouth parts in dorsal view, 4 = mandible, 5 = maxilla, 6 = anterior part of detached egg sac with developed eggs inside, 7 = nauplius, 8 = copepodid.

appearance suggests it is a representative of the genus *Tracheliastes*. The proportions of its major body parts suggest it is conspecific with *Tracheliastes polycolpus*. This conclusion is also corroborated by its host fish, a species of the genus *Leuciscus*. For an overall comparison, however, we included our own composite SEM micrograph of a non-ovigerous female of *Tracheliastes polycolpus*, collected from ide, *Leuciscus idus*, in Szczecin, Poland, some 200 km from the presumed type locality (Fig. 3).

The Principle of Priority as enshrined within the International Code of Zoological Nomenclature, dictates that the oldest available and validly published name is the correct and accepted scientific name for a taxon. The Principle of Priority can be reversed, however, based on specific provisions of the Code. To maintain the prevailing name, we propose to use Article 23.9.1. Stating that the prevailing usage must be maintained when the following conditions are both met:

23.9.1.1. The senior synonym or homonym has not been used as a valid name after 1899, and.

23.9.1.2. The junior synonym or homonym has been used for a particular taxon, as its presumed valid name, in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years.

Both conditions have been met. The name *Lernaea squamicola* Hermann, 1783 has not been used as valid after 1899. The second requirement specified in 23.9.1.2. is fulfilled by a safe margin. We collected more than 260 publications, written by more than 570 authors and published within the preceding 193 years (Supplementary material

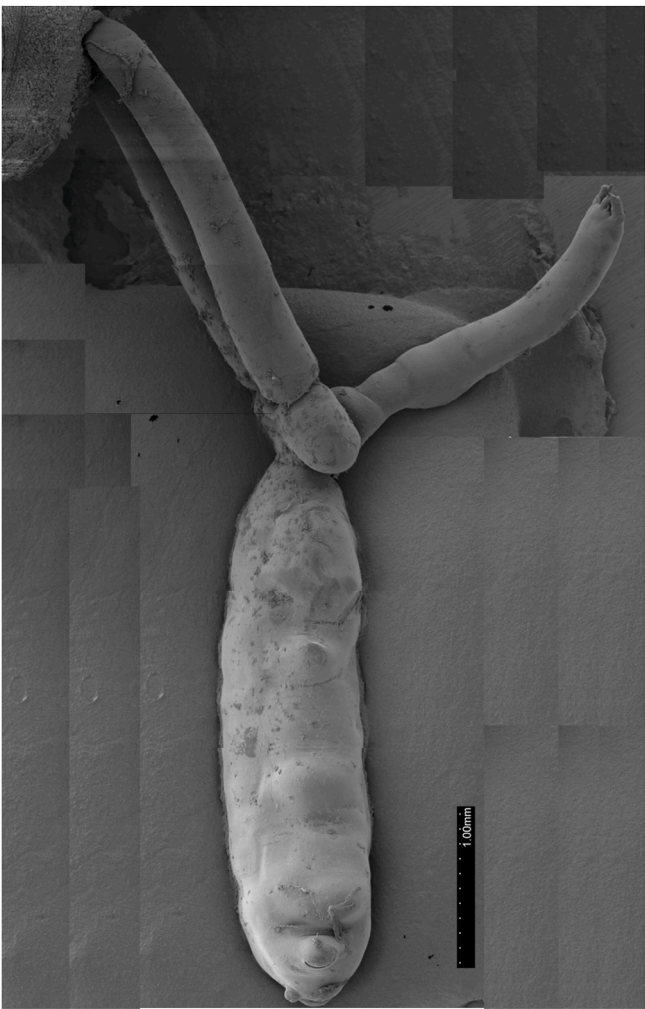


Fig. 3. SEM composite image of a non-ovigerous adult female of *Tracheliastes polycolpus* collected from ide, *Leuciscus idus*, in Szczecin, Poland, some 200 km from the presumed type locality.

1). The time span of those publications—193 years— well exceeds the required 10 years (Table 1).

In conclusion, we propose that *polycolpus* von Nordmann (1832), as published in the binomen *Tracheliastes polycolpus*, is to be given precedence over the name *Lernaea squamicola* Hermann, 1783 whenever the two are considered synonyms. Our paper, in addition to its taxonomic aspects, may have a profound effect on the use of this name in parasitology, zoology, and the study of fish diseases.

CRediT authorship contribution statement

Wojciech Piasecki: Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Investigation, Funding

Table 1
The junior synonym requirements (provision 23.9.1.2.) to reverse the Principle of Priority according to Article 23.9.1 of the International Code of Zoological Nomenclature.

	No. of works	No. of authors	Preceding period	Time span
23.9.1.2. requirement	≥25	>10	>50 years	>10 years
This case	262	>570	193 years	193 years

acquisition, Formal analysis, Data curation, Conceptualization. **Geoffrey A. Boxshall**: Writing – review & editing, Validation, Investigation, Formal analysis, Data curation, Conceptualization.

ZooBank registration

<https://zoobank.org/References/4CB9156B-7BD3-4B49-9EB5-4C720CA4C660>

Declaration of Competing interest

On behalf of the authors, I declare herewith, that we have no competing financial or personal interests that might have influenced the performance or presentation of the work described in the manuscript entitled “**Priority vs. tradition—*Tracheiastes polycolpus* von Nordmann, 1832 (Copepoda: Lernaepodidae) revisited!**” authored by Wojciech Piasecki and Geoffrey A. Boxshall.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijppaw.2025.101151>.

References

- Damkaer, D.M., 2002. The Copepodologist's Cabinet: a Biographical and Bibliographical History, vol. 1. Memoirs of the American Philosophical Society, Philadelphia, p. 300 (World Association of Copepodologists, Washington, D.C.).
- Hermann, J., 1783. Helminthologische Bemerkungen. Drittes Stück, vol. 19. Der Naturforscher, Halle, pp. 147–172.
- ICZN, 1999. International Code of Zoological Nomenclature, fourth ed. The International Trust for Zoological Nomenclature, London, UK.
- Kabata, Z., 1979. Parasitic Copepoda of British Fishes. Ray Society, London, UK.
- Kollar, V., 1835. Beiträge zur Kenntniss der Lernaenartigen Crustaceen. Ann. Wiener Mus. Naturg. 1, 80–92.
- Markevich, A.P., 1937. Copepoda Parasitica Prislkh Vod SRSR. Copepoda Parasitica Der Binnengewässer Der USSR. [Copepods Parasitic on Freshwater Fishes of the USSR.]. Institut Zoologii i Biologii, Akademiya Nauk Ukrainii SSR, Kiev, pp. 1–223.
- Markevich, A.P., 1956. Paraziticheskie Veslonogie Ryb SSSR. Izdatelstvo Akademii Nauk Ukrainskoy SSR, Kiev [Parasitic copepods of fishes of the USSR.].
- Piasecki, W., Boxshall, G.A., Panicz, R., Eljasik, P., 2025. New identification traits of *Tracheiastes maculatus* (Copepoda: Lernaepodidae), a parasite of bream, *Abramis brama* (Cyprinidae). Int J Parasitol Parasites Wildl 27, e101108. <https://doi.org/10.1016/j.ijppaw.2025.101108>.
- von Nordmann, A., 1832. Mikrographische Beiträge zur Naturgeschichte der wirbellosen Thiere. [Micrographic contributions to the natural history of invertebrates.]. Zweites Heft. Mit zehn Kupfertafeln, G. Reimer, Berlin. XVIII: 1–150, plates I–X.
- Wilson, C.B., 1917. North American parasitic copepods belonging to the Lernaedidae with a revision of the entire family. Proc. U. S. Natl. Mus. 53 (2194), 1–150 pls. 1–21. (13–vi-1917).
- Yamaguti, S., 1940. *Tracheiastes polycopus* von Normann, 1832 parasitic on *Leuciscus waleckii* (Dybowski) from Manchoukuo and Sakhalin. Annot. Zool. Japan. 19 (1), 39–42.