

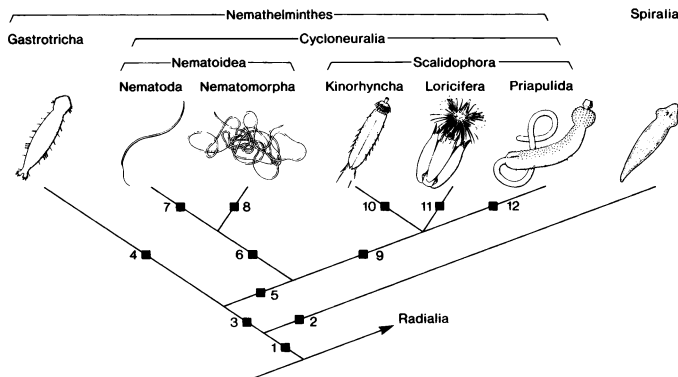
Phylogenetic Systematization of the Nematelminthes (Aschelminthes)

Phylogenetische Systematisierung der Nematelminthes (Aschelminthes)

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For more than a century, the name Nematelminthes was used for various combinations of "pseudocoelomate" groups. Often, the Gastrotricha, Nematoda, Nematomorpha, Rotifera, Acanthocephala, Kinorhyncha, the newly discovered Loricifera and - with reservations - the Priapulida were included in this assemblage. Discussions of relationships between these different taxa and of the monophyly of a taxon Nematelminthes have always been difficult. New phylogenetic approaches (Ahlrichs WH 1995: Ultrastruktur und Phylogenie von *Seison nebaliae* (Grube 1859) und *Seison annulatus* (Claus 1876). Cuvillier, Göttingen) (Lemburg C 1995: Microfauna Marina 10, 7) (Schmidt-Rhaesa A 1996: Zur Morphologie, Biologie und Phylogenie der Nematomorpha. Cuvillier, Göttingen) result in this phylogenetic systematization of the Nematelminthes:

The **Nematelminthes** (with the Gastrotricha, Nematoda, Nematomorpha, Kinorhyncha, Loricifera and Priapulida) constitute a monophylum (autapomorphies (3): stratified cuticle with epicuticle and basal layer; terminal anterior mouth opening; cylindrical, muscular sucking pharynx); the Rotifera and the Acanthocephala do not belong to this monophylum. The **Gastrotricha** (autapomorphies (4): modified spermatozoa; internal fertilization) are the sister group of all other nematelminths called **Cycloneuralia** (autapomorphies (5): circumpharyngeal cerebral ring with central neuropile and anteriorly and posteriorly located perikarya; multiple moults). Within the Cycloneuralia, the Nematodea (= Nematoda + Nematomorpha) and Scalidophora (= Kinorhyncha + Loricifera + Priapulida) are sister groups. The **Nematodea** are characterized by the autapomorphies (6) "a ventral and a dorsal epidermal cord, each with a nerve cord; cloaca in both sexes; loss of circular body musculature; loss of protonephridia". For the **Nematoda** several autapomorphies (7) "lateral epidermal cords with the perikarya; 6+6+4 cephalic sensillae and amphids; female genital pore in a ventral-medial position; males with cuticular spicules; a constant sequence of 4 moults" can be hypothesized. For the autapomorphies (8) of the **Nematomorpha** see Schmidt-Rhaesa (this volume). The **Scalidophora** (autapomorphies (9): invaginable introvert with circllets of scalids; specialized receptors called flosculi) consist of the **Kinorhyncha** (autapomorphies (10): adults with head, neck and 11 trunk zonites; each trunk zonite with paired dorsoventral muscles), the **Loricifera** (autapomorphies (11): mouth cone with buccal tube; one circle of specialized receptors called clavoscalids) and the **Priapulida** (autapomorphies (12): arrangement of scalids in larvae in 25 longitudinal rows; pharynx teathed).



At present, the Nematelminthes can best be hypothesized to be the sister group of the Spiralia (with the autapomorphy (2) "spiral cleavage") within the Gastrotrichalia (with the autapomorphy (1) "ventral nervous system with longitudinal, ventrolateral cords and centralized, anteriorly located cerebral complex").

Fig. 1: Hypothesized phylogenetic relationships within the Gastrotrichalia (= Nematelminthes + Spiralia)