

Astonishing Diversity of Somatic Ciliary Patterns in Oligotrichid Ciliates (Protista, Ciliophora)

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Although the Oligotrichida (Ciliophora, Spirotricha) typically possess only two somatic ciliary rows, the diversity of ciliary patterns is tremendous, i.e., eleven, occasionally very complicated arrangements are distinguished. The evolution of these somatic ciliary patterns is reconstructed, using the orientation of the ciliary rows (which of the paired basal bodies bears the cilium) and the position of the oral primordium, the developing oral ciliature of the daughter cell. Even though molecular phylogenies are still in their infancies concerning the oligotrichids, the genealogy of the small subunit ribosomal RNA gene sequences is congruent with the current hypothesis. It is most parsimonious to assume a convergent pattern development in the tailless taxa and the tailed tontoniids, as the contractile tail is considered a strong synapomorphy due to its complex and unique ultrastructure. Indeed, ontogenetic data suggest that the Ω -shaped pattern evolved not only convergently in the tailed and tailless taxa, but also originated from different patterns. On the other hand, gene sequence data indicate that the sinistrally spiralled arrangement did not develop twice, but represents a synapomorphy of the tailed genus *Spirotontonia* Agatha, 2004 and the secondarily tailless monotypic genus *Laboea* Lohmann, 1908. The curious genera *Apostrombidium* Xu et al., 2009 and *Varistrombidium* Xu et al., 2009 were intuitively affiliated with the strombidiids. The present concept corroborates this assignment and proposes a position for the two genera within the family Strombidiidae. Furthermore, new ontogenetic data necessitate a split of the species-rich genus *Strombidium*. While the oral primordium forms posteriorly to the horizontal ciliary row in the type species of *Strombidium*, it develops anteriorly in three congeners, justifying the establishment of two new genera, which differ in the arrangement of their extrusomes (extrusive organelles): they insert along the anterior margin of the horizontal ciliary row and posteriorly to the oral primordium in one genus, while distinctly apart from the ciliary row and anteriorly to the oral primordium in the other; probably, both patterns evolved convergently (Agatha 2010).

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Agatha, S. 2010. Updated hypothesis on the evolution of oligotrichid ciliates (Ciliophora, Spirotricha, Oligotrichida) based on somatic ciliary patterns and ontogenetic data. *Eur. J. Protistol.* (2010), doi:10.1016/j.ejop.2010.09.001.