

What are conodonts?

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Conodonts are a group of extinct marine organisms that are divided into Proto-, Para- and Euconodonts. Commonly fossil remains are represented by 0.5-4-mm sized discrete elements consisting of apatite. These elements were in use as biostratigraphic tool for Palaeozoic to low Mesozoic strata long before the first “conodont-animal” was discovered (Briggs et al., 1983). As soon as fused conodont clusters, bedding plane or natural assemblages were known, it became obvious that several element types (S, M and P elements) belong to distinctive apparatuses. Since its discovery by Pander in 1856 about 284 genera are described, which result in more than 3000 species. Until now the phylogeny of conodonts is still controversial.

Szaniawski (2002) discussed the chemical composition and anatomical similarity of simple cone elements of protoconodonts in comparison with spines of the grasping apparatus of chaetognaths. On the basis of molecular investigations he concluded that chaetognaths should have originated at about the same time as protoconodonts, and that protoconodonts of the lineage of *Phakelodus* probably formed a stem group of chaetognaths. In contrast, Euconodonts are considered as early vertebrates probably being more derived than hagfish or lamprey (Donoghue and Purnell, 2005). This is based on about 13 natural assemblages of Euconodonts from Scotland, South Africa and Canada. Specimens are about 4-10-cm large, elongate, possessing a head with eyes, extrinsic eye muscles, a notochord, chevron-shaped muscle blocks, a caudal fin, features that they share with jawless vertebrates. But they also possess a mineralized dermal skeleton, which is considered as gnathostome apomorphy.

That shows that within the Conodonts fossil groups of different origin might be lumped and that Euconodonts may be more closely related to living jawed vertebrates rather than to lampreys. The only way to learn more about the true nature of conodonts is the discovery of additional natural assemblages and the examination of diagenetic processes affecting hard and soft tissue during fossilization (e.g. solution of calcium carbonate, emplacement of phosphate).

Briggs, D.E.G., Clarkson, E.N.K., Aldridge, R.J. 1983. The conodont animal, *Lethaia*, 16, 1-14.

Donoghue, P.C.J., Purnell, M.A. 2005. Genome duplication, extinction and vertebrate evolution. *TRENDS in Ecology and Evolution*, 20, 312-319.

Szaniawski, H. 2002. New evidence for the protoconodont origin of chaetognaths, *Acta Palaeontologica Polonica*, 47, 405-419.

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