parvibasis are indicative of an apparatus containing a minimum of 21 elements distributed as 4 M (2 pairs), 1 Sa (symmetrical), 4 Sb1 (2 pairs), 4 Sb2 (2 pairs), 2 Sc (1 pair), 2 Pa (1 pair) and 4 Pb (2 pairs). The same minimum number of elements is recognized for *P. calceatus* but these are instead distributed as 2 M1 (1 pair), 2 M2 (1 pair), 1 Sa (symmetrical), 2 Sb (1 pair), 4 Sc (2 pairs), 4 "Sd" (2 pairs), 2 Pa (1 pair), 2 Pb1 (1 pair), 2 Pb2 (1 pair).

At this moment it is uncertain if the dissimilarities between the apparatus of *P. calceatus* and the other four species suffice to refer the latter species to a new genus. Further investigations of other species, sharing the same morphological characters as *P. calceatus* would be desirable; the comparisons of element types in their apparatuses could show if these species belong to one single and separate evolutionary lineage.

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Cladogenetic size increase with climate induced punctuation in two clades of Triassic plagiosaurides

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Probably the most common evolutionary trend is size increase, also referred to as Cope's rule. This trend was observed in the Plagiosauridae as a by-product when comparing body sizes in a phylogenetic study of the family. The measurement showing this trend is the transverse width of the shoulder girdle. When the sizes were plotted against stratigraphical occurrence a pattern of cladogenetic size increase emerged. The trend shows changes in state space via speciation. The size increasing pattern followed the phylogeny obtained from previous cladistic analyses (Müller 2002; and yet unpublished master thesis material) in the form of two distinct branches (the Plagiosaurinae branch comprising the basal *Plagioscutus*, *Plagiosuchus*, and the terminal *Gerrothorax* and *Plagiosaurus*, and the Plagiosterninae branch comprising the basal *Melanopelta* and *Aranetsia* and the terminal *Plagiosternum*. The only form deviating from the trend was one which was found to be a juvenile of the much larger *Plagiosternum granulosum*. The branch of the large sized plagiosternines had a large diversity with at least four coexisting species immediately before they suddenly perished from the record in the Lower Carnian. The branch of the relatively small sized plagiosaurines also increased in diversity and disappeared from the record in the middle Carnian, but returned in the Upper Carnian as the terminal *Gerrothorax*, the first appearing species of which are much smaller than their ancestors. This branch started a new cladogenetic size-increasing trend with a final termination of the family before the Triassic–Jurrasic transition. Both the diversity and the punctuation are believed to be at least partly controlled by climatic changes. If there is a change to drier conditions the semiaquatic plagiosternines will face great difficulties surviving. Also, larger obligately aquatic plagiosaurines demand larger water bodies as well. This could be the reason why plagiosternines perished during the Carnian and why the relatively smaller plagiosaurines managed to survive until more suitable conditions prevailed.

Reference

Müller, M.E., 2002: Phylogenetical relationships within the enigmatic Triassic temnospondyl family Plagiosauridae. *8th International Symposium on Mesozoic Terrestrial Ecosystems 2002*, Cape Town, South Africa.

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Jurassic marine reptiles from Svalbard: new specimens, new legal challenges

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Plesiosaurian and ichthyosaurian remains from the Jurassic Kimmeridgian-Tithonian Agardhfjellet Formation of Janusfjellet, Spitsbergen, were collected during field work in 2004. Vertebrate remains like these have been known from the Triassic and Jurassic of Spitsbergen since the early works by Nordenskiöld, Hulke and Wiman, and in 1931 an incomplete plesiosaur, *Tricleidus svalbardensis* Persson, 1962, was found near Diabasodden, Isfjorden.

New interest in the geology of Svalbard because of hydrocarbon research in the surrounding Barents shelf, has led to intensified field work, especially in the organic rich Jurassic shales. During academic and commercial excursions several vertebrate remains have been found, but few have found their way into museums.

All these occasional findings ask for better protection of the scientifically important reptile occurrences (Nakrem et al. 2004). The Norwegian Ministry of the Environment has passed a press release stating that a law proposal on automatic protection of certain "fossils of special scientific value or interest" is currently under consideration. Such a protection may stop commercial digging of the mentioned fossils, whereas qualified scientific fieldwork usually would be granted permission.

Another obstacle occurred as it became evident that the area visited during field work was claimed as an area of commercial fossil mining. This is possible because the Svalbard Treaty of 1925 awards any citizens of the 40 signatory nations equal rights to claim, develop and exploit mineral resources of Svalbard. The ownership of the fossils is not settled yet.

The ichthyosaur and plesiosaur fossils are of significant scientific interest, and many research projects are being considered: Systematic description, new species; faunal composition, biogeography; taphonomy; depositional environment, life of the reptiles; skeletons forming hardgrounds; bioturbation and bioerosion.

Reference

Nakrem, H.A., Hurum, J.H. & Dallmann, W., 2004: Protection of articulated marine Jurassic reptiles of Svalbard. *ProGEO News 4*, 1–4.

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