

A species of the *Eurygnathodus costatus* morphocline as important auxiliary conodont marker for the waageni-date definition of the IOB in low palaeolatitudes

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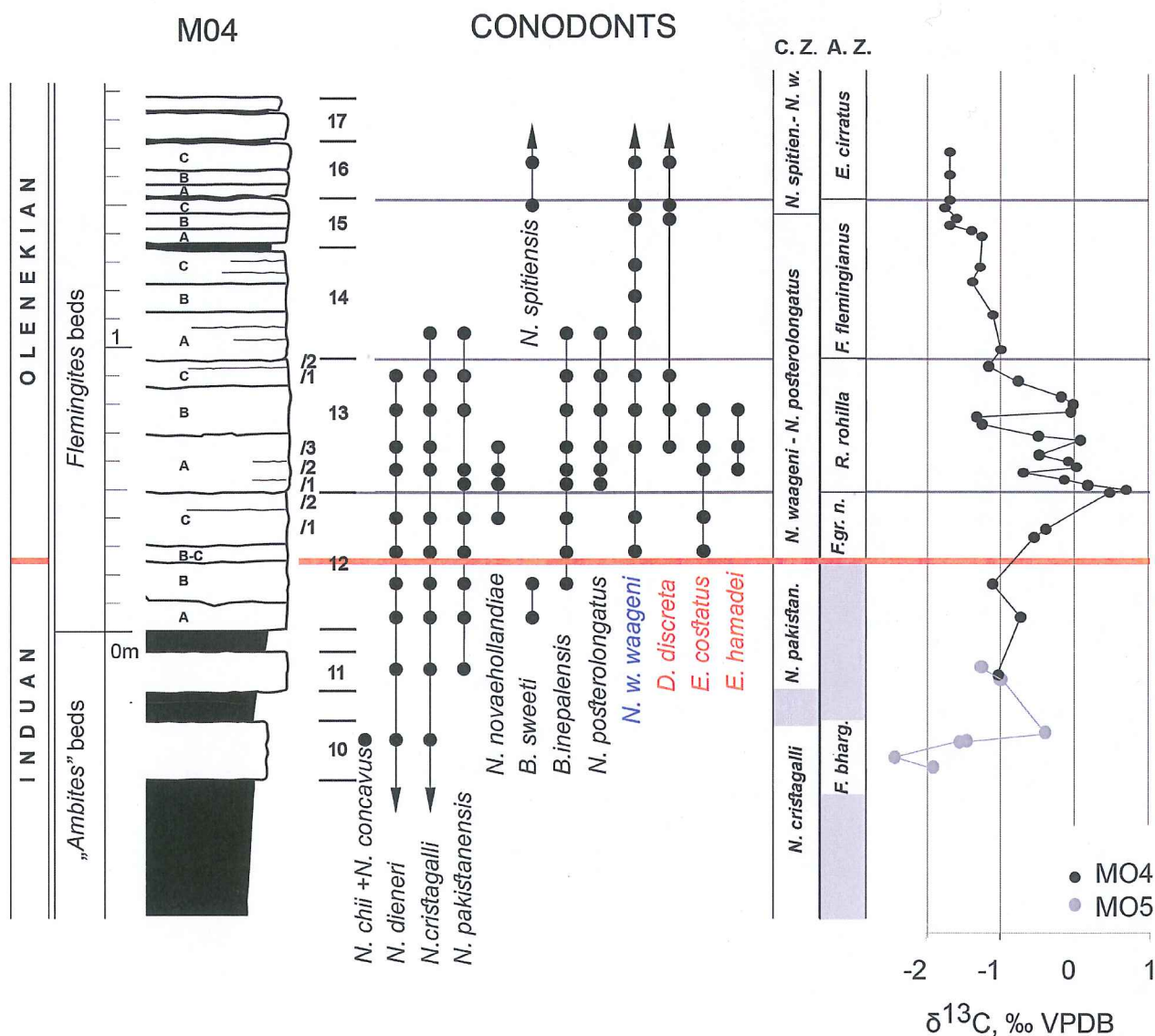


FIG. 1: Conodont biostratigraphy vs. carbonatic delta 13C isotopic curve in the IOB GSSP candidate section of Mud (Spiti, Himalaya).

Extended research in Spiti (Indian Himalaya) and published data from sections in other Tethys regions demonstrate a convincing timely correspondence between the FOs of *Nv. w. waageni* and *Eurygnathodus costatus*. In Spiti (Mud GSSP candidate section) their occurrences can be cross-correlated with a rich ammonoid fauna and a well-individualized carbonatic delta ^{13}C isotopic curve which shows a steep positive increase right after the appearance of *E. costatus* (Fig. 1). The latter species is followed by *Eurygnathodus hamadei* still within the positive excursion, and both species co-occur through the peak excursion. The very thin record of Spiti is well mirrored in the much expanded 25 m thick Golob 44 section of Ziri (Slovenia). A successive appearance of the two *Eurygnathodus* species has also been documented from Chaohu (China) and Chanakchi or former Sovetachen (Armenia). In the latter locality *E. costatus* starts again closely below the main positive excursion. As the latter species is there preceded by *E. paracostatus* – which is interpreted as forerunner of *E. costatus* – it may be argued

that the Chanakchi record can be seen as FAD proof of the species. Additional occurrences of *E. costatus* and/or *E. hamadei* are known from various other places in Far-eastern Russia (Primorye), Japan, China (e.g. Daxiakou, Guandao), Malaysia, Vietnam, Oman, Serbia, Croatia and Italy (Southern Alps).

The common occurrence of the two *Eurygnathodus* species around the IOB – and their FO restriction to the boundary interval – makes them potential candidates as index fossils or at least as primary proxies for a still to be internationally defined IOB in low to middle palaeolatitudes. Especially, since they are present in both deeper and shallow marine sections of which the latter are generally poor in time diagnostic (offshore) conodonts. Furthermore, and adverse to the *Nv. waageni* group, both species are very easily recognizable. Disadvantageous is the absence of *Eurygnathodus* in the Boreal region. Though *E. costatus* is known from the Chache Creek terrane of western North America, missing of *Eurygnathodus* in its cratonic shelf areas still remains an open question.