

## **Taphonomy of the total belemnoid fauna from the Polzberg Konservat-Lagerstätte (Upper Triassic, Northern Calcareous Alps, Austria)**

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Coleoid cephalopods are widespread from the Palaeozoic throughout the whole geological time scale. Biomechanical advantages such as the canalicular, light-weight design of their supporting cartilaginous structures, as well as their dietary flexibility are reasons for their evolutionary-biological success in fossil and recent marine environments. In comparison to other fossils sites, the calcareous to clayey deposits of the Polzberg Konservat-Lagerstätte near Lunz am See (Lower Austria) comprise abundant Phragmoteuthids. Nevertheless, this Mesozoic order only makes up about 5 % of the cephalopod fauna and 3.9 % of the total Polzberg palaeobiota. In this study their often exceptionally preserved remains, such as phragmocones, proostraca, jaws, arm hooks and the cephalic cartilages of *Phragmoteuthis bisinuata* were collected bed-by-bed, measured and evaluated concerning its taphonomical and taxonomical content. Coleoids represent strong and fast predators but also play a key role as favoured prey as suggested by irregular fragmentation of *phragmoteuthid proostraca*. A few specimens were even found directly associated with small thylacocephalans of the species *Atropicaris striata*, supporting their role as scavengers in this low-oxygen ecosystem. In the present study 205 belemnoid phragmocones/proostraca and 19 uniquely preserved, mineralised, cephalic cartilages from recent excavations were collected bed-by-bed. Additional observations and measurements were done on more than 100 phragmocones and proostraca from collection material. Overall numbers of preserved individuals increase throughout the section with time, while the average sizes of the phragmocones and proostraca decrease. The oldest part of the section comprises calcareous deposits with whitish preserved, often larger proostraca, while the smaller specimens from the young and clayey layers mainly appear as pyritized fragments. The number of individuals varies greatly in the lower part of the outcrop, while they are more balanced in the younger layers. Rapid mineralisation processes are essential for the preservation of soft tissues and are strongly influenced by the present environmental factors. Even within one carcass, these factors can fluctuate in so-called “micro-habitats”. Details of preserved soft tissues such as ink sacs and cephalic cartilages were examined by Scanning Electron Microscopy (SEM). Supplementation of the taphonomic pattern of the Polzberg Konservat-Lagerstätte is achieved by geochemical analyses.