

Data on elasmobranch faunas were obtained from a comprehensive literature survey, with additional field data collected from the previously unstudied P-Tr of Oman (western Neothethys), from Japan (Panthalassa), and East Greenland (Boreal). The middle Permian fauna of Oman contains *Glikmanius* and one new ctenacanthiform, four new hybodontiforms and two unidentified taxa (hybodontiform and ?eugeneodontiform). The Omani Early Triassic fauna also contains hybodontiforms (but generically different) and is dominated by synchodontiforms. Japanese Permian and Triassic records also share no genera, but middle Permian faunas of Oman and Japan are similar, with *Glikmanius* in common. The East Greenland middle Permian-Lower Triassic record is eugeneodontiform dominated, has *Hybodus* and *Janassa* in common with Japan but currently no genera with Oman.

This new analysis expands knowledge on global distribution and diversity, and currently shows a clear divide between local Permian and Triassic communities, suggesting at least some influence of extinction on evolutionary patterns.

### **Skeletal Taphonomy of Pterosaurs from the Late Jurassic of Germany**

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The Solnhofen exceptional biota (Late Jurassic, Southern Germany) preserves large numbers of pterosaur fossils. The most common are *Rhamphorhynchus* (a member of the paraphyletic assemblage of basal pterosaurs called 'rhamphorhynchoids') and *Pterodactylus*, a member of the derived pterodactyloid clade.

There are obvious skeletal differences between the two groups, and as such, between these genus (e.g. the size of the head, and the length of the neck and tail). It can be assumed that there are also soft tissue differences although these are difficult to elucidate.

We assessed the skeletal taphonomy of each species using the semi-quantitative method devised by Beardmore et al. in prep. The skeletal system is divided into 9 units (skull, neck, dorsal, ribs, tail, left and right front limbs and hind limbs) and the completeness and degree of articulation of each coded.

Specimens of each taxon are preserved in the same lithologies and the sedimentary context each occurs in is reconstructed as similar. The null hypothesis tested is therefore that systematic variation in the skeletal taphonomy of the two taxa represent physiological differences in vivo and how this impacts on their post mortem decay, not differences in the depositional environment. *Pterodactylus* exhibits consistently higher values for completeness and articulation, especially in the body region. In contrast, the head and neck units of both species disarticulated equally, and *Rhamphorhynchus*' tail unit disarticulated less than that of *Pterodactylus*. The differences suggest that the soft-tissue architecture of the body was more robust in *Pterodactylus* - i.e musculature was more extensive, and ligament and tendon attachments stronger.

### **The Strange Case of the Jurassic Ichthyosaur**

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A report is given on the four decades of unpublished research on a novel ichthyosaur taxon from Iraq. Found in 1952 by field workers for Iraq Oil, it was donated to the Natural History Museum (London), then borrowed by the late Robert M. Appleby at University College, Cardiff. Appleby aimed to complete a full description of the specimen; his final manuscript also included an extensive discussion of the stratigraphic provenance of the specimen, its phylogenetic affinities, and speculations on its possible ecology. During his investigation, a broad collaboration ensued with members of the universities of Reading and Cambridge and HV Dunnington & Associates (exploration and resource appraisal consultants), as Appleby attempted to constrain the precise age of the specimen within the Jurassic Sargelu Formation. However, the manuscript resulting from this collaboration (submitted to the journal *Palaeontology* in 1979) was not deemed to have satisfactorily addressed that outstanding question. Although Appleby continued to work widely on ichthyosaurs up until his death in 2004, he was unable to resolve this problem.

Subsequent work by the first two authors, incorporating archival research and a revisiting of earlier laboratory techniques, has led to a conclusive resolution of this issue, making it possible for a manuscript describing the specimen to finally be acceptable for publication. Resulting from one of several pieces of Appleby's unpublished research, the new Iraq taxon has major implications for our understanding of ichthyosaurian diversity, phylogeny and distribution across time and space.