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Abstracts

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in southwestern China documents the earliest known fossil evidence of the so-called 'Cambrian Explosion' – a significant bio-radiation event in which the oldest known representatives of the major animal groups known from today appeared within a relatively short geological time window. Studies on Chengjiang fossils, however, have mainly been limited to the information exposed on the surface of the slabs. As a consequence, understandings of the origin and evolution of those early Cambrian animals have been based on such two dimensional data. Here, we take Chengjiang arthropods as an example and show that X-rays of a micro-CT can penetrate the fossil slabs and extract brand-new information from the third dimension. Such information is key to understanding many aspects of those early arthropods, including evolutionary developmental biology, ecology, and phylogeny.

Habitat partitioning of two fish species from the Middle Triassic of the Monte San Giorgio (Canton Ticino, Switzerland)

Oral Presentation

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A new neopterygian genus including two new species is described from Middle Triassic deposits of the Monte San Giorgio. The fish shows a mosaic of typically halecomorph and ginglymodian anatomical characters. It might thus represent a basal holostean and its mosaic morphology challenges the monophyly of both Halecomorphi and Ginglymodi, which together with Teleostei represent the three main crown neopterygians lineages.

During the latest Anisian to earliest Ladinian the two new species coexisted in the intraplatform basin represented by the uppermost Besano Formation, but only the type species inhabited the more restricted basin represented by the Ladinian Meride Limestone, except for the 'Kalkschieferzone'. The different distribution of the species is interpreted as a result of habitat partitioning and different adaptability to palaeonevironmental changes. The more widely distributed type species shows interesting patterns of intraspecific variation including ontogenetic changes and morphological variation over time. The second species presents anatomical features that strongly indicate a strictly durophagous diet.

The partition of habitat and the trophic specialization of the second species suggest a previous event of sympatric speciation, which together with the presence of top predators indicate the existence of well-stablished ecosystems. Therefore, following the rapid recovery during the Anisian immediately after the end of the coral and coal gaps, the ecosystems of the upper Besano Formation at around 10 Ma after the Permo–Triassic mass extinction had already entered the third phase of recovery proposed for the Triassic biotas, which is in agreement with the model of ecosystem stepwise recovery pattern.

Kleptoplasts – starch storage factories in solar-powered sacoglossan sea slugs?

Oral Presentation Student Prize

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The incorporation of chloroplasts in enigmatic sacoglossan sea slugs has been known and studied for a long time. Previous work has shown that both the slugs and their stolen chloroplasts (kleptoplasts) survive for weeks to months when the slug enters a starvation period. Carbon fixation is performed by these plastids, a process which is affected by temperature, irradiance and even slug behavior. The particular algal species also affects kleptoplast survival. Active carbon fixation could prolong a starving slug's life span, likely due to the photosynthates produced, although photosynthate accumulation and degradation have only recently been considered. Therefore, the aim of this study is to investigate the relative amount of photosynthates in sea slugs during starvation. The long-term plastid retaining form, *Elysia timida* and its sole food source, the chlorophyte, *Acetabularia acetabulum* were examined. The main photosynthate produced by *A. acetabulum* is starch, a polysaccharide comprised of amylose and amylopectin. We present here for the first time, a significant increase in amylose concentration, within the slug's digestive gland cells during a starvation period, followed by a sharp decrease. This suggests that kleptoplasts function as both, a nutritive producer and storage device, holding onto the polysaccharides they produce for a certain time until they are finally available and used (as indicated by the concentration decrease) by the starving slug. This directly indicates some benefits provided by functional kleptoplasty to a long-term retaining species.