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The Bletterbach section (S-Alps, N-Italy): a unique record of a low-latitude late Permian terrestrial ecosystem

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The late Palaeozoic is a key period for the evolution of terrestrial ecosystems. Typical hygrophytic Palaeozoic plant groups were substituted by xerophytic Mesozoic groups. Tetrapod faunas changed from those dominated by basal synapsids to faunas dominated by non mammalian-therapsids. Diverse and complex Lopingian terrestrial ecosystems are known only from the Karoo Basin [1], and the South



The Lopingian succession outcropping at the Bletterbach gorge (S Alps, N Italy) is proposed as a reference for late Permian equatorial to low latitude ecosystems.

Urals, Russia [2]. The extreme rarity of well-preserved late Permian terrestrial ecosystems hampers any attempt to reconstruct a coherent, global, scenario. Moreover, a deep understanding of terrestrial ecosystems in this period is fundamental to understand the effects of the end-Permian mass extinction on lands. Between the villages Radein and Aldein (South Tyrol, Italy), the scenic Bletterbach gorge exposes a continuous Lopingian to Olenekian succession. The Lopingian strata records a late Permian palaeoequatorial to low-latitude terrestrial ecosystem (about 5-10° N) where plant remains with traces of plant-animal interactions and tetrapod footprints are exceptionally preserved [3]. The multidisciplinary analysis of the succession, based on sedimentology, palaeobotany, plant-animal-interactions and palaeoichnology allowed disentangling preservation bias from true biological signal. The reconstructed well-structured ecosystem

of a distal floodplain environment was characterised by a complex trophic network. The flora (> 30 taxa) is dominated by ginkgophytes and conifers, while seed ferns, taeniopterids and sphenophytes are rare elements in the association. Plant-animal interactions are rare but provide a baseline for comparison of foliage-damage intensity during the extinction event. The ichnofauna (13 ichnotaxa) is represented by various groups of synapsid (therapsids), parareptiles (pareiasaurs) and eureptiles (caphorinids and nedapsids). The only comparably rich ecosystems (Russia and South Africa), were situated at mid to high latitudes. To date no other late Permian terrestrial ecosystem is known from the palaeoequatorial

belt. The Bletterbach ecosystem therefore constitutes a unique record of equatorial to low latitude life of the late Permian and might represent a reference for future studies.

References:

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