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Information and Abstracts

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oldest fissures (ca. 160 g, F15 and F21a-b) and the youngest ones (ca. 215 g, F1 and F9); while *P. imperialis* almost doubled its initial size (ca. 470 g, F9; to ca. 760 g, SG and F32) throughout its insular evolution. A bimodal distribution of body masses was clearly observed in F9, suggesting the coexistence of the two species already at this fissure. The occurrence of *P. imperialis* (from F9 on) did not suppose a drop of size of *P. apricenicus*, as might be expected as they are competitors (grazers). This may be explained because following F1 fissure, grassland dwellers were favoured by an environmental change towards a drier habitat.

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Bone Histology of *Equus* from Mosbach Sands (Middle Pleistocene, Germany)

Poster Presentation

The family Equidae has been extensively studied in paleontology. The almost continuous fossil record of equid remains allows the tracking of evolutionary changes in the clade, making equids a paradigm of macroevolution. Along with other anatomical modifications, this group experienced a large-scale trend towards ever increasing body size during their evolutionary history, interrupted by repeated size decreases such as, for instance, those observed during the European Pleistocene. Body size is an important life history trait that depends to a great extend on ecological conditions. Also, it tightly correlates with and depends on other biological traits, such as longevity and growth rate, which can be inferred from the histological study of bones in fossil taxa. In a fist attempt to describe the life history of a Middle Pleistocene horse, we studied the paleohistology of *Equus* cf. *mosbachensis* from Mosbacher Sande (Wiesbaden, Germany) in the context of body size. Two metacarpals and one metatarsal were histologically analyzed, while different dental and postcranial remains were measured to calculate the species' body mass. We obtained an estimated weight of approximately 590 kg for *E.* cf. *mosbachensis*. The same as in extant horses, fibrolamellar bone was the main primary tissue type found in both metapodials. However, a higher proportion of vascular canals were observed in *E.* cf. *mosbachensis*, suggesting a faster growth rate. The growth pattern of *E*. cf. *mosbachensis* was also reconstructed from the study of cyclical bone growth marks, providing valuable insights about the growth and pace of life of this Pleistocene species.

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Cranial Integration Patterns in Landbirds: Macroevolutionary and Ecomorphological Implications

Oral Presentation
Symposium: Ecomorphology and Functional Anatomy in Vertebrate Palaeontology

The evolutionary plasticity of the avian beak is often lauded as one of the key innovations that led to the diverse radiation of birds from within non-avian theropods. The particular architecture of the avian skull and extraordinary variability of beak morphologies suggests that bird beaks evolved as separate evolutionary units. Yet recent research has challenged these views showing that cranial integration is prevalent in several avian lineages, or even in the whole crown group of birds. While cranial integration is a widespread phenomenon in vertebrate evolution, how alterations to this integration affect macroevolutionary and ecomorphological patterns is still poorly explored. Here we used shape analysis (geometric morphometrics) to test the evolutionary covariation between the beak and the posterior skull across the whole landbird clade (Inopinaves). We tested the strength of cranial integration at several evolutionary levels between all clades of landbirds, and pinpointed where shifts in the degree of integration have likely occurred. We found strong cranial integration within and between the majority of landbird clades and a conserved pattern of integration across many of them. Interestingly, we found that cranial integration significantly intensifies in parrots and oscine passerines (songbirds), but with much weaker levels of integration in the suboscines and basal songbirds, that sit phylogenetically between the other two clades. We propose that a key evolutionary mechanism in birds is the shifting strength of integration between craniofacial regions, which allows some clades to evolve and diversify more rapidly along particular axes of morphological change and thus access unique ecologies.