part of the Dinarides, at the transition towards the Pannonian basin. These Miocene detachments were mapped and dated in the areas of the Cer, Bukulja and Fruska Gora Mountains and in all cases follow a major weakness zone, inherited from the Cretaceous-Paleogene stage of mountain building, i.e the contact between the Dinaridic upper plate (Tisza-Dacia) and lower plate (Adria) along the Alpine Tethys (Sava) subduction zone. The footwall of these detachments exhume Jadar (Adria) basement and its Triassic-Jurassic cover (including obducted ophiolitic zones), altogether metamorphosed during previous phases of Cretaceous and/or Eocene crustal shortening. Detachment zones seem to be developed mainly in the Late Cretaceous-Eocene flysch of the Sava zone, which can be found metamorphosed in their footwall and non-metamorphosed in their immediate hanging-wall. The regional hanging-wall of these detachments is in all cases the Pannonian basin with its observed upper crustal extensional structures. In Cer and Fuska Gora Mountains these accommodate a Middle-late Miocene normal faulting, while the Bukulja detachment accommodate the formation of the lower Miocene Morava basin (or “peri-Pannonian” depression). By correlating these observations with other recent research in areas of Southern Serbia and Bosnia-Croatia, an overall image of large scale extensional collapse along detachment zones is observed along the entire central and internal Dinarides during the Miocene. Therefore, a full mechanical explanation can be provided for the Pannonian basin extension by incorporating this Dinaridic collapse. Two directions of extension were observed by field kinematic mapping, and initial Early-Middle Miocene top-N was followed by subsequent Middle-late Miocene top-E direction of extensional movement. While the second direction of movement is compatible with the invasion of the Tisza-Dacia block into the Carpathians embayment, the first might alternatively suggest the existence of a phase of Dinaridic extension driven by the roll-back of an Adriatic slab, prior to its detachment somewhere after the late Miocene.

The Early Miocene Carnivores from Sabuncubeli, Turkey

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Thanks to collobarative studies that have started from 1970’s, numerous Early Miocene localities that have produced abundant micromammal fossils were found in Turkey. These micromammal fossil discoveries have added greatly to our knowledge in terms of distribution and paleoecology of these taxons. However, due to substantial sampling and collecting bias against macromammals, only very limited and somehow diverse artiodactyl fossils from the localities Hancili (MN1), Harami (2), Kilcak (MN1), Keseköy (MN3b) and Semsettin (MN4) are the total findings. This case has changed as a new locality, Sabuncubeli, which is situated along the road between the village of Sarnic and Sabuncubeli crossroad, 15 km NW of Izmir, was exposed near a small valley after an artificial cutting for the construction of the road in 1998. Collecting procedure from fine conglomerate lenses during 2000-2006 yielded numerous carnivore and relatively rich artio and perissodactyl fossils. Based on its previously collected micromammal assemblages, Sabuncubeli fauna is dated as Early Miocene (MN3a). Here, three new and three common taxa of carnivorous mammals from Sabuncubeli will be described.

The carnivore fauna comprises of an amphicyonid (*Cynelos* nov.sp.), a procyonid (*Broiliana* nov.sp.), three viverrids (Viverridae, new genus, new species; *Euboictis aliveriensis*, *Semigenetta elegans*), a mustelid (*Palaeogale* sp.) and undetermined Felidae which can not be yet formally assessed to any genus. European originated *Cynelos* is the widespread genera common to localities around Eurasia, Africa and America throughout Early-Middle Miocene. The new Sabuncubeli *Cynelos* has common similarities with *Cynelos macrodon*, *C. helbingi* and *C.bohemicus*, but has proportional as well as morphological differences in dentition. So far, *Euboictis* is a unique faunal element which has a sole record from the middle Orleanian (MN4) locality of Aliveri, Evia Island, Greece. For the first time, Sabuncubeli fossils provides lower dentition of this genera which remarks on the affinities between *Euboictis* and *Sivanasua* ssp. The oldest procyonid *Broiliana* is not a common element of Orleanian localities and hereby its represented by a new species. *Semigenetta elegans* from Sabuncubeli is similar to the holotype from Winterhoft-West (MN3a) but is slightly smaller. Besides *Euboictis*, *Palaeogale* is the second genera that have records in both Aliveri (MN4) and Sabuncubeli. Most interesting part of Sabuncubeli carnivore fauna is the new Viverid genera which closely resemble that of enigmatic viverrids *Kichechia* and *Legetetia* and marks clear affinities with *Euboictis-Sivanasua* group. Although, Creodonts are quite common in Early Miocene faunas of Africa and somehow Europe, they are absent in Sabuncubeli

Although, small mammals clearly show that Anatolia and Europe were different bioprovinces during the Early Miocene, the carnivore fauna of Sabuncubeli marks a unique composition in having European and African (?) (Viverridae, new genus) affinities together. In the light of new taxa, different migration scenarios will be discussed in terms of faunal similarities.

Factors influencing sandstone response to changing environmental conditions in Northern Ireland

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The built environment will respond to climate change. Evidence already suggests that the 'greening' of sandstone masonry reflects recent atmospheric changes in moisture and pollution. This emphasises the importance of changing environments as a key controller on stone decay processes. As such, there is a need to understand decay, not just in a dynamic environment, but in a world where the nature of the dynamics themselves are changing. The current study investigates how changing future meteorological conditions impact upon the underlying drivers of stone decay – specifically, the thermal and moisture cycles experienced at and below the stone surface. To evaluate the nature and scale of future damage to masonry knowledge of the current interplay of water, materials and surroundings is required. Environmental monitoring of both meteorological and internal sandstone conditions will satisfy this need. The construction of test-walls embedded with sensors will record temperature and wetness profiles with depth from the surface. This is relevant for identifying internal moisture cycles which have influence the deliquescence, movement and precipitation of hygroscopic salts, the swelling of clay minerals and on associated stress gradients. Both heat and moisture are monitored in real-time, an approach that will consider the synergies between the two variables. Logging stone moisture contents will allow the 'time-of-wetness', a variable of importance for biological colonisation, to be quantified. The presence of a weather station mounted to the test walls permits measurement of the 'perturbed' situation. The observed microclimate will be linked to conditions recorded within the stone. Matching stone response to changing meteorological parameters will provide an understanding into the scale interaction between, and lag-structures associated with, seasonal, daily and sub-hourly cycles. It will also allow the identification of potential feedbacks (such as stones with high surface wetness will have a lower albedo, therefore altering the thermal regime, and perhaps resulting in less marked temperature ranges between the surface and sub-surface) between atmospheric and stone decay processes. Few studies consider the influence of climatic change on stone decay processes. Where studies exist, they all neglect the uncertainty inherent in climate modelling. This research employs a modelling structure that allows the development of multiple, equally plausible futures and at a finer resolution than previous stone decay-climate change studies. Future projections for; temperature, precipitation, wind speed, relative humidity, potential evapotranspiration, and solar radiation, will be made using the Statistical DownScaling Model 4.2. This involves establishing relationships between observed surface stations and large-scale atmospheric variables. The model is then forced under future emissions scenarios to produce a daily time series for a 30-year time-slice. Uncertainty is catered for by using multiple climate models and emission scenarios and also an ensemble of model runs. It is necessary for model outputs to be made relevant to factors affecting decay processes. Therefore, rather than investigating annual sums of rainfall, the intensity, duration