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Abstracts

tephras, magnetostratigraphy and nannofossil datums. Stratigraphic range (horizon of extinction and appearance) of the component taxa, species richness of each assemblage, and morphological change of diaspores indicating speciation were analyzed with the climatic reconstruction from each assemblage to clarify the impact of climatic changes on species diversity. We compared temporal cumulative diversity curves for extinction and appearance of taxon among trees, shrubs (including vines), and herbaceous taxa. Local extinction centered on 1.3 Ma for tree taxa, 1.1 Ma for shrubs, and 1.05 Ma for herbs. These horizons corresponded to phase of striking climatic deterioration and fluctuations between 1.4 and 1.0 Ma. In case of tree taxa, appearance of the same number of taxa (8 taxa, including *Picea jezoensis* and *Pinus* subgen. *Haploxylon*) compensated for extinction (*Metasequoia, Chamaecyparis obtusa*, and *Stewartia monadelpha*) so that species richness did not change in ca. 1.3 Ma. Change of morphotype similar with extant Chinese taxon to that endemic to Japan occurred in cupule of *Fagus* (from *F. microcarpa* to *F. crenata*), nut of *Juglans* (from *J. megacinerea* to *J. ailanthoides*), and nutlet of *Cyclocarya* (to smaller and smoother nutlet than extant taxon), showing speciation of Japanese endemic taxa. Species richness of assemblages standardized by rarefaction increased significantly since 1.4 Ma, contributed by species diversity increase of herbaceous taxa, annual herbs, and heliophylous plants. It indicates that increased disturbance by heavy rain and snowfall along with the development of Asian Monsoon influenced the turnover of vegetation succession to accelerate migration of plants with climatic fluctuations.

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Epiphyllous mycoflora from the Siwalik sedimentary strata of Eastern Himalaya, India

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The present study deals with the *in situ* record of fossil epiphyllous fungi from the Siwalik sedeiments of subHimalayan West Bengal (Darjeeling) and Arunachal Pradesh, India. The recovered mycoflora from the Lower Siwalik (Middle- Upper Meiocene) are viz. *Asterina* (Asterinaceae), *Meliola* (Meliolaceae), *Phomites* (Sphaeropsidales), *Palaeocercospora* (Dematiaceae), *Phragmothyrites* and *Trichothyrites* (Microthyriaceae). The host plants of these epiphyllous fungi are comparable to the modern *Anthocephalus chinensis* (Rubiaceae), *Combretum chinense* (Combretaceae) and Poaceous grasses. The Upper Siwalik (Upper Pliocene-Lower Pleistocene) recovers rich assembly of mycoflora viz. *Palaeoasteromella* gen. nov. (Sphaeropsidales), *Phomites* (Sphaeropsidales), *Palaeoasterina* (Asterinaceae), *Asterina* (Asterinaceae), *Meliola* (Meliolaceae), *Coniothyrites* and *Rhizoctonites* gen.nov. (Sphaeropsidales). In addition various microthyraceous germling and fungal spores have also been documented. The modern host analogues of the recovered fungi from Upper Siwalik are viz. *Uvaria* (Annonaceae), *Dipterocarpus tuberculatus*. (Dipterocarpaceae), *Dipterocarpus* sp. (Dipterocarpaceae), *Chonemorpha macrophylla* (Apocynaceae), *Dysoxylum procerum* (Meliaceae), *Amherstia nobilis* (Fabaceae), *Macaranga peltata* (Euphorbiaceae), *Litsea sp.* (Lythraceae) and *Careya arborea* (Lecythidaceae). The study indicates prevalence of evergreen-deciduous forest cover under tropical, moist condition with high rate of precipitation in the area during deposition.

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Olive yards and pastures in the cultural landscape of Piazza Armerina (Enna, Sicily) in the Middle Ages by pollen analysis

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An archaeopalynological project has recently been set up at Piazza Armerina, promoted by the Planning and Restoration Regional Centre of the Sicilian Region. It includes archaeopalynological analyses at the Roman Villa (the renowned "Villa del Casale") and Medieval settlement recently unearthed in the south area of the Villa (excavations directed by P. Pensabene) as well as analyses of recent pollen samples. Aim of the project is to reconstruct the history of the cultural landscape of the site, to compile a list of useful plants available in the past and to prepare pollen materials for the local indoor/outdoor museum. In 2007 ca. 100 samples were collected. This paper presents the results concerning the Medieval settlement. Samples concern two cultural phases. Based on archaeological records, Phase I was dated in the transition between the Arab and Norman age (10th - 12th century AD) and Phase II in the Norman age. Samples showed a sufficient pollen concentration, good state of preservation, and high floristic diversity (ca. 150 pollen taxa have been identified so far). Pollen flora and vegetation testified plant species and communities from different vegetation belts (e.g. *Abies*, *Carpinus*, *Castanea*, *Fagus*, *Myrtus*, *Quercus* cf. *ilex*, *Pinus halepensis*, *Phyllirea*, *Pistacia*, *Quercus* deciduous, *Ulmus*) as well as fresh water plant communities (*Alnus*, *Carex* type, *Nymphaea*, *Populus*, *Salix*, *Typha angustifolia* type). Besides woody plants suitable for timber, pollen suggested a number of useful plants, cultivated or exploited in the wild, for food, decoration or other uses (e.g. *Avena-Triticum* group, *Beta*, *Corylus*, *Cynara* cf., *Hordeum* group, *Nerium oleander, Olea*, *Platanus*, *Pinus* cf. *pinea*, *Prunus*, *Secale cereale*, *Vitis*). The plant landscape was open (arboreal pollen < 30-40%), and mainly characterized by olive yards and pastures. Olive yards were more spread in the Arab-Norman Phase I, and pollen morphology of *Olea* (pollen size, polar amb, muri and columellae depth, lumina size) suggested that more than one variety had been cultivated. Pastures were more spread in the Norman Phase II. They are testified by Cichorioideae and Gramineae, and many other herbs (e.g. *Aster* type, *Anthemis* type, Leguminosae, *Mentha* type, Umbelliferae). On the whole pollen spectra described a hilly Mediterranean cultural landscape, not far from a river and well managed by the inhabitants of the settlement.