

# THE LATE-QUATERNARY HISTORY OF BEECH (*FAGUS ORIENTALIS*) IN THE CENTRAL HYRCANIAN FORESTS OF NORTHERN IRAN

Oral presentation- Palaeoecology and distribution of beech

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## *Abstract*

Palynological studies of peatland deposits in the Hyrcanian region of central northern Iran allow the reconstruction of the history of oriental beech communities since 20,000 years calBP. During the cold and dry climate of the Last Glacial Maximum (LGM), beech was chiefly restricted to elevations below 1000 m. Only sparse stands of beech, oak (*Quercus* spp.) and birch (*Betula* sp.) associated with elm (*Ulmus* spp.) and hornbeam (*Carpinus betulus*) occurred at 1000-1300 m elevation. Higher up a dry and/or cold climate with steppe vegetation (consisting mainly of *Artemisia*, Chenopodiaceae and Apiaceae) prevailed. Climatic deterioration in the period 16,900-14,500 calBP led to a strong decrease of the already rare beech and a gradual replacement by the more cold- and drought-resistant Persian oak (*Quercus macranthera*) at mid-elevations (i.e. 1000-1500 m). In the warm and moist Allerød interstadial (i.e. 14,500-13,150 calBP), oak communities were widespread at mid-elevations whereas beech still occupied only lower altitudes. The extremely cold and dry Younger Dryas (13,150-12,100 calBP) was associated with a radical decline of forest stands and the reestablishment of steppe vegetation at elevations higher than 1000 m. In the early Holocene (ca. 12,100-8,100 calBP) the mid-elevation of the central Alborz Mountains was dominated by Persian oak, while beech gradually started to climb up from lower elevations. Hornbeam, which hitherto had merely been a minor - if any - constituent of the mid-elevation forest, gradually started to increase in abundance from the onset of the Holocene, became a major forest tree at around 10,000 calBP and remained abundant thereafter. Only after 8,500 calBP, the modern beech-hornbeam community replaced the oak stands at mid-elevation indicating the establishment of present-day temperate climate and vegetation. Late-Quaternary climate change thus triggered significant altitudinal shifts of vegetation belts in the central Hyrcanian forests, e.g. a timber line depression of around 1200-1300 m during the Allerød and early Holocene, and deeper depressions through the Younger Dryas. The Alborz foothills were a major Quaternary refugium for temperate deciduous broadleaf tree species of the Euxino-Hyrcanian province. Over the last decades, however, the beech communities have been subject to severe anthropogenic impact.

*Key words:* Euxino-Hyrcanian province, Holocene, Last Glacial Maximum, late-Pleistocene, palynology, refugia.