

Palynological reconstruction of the Caspian Sea level oscillations during the past 3000 years

Elias RAMEZANI ^{*1,2}, Almut SPANGENBERG², Ata ABDOLLAHI KAKROODI³, and Hans JOOSTEN²

¹ Department of Forestry, Faculty of Natural Resources, Urmia University, Urmia, Iran. Tel./Fax: 0441-2770489; e-mail address: e.ramezani@urmia.ac.ir; elias.ramezani@gmail.com).

² Department of Peatland Studies and Palaeoecology, Institute of Botany and Landscape Ecology, Ernst-Moritz-Arndt-University, Grimmer Straße 88, D-17487 Greifswald, Germany.

³ Faculty of Geography, University of Tehran, Tehran, Iran.

* Corresponding author

Abstract

A 5.35 m sediment core of peat over clay and wood pieces was collected using a Russian-type corer (50 cm length, 5 cm diameter) from the center of MZG mire (Nowshahr; (Mazandaran Province, N Iran; 22 m bsl; N 36°36'17"; E 51°36'21") in May 2005. Pollen samples were taken at 20 cm intervals and prepared following standard techniques (cf. Fægri and Iversen, 1989). Five ¹⁴C-AMS-datings were carried out in order to determine the age of major palynological events throughout the record. The MZG pollen record has registered vegetation history of the central Caspian regions over the past three millennia. The lowermost ca. 60 cm of the core consists of fluvial deposits which may suggest the fall of Caspian Sea level. This is followed by the rise of ALNUS, CARPINUS, FAGUS, and fall of ARTEMISIA and CHENOPODIACEAE AND AMARANTHACEAE (C-A) at around 2700 BP, which could be indicative of cooler and wetter climate. A major highstand at 2600 BP has been recognized for the Caspian Sea which is synchronous with periods of global cooling and wetter climates. Our record suggests that the 2600-BP highstand of the Sea continued to around 2200 cal BP, as is evidenced by findings of Carophyets and the subsequent lagoonal deposits and findings of numerous Caspian Sea fauna (e.g.

Cerastoderma sp., *Dressena* sp., *Pyrgula* sp., *Cyprideis* sp., and *Hypanis* sp.) and also Gloeotrichia, and diatoms. This reconstructed sea level rise can explain the overall low values of ALNUS and the sharp decrease of PTEROCARYA for this time span, suggesting that there was little sufficiently dry site for trees to grow in the lowlands. Alder and wingnut thus should have retreated to a few remaining hummocks in the lowland or even retreated to the southern foothills. Unfavorable condition should also have precluded the development of forbs (*Artemisia* and chenopods) in the lowland. For the period 1,600-1,100 BP, it appears from the high values of ALNUS and PTEROCARYA that their corresponding pollen producers, i.e. alder and wingnut were dominant local elements, which might imply hydrologic changes in the lowland areas. The most conspicuous feature of the upper part of MZG diagram is the substantial decrease of PTEROCARYA pollen at around 1,100 BP, which is well synchronous with a climatic phenomenon known as Mediaeval Climatic Anomaly, hence suggesting a regional climate change for northern Iran.

Key words: palynology, Holocene, vegetation history, Caspian Sea, climate.