Fossil beetles as possible evidence for transhumance during the middle and late Holocene in the high mountains of Talysch (Talesh) in NW Iran?

Philippe Ponel[1], Valérie Andrieu-Ponel[1], Morteza Djamali[1], Hamid Lahijani[2], Michelle Leydet[1], Marjan Mashkour[3]

[1]IMBE-CNRS-IRD-UAPV, Aix-Marseille Université, Technopôle de l'Environnement Arbois-Méditerranée, BP 80, F-13545 Aix-en-Provence cedex 04, France, [2]Iranian National Institute for Oceanography (INIO), No. 9 Etemad Zadeh Street, West Fatemi Ave., 14155-4781 Tehran, Iran, [3]Laboratoire d'Archéozoologie et Archéobotanique, UMR 7209 CNRS, Département Ecologie et Gestion de la Biodiversité, Muséum National d'Histoire Naturelle (MNHN), 55 rue Buffon, 75005 Paris, France

A short sediment core (300 cm) was retrieved from a peaty deposit in the northeastern corner of Lake Neor in NW Iran yielding a 6500-year-old sequence relatively rich in pollen and beetle remains. Beetle assemblages contained a significant amount of coprophagous and coprophilous species all along the core. Pollen spectra suggest an open steppe landscape typical of the modern Irano-Turanian highlands with pollen indicators of agro-pastoral activities and also the proximity of the mesic temperate Hyrcanian forest to the east. Together, insect and pollen evidence, in agreement with the archaeological evidence for NW Iran, suggest that pastoralism was practised in the high elevation surroundings of Neor in Talysch Mountains at least since ca. 6500 years ago. This preliminary study highlights the strong potential of palaeoentomological investigations in furthering our understanding of the history of pastoralism in the Middle East.

Keywords: Coleoptera, Pollen, Holocene, Iran, Neor lake, Pastoralism

Introduction

Recent high-resolution palaeoecological investigations of lake and peat deposits have been very informative in detecting high-frequency climatic events, reconstructing human impact on ecosystems, and understanding socio-economic changes driven by climatic and historical events in the Middle East (Neumann *et al.* 2007; Ramezani *et al.* 2008; Djamali *et al.* 2009b). In Lake Maharlou in southern Zagros, significant human activity is implicated in causing a large-scale deforestation event, leading to an almost total destruction of *Pistacia-Amygdalus* steppe forest contemporaneous with the Achaemenid period (Djamali *et al.* 2008). However, despite the importance of pollen analysis in reconstructing past vegetation change in relation to climate change and human activities, and the recent development of studies aiming to improve the interpretation of fossil pollen assemblages in Iran (Djamali *et al.* 2009a), it seems that the identification and classification of anthropogenic indicator pollen taxa is less clear or more poorly known in the Middle East and even Central Asia compared to Europe and the Mediterranean region (e.g. Djamali *et al.* 2008; Miehe *et al.* 2009). However, at Lake Almalou, in the first palaeoentomological environment reconstruction in the Middle East, Djamali *et al.* (2009b) considered the discovery of dung beetle remains in layers corresponding to the Achaemenid period (2450–2220 cal. yr BP) to be possible evidence for intensive agro-pastoral activity in this region.

In the present study, we use fossil beetle analysis as a tool to complement pollen for finding traces of pastoralism in the Lake Neor region in NW Iran. The area has several interesting ecological and archaeological characteristics. First, it is located at the limit of two contrasting climatic systems: the temperate humid

Correspondence to: Philippe Ponel, IMBE-CNRS-IRD-UAPV, Aix-Marseille Université, Technopôle de l'Environnement Arbois-Méditerranée, BP 80, F-13545 Aix-en-Provence cedex 04, France.
Email: philippe.ponel@imbe.fr

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