

THE CANARY RECORD OF THE EVOLUTION OF THE NORTH ATLANTIC PLIOCENE: NEW 40AR/39AR AGES AND SOME NOTABLE PALAEOONTOLOGICAL EVIDENCE

Meco, J.^a; Koppers, Anthony A. P.^b; Miggins, Daniel P.^b; Lomoschitz, Alejandro^c; Betancort-Lozano, Juan Francisco^a

a Departamento de Biología, Universidad de Las Palmas de Gran Canaria (ULPGC), Canary Islands, Las Palmas de Gran Canaria, Spain

b College of Earth, Ocean and Atmospheric Sciences, Oregon State University, Corvallis, OR, United States

c Instituto de Oceanografía y Cambio Global (IOCG), Universidad de Las Palmas de Gran Canaria (ULPGC), Canary Islands, Las Palmas de Gran Canaria, Spain

Abstract

Two new ⁴⁰Ar/³⁹Ar ages (*) and previously published K/Ar ages of basaltic pillow lava flows are coeval with closely-related fossiliferous marine layers, allowing us to establish the beginning (5.8; 5.0; 4.8Ma at Ajuí, Fuerteventura Island and 4.8±0.03Ma (2σ)* at Tamaraceite) and a middle stage (4.20±0.18Ma (2σ)* at La Esfinge in Gran Canaria Island) of Early Pliocene marine deposits in the Canary Islands. Here the presence of tropicopolitan fossils (*Megaselachus megalodon*, *Janthina typica*) suggests the influence of a possible Central American Circumtropical Current during the Pliocene and in the North Atlantic basin. The presence of both *Janthina typica* and the *Argonauta argo* also indicate the occurrence of tropical storms in the area of the Canary Islands around that time. In addition, the pillow lava flow at La Esfinge overlies a submarine pyroclastic layer containing *Ostrea offreti* that was preserved in its life position, a fossil from the terminal Miocene and commonly found on the south eastern Iberian Peninsula. At La Cruz on Fuerteventura Island, a dune formed above marine deposits lies beneath a palaeosol and a basaltic lava flow that was K/Ar dated at 2.9Ma. Near El Mármol in Gran Canaria the corresponding palaeosol lies between lava flows K/Ar dated at 3Ma. Based on these observations, we argue in this paper that the first appearance of the Canary Current, the eastern boundary current of the North Atlantic sub-tropical gyre, occurred between 4.2Ma and 2.9Ma ago. This was followed by a major sea level drop (of about 40 m) and the formation of a first fossil-bearing palaeosol which indicate that major climate change that took place around 2.95-2.82Ma.