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Palaeogeographic evolution of the Central-Western Mediterranean area in the last 50 Myr: stratigraphical and palaeontological constraints

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Herein we present the palaeogeographic evolution of the Central-Western Mediterranean area since the Eocene. The study relies on the geodynamic model developed by Carminati et al. [1], which integrates magmatic and tectonic information. In this work we take another step forward superimposing on each kinematic map a large number of high quality stratigraphical and paleobiogeographical data, released at 1 Myr interval. Land vertebrates (both skeletal remains and footprints) as well as freshwater or land plant remains are used as palaeogeographic constraints, and indeed provide important clues for a characterization of such terrestrial ecosystems.

The result consists of 50 palaeogeographic maps, showing in detail the domain running from the Strait of Gibraltar to Western Greece, including Northern Africa and Central-Eastern Europe (Rhine Graben to Pannonian Carpathians).

The maps take into consideration multiple constraints in order to assess the relative position of emerged lands, seas and oceans: geological-stratigraphic, tectonic, geophysical, palaeomagnetic and palaeontological. These data were derived from the screening of the vast geological and palaeontological literature available for the study area.

The distribution of the magmatic activities is also figured on each maps grouping the products into "subduction-related" and "intraplate-like" geochemical types.



The model is presented as video (.mov) obtained by mounting each paleogeographic frame and showing contemporaneously the kinematic and palaeogeographic evolution of orogenic systems and back-arc basins of the Central-Western Mediterranean area.

This multidisciplinary synthesis of all available data on the Central-Western Mediterranean palaeogeography in the last 50 Myr is aimed to both scientific and educational goals.

Figure 1: Timeframe example of a

*palaeogeographic
reconstruction of the Central-Western Mediterranean
at 15 Ma. Light blue, marine shallow continental
platform (0-200m); blue, 200-3000m below sea-level;
dark blue, >3000 m, or oceanic crust.*

References:

[1] Carminati et al. (2012) Tectonophysics 579:173-192

