

MESOZOIC PALAEOGEOGRAPHY OF SOUTHERN SOUTH AMERICA

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Different palaeogeographic reconstructions of southern South America have been reported by Harrington, 1962; Camacho, 1967; Riccardi, 1987, Uliana and Biddle, 1987, 1988; Macellari, 1988 and Urien et al., 1995. Our study was specifically designed to develop eight palaeogeographic maps of Patagonia, between the Late Triassic and the Late Cretaceous in 15 to 30 Ma steps. More than 300 references relevant to the interval 210-75 Ma were selected to compile a palaeogeographic database including stratigraphic, structural, sedimentologic, geotectonic and palaeoenvironmental information.

In the Late Triassic Patagonia was an almost positive land with narrow and isolated continental rifts, filled with volcanoclastic sediments (Fig. 2a). Calc-alkaline intrusions (Central Patagonian Batholith) and the Comallo volcanics are emplaced at the NW end of the Gastre Fault System.

The 180 Ma map (Fig. 2b) shows the opening of the Neuquén and the Pampa de Agnia basins, characterized by shallow to deep marine deposits related to a palaeopacific transgression. A dominantly acidic volcanism (Marifil Complex) covers large areas of northern Patagonia. The older evidence of an Andean magmatic arc occurs at the southern margin of the Pampa de Agnia depocenter.

During the Bathonian-Callovia transition (165 Ma), most of the Patagonian region to the south of the Gastre Fault System is characterized by the (Chon Aike and Tobífera) bimodal volcanism. In central and southern Patagonia several NW-SE and NNW-SSE trending grabens formed as a result of widespread extensional tectonism. Transcurrent displacement along the Gastre Fault System controlled the Cañadón Asfalto depocenter in north-central Patagonia.

The Late Jurassic map (150 Ma, Fig. 2d) shows significant palaeogeographic changes. The Río Mayo-San Jorge and the Magallanes basins are entirely developed, and the silicic volcanism is restricted to SW Patagonia, where submarine rhyolite-flows intercalate with deep marine siliciclastics. The Andean magmatic arc reaches the 50 ° S.L. The early rift continental deposits of the San Jorge Basin laterally grade into continued shallow marine sediments in the intra-backarc Río Mayo basin. Shallow marine facies in most of the Magallanes basin indicate the onset of widespread extension, and to the west, deep marine deposits suggest an effective connection between the Magallanes basin and the Pacific Ocean.

At 135 Ma (Fig. 3a) the Andean magmatic arc extends along the whole western Patagonian margin. However, the Pacific connection of the Magallanes basin persists, and the marginal Rocas Verdes basin, floored by oceanic crust, develops in a backarc position.

The Aptian (120 Ma, Fig. 3b) was a time of transition. Continental red beds are widespread in the Neuquén and San Jorge basins. The topographic barrier of the magmatic arc produced the closure of the Río Mayo basin. To the south, several paths through the volcanic chain connect the Magallanes basin with the Pacific Ocean.

During the Cenomanian-Turonian (90 Ma, Fig. 3c), the Neuquén and the San Jorge basins are integrated in a single continental depocenter. In northeastern Patagonia, the newly opened Colorado rift is

also filled up of continental deposits. Along the western margin of southern South America the Andean magmatic arc chain separates Patagonia from the Pacific Ocean. In the Magallanes basin, a foreland stage causes strong detrital contributions from the west and progressive migration of the depocenter to the east.

The 75 Ma map (Fig. 3d) shows a widespread transgressive episode embracing the Colorado basin and the North Patagonian platform. The San Jorge basin becomes again a large and isolated continental depocenter. A general regression is recorded in the Magallanes basin, caused by both renewed uplift along the Andean margin and a marked NNW to SSE fluvio-deltaic progradation.

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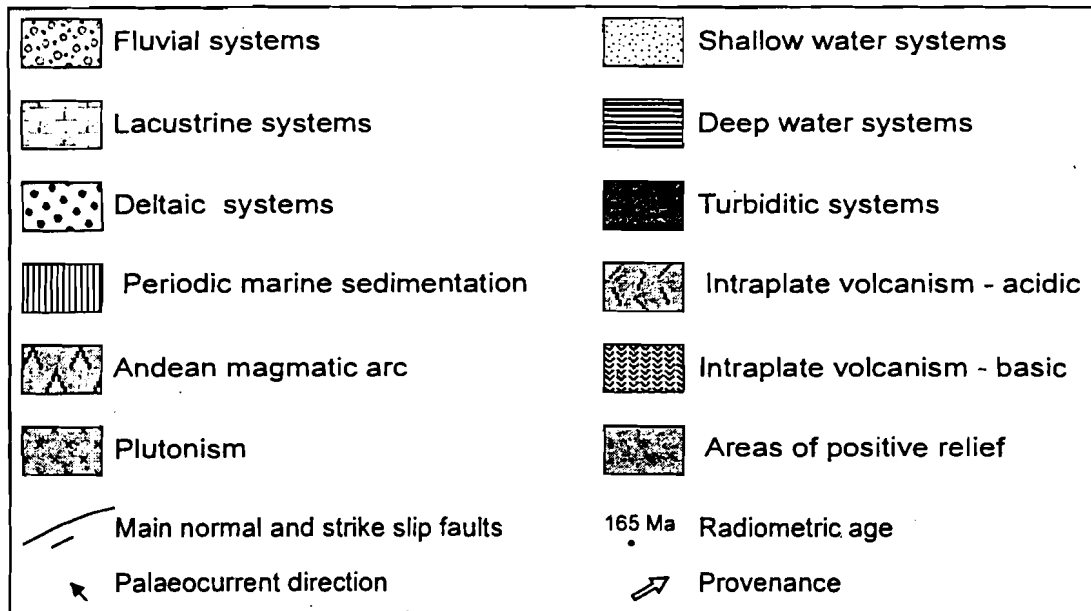


Figure 1. Legend to palaeogeographic maps shown in figures 2 and 3.

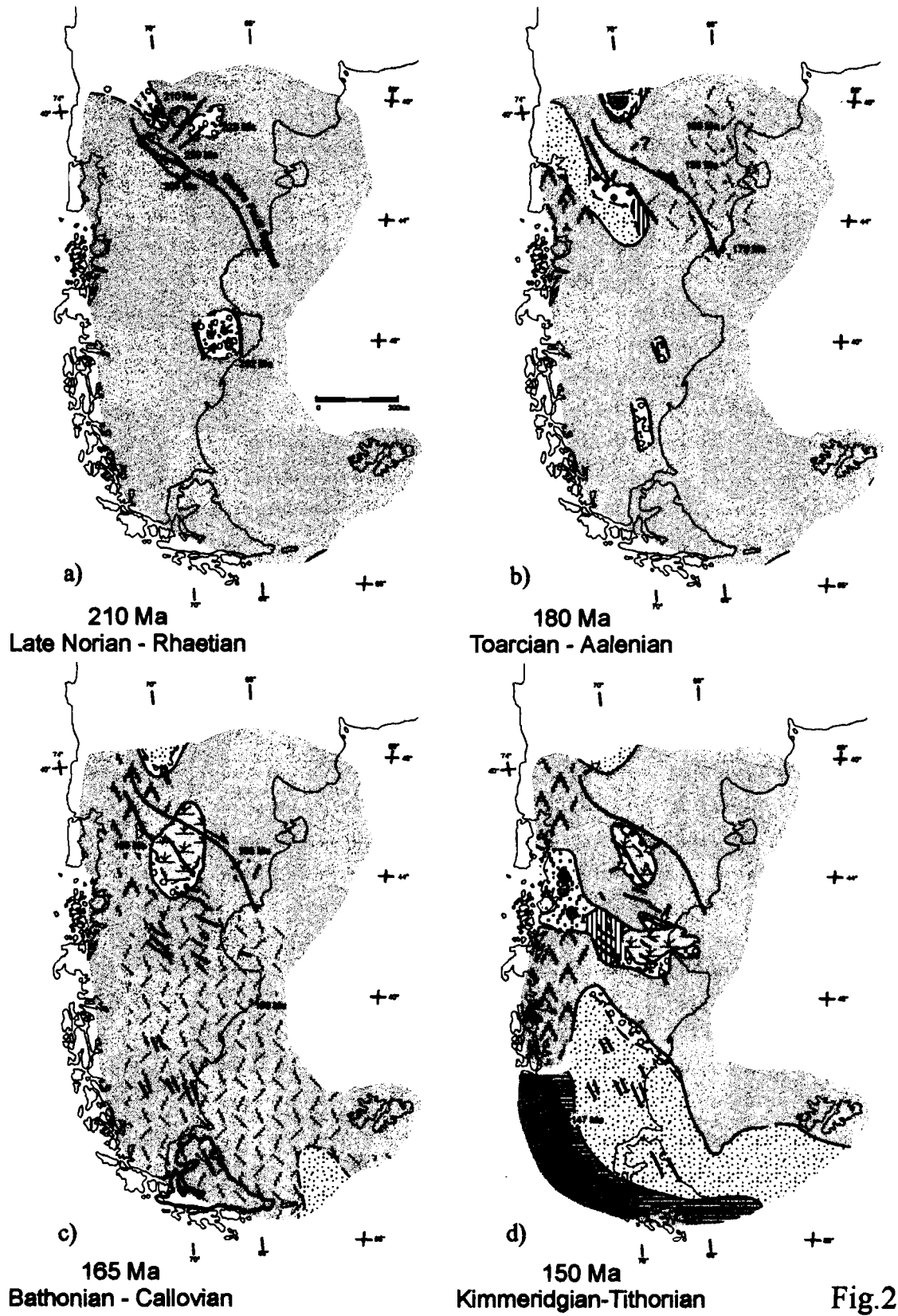


Fig.2

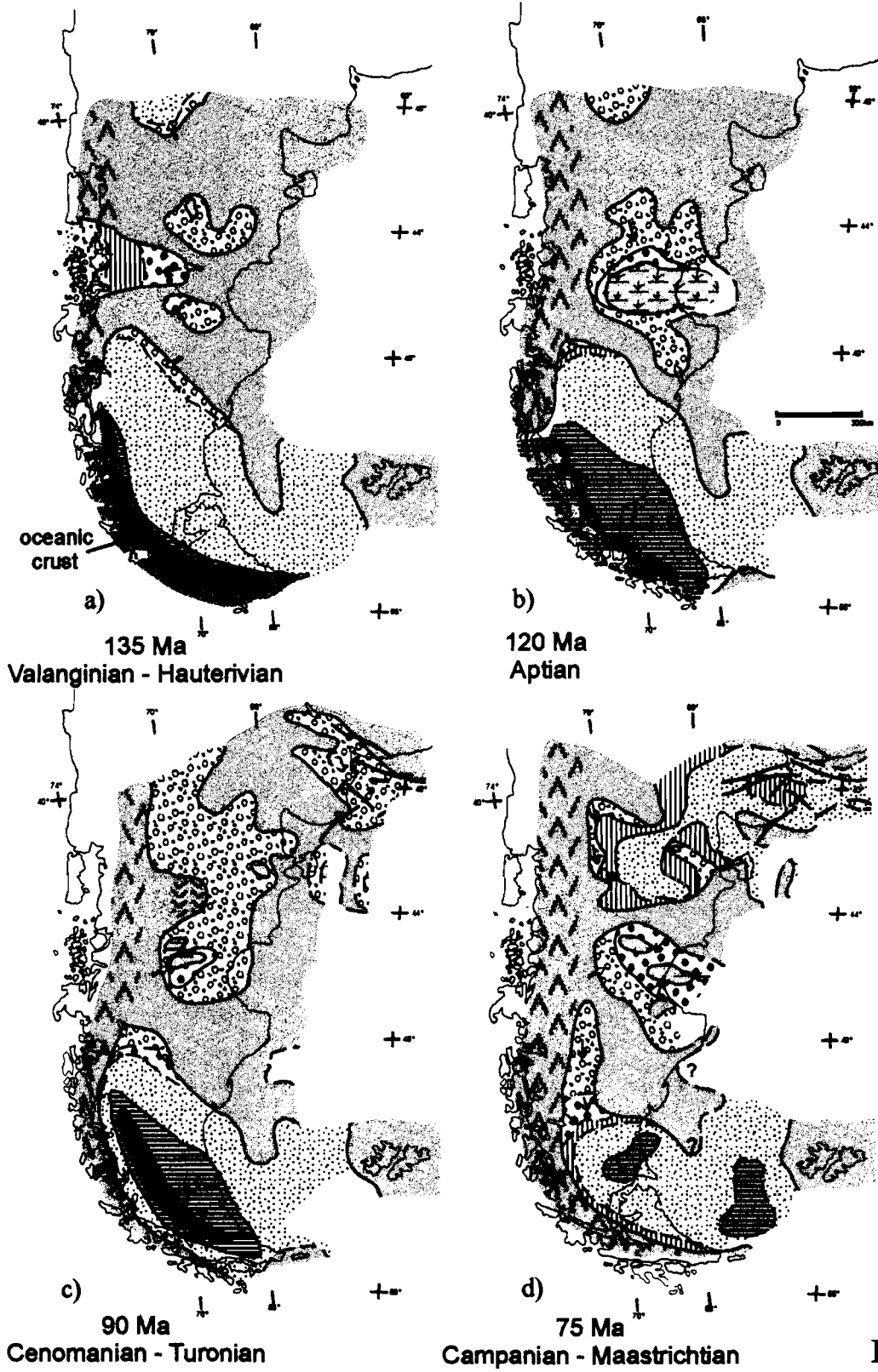


Fig.3