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Introduction

Paleontology and stratigraphy of South America

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This special issue of the *Journal of South American Earth Sciences* gathers contributions presented at the Third European Meeting on the Palaeontology and Stratigraphy of Latin America (EMPSLA), held in Toulouse on September 19–20, 2002. Forty-four participants from 15 countries (Argentina, Belgium, Brazil, Chile, Canada, Colombia, Ecuador, Finland, France, Germany, the Netherlands, Spain, the United Kingdom, the United States, and Venezuela) provided 37 extended abstracts that were published and distributed to the participants (Jaillard, 2002). The meeting itself comprised 23 presentations and 17 posters. Seven of these contributions appear in this special issue of the *Journal of South American Earth Sciences*.

The Toulouse meeting was organized in conjunction with the 5th International Symposium on Andean Geodynamics (ISAG, September 16–18, 2002) by the French Institut de recherche pour le développement (IRD) and the Université Paul Sabatier of Toulouse. It followed the Table Ronde Européenne Paléontologie et Stratigraphie d'Amérique Latin held in Lyon in 1992 (Gayet, 1993) and the Second European Meeting on the Palaeontology and Stratigraphy of South America in Heidelberg in 1997 (Bengtson, 2001, 2004). In view of the excellent atmosphere and fruitful scientific exchange during the meetings thus far, we intend to continue to organize these events approximately every 5 years. The next EMPSLA is planned for 2007, probably in Madrid.

South America shows distinctive biogeographic patterns, at times marked by endemism, which makes correlations with standard biostratigraphic scales difficult. The area also presents challenges regarding faunal migration and evolution. These issues are enhanced because most paleontological and biostratigraphic studies were carried out more than 50 years ago. Therefore, it is important to compare the paleontological material and biostratigraphic scales for South America with those in use in classical European areas. For understanding the evolution of the backarc areas or the pre-Andean history of the margin, biostratigraphy provides the most economical and precise tool for dating nonmagmatic rocks. These facts have been considered by the organizers of the meetings held thus far.

The papers included in the issue, by authors from Germany, France, Chile, and Brazil, deal with the paleontology and biostratigraphy of Cretaceous–Tertiary marine deposits of South America. They refine the biostratigraphic schemes of the Andean region and improve regional and global correlations.

In western South America, the early Cretaceous marine deposits appear in a discontinuous belt of sedimentary basins that extend from Neuquén (Argentina) to Bogota (Colombia). Of these, the Atacama (Chile) and Lima (Peru) basins remain poorly known. F. Mourgues presents preliminary results about early Valanginian-late Aptian ammonites from the Atacama basin of northern Chile that provide a reinterpretation of the sedimentary evolution of this part of the margin, as well as a means to correlate it with the Neuquén basin of Argentina.

A subsequent transgression in the Albinan progressively advanced onto the South American craton to the east and deposited organic-rich sediments. E. Robert and L. Bulot launch a new hypothesis about the phyletic evolution of the endemic Albian engonoceratids of Peru based on an exhaustive study of sections in central and northern Peru. Such studies make it possible to refine the age and distribution of the successive transgressive pulses.

Mid and Late Cretaceous times are marked by the opening of the South Atlantic Ocean, which led to individualization of South American faunal provinces. E.J. Andrade et al., describe and reassess the bivalve *Neithea* from the Cretaceous of northeastern Brazil and discuss the biogeographic and biostratigraphic distribution of the various species.

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J. Philip and E. Jaillard present a revision of the Campanian–Maastrichtian rudistids of northern Peru, which previously were studied only before 1923. These faunas show affinities with Caribbean faunas and provide new constraints on the trans-Pacific and peri-Caribbean migration paths of the group during latest Cretaceous times.

During the Late Cretaceous–Tertiary interval, Andean building led to significant topographic, climatic, and sedimentary changes in South America, as well as to plate reorganizations and accretions in the paleo-Pacific realm. However, because of the uplift of western South America, the marine fossil record in this area is scarce. Nevertheless, only biostratigraphic studies involving various fossil groups can provide precise chronological information about the evolution of the Andean chain and subsequent paleogeographic changes.

Using both macro- and microfaunas, E. Jaillard et al. propose a stratigraphic revision of the late Campanian–Eocene synorogenic deposits of the Western Cordillera of Ecuador. They suggest that two distinct oceanic terranes were accreted successively to the Andean margin in Campanian and late Maastrichtian times, respectively.

M. Schöning and K. Bandel describe fossil wood of Miocene age from southern Chile, inferring a warm climate, diversified flora, and endemism, which led to the present-day flora of the region. Peculiar diagenesis and preservation are related to the associated tuffaceous and calcareous deposits.

S. Nielsen et al., reassess the Miocene gastropod fauna from the same area. The fauna shows little affinity with other parts of the world, in support of the endemic character of the fossils from this region noted by Schöning and Bandel.

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