TOWARDS A PALAEOECOLOGICAL RECONSTRUCTION OF THE MIOCENE VERTEBRATE FAUNAS OF THE PISCO FORMATION (PERU): GLIMPSES INTO THE PAST OF THE HUMBOLDT CURRENT ECOSYSTEM

A. Collareta[1*], O. Lambert[2], F.G. Marx[3,4], C. de Muizon[5], R. Varas-Malca[6], W. Landini[2], G. Bosio[7], E. Malinverno[7], K. Gariboldi[1], A. Gioncada[1], M. Urbina[6] and G. Bianucci[1]

[1]Dipartimento di Scienze della Terra, Università di Pisa, Pisa, Italy
[2]D.O. Terre et Histoire de la Vie, Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium
[3]Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand
[4]Department of Geology, University of Otago, Dunedin, New Zealand
[5]Département Origines et Evolution, CR2P UMR 7207, (MNHN, CNRS, UPMC, Sorbonne-Université), Muséum national d'Histoire naturelle, Paris, France
[6]Departamento de Paleontologia de Vertebrados, Museo de Historia Natural-UNMSM, Lima, Peru
[7]Dipartimento di Scienze dell'Ambiente e della Terra, Università degli Studi di Milano-Bicocca, Milan, Italy

*pcitton@unrn.edu.ar

Keywords
Cetacea, East Pisco Basin, Elasmobranchi, Fossil-Lagerstätte, Peru–Chile Current

Flowing northwards along the western coast of South America, the Humboldt Current hosts extremely high levels of biological productivity all-year-round. With the aim of developing a deep-time investigation of this unique ecological setting, we provide the first synoptic overview of the palaeoecological habits of the fossil marine vertebrates of the Pisco Formation, a shallow-marine sedimentary unit of southern Peru that is renowned worldwide for its abundant and well-preserved Miocene fossil content. By building upon palaeontological data gathered on hundreds of fossils (including cetaceans, pinnipeds, seabirds, turtles, crocodiles, and bony and cartilaginous fishes), palaeoenvironmental conditions and palaeoecological relationships are thus reconstructed for the three sequences that comprise the Pisco Formation and their marine vertebrate assemblages. Some aspects of the Pisco palaeoecosystems are then investigated in detail, and similarities and differences are highlighted with respect to the present-day Humboldt Current Ecosystem and other extant Eastern Boundary upwelling systems. Like today, the southern Peruvian shelfal ecosystems witnessed by the Miocene Pisco strata were based on sardines, which are locally known from several fossils (including stomach contents). At the same time, they notably differed from their modern equivalent in being dominated by extremely large-bodied apex predators such as ***Livyatan melvillei*** and ***Carcharocles megalodon***.

Acknowledgments Stephen J. Godfrey and one anonymous reviewer.