

The 1973 and 1975 Paleontological Expeditions of Madagascar by the National Science Museum, Tokyo*

By

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The Gondwanaland that had existed in the late Paleozoic Era, with Madagascar in the center, was broken up in the supposedly post Jurassic time. For the purpose of elucidating the relationship between the split of the continent and the subsequent changes in fauna and flora, the National Science Museum Party carried out a Paleontological investigation of Madagascar in 1973 and 1975, over a period of 70 days from August to October, respectively.

Outline of the Paleontological Investigation in 1973

Members and their specialities are as follows: Kazuo ASAMA (National Science Museum)—Paleozoic and Mesozoic plants; Hiroshi UJIIÉ (National Science Museum)—Mesozoic and Cenozoic foraminifers; Ienori FUJIYAMA (National Science Museum)—Mesozoic and Cenozoic insects; Yoshikazu HASEGAWA (National Science Museum)—Fossil vertebrates; Yasumitsu KANIE (Yokosuka City Museum)—Mesozoic mollusks.

In the first half of the period (Sept. 4–Sept. 25), the party split into two groups, A and B, to carry out field work in different regions. Group A (ASAMA, FUJIYAMA and HASEGAWA) collected scores of fossil fish and several ammonites, which were contained in nodules from the marine sediments at about 20 km south of Ambilobe. In a village of Berivotra, 50 km southeast of Majunga, dinosaur remains were found in the Cretaceous sandstone and a small-scale excavation was tried in cooperation with Group B. Besides the dinosaur remains, they could collect some specimens of crocodile and chelonian carapaces from the same sediments.

Group B (UJIIÉ and KANIE) accomplished fairly serial sampling extending from the Maestrichtian through Paleocene in the Majunga area. Studying these samples, they may be able to trace consecutive changes of marine fossil assemblage from Cretaceous to Tertiary and ascertain the horizon of dinosaur-bearing beds by referring to marine formations. A considerable amount of fossils was also collected from the Cenomanian marine sediments in the Diégo-Suarez region, northern tip of Madagascar.

In the latter half of the period (Sept. 29–Oct. 11), the party split into three groups, A, B and C. Group A (ASAMA and FUJIYAMA) collected Triassic plants from the Sakamena Group at several localities by a road between Ranohira and Ihosy and at

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a locality along a river in the village of Andasy, although these specimens were all fragmentary and ill-preserved.

Group B (UJIIÉ and HASEGAWA) obtained many fragments of egg of *Aepyornis* in the vicinity of Ampanihy, southern point of Madagascar. Along the Onilahy River in the Tuléar area they sampled 21 samples mainly for the study of foraminifers and calcareous algae. Of these the lower three samples belong to the Cretaceous System, and this presents a problem of presence of the Danian-Paleocene Series between the Cretaceous System and the overlying limestone of the lower Eocene. In Menabe hills,



Fig. 1. Sketch map of Madagascar, showing the surveyed route.

KANIE (Group C) collected many ammonites and inoceramids from the Mesozoic beds which are supposedly Campanian in age. He obtained a large quantity of *Ostrea* from the Maestrichtian beds in Menabe, too.

Outline of the Paleontological Investigation in 1975

The Second Party was composed, in addition to ASAMA, HASEGAWA and KANIE, of the following members:

Ikuwo OBATA (Mesozoic ammonites) and Satoshi MATSUBARA (biomineralogy), both National Science Museum; Charles RAMANITRAHIRAISANA, William RAKOTOARIVELO, and Yves RATSIMBA, all Geological Survey of Madagascar; Charles RANAIVOSON, University of Tananarive; THEODORE, Direction of the Scientific and Technical Research.

In the first half of the period (Sept. 1–Sept. 15), the party split into two groups, A and B, to carry out field work in two regions, Tuléar and Menabe.

Group A (ASAMA, HASEGAWA, MATSUBARA, RAKOTOARIVELO and THEODORE) dealt chiefly with fossil vertebrates, ammonites and plants in the Tuléar region. At several localities, Lower Cretaceous ichthyosaurs and plesiosaurs were newly discovered, in association with mollusks. The first finding of these reptiles in Madagascar may be significant in connection with distribution and evolution of the marine reptiles. Permian plants including many fragments of *Glossopteris* were collected from sandy shale of the Sakoia Group on the bank of the Mavonono River, although they were so fragile to be kept eternally.

Group B (OBATA, KANIE, RANAIVOSON and RATSIMBA) surveyed the stratigraphy of the Menabe and Morondava regions and collected several hundreds of Campanian ammonites and inoceramids.

In the latter half of the period (Sept. 19–Oct. 10), the two groups joined in the excavation of dinosaur remains and collected a great number of dinosaur bones, chelonian carapaces, crocodile bones and snake vertebra in the Upper Cretaceous rocks of the Majunga region. In association with these fossil animals, many barite crystals a few centimeters across were discovered so that the dinosaurs may have been lived in a calm lake, where barium sulfate was precipitated in freshwater. In the Majunga region the Campanian non-marine sediments are divided into two parts; the upper is composed of greenish siltstone to sandstone, cross-laminated white sandstone and massive white sandstone and the lower member is composed of spotted greenish to reddish sandstone to siltstone and white sandstone. The reptilian fossils are commonly found in the lower greenish sediments.

Deposition of Fossil Collections and their Study

The fossil specimens collected in 1975 are all deposited in the Geological Survey of Madagascar and those in 1973 were sent to Japan and now under studying.

The results will successively be published in the Bulletin of the National Science Museum. After the studied specimens are registered in the Museum, they will be returned to the Geological Survey of Madagascar.

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