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Palaeogeography, Palaeoclimatology, Palaeoecology 239 (2006) 470–486
PALAEO
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# New Oligocene–early Miocene microflora from the southwestern Turkana Basin Palaeoenvironmental implications in the northern Kenya Rift

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Received 15 March 2005; received in revised form 17 February 2006; accepted 17 February 2006

**Abstract**

We report five Oligocene–early Miocene pollen assemblages from the Loperot-1 exploration well drilled in the semi-desert Lokichar Basin (latitude 02° 21′ 46.15″ N, longitude 35° 52′ 23.47″ E, ground elevation 615 m above MSL), near Lake Turkana in northern Kenya. They represent the second oldest plant microfossils so far recovered from East Africa and add significantly to the Paleogene–Neogene tropical African fossil plant record. The Loperot pollen indicate a mosaic environment of semi-deciduous forest and humid woodland whose floristic composition presents strong affinities with the vegetation occurring today in the Guinea-Congolia/Zambezia phytogeographical transition zone, with a rainfall more than 1000 mm/year and a well defined dry season. The weak representation of Poaceae and herbaceous taxa characteristic of grassland, dry bushland or savanna and the abundance of shade tolerant plants such as ferns all point to a vegetation composed to a variety of communities with closed forest formations predominant. The lack of typical temperate mountains elements, mainly *Podocarpus* and *Juniperus* today widespread on the East African highlands, indicates that the geography of the region was different from that of today. The plateaux or uplands adjacent to the Lokichar basin were probably still not high enough during this period of early rifting in East Africa to support the temperate coniferous forests characteristic of the Plio-Pleistocene.


*Keywords:* Kenya Rift; Turkana depression; Lokichar Basin; Oligo-Miocene; Palynology; Palaeovegetation; Palaeoclimate; Palaeogeography

## 1. Introduction

The central and northern segments of the Kenya Rift contain a full sequence of Neogene sedimentary rocks and lavas several hundred metres thick, spanning the time from the early stages of rift development through to the present day (Fig. 1). Parts of these sequences are exposed along the faulted margins of the rift, and parts are only revealed by geophysical data (Morley et al., 1992; Mugisha et al., 1997; Morley et al., 1999; Renaut et al., 1999; Hautot et al., 2000). These sedimentary formations contain a remarkably rich and diverse mammalian fauna. In the Turkana Basin of northern Kenya, fluvial and lacustrine sediments exposed on the eastern and western shores of Lake Turkana have been a

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doi:10.1016/j.palaeo.2006.02.007

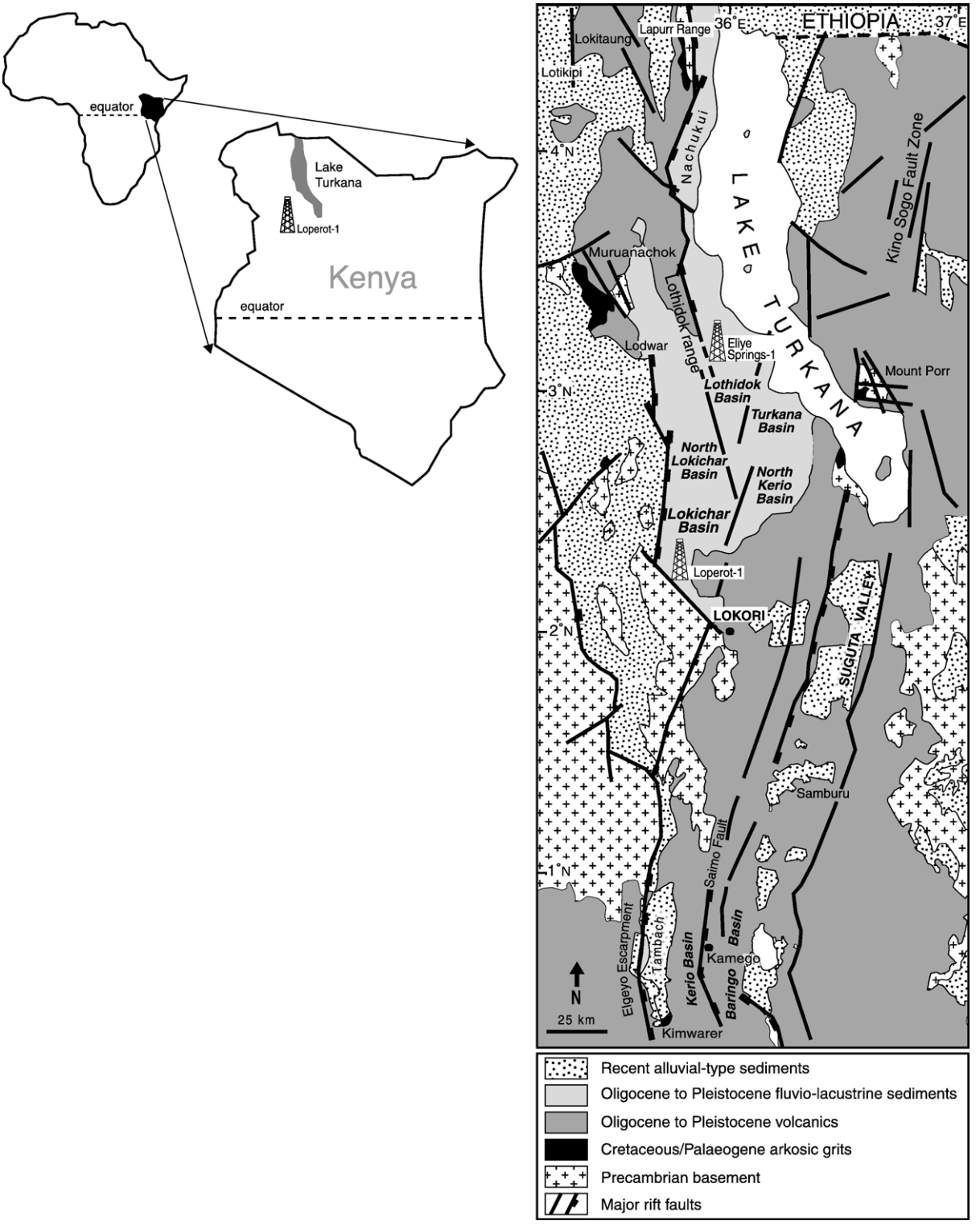


Fig. 1. Location of the Lokichar Basin the Turkana region of northern Kenya, and regional geology of the central and northern Kenya Rift showing the Paleogene–Neogene sedimentary and volcanic terrains (compiled from Joubert, 1966; Walsh, 1969; Walsh and Dodson, 1969; Geological Map of Kenya, 1987). Sedimentary basins initiated during Paleogene times are indicated in bold italic letters. The location of the two Shell exploration wells (Loperot-1 and Eliye Springs-1) is shown, as well as sites providing modern pollen rain data (in bold capital letters).