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The first Indo-French Prehistorical Mission in Siwaliks and the discovery of anthropic activities at 2.6 million years

La première mission préhistorique franco-indienne dans les Siwaliks et la découverte d'activités anthropiques à 2,6 millions d'années

Anne Dambricourt Malassé

Histoire naturelle de l'Homme préhistorique (HNHP, UMR 7194 CNRS/MNHN/EPCC), Département de préhistoire, Muséum national d'histoire naturelle, Musée de l'Homme, Institut de paléontologie humaine, 1, rue René-Panhard, 75013 Paris, France

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ABSTRACT

This paper presents the first Indo-French Prehistorical Mission in the Himalayan foothills, northwestern India, and introduces the results of the multidisciplinary research program "Siwaliks" under the patronage of Professor Yves Coppens, from the Collège de France and Académie des Sciences, France. This program is dedicated to the discovery of cut marks on mineralized bovid bones collected among vertebrate fossils in a fluvial formation named "Quranwala zone" in the Chandigarh anticline, near the village Masol, and located just below the Gauss–Matuyama polarity reversal (2.58 Ma). Artefacts (simple choppers, flakes) have been collected in and on the colluviums. This important discovery questions the origins of the hominins which made the marks.

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RÉSUMÉ

Cet article présente la première mission préhistorique franco-indienne dans les piémonts himalayens du Nord-Ouest de l'Inde et introduit le programme de recherche pluridisciplinaire « Siwaliks », sous le parrainage du professeur Yves Coppens, du Collège de France et de l'Académie des sciences. Ce programme est dédié à la découverte de traces de boucherie sur des os minéralisés de bovidés, collectés parmi des fossiles de vertébrés d'une formation fluviale nommée zone Quranwala dans l'anticlinal de Chandigarh, près du village de Masol et située juste sous la limite de l'inversion de polarité Gauss–Matuyama (2,58 Ma). Des artefacts (choppers simples et éclats) ont été collectés dans et sur les colluvions. Cette importante découverte interroge l'origine des hominiens auteurs de ces traces.

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E-mail address: iphadm@mnhn.fr

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1. The first Indo-French Prehistoric Mission

The first Indo-French Prehistoric Mission is a partnership between the Mixed Research Unit 7194 CNRS, National Museum of Natural History, Department of Prehistory, Paris, and the NGO Society for Archaeological and Anthropological Research, (SAAR), headquartered in Chandigarh, Union Territory in northern India. “Siwaliks” is the name bestowed at the research program developed to investigate geological formations in the Northwestern Himalayan foothills (Fig. 1A and B).

The name Siwaliks evokes the large geographical areas that have marked the story of human paleontology and prehistory in Asia well before the South African karsts and the East African Great Rift Valley. The history of the cooperation between the two partners is described in detail in these Proceedings of the French Academy of Sciences, entitled “Human origins on the Indian sub-continent” with a forward by Yves Coppens, Honorary Professor at the College of France and member of the Academy of Sciences. Ten articles are devoted to the discovery of human scavenging activities in the sub-Himalayan floodplains dating from 2.6 Ma (Fig. 1) (Dambricourt Malassé et al., 2016a) covering a multidisciplinary field of research: geomorphology; mineralogy; sedimentology; lithostratigraphy; paleomagnetism; paleontology; taphonomy; techno-typology of lithic assemblages; and microtopography of the cut-marks.

Prehistorical surveys were first conducted in the Hindu Kush in Pakistan between 1996 and 1998 (Dambricourt Malassé, 2008; Dambricourt Malassé and Gaillard, 2011; Gaillard et al., 2002). As early as 2002, Mukesh Singh, President of the SAAR, proposed to pursue the research in the Indian Himalayan foothills where he had surveyed the terraces during many years (Mohapatra and Singh, 1979), in the high valleys of Himachal Pradesh and in the Siwalik Frontal Range, a small chain that separates Himachal Pradesh and Punjab States (Fig. 1C). The Miocene formations of Himachal Pradesh are world-renowned for their extinct great apes *Sivapithecus* and *Indopithecus giganteus* (*Gigantopithecus bilaspurensis*), but much less for their karsts and their caves perched by the uplift of the Tibetan Plateau.

The site is a small inlier in the Siwalik Frontal Range near the Masol village, 30°50' 2"N, 76° 50' 31" E, north of the Union Territory of Chandigarh, the capital of Punjab and Haryana States, and 450 km east from Riwayat, in the Potwar Plateau, Pakistan; Riwayat is the locality where Dennell and his team collected a few artefacts in situ dated at least 2 Ma (Dennell et al., 1988; Hurcombe, 1989) and may date back to 2.58 Ma (Dennell, 1998) (Fig. 2). Masol is at the same latitude as two other majors prehistoric sites in China close to the River Yangtze: the cave of Longgupo, Wushan County, Gansu Province in Central South China, 3150 km away and dated to 2.48 Ma (Han et al., 2015), and the large fissure of Renzidong, Fanchang County, Anhui Province in Central East China, at a distance of some 3800 km dated to the maximum of 2.58 Ma (Hou and Zhao, 2010). The parallel passes through the Tibetan Plateau, especially the Mio-Pleistocene fossiliferous Zanda Basin (Wang et al., 2013) located 330 km north-east of Masol. This basin is crossed by the Langqen Zangbo River, or the Sutlej River in India which

cuts through the Siwalik Frontal Range 30 km north of Chandigarh (Fig. 1C). Masol, Riwayat, the Zanda Basin, Longgupo and Renzidong are below the Qinling Range (34°N), which separates conventionally Northern (Palearctic) and Southern (Eastern) China. The sources of the Indus, Sutlej and the Yangtze Rivers are located on the Tibetan Plateau.

The Siwalik Frontal Range has gradually risen since the Middle Pleistocene due to the progressive uplifting of the Himalayan Range generated by the tectonics between Indian and Eurasian plates. The Himalayan rivers filed their terraces on the margins of these foothills, rich in stone tool assemblages named Soanien (Gaillard and Dambricourt Malassé, 2008; Gaillard et al., 2011). The combination of the ongoing anticlinal folding and the monsoon rains excavates and exposes the Plio-Pleistocene fossiliferous layers, and by locations, terrestrial vertebrates, among which featured freshwater species, many reptiles such as the turtle *Geoclemys*, the crocodylian *Crocodylus* and *Gavialis* and the large herbivore, *Hexaprotodon*. The terrestrial species included the giant turtle *Colossochelys*, carnivores such as *Hyena* and *Panthera*, many herbivores of different sizes such as *Stegodon*, *Elephas*, *Hipparion*, *Equus*, *Hemibos*, *Sivatherium*, *Camelius*, rare species such as anthracothere *Mericopotamus dissimilis*, and two primates, namely, *Theropithecus* and *Procynocephalus* (e.g. Patnaik and Nanda, 2010; Patnaik et al., 2014).

Since 2012, the research program, “Siwaliks” is under the patronage of Yves Coppens (Coppens, 2016).

2. The Siwaliks and the origins of *Homo* genus (1930s–1970s)

The first fossil Asian ape was found in 1879 in the Potwar Plateau, the Western molasse of the Siwaliks bordered by the Indus River and crossed by the Soan River. Lydekker named the specimen *Sivapithecus* well before the discovery in 1933 of the *Proconsul* in Kenya, Eastern Africa. In 1934, Lewis collected a partial maxillary in the Miocene formations of Himachal Pradesh at Haritalyangar, 80 km north-west of Masol (31° 32' N, 76° 38' E) (Fig. 1C, Fig. 2, Fig. 3A and B). The famous YPM 13799 (Yale Peabody Museum) was assigned to a new genus, *Ramapithecus brevirostris*, because of its prognathism apparently less developed than *Sivapithecus*, Lewis proposed to consider the new fossil as an ancestor of the genus *Homo*. The Upper Indus Basin and the Himalayan foothills became the cradle of humankind up to the 1970s thanks to the works of Simons and Pilbeam; nevertheless the maxillary YPM 13799 was reclassified as a *Sivapithecus* (for a review see Kelley, 1988; Patnaik and Chauhan, 2009; Pillans et al., 2005; Vogel, 1975). The primate list of Haritalyangar was completed by the discovery of a mandible of a large species *Indopithecus giganteus* (CYP 359/68, Chandigarh Yale Paleontology), the magnetostratigraphy dating this assemblage from the Dhok Pathan Formation, to 8.5 Ma (Patnaik and David, 2007), while other analyses concluded that “the sedimentary environments and fauna suggest that Haritalyangar primates lived within a river floodplain setting, which included open forest vegetation with patches of bamboo, in a seasonally wet sub-humid to semi-arid climate” (Pillans et al., 2005). The absence of apes in the fossiliferous formations of late

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