

Paléontologie humaine et Préhistoire

Narmada *Homo erectus* – A possible ancestor of the modern Indian

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Received 15 November 2004; accepted after revision 5 October 2005

Available online 19 January 2006

Written on invitation of the Editorial Board

Abstract

Tracing continuity of evolving humans with the aid of their scanty skeletal remains is an intricate puzzle. In the specific case of Indian sub-continent, the so-far oldest human ancestor, the Narmada hominid, has wider spatial distance both from the antecedents on one side and the descendants on the other side. *Ramapithecus*, a geographically closely located primate earlier considered of *hominidae* affinity, is now far out of human lineage. Distance to the nearest possible *Homo erectus* remains for Southeast and East Asia and the westward located Levantine, African and European remains are no less than exorbitant three to four thousand kilometres from the Hathnora fossil locality. The nearest possible 25 000–30 000-year-old descendants of Batadombalena (Sri Lanka), Darra-i-Kur (Afghanistan), Kurnool District caves, or even younger Bhimbetka, Sarai Nahar, Mahadaha, Lothal, Dholavira of 4000–10 000-year-old antiquity are closely located (Fig. 1). A possible hierarchical relationship is attempted. **To cite this article:** A. Sonakia, H. de Lumley, C. R. Palevol 5 (2006).

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Résumé

L'*Homo erectus* de Narmada : un ancêtre possible de l'homme indien moderne. Retracer la continuité de l'évolution humaine à l'aide d'un nombre restreint de restes de squelettes constitue un puzzle embrouillé. Dans le cas particulier du sous-continent Indien, l'ancêtre de l'homme le plus ancien jusqu'à présent, l'homme de Narmada, se situe à une distance spatiale assez grande à la fois de ses antécédents et de ses descendants. *Ramapithecus*, un primate proche géographiquement, considéré précédemment comme ayant une affinité *hominidae*, est actuellement considéré comme très éloigné de la lignée humaine. Les sites les plus proches comportent des restes d'*Homo erectus* en Asie de l'Est et du Sud-Est, dont les restes européens, africains et levantins sont très éloignés, à savoir pas moins de 3 à 4000 km de la localité fossilifère d'Hathnora. Les descendants les plus proches, dont l'âge se situe entre 25 000 et 30 000 ans, à savoir ceux de Batadombalena (Sri Lanka), Darra-i-Kur (Afghanistan), des grottes du district de Kurnool, et même ceux, plus jeunes (4000 à 10 000 ans), de Bhimbetka, de Sarai Nahar, de Mahadala, de Lothal, de Dholavira, sont très proches spatialement (Fig. 1). Une tentative de relation hiérarchisée est présentée ici. **Pour citer cet article :** A. Sonakia, H. de Lumley, C. R. Palevol 5 (2006).

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Keywords: *Homo erectus*; Modern Indian; Narmada; India

Mots clés : *Homo erectus* ; Homme indien moderne ; Narmada ; Inde

1. Introduction

After the discovery of the Hathnora hominid, hopes and prospects have definitely increased for more discoveries of skeletal remnants of primitive hominids in the geographic province that constitutes the Indian sub-continent. Twenty-two years have since elapsed after the Narmada *Homo erectus* skull was discovered at Hathnora in Sehore district of the central India State of Madhya Pradesh. Surveys have been vaguely and sporadically conducted, but still any authentically reported news is very much awaited. Most of the surveys have been just of prospecting type, like scanning the lithological units similar to that of Narmada gravels in the Narmada River channel and other alluvial deposits, but what is really called for is a systematic and logic-based search by multidisciplinary faculties of academic and surveying organisations and institutions.

Few multidisciplinary studies should have been concentrated around suitable ecological niches and favourable habitats, nearness or connectivity with known fossil localities, locations of primary Palaeolithic sites found in abundance and in probable sites from where the minimum sustainable needs of those days were drawn.

With the deep paucity of skeletal material, it is very difficult to evolve a model to exhibit true and absolutely flawless picture of human radiation. Then there has been another ambiguity that human evolution and radiation is being generally observed in isolation from other contemporary mammals that essentially formed an integral component of the food web. Secondly, entire mammal legacy in the peninsular India is looked up as totally descended from the Mio-Pliocene Siwaliks. Not only the peninsular Indian but furthermore the mammals of the Indonesian Archipelago have been described as very closely related to the Narmada Quaternary fauna. However, the story of continuity of primate legacy is full of spatial gaps and negative options.

2. The Primates

It was in 1934: *Ramapithecene* molars, partial maxillae and mandibles were reported by Lewis [9] and a great exercise was conducted to reconstruct not only its cranium, but a hypothetical model of its entire body structure. Presumably, an occasional bipedal gait was

also presumed. *Ramapithecus* was stocky, but short and slender built.

Now all the Indian Siwalik Mio-Pliocene great apes viz. the *Gigantopithecus*, *Sivapithecus* and the *Ramapithecus* have been basically grouped under one single taxon, the *Sivapithecus*. The term *Sivapithecus* was however coined by Pilgrim [13]. Primary basis of this grouping has been the excessive thickness of enamel on the occlusal surface of cheek teeth and not the dental-gnathic pattern alone. The incisor-form canines have also not been of much support to keep the classical *Ramapithecenes* in family Hominidae [12]. In context with the evolving hierarchy, Prasad's logic [14] appears befitting that "the occurrence of many of these advanced apes and *Ramapithecus*, the Siwalik of India formed the radiation centre for the evolution of man". Prasad further goes on to add that "Siwalik hills and Narmada valley hold key to the future exploration pertaining to the origin and evolution of primates." And that proved true.

3. Human remains

When the *Ramapithecus* remains have been put as antecedents to the present-day orang-utans, little scope is left to fill in the phylogenetic void prior to the Hathnora *Homo erectus* individual in human or pre-human lineage.

The geographically nearest *H. sapiens* that have been studied by Wakankar (personal communication) are from the well-known UNESCO Heritage caves of Bhimbetka, located barely 40 km northwest of the Hathnora *Homo erectus* site (Fig. 2a). The Vindhyan caves, rock shelters complex, well known for rock paintings, have also yielded bones of 10 000–12 000-year-old *Homo sapiens* (Fig. 1) with highly evolved features in a dorsally enlarged neuro-cranium, although there are innumerable caves in the low-dipping Vindhyan quartzite strata comprising the Vindhyaçal mountain range that runs very close to the Narmada River channel on its northern side. The Bhimbetka complex is however much different from other rock shelters and since there is practically no stratified cave deposit of prominence, the chances of getting human or other cave dwelling animals are very meagre. However, the thick pile of debris, just in front of these rock shelters, ap-



Fig. 1. Hathnora *Homo erectus* site and other human fossil sites in India and neighbouring countries.

Fig. 1. Site de l'*Homo erectus* d'Hathnora et autres sites de restes humains en Inde et dans les pays voisins.

pears to be a potential ground for locating remnants of possible inhabitants.

The artefact sites in the sub-continent are numerous, but if we take into account the human skeletal remains, the geographically next location is that of Sarai Nahar Rai and Mahadaha remains of the Pratapgarh district of Uttar Pradesh [15]. These remains were dug up accidentally during construction of irrigation canals. A large number of basal Holocene human remains with modern features have been systematically excavated here by Allahabad University scholars. Still older or contemporary could be a mandible from the later Pleistocene Mogasrayanigondi cave deposits in Kurnool district, of Andhra Pradesh (Fig. 2b) [3] with broad retromolar area and large mental foramen. This individual appears to be an aging adult surviving in a hibernating environment. In an overall granitic terrain in the southern peninsula, very thin veneer of alluvium is observed. Though excellent primary Palaeolithic sites have been reported from this part of the country, yet only one human tibial part is reported from the Attirampakkam area near Chennai [5].

4. The Lothal–Dholavira–Mohenjodaro human remains

Most famous and culturally very deeply studied *Homo sapiens* skeletons have been unearthed from the five-millennium BC-old sites of Harappa (Fig. 2c), and Mohenjodaro. These localities are now in Pakistan.

Their chronologically contemporary sites have been discovered by the Archaeological Survey of India in Dholavira, Lothal and Kalibangan in western and north-western India.

The Bronze Age Harappan skeletons show advanced physical evolution. Specifically the skulls sometimes exhibit hyperdolichocephaly, the glabella is massive, the frontal region is low and steeply inclined, the supra-mastoid crest is in mere traces. Orbits have sharp margins, and a low mid sagittal keeling is also observed. Some of these features are common to both Asian and European modern-day humans. The regional population of Harappa, Mohenjodaro and Lothal exhibit heterogeneous characters.

5. The human remains from Sri Lanka and Afghanistan

Fossil evidences of anatomically modern *Homo sapiens* have been recovered from Batadombalena caves besides Belanbandi Palassa, Belilena Kitulgala area in the Sabaragamuva Province near Kuruvita, in central Sri Lanka [5] (Fig. 2d). Kennedy et al. [7] have given a summing up account of the discoveries of the human skeletal remains of ancient Sri Lankans that have been dated around 30 000 years utilizing radiocarbon and thermo-luminescence dating methods for the prehistoric deposits. Human fossils resembling the Sri Lankan ones are yet to be discovered from the Indian sub-continent.

The Darra-i-Kur *Homo sapiens* of Afghanistan [6] is of equal antiquity to that of the Sri Lankan skeletal remains. The skeletal remains comprise a broken right temporal bone of both Neanderthal as well as modern *Homo sapiens* affinity (Teshih Tash Shanidar El Kowm) [2]. This is the only human fossil link between Ubeidiya in the Levant and Narmada.

6. The Narmada *Homo erectus*

The Narmada *Homo erectus* remains (Fig. 3) comprising fairly complete neuro-cranium [10,11,16] have provided evidence of early human existence in peninsular India. For quite long, the Narmada Valley has yielded one of the richest collections of gradually evolving Pleistocene mammals in their stratigraphic disposition. The Narmada *Homo erectus* possesses some of the typical *Homo erectus* features based on both metrical and non-metrical features summarised by Andrews [1], viz., the very low disposition of maximum cranial breadth, flat and gently receding frontal, strong and bulging mastoid and supra-mastoid crests, opisthocranium

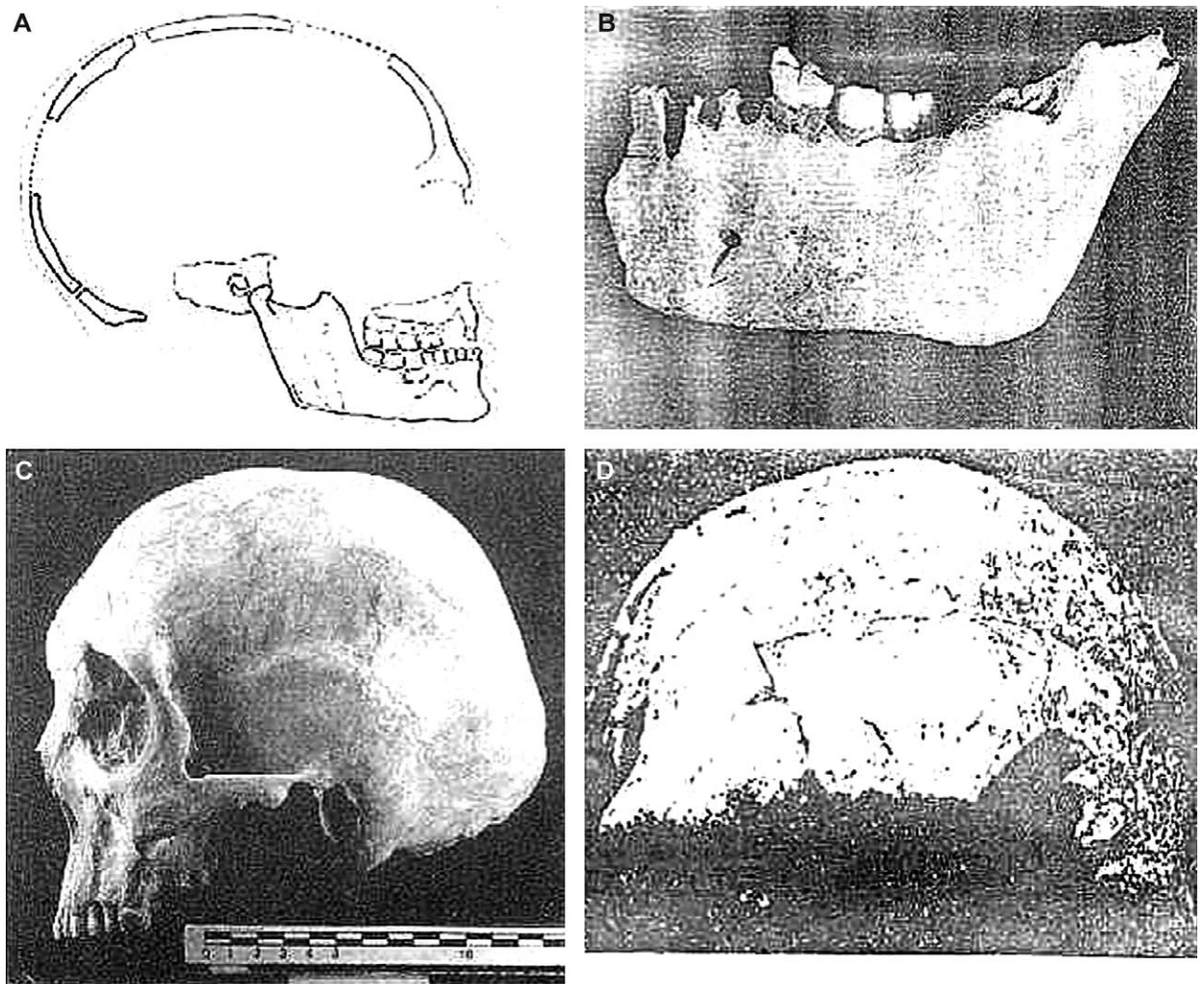


Fig. 2. (a) Right lateral view of *Homo sapiens* skull, Bhimbethka. (b) Mogasarayanigondi Cave's mandible, District of Kurnool. (c) Skull of the Harappan *Homo sapiens*. (d) Frontal view of the *Homo sapiens* from Batadombalna, Sri Lanka.

Fig. 2. (a) Vue latérale droite du crâne d'*Homo sapiens* Bhimbethka. (b) Mandibule de la grotte Mogasarayanigondi, district de Kurnool. (c) Crâne de l'*Homo sapiens* d'Harappan. (d) Vue frontale de l'*Homo sapiens* de Batadombalna, Sri Lanka.

coinciding with inion, pronounced post-orbital constriction, strong supraorbital torus, flat parietal, low temporal squama, angularity between the axis of the petrous bone and the thick tympanic plate, the later being in coronal plane, the upper squama being shorter than the lower in the occipital bone, strong but abraded occipital torus, thick external and internal tables of skull wall, metopic prominence, a median keel in parietal junction area, flanked by parasagittal depressions, and a clearly brought out bregmatic eminence. Kennedy et al. [8], utilizing multivariate analysis and highlighting negative factors only, however, differ in taxonomic assignment and prefer to designate the Narmada cranium as 'archaic' *Homo sapiens* [4]. Kennedy et al. [7], how-

ever, quote that "the Narmada calvaria is the only well-preserved and authenticated discovery of a Middle Pleistocene fossil hominid recovered from the Indian sub-continent and its geographical mid-point situation between the east and relatively richer fossil hominid sites in far East and Southeast Asia, and in the Eurasian and African land masses afford it a unique place." The Narmada *Homo erectus* was excavated along with typical Middle Pleistocene fauna, like *Stegodon namadicus* and *Sus namadicus* in the gravel conglomerate layer in which it was found in situ just overlying the Matuyama–Brunhes palaeomagnetic reversal shown by deeply oxidised silt. This reversal is dated at 0.78 Ma [17].



Fig. 3. Skull of Narmada *Homo erectus*.

Fig. 3. Crâne de l'*Homo erectus* de Narmada.

7. Conclusion

The morphological features of the progressively evolved humans in the sub-continent show a kind of biological continuity disseminating from Narmada in the central India to Sri Lanka towards south and from Sarai Nahar in north and further to Lothal, Mohenjodaro in the western part of sub-continent. The gaps in the records of skeletal remains are substantiated by the relicts of cultural activity and that would hopefully help us to find more skeletal evidences. With the Hathnora *Homo erectus* specimen in core area, a gradual evolution to modern *Homo sapiens* could be inferred.

References

- [1] P. Andrews, An alternative interpretation of the characters used to define *Homo erectus*, *Cour. Forsch. Inst. Senkenb.* 69 (1984) 167–175.
- [2] J.L. Angel, A Middle Palaeolithic temporal bone from Dara-i-Kur, Afghanistan, *Trans. Am. Phil. Soc.* 62 (4) (1972) 54–56.
- [3] Anonymous, “News”, Geological Survey of India Southern Region 123 (1) (1994).
- [4] S.C. Anton, Natural history of *Homo erectus*, *Yearb. Phys. Anthropol.* 46 (2003) 126–170.
- [5] S.U. Deraniyagala, Man and environment during the Pleistocene in Sri Lanka. Paper presented at the 14th Congress of the Indo-Prehistory Association, Yogyakarta, Indonesia, 1990.
- [6] L. Dupree, Prehistoric research in Afghanistan, *Trans. Am. Phil. Soc.* 62 (1972) 1–84.
- [7] K.A.R. Kennedy, A. Sonakia, J. Chiment, K.K. Verma, Is the Narmada Fossil Hominid an Indian *Homo erectus*?, *Am. J. Phys. Anthropol.* 96 (4) (1991) 475–496.
- [8] K.A.R. Kennedy, S.U. Deraniyagala, W.J. Roertgen, J. Chiment, T. Disotell, Upper Pleistocene fossil Hominids from Sri Lanka, *Am. J. Phys. Anthropol.* 72 (1987) 441–461.
- [9] G.B. Lewis, Preliminary notice of New Man like Apes from India, *Am. J. Sci.* 27 (1934) 161–179.
- [10] H. de Lumley, A. Sonakia, Contexte stratigraphique de l’Homme de la Narmada, Hathnora, Madhya Pradesh, Inde, *L’Anthropologie* 89 (1) (1985) 3–12.
- [11] M.-A. de Lumley, A. Sonakia, Première découverte d’un *Homo erectus* sur le continent indien, à Hathnora dans la moyenne vallée de la Narmada, *L’Anthropologie* 89 (1) (1985) 13–61.
- [12] D. Pilbeam, G.E. Meager, C. Badgly, M.P. Rose, M.H. L. Pideford, A.K. Behrensmeyer, S.M.I. Shah, New hominid Primates for the Siwaliks of Pakistan and their bearing on hominoid evolution, *Nature* 270 (1977) 689–695.
- [13] G.E. Pilgrin, Notice of New Mammalian genera and species from the Territories of India, *Geol. Surv. India Rec.* X (1910) 63–71.
- [14] K.N. Prasad, in: An introduction to Earth science, Vikas Publishing House Private Ltd., 1994, pp. 117–118.
- [15] G.R. Sharma, Mesolithic lake culture in the Ganga Valley, *Proc. Pre-Hist. Soc.*, 1973.
- [16] A. Sonakia, The skull-cap of Early man and associated mammalian Fauna from Narmada Valley alluvium, Hoshangabad Area, Madhya Pradesh (India), *Geol. Surv. India Rec.* 113 (6) (1984) 159–172.
- [17] A. Sonakia, S. Biswas, Antiquity of Narmada *Homo erectus*: The early man of India, *Curr. Sci.* 75 (4) (1998).