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SCIENTIFIC NOTE

A DISCOVERY OF MAMMOTH TUSK FOSSIL IN THE "BAI HASSAN FORMATION" NORTHEAST, IRAQ

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INTRODUCTION

A mammoth tusk was found in Cham Chamal area, Northeast Iraq. It is found in the clastics of the Late Neogene sediments, within a conglomerate bed of the Bai-Hassan Formation (Pliocene – Pleistocene).

The aim of this report is to document the discovery of the mammoth tusk fossil.

The site is located within the Southwestern limb of Darband Bazian Anticline, at Qara Dagh Mountain, southwest Sulaimaniyah City (Fig.1). The mammoth tusk was uncovered by the action of the seasonal stream water.

The area includes the Late Neogene sequence of Injana, Mukdadiya and Bai Hassan formations. These formations are exposed in a small synclinal structure at the northeastern edge of the Low Folded Zone of the Outer Platform of the Arabian Plate (Fouad, 2012).

All of the previously discovered vertebrate fossil remains were found in the clastic sediments of these formations.

Al-Naqib (1959) mentioned the occurrence of vertebrate remains in Mukdadiya Formations. Since then, many workers found such vertebrates remains as (*Mastodon longirostris, Hipparion gracile, Achtiaria* sp., *Gazelladeperdita*, *Gazellagaudryi* and *Oiocerosrothi*).

Behnam (1977) and Raji (1978) mentioned that very rare fossils in Bai Hassan Formation were recorded, such as some smooth ostracods, charophytes, bryozoa and *Mammalian* bones.

Karim *et al*., (2008), discovered vertebrate foot prints of birds and hoofed sheep in the Mukdadiya Formation in Cham Chamal area.

Al-Zubaidi and Jan, (2015), reported the presence of vertebrate fossils in Fatha, Injana and Mukdadiya formations. Those vertebrate fossils include mold of fish fossils and large femur bone of mastodon and large number of bone remains, which were deposited and preserved within rock units of evaporate and fluvial environments.

The Bai Hassan Formation is exposed almost in all anticlines of the Low Folded Zone; east of Tigris River (Sissakian and Al-Jibouri, 2012).

Mammoth, mastodons, and elephants belong to the family Elephantidae, a group of large land trunks and tusks (Shoshani *et al*., 2007). Most populations of wooly mammoth are found in North America and Eurasia.

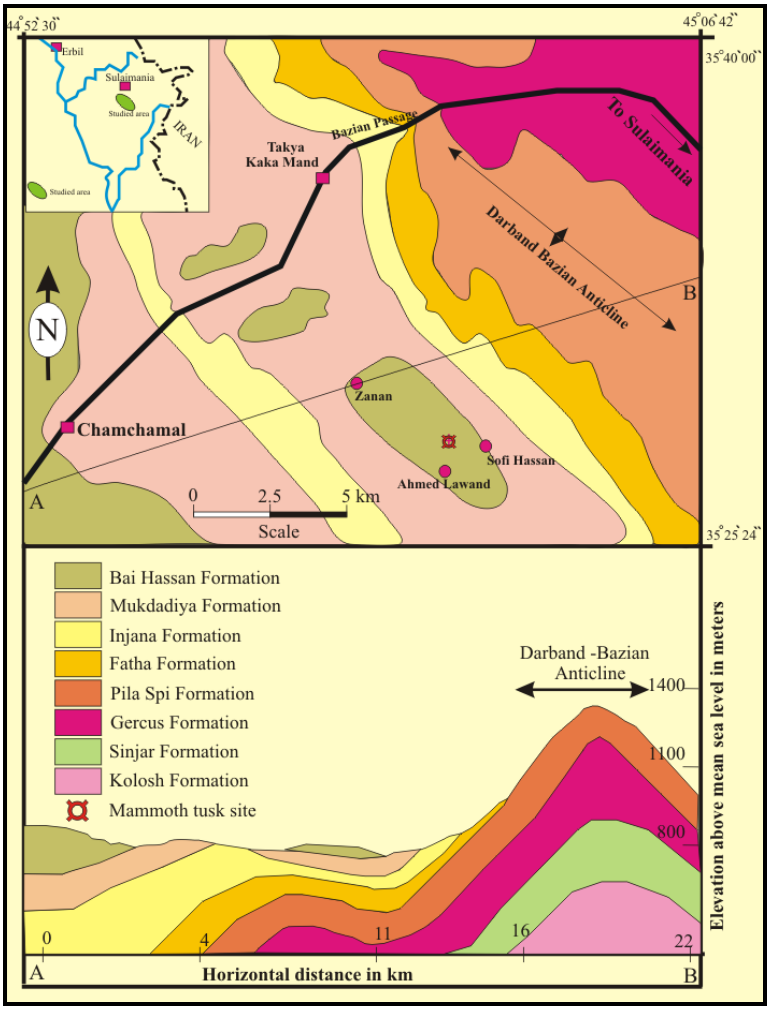

Fig.1: Geological map and cross section of the studied area,
(Karim *et al*., 2008)

Wooly mammoths had very long tusks (modified incisor teeth), which were more curved than those of modern elephants. The largest known male tusk is 4.2 m long and weighs 91 kg. Female tusks were smaller and thinner, averaging at 1.5 – 1.8 m and weighing 9 kg (Kurten and Anderson, 1980).

Mastodon were smaller than mammoths, with a height of 2.1 m for females and 3.1 m for males, (Lister and Bahn, 2007). In the Asian species, only the males have large tusks. Asian females have very small ones, or none (Gilbert *et al*., 2008).

Most of the tusk composed of dentine, which is deposited in layers, usually in thickness of 6 mm a year. The annual layers of tusks are somewhat like tree rings.

The newly discovered mammoth tusk was found during the detailed geological mapping of Cham Chamal plain. The mammoth tusk was found in the area, northeast "Ahmed Lawand" village and northwest "Kani Mustafa" village. It was embedded in a conglomerate bed of the Bai Hassan Formation. The conglomerate bed has (30° − 45°) dip in 223 SW direction, which is a part of the southwestern limb of Darband-Bazian anticline (Fig.1).

The mammoth tusk, appeared by weathering processes of the seasonal stream water of the relatively soft conglomeratic bed (Fig.2).

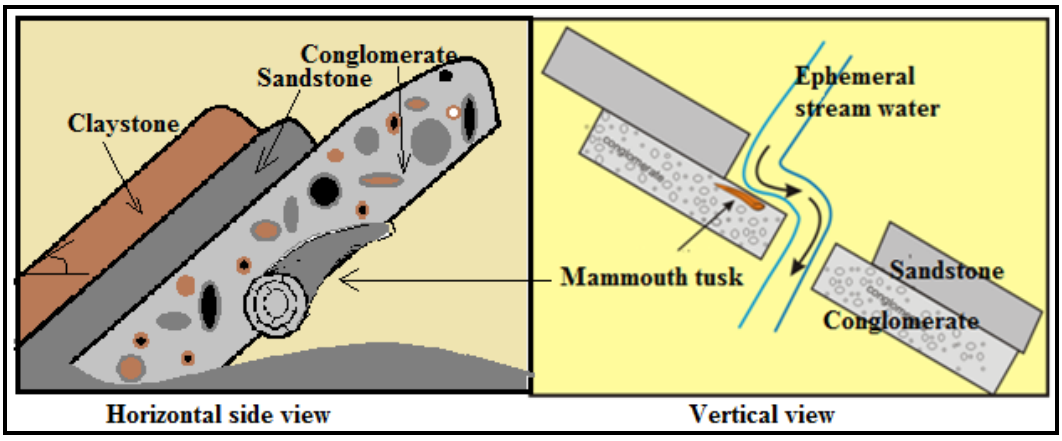

Fig.2: Mammoth tusk appeared by stream water erosion

The tusk is about; 10 cm in diameter and 40 cm lengths. Its cylindrical end was weathered by stream water to become very soft, while the conical end was grooved indented and buried within the conglomerate. The conglomerate bed is relatively compact, but its base became relatively softened, weakened and then eroded by stream water, which exposed the tusk. The mammoth tusk was also affected by the weathering processes and became very soft and can be detached with a slight touch, (Fig.3A and B).

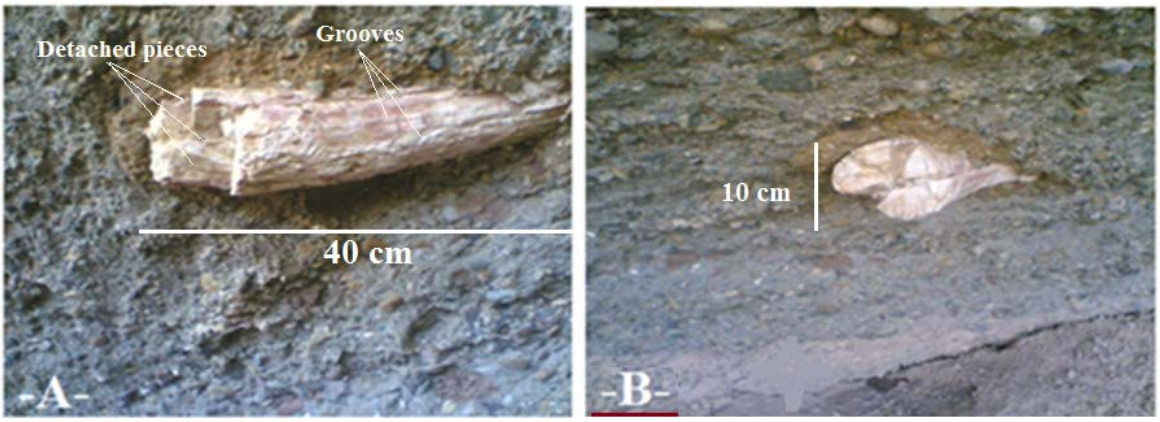

Fig.3: Different views for the discovered Mammoth tusk

More than one piece (3 − 7 cm in diameters) of bone fragments were found impregnated and disseminated in the conglomerate beds of the Bai Hassan, in the same area.

The author believes that, this tusk fossil (because its short and straight in appearance) belong to either a young female mastodon (*mammuthus primigenious)* or it is a broken tusk of any of wooly mammoth sexes that lost its tusk by fighting or during sweeping aside snow or during the transportation from death location to the current burial site (Vereschagin and Baryshnikov, 1982; and Kubiak, 1982; Gilbert *et al*., 2008).

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