

## Wadi El Hittan The Only Natural Heritage Site in Egypt between the Past and the Present

Rodaina Mohamed Shideed Mohamed

Guidance Section, Faculty of Tourism and Hotels Management, Helwan University

Shereen Mohammed Ahmed

Instructor at Faculty of Tourism Studies and Hotels Management, Helwan University

### Abstract

Valley of the Whales; Wadi El Hitan; is one of the most important heritage sites in Egypt, it is the only natural heritage site among the UNESCO list in Egypt. It is located at El Fayoum governorate, the importance of which refers to the difference in whales' skeletons that were excavated in this area; Moreover, geological evolution that occurred in this area. This article aims to highlight the importance of the site and its development. Moreover, the recommendations that could help in a new touristic plan to be announced.

**Keywords:** Whales- evolution- fossils-Cetaceans<sup>1</sup>- Basilosaurus

### Introduction & Description (Historical back ground)

Wadi El Hitan<sup>2</sup> (or Zeuglodon Valley<sup>3</sup>) is about 12 kilometres west of the prominent hill of Garet Gehannam in Wadi el Rayan Protected Area. 80 km to the west of Cairo, in the western desert. The dry and magnificent environment preserve the traces of the early evolution of life. The place houses the fossils which represent an important stage in biological growth: the evolution of whales from mundane creatures into mammals that lived in the ocean<sup>4</sup>. The fossils vividly show the life forms and lifestyles of the transitional whales starting with its numbers, the burial concentration, and ending with the preservation quality which was considered a valuable phase in this prospective<sup>5</sup>.

<sup>1</sup>Originated in the ancient *Tethys ocean* 50 million years ago from terrestrial mammals that were adapting to the aquatic environment. They have evolved so that they are the dominant group of marine mammals for their species and habitats diversity and their wide distribution in the planet.

<sup>2</sup>D. P. DOMNING and P. (1994). GINGERICH, "NEW SPECIES (MAMMALIA, SIRENIA), FROM THE LATE MIDDLE EOCENE OF WADI HITAN, EGYPT", *Contributions from the museum of Paleontology the University of Michigan*, Vol 29, n. 3.

<sup>3</sup>Ph., GINGERICH. (1990). "Hind Limbs of Eocene *Basilosaurus*": Evidence of Feet in Whales, Vol, 249, p. 154-5.

<sup>4</sup>Shanan E. Peters, Mohammed Sameh M. Antar, Iyad S. Zalmout and Philip D. Gingerich "Sequence Stratigraphic Control on Preservation of Late Eocene Whales and Other Vertebrates at Wadi Al-Hitan, Egypt" in *PALAIOS* Vol. 24, No. 5/6 (May - Jun., 2009), pp. 290-302 (13 pages), p. 290.

<sup>5</sup>Chen A., Ng Y., Zhang E., Tian M. (2020) Wadi Al-Hitan (Whale Valley), *Egypt*. In: (eds) *Dictionary of Geotourism*. Springer, Singapore. [https://doi.org/10.1007/978-981-13-2538-0\\_2717](https://doi.org/10.1007/978-981-13-2538-0_2717); S. PETER; M. SAMEH; I. S. ZALMOUT; P. GINGERICH, "SEQUENCE STRATIGRAPHIC CONTROL ON PRESERVATION OF LATE EOCENE WHALES AND OTHER VERTEBRATES AT WADI AL-HITAN, EGYPT", p. 290-302, *Palaios*.

In 2005, it was included among the World Hirtage list of the UNESCO<sup>1</sup> in Egypt. The site of Wadi El Hitan is considered as area because of the unique excavations that occurred in it. However, according to the documents several studies were made in the site. These studies varied between stratigrphy, geological, Paleontological and other studies. The paleontologic studies focused on the importance of the vertebrate fossils of the area, as it studied different mammals like, the shark and ray faunasin the middle and late Eocene of the Fayoum Area<sup>2</sup>.

The upper Middle and Upper Eocene strata in Wadi Al Hitan area are divided into four formations namely the Gehannam, Briket Qaroun and Qasr El-Sagha formations in addition to a new formation erected and introduced in the present work called Garet El-Naqb Formation.

The importance of Wadi Al-Hitan in Egypt is mentioned by scholars in two different theories, the first is that it is the only place in the world where the skeletons of families of archaic whales could be seen and exposed in their original geological and geographic settings of the shallow nutrient-rich bay of a sea of some 40 million years ago, as the site recorded the evolution of the ancestors of modern whales. Remarkably, two species still had small hind limbs, feet and toes<sup>3</sup>. The second theory indicates that for more than 35 million years there was a great ocean<sup>4</sup>that separated among the three continents, part of this ocean extended as a small part called "Teth Sea" which was located in this site, and passing with the development of the Earth`s geological layer sand<sup>5</sup>.

The geological changes lead to the variation of the nature of the place which resulted in the minimizing of the size of the ocean till it was completely disappeared and the only remaining parts that occurred are the two main seas, the Mediterranean and the Red Sea <sup>6</sup>.

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<sup>1</sup> <https://fayoumegypt.com/the-valley-of-the-whales-wadi-hitan/> visited in 18 August, 2021;S. EL SAYED, M.

KORA, H., SALLAM, K., CLAESON, ER., SEIFFERT, M., ANTAR,"A new genus and species of marine catfishes (Siluriformes; Ariidae) from the upper Eocene Birket Qarun Formation, Wadi El-Hitan, Egypt, 2017.

<sup>2</sup>M. GAMIL,(2016) M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR, "*Lithofacies and biofacies characteristics and whales skeletons distribution in the Eocene rock units of Fayoum Area*, Egypt, Journal of African Earth Science, Vol, 116, p. 43.

<sup>3</sup>W. EL-SAADAWI, "*On the Eocene mangroves of Wadi Al-Hitan World Heritage site*, Fayoum, Egypt..

<sup>4</sup>*Many scholars mentioned that there was no ocean,while this water was from the extended Mediterranean to the middle of the site, while others refused this idea and mentioned that there was no deep water it was just shallow water. (Tethys Sea reached far south of the existing Mediterranean. It gradually retreated north depositing thick layers of sediments which became sandstone, limestone and shale, seen at Wadi Al-Hitan.)*

<sup>5</sup>Shanan E. Peters, Mohammed Sameh M. Antar, Iyad S. Zalmout and Philip D. Gingerich "Sequence Stratigraphic Control on Preservation of Late Eocene Whales and Other Vertebrates at Wadi Al-Hitan, Egypt" in *PALAIOS* Vol. 24, No. 5/6 (May - Jun., 2009), pp. 290-302 (13 pages), p, 291. (The sand in wadi El Hitan is bioturbated)

<sup>6</sup> W. EL-SAADAWI,(2022). "*On the Eocene mangroves of Wadi Al-Hitan World Heritage site, Fayoum, Egypt. Three Eocene formations are visible. Geological History: For eons the Tethys Sea reached far south of the existing Mediterranean. It gradually retreated north depositing thick layers of sediments which became sandstone, limestone and shale, seen at Wadi Al-Hitan. Three Eocene formations are visible. The oldest is the Gehannam Formation (ca 40-41 million years old) consisting of white marly limestone and gypseous shale and yielding many skeletons of archaic whales (archaeocetes), sirenians (sea cows), shark teeth, turtles, and crocodylians. The middle unit, Birket Qarun Formation, consists of sandstone, clays and hard limestone, which*

Though *Wadi al-Hitan* took its name after the whales, but it was proved that they were not the only ancient guests, as the area was also home to ancient animals, the remains of which could still be deduced. More than 400 fossils included sharks, crocodiles, and turtles<sup>1</sup>, whales, mermaids, and other marine mammals. White deer, Egyptian deer, fennec fox, sand fox, wolf, migratory birds like peregrine falcon, falcon deer, Saker, osprey bird, ducks, quail, cleavage, heron, and goats, Wild plants like Atlas plant, rattlesnake, sapiens plant, samar plant, jungle plant, reed plant, are the most important creature preserved in Wadi El Hitan<sup>2</sup>. Wadi El Hitan housed the skeletons of 10 whales exposed like they were in an open air museum, in the Western Desert for the ancient skeletons of the whales and their families<sup>3</sup>.

Excavations of fossils at the site of Wadi El Hitan began in 1902 by H.J.L Beadnell a member of the geological survey in Egypt; however, nine expeditions were led by Egyptian and American Paleontologists between 1983 and 2007. These expeditions resulted in the discovery of 400 types of whales and sea cow skeletons in the valley. Moreover; during the 1989 expedition, the first fully aquatic whale with legs and feet specimens were discovered<sup>4</sup>.

Vertebrate fossils represented by numerous whale skeletons were first described by Beadnell in 1905, and later described in detail by Gingerich in 1992, who has documented more than 500 complete and partial vertebrate skeletons from an area of about 20 km<sup>2</sup>. The most common whale fossils encountered in the area are *Basilosaurus isis* Andrews discovered between 1904 and *Dorudon atrox* Andrews excavated in 1906<sup>5</sup>.

The whales` fossils at Wadi El Hitan depict the evolution of whales from very ancient time up till now. Although today whales are considered air breathing mammals that live in the ocean, but evidence from Wadi El Hitan and another important site in Pakastin show that whales developed from four legged land dwelling mammals to marine creatures. Opinions mentioned by scholars about the evolution of mammals and the reason that caused the land mammals to enter the sea was that at the beginning of the Eocene Epoch, 55 million years

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*also yields* whale skeletons. The youngest formation is the Qasr El-Sagha Formation of Late Eocene age, about 39 million years old. It is rich in marine invertebrate fauna, indicating a shallow marine environment. These formations were uplifted from the southwest, creating palaeo-drainage systems, now buried beneath the sand, which emptied to the sea through mangrove-fringed estuaries and lagoons when the coast was near present Faiyum some 37 million years ago. <http://world-heritage-datasheets.unep-wcmc.org/datasheet/output/site/wadi-al-hitan-whale-valley/> access in 20-6-2022.

<sup>1</sup>Shanan E. Peters, Mohammed Sameh M. Antar, Iyad S. Zalmout and Philip D. Gingerich (2009). "Sequence Stratigraphic Control on Preservation of Late Eocene Whales and Other Vertebrates at Wadi Al-Hitan, Egypt" in *PALAIOS* Vol. 24, No. 5/6 (May - Jun., 2009), pp. 290-302 (13 pages), p, 291.

<sup>2</sup>*Ibid.*, <https://egyptiangeographic.com/ar/news/show/299>, accessed in 16-9-2021.

<sup>3</sup><https://fayoumegypt.com/the-valley-of-the-whales-wadi-hitan/> visited in 18 Aughust, 2021; M. GAMIL, M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR, "Lithofacies and biofacies characteristics and whales skeletons distribution in the Eocene rock units of Fayoum Area, Egypt, *Journal of African Earth Science*, Vol, 116, 2016, p. 42.

<sup>4</sup>Siltstone can only form in quiet, relatively still waters, such as river floodplains, lake beds, river deltas, and swamps.

<sup>5</sup>M. GAMIL, M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR. (2016). "Lithofacies and biofacies characteristics and whales skeletons distribution in the Eocene rock units of Fayoum Area, Egypt, *Journal of African Earth Science*, Vol, 116, p. 43.

ago, global temperature increased rapidly more than usual in geologic history, these changes resulted in the promotion of some land mammals to seek new habitats.

Several types of whales were discovered in this area, the 1<sup>st</sup> two types of whales were excavated in 1903<sup>1</sup>:-

- Basilosorus Isis which length about 18 m up to 21m, as it is considered to be the most complete skeleton found in the site<sup>2</sup>.
- Doryodon athrox as their size is smaller than the 1<sup>st</sup> kind, and their skeletons are not completed like the previous kind, in addition to bones of sea cow and teeth of sharks<sup>3</sup>.
- Saghacetus Osiris and Anclacetus simonsi<sup>4</sup>.

Pakicetus<sup>5</sup> the early ancestor of whales walked on four legs, but it used to take its meals from the water so it used to dive in the ocean to take its meals<sup>6</sup> the origin of this type of whales was Pakistan and India<sup>7</sup>.

The excavations in this site resumed several years later, starting with year 1989 the 1<sup>st</sup> discovery of fully aquatic whale specimen with legs and feet were announced. However, in 1996 they had another excavation in depth of 5 m to find the another type of whale that are called, Atchernous Simondes, passing through year 2006 they excavated for the 1<sup>st</sup> time the marine mammals of elephant ancestors which was known as Peratherium. Finally in 2007 the last excavation occurred for another type of whales with 10 m length known as Maswa Sisty Markagreef<sup>8</sup>.

However; Wadi El Hitan is considered to be an open air museum<sup>9</sup> not only for housing the skeletons of ten ancient whales and their families, but also for rare gigantic fossils of sharks proving that some 40 or 50 million years ago, the area was submerged in the water of what is known as Teth sea<sup>10</sup>. However, Wadi El Hitan was not only a place for the local skeletons of

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<sup>1</sup>Nabil Abu El Seoud (20160. <https://www.elbalad.news/4520621>; M. GAMIL, M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR, "Lithofacies and biofacies characteristics and whales skeletons distribution in the Eocene rock units of Fayoum Area, Egypt, Journal of African Earth Science, Vol, 116. p. 42

<sup>2</sup>M. GAMIL, M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR, "Lithofacies and biofacies characteristics and whales skeletons distribution in the Eocene rock units of Fayoum Area, Egypt, *Journal of African Earth Science*, Vol, 116, p. 43.

<sup>3</sup>Zaki., A., ABDEL FATTAH, Murray., K., GINGRAS "Origin of compound biogenic sedimentary structures in Eocene strata of Wadi El-Hitan universal heritage area, Fayoum, Egypt: Mangrove roots or not?" In *Palaeogeography, Palaeoclimatology, Palaeoecology*, Vol 560, 2020.

<sup>4</sup>M. GAMIL, M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR, *Ibid.*, p. 42.

<sup>5</sup>This kind of whales found in Pakistan and India.

<sup>6</sup><https://www.nhm.ac.uk/discover/when-whales-walked-on-four-legs.html>; M. GAMIL, M. AL NABWY, M. ABDEL FATTAH, G. ABU ELKHEIR, "Lithofacies and biofacies characteristics and whales skeletons distribution in the Eocene rock units of Fayoum Area, Egypt, *Journal of African Earth Science*, Vol, 116.

<sup>7</sup>Pakicetus inachus and the origin of whales and dolphins (Mammalia: Cetacea).

Oelschläger HA Gegenbaurs Morphologisches Jahrbuch, 01 Jan 1987, 133(5):673-685.

<sup>8</sup>OP.cit.

<sup>9</sup>The rock of the Germans is considered to be one of the most important element in Wadi El Hitan as it recorded till now signs which clarify the personality of one of the soldiers, as it seems that during the Second World War in 1942 one of the military planes crashed near to the rock.

<sup>10</sup>W. EI-SAADAWI, "On the Eocene mangroves of Wadi Al-Hitan World Heritage site, Fayoum, Egypt.

Egypt, but also it included skeletons from other places like Pakistan, Europe, North America and Asia, as it had the largest number of discovered skeletons from all over the world<sup>1</sup>.

### **Aims and objectives**

The work at Wadi Hitan started in 1903 as the main target was a comparative study between the whale's fossils here in Egypt and Pakistan (*pakicetus*) according to the study of Charles Darwin (geologist and paleontologist). This site was called "Zeugloden Valley" and it was completely neglected, but the importance and the richness of the site was proved, especially after being announced by the UNESCO as a World Heritage Site<sup>2</sup>. The comparison is based on a deep study on the Whales evolution and the transformation of the limbs to other organs to be converted to mammals<sup>3</sup>. In the site more than two different samples were discovered, the smaller one called *Dorudonatrox*, while the larger called *Basilosarusis*.

Wadi El Hitan is a rich region with its valuable natural and heritage resources. Many types of tourism can be practiced in this natural protectorate. It could be recorded as a natural heritage site as well as being an ancient geological site explaining the evolution of the place, also it is considered as an astronomical place known as "Wadi El Hitan Reserve" as it is one of the best places from which the stars and the Milky Way Galaxy<sup>4</sup> could be observed.

### **Recommendations should be stated as follows;**

#### **Cultural and Heritage Tourism**

The ancient Lake Moeris in the nearby Fayoum depression was large and the climate 8,500-4,000 years ago was wetter, so the abundant wildlife and surrounding fertile soils, attracted continuous human habitation to the Fayoum area from Neolithic times to the present. It was also a major crossroad used for many centuries by travelers between the Nile Valley and the oases of the Western Desert. Remains of human settlements from the early Egyptian, Greek and Roman eras are found there<sup>5</sup>. It is recommended to identify this ancient road used for several centuries ago as an open air museum for this natural heritage site.

#### **Scientific Tourism**

##### **Natural tourism ecotourism**

Geo tourism is tourism associated with geological attractions and destinations a form of natural area tourism that specifically focuses on landscape and geology. It promotes tourism to geo sites and the conservation of geo-diversity and an understanding of Earth sciences through appreciation and learning. This is achieved through independent visits to geological features, guided tours, geo-activities in Wadi El Hitan.<sup>6</sup>

##### **Astrotourism in Wadi El Hitan**

Wadi Al-Hitan (Whale Valley) Reserve, is the best place to observe the stars and our arm of the Milky Way galaxy. The stars in this place appear more clearly and luminously than anywhere else in Egypt. The place is far from light sources, there is no communication network, and nothing but the way the earth looked before urbanization and technology. The

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<sup>1</sup><https://www.memphistours.co.uk/Egypt/Egypt-Travel-Guide/Egypt-Oases/wiki/whale-valley>, visited in 13 Augusts 2021.

<sup>2</sup>Ph., D., GINGERICH, "Evolution of Whales from Land to Sea, Vol, 156. p. 315.

<sup>3</sup>Ph., D., GINGERICH, *Ibid.*, p. 319.

<sup>4</sup>P. W. HODGE, **Milky Way Galaxy**, large spiral system consisting of several hundred billion stars, one of which is the Sun. It takes its name from the Milky Way, the irregular luminous band of stars and gas clouds that stretches across the sky as seen from Earth.

<sup>5</sup>YH., RAMZY.(2013). "Sustainable Tourism Development in Al Fayoum Oasis, Egypt, p. 161.

<sup>6</sup>N. D. and D. R.K.(2010). "The Tourism of Geology and Landscape", Geotourism, Oxford.

most beautiful photos of the stars and the galaxy arm with people who love astronomy could be taken there.<sup>1</sup>

Observing and shooting the Milky Way in the Egyptian desert is breathtaking, especially in Fayoum, where Wadi el-Hitan is located, whose dry, clear weather makes stargazing crystal clear. It is an event that was held on 12<sup>th</sup> June 2017.<sup>2</sup>

With some travel agencies' tour programs; there is a chance to explore the sky with Egyptian Society for Astronomy and listening to stories about legends and tales of the stars and observe the planets and stars with a guide to explain a very distinctive astronomical explanation lecture at night under the stars<sup>3</sup>.

### **The Management of the Wadi El Hitan region**

It is managed as a Special Protection Zone within the Wadi el-Rayan Protected Area (WRPA). The 2002-2006 Management Plan for the WRPA was applied to Wadi Al-Hitan, restricting visitors to the site to guided tours along a marked trail and proscribing many activities. These include the destruction of geological formations, discharging pollutants, hunting and littering. The Wadi Al-Hitan site is patrolled daily to catch illegal visitors and twice a week a team monitors the condition of the fossils, photographing them and when necessary repairing damage. Staff from neighbouring tribes is to be trained as guards and tourist guides, and local people will participate in the area's management. Motorcycle patrols and camel supply transport are proposed. A field outpost is to be sited in excavated caves for protection from the extreme conditions. An open-air museum, two camping sites, camel tours and a bedouin-style ecolodge supplied by private eco tourist companies are all projected, and a sustainable source of funds will be sought<sup>4</sup>.

### **Visitors and visitor facilities**

From 1997 on, Wadi el-Rayan became a popular area for Cairenes, and in 2003 a well equipped Visitors' Centre with an audio-visual theatre and fossil museum was sited on the western lakeshore. Brochures, a video and a website have been produced for the site which is visited by some 150,000 people a year. However at first only about 1,000 visitors a year drove on to Wadi Al-Hitan as the 4WD track is unpaved, crosses treacherous sands and the site itself is extremely desert. Sustainable tourism is being developed and by 2008 on words, 12,000 visitors were arriving each year<sup>5</sup> Because the area has had to be protected, the management plan for the Wadi el-Rayan Protected Area is applied to Wadi El-Hitan restricting visitors to prearranged guided tours along a prescribed trail either on foot or by

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<sup>1</sup>P. W. HODGE, **Milky Way Galaxy**, large spiral system consisting of several hundred billion stars, one of which is the Sun. It takes its name from the Milky Way, the irregular luminous band of stars and gas clouds that stretches across the sky as seen from Earth.

<sup>2</sup>P. W. HODGE, **Milky Way Galaxy**, large spiral system consisting of several hundred billion stars, one of which is the Sun. It takes its name from the Milky Way, the irregular luminous band of stars and gas clouds that stretches across the sky as seen from Earth.

<sup>3</sup> N., KHAIRY ALI, (2022).The Effect of Perceived Quality on Visitor Satisfaction and Loyalty to Wadi El Hitan Protected Area", *International Journal of Tourism and Hospitality Management*.

<sup>4</sup>(<http://world-heritage-datasheets.unep-wcmc.org/datasheet/output/site/wadi-al-hitan-whale-valley/> last accessed 16 August at 12:50pm)

<sup>5</sup>According to UNESCO, 2010.

camel<sup>1</sup>. Wadi El-Hitan is a nature reserve, a world heritage area, and a place for the protection of wildlife<sup>2</sup>.

### Restrictions:

- It is strictly forbidden to throw any waste on the ground.
- It is forbidden to try to feed wild animals, because this destroys their diets.
- The desert weather will be hot during the day and very cold at night.
- Good bathrooms are available in Whale Valley.
- You will need food and clothes for two days. It is not recommended to drink water at the site. Do not forget to bring tissue with you.
- In a cafeteria, there is food and drink at tourist prices.
- It is not advisable to overload your bag. The extra weight can tire you out and hinder your movement.
- Be careful with flashlights. They can cause temporary blindness and harm the eyes because the place is otherwise completely dark.

### Conclusions

The skeletons which were found in different depth in Wadi El Hitan put us in front of a very important question which is the origin of these kinds of whales whether they are the same of the modern whales or an evolution that occurred to give the modern shape. The answer of this question will be indefinite by the different opinions that were mentioned by scholars to explain the origins and the evolution of the skeletons of the whales found inside the site of Wadi el Hittan.

The deep study of Wadi el Hittan, its sand layers, the different types of animals, birds and fish who inhabited the site in ancient times, probably, indicates that different stages that occurred in the evolution of the place and the creatures living in it<sup>3</sup>.

The first type of whales had rear limbs in the form of very small legs, their skeletons especially their jaws and teeth were very near in shape to their ancestors that were known as “

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<sup>1</sup>(<http://world-heritage-datasheets.unep-wcmc.org/datasheet/output/site/wadi-al-hitan-whale-valley/> last accessed 16 August at 12:50pm)

<sup>2</sup> S., A., MOHAMED, M., E., EL RAEY, " *Land cover classification and change detection analysis of Qaroun and Wadi El-Rayyan lakes using multi-temporal remotely sensed imagery*".

<sup>3</sup>At Qaret Gehannam section, the maximum thickness of the Gehannam Formation is about 50 m. *The Gehannam Formation is composed at the base of calcareous, yellowish gray to grayish green, laminated mudstone, which grades upward to calcareous, bioturbated sandstone that contains plant roots and many whale skeletons especially *Basilosaurus isis* and *Dorudon atrox*. This sandstone is followed by pale yellow siltstone and fossiliferous limestone containing bivalve fossils like *Lucina sp.* And many whale bone fragments. The limestone is overlain by yellow fossiliferous marls containing whale skeletons of *Basilosaurus isis*. The topmost part of the succession is formed of calcareous, fossiliferous, nummulitic limestone with *Thalassinoides* (what so called mangrove layer) rich in whale bone fragments, which forms the contact between the Gehannam and the Birket Qaroun formation*

Mesonychids “ looking like “wolves”. The second kind was known as “Pakicetus” the origin of which was Pakistan and India<sup>1</sup>.

The shape of the ancient whales is very near to the hippopotamus, may be an indication that the ancient whales were able to live inside and outside water like the hippocampus nowadays.

It is concluded that the ancient whales were mammals with four legs and this site was a desert with shallow water not an ocean as it was mentioned, so this very dry atmosphere allowed the ancient whales and their ancestors like pigs and giraffes to live in it and to swim if they were obliged to do this.

The theory is that some land-living ungulates favoured munching on plants at the water's edge which had the added advantage of allowing them to easily hide from danger in shallow water. Over time their descendants spent more and more time in the water and their bodies became adapted for swimming.

Although whales are expert swimmers and perfectly adapted to live underwater, these marine mammals once walked on four legs as proved by scholars. Moreover, Their land-dwelling ancestors lived about 50 million years ago. The components of the ocean sand is most biogenic sands which are composed of fragments of coral skeletons, coralline algae, and mollusks. This type of sand is described by its most abundant component. For example, sand composed mostly of coral skeletons is called coral sand an indication that it was not defiantly. Wadi El Hittan is not only famous for housing the ancient skeletons of whales, but it is also considered as the best place to observe the stars and the milky way Galaxy<sup>2</sup>,

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<sup>1</sup>Gingerich PD, Smith BH, Simons EL.(1990). *Hind limbs of Eocene Basilosaurus: evidence of feet in whales.* *Science.* 229: 154–157.

<sup>2</sup>I. E., A Reserve.



List of Plates:



Photographed by Turisi



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<http://www.touregypt.net/images/touregypt/whales7.gif>



Photographed by Turisi

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## وادي الحيتان

### موقع التراث الطبيعي الوحيد في مصر بين الحاضر والمستقبل

#### المستخلص

يعد وادي الحيتان واحد من اهم مواقع التراث في مصر, حيث ان وادي الحيتان مدرج في قائمة اليونسكو بانه موقع التراث الطبيعي الوحيد في مصر. يقع وادي الحيتان في محافظة الفيوم على بعد 80 كيلومتر غرب القاهرة. واكتسب هذا الموقع الاهمية التراثية وذلك لوجود الهياكل العظمية المختلفة للحيتان وتطورها الجسدي تبعا للتغيرات البيولوجية التي حدثت في الوادي. من الملاحظ ان حرارة وجفاف الطقس في هذه المنطقة ساعد بشكل كبير في الحفاظ على الهياكل العظمية لتصبح موقع التراث الطبيعي الاوحد في مصر وذلك بعد اعلانه رسميا عام 2005 في قائمة اليونسكو العالمية للتراث .

تلقي المقالة الضوء على اهمية وتطور الحيتان عن طريق دراسة الهياكل دراسة تفصيلية وكيفية تحور الاطراف في جسم الحوت لتلائم التغير البيئي والبيولوجي الحادث لطبقات الارض, وان هذا يعد تكيف بيئي ميزها بيها الخالق عن باقي الثدييات لكي يحميها من الاندثار ويساعدها على مواجهة صعوبات البيئة المحيطة, مع الاخذ في الاعتبار التوصيات اللازمة لوضع هذه المنطقة التراثية ضمن الخريطة السياحية .

**الكلمات الدالة:** الحيتان- التطورات- الحفريات- الحيتانيات- باسيلوصور