

## The mammals of the Farasan archipelago, Saudi Arabia

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**Abstract:** The Farasan archipelago is located in the southern Red Sea, off the south-western coast of Saudi Arabia. Around the beginning of the 1990s, these islands were designated as a marine and terrestrial reserve, mainly for the protection of the Farasan gazelle, which is the only wild ungulate present on the archipelago. As far as is presently known, other mammals reported from the islands are 2 or 3 species of bat, the Eastern spiny mouse, possibly 1 rat, and the white-tailed mongoose. To date there is no evidence for the occurrence of house mice. Furthermore, the occurrence of the Arabian sacred baboon has been reported from Farasan Kebir. The sea surrounding the archipelago is still home to dugongs and several species of cetaceans. All the non-volant mammalian species occurring at present on the Farasan islands appear to be essentially related to human introduction. The aim of the present work is to outline the occurrence and the distribution of the mammals of the Farasan islands in order to offer a starting point for future studies.

**Key words:** Mammals on islands, *Papio hamadryas*, *Rhinopoma hardwickii*, *Asellia patrizii*, *Ichneumia albicauda*, *Gazella gazella*, *Acomys dimidiatus*, Farasan islands, Saudi Arabia

### Introduction

The Farasan archipelago, Saudi Arabia, is located in the southern Red Sea, off the south-western coast of the Arabian peninsula, between 16°20'N and 17°10'N and 41°30'E to 42°30'E (Figure 1). Its islands vary in size from about 60 km in length (Farasan Al-Kebir) to islets of a few square metres. They consist of fossilised coral and are low, barren, and rather sparsely vegetated (Felemban, 1995). Some islands are fringed with salt-tolerant bushes (Evans, 1994) and mangroves. The Farasan archipelago is of international importance (Thouless, 1991), housing breeding colonies of many seabirds and turtles, and there are major fisheries based on the surrounding coral banks.

Several unique plants and other endemic organisms are known to occur there (Kingdon, 1990), but there are very few endemic vertebrates, possibly due to the fact that these territories were joined to the Arabian peninsula at the end of the Pleistocene (cf. Macfadyen, 1930), enabling them to be colonised by contemporary continental fauna. The most intriguing vertebrate is perhaps an endemic snake, *Coluber insulanus* Mertens, 1965, the type specimen of which was captured while swimming in the sea along the coast of the island of Sarso, in November 1964, in the course of the “Meteor”-Expedition launched by the Senckenberg-Museum in the Indian Ocean (Mertens, 1965). However, according to Gasperetti (1988): “... to be sure, such an amphibious adaptation in highly saline sea water is unusual colubrine activity”.

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The aim of the present work is to outline the occurrence and the distribution of the insular mammals in order to offer a starting point for future studies. The concentration of the entire existing bibliography on the mammals of the Farasan archipelago is an additional aim of this work.

### Material and methods

This research is mainly based on the examination of the material collected in the course of a survey carried out on the Farasan archipelago in 1984 by the joint mission of the Gruppo Ricerche Scientifiche e Tecniche Subacquee of Florence (Italy) and the Feal Costruzioni of Milan (Italy), which was building a hospital there. This material is now conserved in the Zoological Museum “La Specola” of the University of Florence. Data also were collected through original sightings and direct observations of tracks and other field signs, excrement and food remains, as well as a review of all previous knowledge of the history and natural history of these islands. Additional data on the mammalian composition of the islands were also

obtained through evaluation of the materials conserved in the following museums and private collections: British Museum of Natural History, Gasperetti’s private collection, Muséum d’Histoire naturelle of Geneva, Senckenberg Museum, Frankfurt am Mein, and Berlin Zoological Museum. An additional aim of this work is a synthesis of the entire existing bibliography on the mammals of the Farasan islands.

### Results and discussion

#### The terrestrial mammals

The terrestrial mammals recorded to date from the Farasan islands are very few and, as far as is presently known, comprise only 8 species, including 2, perhaps 3 bats, 1 primate, 1 carnivore, 1 ungulate, and possibly 2 or more rodents (Table 1). Members of the latter taxonomic group are represented by the eastern spiny mouse, *Acomys dimidiatus* (Cretzschmar, 1826), 15 specimens of which were trapped on Farasan Kebir by Iyad Nader (*in litteris*), on 18 November 1983. One

Table 1. Terrestrial mammals reported to date from the Farasan archipelago.

Species	Island	References
Lesser mouse-tailed bat, <i>Rhinopoma hardwickii</i> Gray, 1831	Farasan Al-Kebir	Harrison and Bates, 1991; NCWCD, 2000
Patrizi’s trident leaf-nosed bat, <i>Asellia patrizii</i> De Beaux, 1931	Farasan Al-Kebir and Segid	Moeschler et al., 1990; Harrison and Bates, 1991; Evans, 1994; Horáček et al., 2000; Nader, 2000
<i>Pipistrellus</i> sp.	Farasan Al-Kebir	Jennings, 1988
Hamadryas baboon, <i>Papio hamadryas</i> (L., 1758)	Farasan Al-Kebir	MZUF 11329; Masseti and Bruner, 2009;
White-tailed Mongoose, <i>Ichneumia albicauda</i> (G. [Baron] Cuvier, 1829)	Farasan Al-Kebir	Jennings, 1988; NCWCD, 2000; Taylor (in press).
Farasan gazelle, <i>Gazella gazella farasani</i> Thouless & Al Bassri, 1991	Segid, Farasan Al-Kebir, Zifaf, Dumsuq, and Qummah	Kingdon, 1990; Thouless and Al Bassri, 1991; MZUF 11330, 11331, 11332
<i>Rattus</i> sp.	Farasan Al-Kebir	Newton, 1995; Gladstone, 2000; NCWCD, 2000
Eastern spiny mice, (Cretzschmar, 1826) <i>Acomys dimidiatus</i>	Farasan Al-Kebir	Iyad Nader, 2007 (pers. com.)



Figure 1. The geographical location of the Farasan archipelago in the Southern Red Sea.

species of rat also appears to occur on these islands (see Newton, 1995; Gladstone, 2000; National Commission for Wildlife Conservation and Development, 2000), perhaps *Rattus rattus* (L., 1758), although to date there is no scientific evidence for the presence of the latter murid, or of house mice, *Mus musculus* L., 1758. Evans (1987), however, reported that in the Red Sea, black rats are present on a number of islands where they are known to prey upon the eggs and chicks of marine birds (see also De Marchi et al., 2006; Clapham, 2008).

According to the National Commission for Wildlife Conservation and Development (2000), foxes and hares also formerly occurred on the Farasan islands. Today, however, the occurrence of carnivores is limited to that of the white-tailed mongoose, *Ichneumia albicauda* (G. [Baron] Cuvier, 1829), on Farasan Al-Kebir (Jennings, 1988; Simmons, 1995; National Commission for Wildlife Conservation and Development, 2000). This species has been shown to have a severe adverse effect on the success of the local breeding of the osprey, *Pandion haliaëtus* (L., 1758) (Fisher, 2001).

Bats are represented by the lesser mouse-tailed bat, *Rhinopoma hardwickii* Gray, 1831 (Gaucher in Harrison and Bates, 1991), and as observed by Jennings (1988), possibly by one representative of the genus *Pipistrellus*. The Farasan archipelago is also known as the only site in Arabia that provided specimens of the Patrizi's trident leaf-nosed bat, *Asellia patrizii* De Beaux, 1931 (Moeschler et al., 1990;

Harrison and Bates, 1991; Evans, 1994; Horáček et al., 2000).

### The enigma of the gazelle

The archipelago is today characterised by the occurrence of an endemic subspecies of the mountain gazelle, *Gazella gazella farasani* Thouless & Al Bassri, 1991 (Flamand et al., 1988; Thouless and Al Bassri, 1991) (Figure 2). This is the only wild ungulate present and being dispersed on the islands of Farasan Al-Kebir (380 km<sup>2</sup>), Segid (150 km<sup>2</sup>), Zifaf or Sarso (32 km<sup>2</sup>), Qummah (15 km<sup>2</sup>), and perhaps Dumsuq. This population may possibly be regarded as the largest population of gazelles left in Saudi Arabia. Largely for its protection, around the beginning of the 1990s, the archipelago was designated as a marine and terrestrial reserve and rangers were introduced (Thouless, 1991). The task assigned to the rangers is primarily to prevent the poaching of gazelles, which is not currently a serious threat to the population, and they are not dealing with the more serious problems of protecting seabird and turtle nesting sites (Thouless, 1991). In reality, the subspecies of gazelle today described for these islands displays phenotypical patterns somewhat different from the ungulate which was originally reported from the archipelago and previously designated as the Farasan gazelle, *Gazella arabica* (Lichtenstein, 1827). This



Figure 2. Skull of an adult female of Farasan gazelle, preserved in the collections of the Zoological Museum of the University of Florence (MZUF 11330) (photo Saulo Bambi; courtesy of the Museo di Storia Naturale dell'Università di Firenze, Sezione di Zoologia "La Specola").

enigmatic ungulate is known only from a single male specimen in the Berlin Museum (ZMB 2115. skull and skin, labelled “Type” of *Gazella arabica* Hemprich and Ehrenberg). This was apparently collected by Hemprich and Ehrenberg, in 1825 (Harrison, 1968; Groves, 1983), but there is some doubt as to whether the specimen in fact originated from the Farasan, and its former distribution and status may never be known (Mallon and Kingswood 2001; Mallon, 2003). Originally described as *Antilope arabica*, this specimen was indicated as representing a separate species restricted to the Farasan insular range (Dollman, 1927), with skull characteristics distinguishing it from all other gazelles (Groves, 1983). Harrison (1968), however, prefers to consider it at the subspecies level of *G. gazella arabica* Lichtenstein, 1827. According to Kingdon (1990), it cannot be excluded that the original population has been replaced by new stocks from the mainland or that crossings have arisen from new introductions over the last 160 years. It has also been suggested that there may very likely have been an element of human error concerning the origin of the Berlin specimen.

The enigma of the Farasan gazelle continues; the taxonomic status of this subspecies is currently investigated by the staff of the King Khalid Wildlife Research Center.

### The hamadryas baboon

A complete skull with mandible of a subadult female of hamadryas baboon, *Papio hamadryas* (L., 1758), was discovered in a provisional burial on Farasan Al-Kebir (Figure 3). The skull was collected in April 1984 by the Italian zoologist Benedetto Lanza (Masseti and Bruner, 2009). The specimen is now preserved in the collections of the Museum of Natural History of the University of Florence, Zoological Section “La Specola”, under catalogue number MZUF 11329. The hamadryas is the only baboon whose range extends beyond continental Africa (cf. Napier and Napier, 1967). In Arabia, it is dispersed in the mountainous areas along the coasts of the southwestern and southern regions of the Arabian Peninsula and Yemen, from about 20°N to about 50°E (Haltenorth and Diller, 1977; Nader, 1990; Harrison and Bates, 1991; Al-Jumaily, 1998). Its distribution is strongly influenced by the availability of food, water, and safe havens (Al-Safadi, 1994). Thus, it is the only



Figure 3. Skull of a subadult female of Arabian sacred baboon, *Papio hamadryas arabicus* (Thomas, 1900), collected on the island of Farasan Kebir in April 1984 (photo Saulo Bambi; courtesy of the Museo di Storia Naturale dell'Università di Firenze, Sezione di Zoologia "La Specola").

large Arabian mammal that can be considered to be over-abundant, causing problems for farmers and local people (AbuZinada et al., 2002). A transfer of pets by humans is the most likely explanation of this occurrence of a hamadryas baboon on Farasan Al-Kebir (Masseti and Bruner, 2009). It should be, however, noted that this species is not to be regarded as one of the true Farasan mammals as it is recorded only once from remains of a single specimen.

### Marine mammals

The waters surrounding the islands are equally important for their marine life, including dugongs, *Dugong dugon* (Müller, 1776), a remnant population of which appears to be confined to the extensive seagrass beds in Khawr Ma'di between Farasan Kebir and Segid (Newton, 1995) (Figure 4). This area is regarded as one of the few locations of the distribution of the species in the Saudi Arabian Red Sea (cf. Nasr, 1999), although only 1 or 2 individuals have been sighted in recent years. Local fishermen claimed that they no longer hunted this marine mammal, and no evidence contrary to this was observed (Gladstone, 2002). The name *D. dugon hemprichi* (Ehrenberg, 1932) is available if the Red Sea race can be proved to be distinct from that of the Indian Ocean (Ellermann



Figure 4. The extensive seagrass beds in Khawr Ma'di between Farasan Kebir and Segid are regarded as one of the few locations of the distribution of dugongs, *Dugong dugon* (Müller, 1776), in the Saudi Arabian Red Sea (photo Franco Trafficante).

and Morrison-Scott, 1951; Husar, 1978). Allen (1939) and Shoshani (2005) list it as a synonym of *dugon*; but Pocock (1940) does not feel justified in adding *hemprichi* definitely to the synonym *dugon*.

Several species of cetacean also frequent the coastal waters, such as the Indo-Pacific humpbacked dolphin, *Sousa chinensis* (Osbeck, 1765), the spinner dolphin, *Stenella longirostris* (Gray, 1928), and the bottlenose dolphin, *Tursiops truncatus* (Montagu, 1821) (Newton, 1995; Gladstone and Fisher, 2000) (Table 2). During surveys carried out before the mid-1990s, Bryde's whales, *Balaenoptera edeni* Anderson, 1897, were recorded in both summer and winter; these are the first records for the Red Sea and suggest that the species may be resident in the area (Newton, 1995).

### Concluding remarks

Apart from the elusive origin of the specimen of gazelle ostensibly collected by Hemprich and Ehrenberg in 1825, and described as *Gazella arabica* by Lichtenstein (1827) (see Groves, 1983), the non-volant mammals of the Farasan islands do not provide any endemic taxon. They are almost exclusively characterised by south-western Arabian continental species whose appearance on the archipelago seems to be directly related to human activity. It is not immediately apparent why man should have wanted to introduce some of these animals. This phenomenon can only be explained considering each case individually. The evidence suggests, for example, that white-tailed mongooses were imported voluntarily by man, otherwise they would not have been able to pass unobserved on board the boats employed to reach the islands (cf. Masseti, 2009), where they were possibly much appreciated as a pest control (Simmons, 1995). These carnivores are, in fact, often regarded as efficient predators of poisonous snakes. Gazelles were introduced for hunting, and to provide a reserve of fresh meat as need arose. This is one way of simplifying management problems, considering the islands as natural enclosures and allowing the ungulates to derive their food supply directly from the carrying capacity of the environment. Examples of this type of game management are known in the Arabian seas since prehistory (cf. Karami and Groves, 1993; Tomé, 2003).

At the present state of art, however, further field works - such as trapping for small mammals, mistnetting for bats, spotlighting, and other trapping for larger mammals - are required to validate and

Table 2. Marine mammals reported to date from the Farasan archipelago.

Species	References
Dugong, <i>Dugong dugon</i> (Müller, 1776)	Newton, 1995; Nasr, 1999; Gladstone, 2002
Indo-Pacific humpbacked dolphin, <i>Sousa chinensis</i> (Osbeck, 1765)	Newton, 1995; Gladstone and Fisher, 2000
Spinner dolphin, <i>Stenella longirostris</i> (Gray, 1928)	Newton, 1995; Gladstone and Fisher, 2000
Bottlenose dolphin, <i>Tursiops truncatus</i> (Montagu, 1821)	Newton, 1995; Gladstone and Fisher, 2000
Bryde's whale, <i>Balaenoptera edeni</i> Anderson, 1897	Newton, 1995

confirm the occurrence on the Farasan archipelago of some of the above reported species and other mammalian taxa.

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