

HERPETOLOGICAL OBSERVATIONS IN THE CHAGOS ARCHIPELAGO, BRITISH INDIAN OCEAN TERRITORY

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INTRODUCTION

Description of the Chagos Archipelago

The Chagos Archipelago has been British territory since 1814. It was made a dependency, the British Indian Ocean Territory (BIOT) of the United Kingdom in 1965 (Edis, 1993; Foreign & Commonwealth Office, 1993; Pearce, 1994).

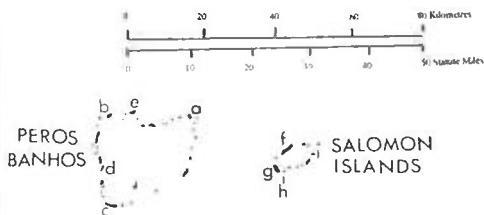
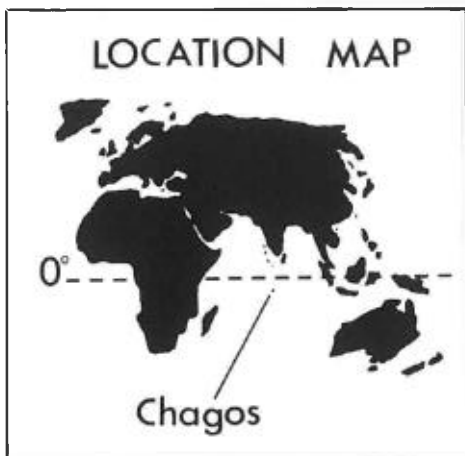
The Chagos Archipelago is the largest and most isolated coral atoll complex in the world (Pearce, 1994). It is centred at 6 degrees south, 72 degrees east, about 3,380 kilometres east of Mombassa and west of Singapore, 1,930 kilometres east of Mauritius, and 1,770 kilometres east of Mahe (the main island of the Seychelles). The nearest land to the Chagos is Addu Atoll, the southernmost part of the Maldives group, lying 600 kilometres to the north. The whole territory covers 54,400 square kilometres of the Indian Ocean, of which the archipelago covers about 37,500 square kilometres. There are five island atolls – Diego Garcia, Egmont, the Great Chagos Bank, Peros Banhos and Salomon. There are also several submerged atolls and vast banks and shoals. The limestone bank on which the Chagos Archipelago is situated is also one of the world's largest, being on a par with the Mascarene and Bahaman banks (Foreign & Commonwealth Office, 1993).

Diego Garcia, the most southerly of the islanded atolls, consists of a V-shaped sand cay which almost encloses a large, deep lagoon. There are three smaller islands in the mouth of the lagoon. The total land area is about 44 square kilometres, and there is an American military base on the main island, which houses British and United States military, and civilian-contractor personnel. The Egmont Atoll is the smallest islanded atoll and contains six islands. The Great Chagos Bank contains eight islands that are quite widely separated from one another relative to the other atolls. The main island groups are the Peros Banhos Atoll, which has 29 islands and a land area of 10.4 square kilometres, and the Salomon Atoll, with 11 islands and a land area of 5.2 square kilometres (Foreign & Commonwealth Office 1993).

The islands have a typical tropical maritime climate. The average temperature on Diego Garcia is 27°C with the average maximum and minimum being 29°C and 25°C respectively. Rainfall is between 2,290 and 2,540 millimetres per annum (Edis, 1993; Foreign & Commonwealth Office, 1993).

The islands were exploited for copra from the late eighteenth century onwards, with much of the native vegetation being removed to make way for Coco Palm plantations. Many of the islands were inhabited during this period by the plantation workers. After emancipation from slavery in the nineteenth century, some of the workers (most of them came from Mauritius) decided to stay on the islands and become contract employees in

THE CHAGOS ARCHIPELAGO



Key to maps

Peros Banhos:

- a = Isle Yeye
- b = Isle Diamant
- c = Isle du Coin
- d = Isle Petite Soeur
- e = Moresby Islands

Salomon:

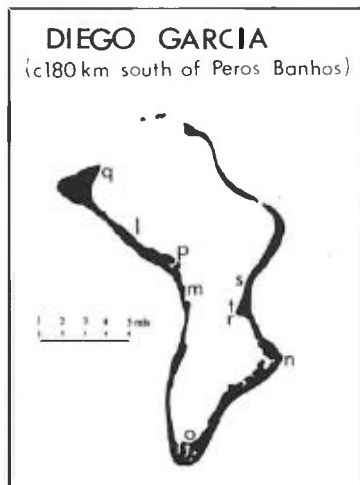
- f = Isle Anglaise
- g = Isle Boddam
- h = Isle Poule
- i = Isle Takamaka

Great Chagos Bank:

- j = Middle Brother
- k = Danger Island

Diego Garcia:

- l = Wharf
- m = Incinerator/landfill
- n = Horsburgh Point
- o = Turtle Cove
- p = Point Marianne
- q = Downtown
- r = East Point
- s = Meteorological Station
- t = Plantation



the plantations which were owned by a private company. In 1966 it was agreed to make BIOT available for the defence purposes of Britain and the United States. The plantations were allowed to run down in 1967 as their commercial future could not be ensured, and the islanders were offered the choice of returning to Mauritius or the Seychelles. The majority of them, some 1,200 people, elected to settle in Mauritius. The final exodus of workers took place in 1973 (Foreign & Commonwealth Office, 1993). Since then the islands have been uninhabited, apart from the military base on Diego Garcia, though extended visits by yachtsmen to both the Salomon and Peros Banhos atolls are becoming increasingly common (Edis, 1993; Foreign & Commonwealth Office, 1993; Hutson, 1981).

RECENT SCIENTIFIC EXPEDITIONS

Three major scientific expeditions visited the Chagos Archipelago in the 1970s (Hutson, 1981). The first, a joint services diving expedition, took place in 1972/73 and concentrated on the Egmont Atoll. The second joint services expedition took place in 1975 and concentrated on the Great Chagos Bank (Bellamy, 1979). The third joint services expedition took place in 1978/79 and visited all of the atolls (Dutton, 1980). Only the last expedition studied the herpetology of the Archipelago and then only as a small component of its itinerary.

The 'Friends of the Chagos' 1996 International Scientific Expedition

A six week visit to the Chagos Archipelago took place in February and March 1996. An international scientific research programme was developed for this visit, covering two broad lines of investigation:

- To provide a scientific foundation for a conservation management plan of the Archipelago. This included research on diversity, biogeographic position, biological productivity and condition of the flora and fauna.
- The use of Chagos in the global environmental network and the emerging coral reef monitoring network.

24 of the 58 islands on the Chagos were visited by the authors of this paper during the 1996 expedition and surveyed intensively for insects, as well as amphibians and reptiles on a more casual basis. The other expedition members included Dr Jeanne A. Mortimer who conducted a dedicated survey of the Archipelago for sea turtles. The results of her work will be published in due course.

SPECIES ACCOUNT

The Chagos Archipelago has had a total of seven species of amphibian and reptile recorded in the past. During the 1996 'Friends of the Chagos' International Scientific Expedition one species of amphibian and four species of reptile were observed.

AMPHIBIA

Bufo sp.: Stoddart (1971) states that no amphibians were known on the island of Diego Garcia or on any of the other islands in the Chagos Archipelago. There is also no mention of amphibians being located on the Chagos by Dutton (1980) during the Chagos research expedition of 1978/79. The earliest record of an amphibian is made by Edis (1993), who states that 'at least one species of toad' is found on Diego Garcia. Presumably this species has been recently introduced to Diego Garcia, though there is no

direct evidence to substantiate this claim. The nearest record of a toad species to the Chagos Archipelago is *Bufo melanostictus* which is common on Addu Atoll and Male in the Maldives (Stoddart, 1971). During the 1996 expedition, toads were found to be common on Diego Garcia. They were recorded as tadpoles in freshwater ditches at the wharf (3/3/1996) and also at the incinerator/landfill site (27/2/1996 & 2/3/1996), and as adults from many areas of the island (Horsburgh Point: 27/2/1996; 29/2/1996. Turtle Cove: 29/2/1996. Point Marianne: 4/3/1996. Downtown: 5/3/1996). They were especially noticeable in the early evening as they crossed the main road that runs almost the length of the island. Several specimens of tadpoles and adults were collected and preserved. These specimens were identified to the generic level by the staff of the Zoological Section of the British Museum (Natural History) in London, and are now lodged in their collection.

REPTILIA

Chelonia

Chelonia mydas: The earliest record of the Green Turtle for the Chagos Archipelago appears to be by Bourne (1886b) at Diego Garcia. Stoddart (1971) does not mention having seen *C. mydas* in Diego Garcia during 1967, and Dutton (1980) did not see this species during 1978/79 even though he walked the perimeter of many islands in the Salomon and Peros Banhos atolls in search of turtle nests Edis (1993) states that this species comes ashore to breed during the south-east trade winds (June to September). The authors of this paper made the following casual observations of *C. mydas*: one subadult was observed at Turtle Cove, Diego Garcia on 29/2/1996, in association with *Eretmochelys imbricata* subadults. Tracks and completed nests of this species were located on the islands of the Salomon, Peros Banhos and Great Chagos Bank atolls. The Green Turtle is found in tropical and subtropical seas and is a very large, hard-shelled turtle. During their first year, Green Turtles feed on jellyfish and other floating organisms. When older, they become predominantly herbivorous, grazing on sea-grasses in shallow waters (Branch, 1988). The only sea-grass bed in the Chagos is a small area located inside the lagoon of Diego Garcia.

Eretmochelys imbricata: The earliest record of the Hawksbill Turtle for the Chagos Archipelago is by Bourne (1886b) who states that three or four were taken each week at Diego Garcia (presumably for food). *E. imbricata* was reported as having been seen in the lagoon of Diego Garcia in July 1967 (Stoddart, 1971), but records of this species in the other atolls of the archipelago were not forthcoming until a turtle survey was undertaken by the joint services expedition between 15 November 1978 and 24 January 1979 (Dutton, 1980). During this survey many islands in the Salomon and Peros Banhos atolls were searched by walking their perimeters, counting completed nests and noting their locations. In the Salomon Atoll all eleven islands were surveyed and eleven nests were located, with more than half of these on Isle Anglaise. In the Peros Banhos Atoll eighty-eight nests were located on eleven of the seventeen islands visited. Nearly a third of these were on Isle Yeye. The islands on the eastern rim of the atoll had most signs of turtle activity. According to Dutton this is consistent with the lack of human activity there, in contrast to the islands in the south and west. Edis (1993) states that this species comes ashore to breed during the north-west monsoon (December to March). The authors of this paper made the following casual observations of *E. imbricata*: Surfacing subadults/adults were observed in the lagoon of the Salomon Atoll between 9/2/1996 and 17/2/1996, and also between 8/3/1996 and 10/3/1996; Surfacing subadults/adults were observed in the lagoon of the Peros Banhos Atoll between 19/2/1996 and 25/2/1996. Tracks and completed nests were located on most of the islands visited in these atolls. Hawksbill Turtle hatchlings were observed leaving a nest on Isle Diamant, Peros Banhos

Atoll on 19/2/1996. On Diego Garcia, subadults of this species were numerous in the tidal channel of Turtle Cove between 27/2/1996 and 5/3/1996 (over 40 specimens were captured, weighed, measured and tagged by Dr Jeanne Mortimer, with the assistance of the authors and a few volunteers drawn from the military personnel on the island). The Hawksbill Turtle is circumtropical on coral reefs and is a relatively small sea turtle. Young juveniles eat floating vegetation, but adults are mainly carnivorous, feeding on hard-bodied, bottom-living marine invertebrates, including corals and urchins (Branch, 1988).

Pelusios subniger: This terrapin is presumably introduced to the Chagos, though there is no direct evidence for this (Stoddart, 1971). Two specimens were collected by J. Stanley Gardiner in 1905 'in one swamp near East Point' on Diego Garcia. They are lodged in the collection of the British Museum (Natural History) in London (Gardiner & Cooper, 1907). This species was not found on Diego Garcia during 1967 (Stoddart, 1971), or by the 1978/79 Chagos research expedition (Dutton, 1980), although a determined search was made for it by Richmond Dutton. Stoddart (1971) states that, according to local inhabitants, *P. subniger* has not been seen in Diego Garcia since at least 1945. He then adds the following note: 'According to J. Frazier, who visited Diego Garcia in 1970, and Jean-Michel Vinson, the meteorological station staff on the atoll reported that *P. subniger*, or *Geomyda trijuga*, or both of these reptiles were still extant though difficult to find during the dry season'. During the 1996 expedition several barochois on Diego Garcia were searched for the presence of this species without result. It is a widespread terrapin of East Africa and Madagascar, and is also present on the Seychelles (Branch, 1988; Stoddart, 1971) and possibly Mauritius (Branch, 1988). Two races are recognised. The typical race *P. s. subniger*, occurs on the African mainland and Madagascar, and is replaced on the Indian Ocean islands by *P. s. parietalis*. In Africa the habitat of this species is pans and temporary waterbodies, where it feeds on small frogs and invertebrates. During the summer *P. subniger* often aestivates on land during droughts (Branch, 1988).

Geomyda trijuga thermalis: This terrapin is presumably introduced to the Chagos, though there is no direct evidence for this (Stoddart, 1971). G.C. Bourne collected a specimen of this species in 1886 from Diego Garcia. He referred to it only as 'a mud-tortoise.....abundant in some of the marshy pools' (Bourne, 1886). This specimen is in the collection of the British Museum (Natural History) and was identified by G. A. Boulenger (Boulenger, 1909). *G. trijuga* was not found on Diego Garcia during 1967 (Stoddart, 1971) or by the 1978/79 Chagos research expedition in Diego Garcia (Dutton, 1980) although a determined search was made for it by Dutton. According to local inhabitants the species has not been seen in Diego Garcia since at least 1945, and it is likely that the species had become extinct by the time of Gardiner's visit in 1905 (Stoddart, 1971). However, attention should be paid to the report of J. Frazier and Jean-Michel Vinson in the previous species account that *G. trijuga* may still have been extant on Diego Garcia in 1970 (Stoddart, 1971). During the 1996 expedition several barochois on Diego Garcia were searched for the presence of this species without result. This terrapin is native to Sri Lanka, India and Burma. It is also present in the Maldives at many localities (Stoddart, 1971).

Squamata

Hemidactylus frenatus: Boulenger (1909) records this house gecko from the Diego Garcia and Salomon atolls. Gardiner also collected *H. frenatus* from the Diego Garcia, Salomon and Peros Banhos atolls (Gardiner & Cooper, 1907). G. R. Zum of the Smithsonian Institution in Washington identified Fehlmann's collection of ninety-one specimens from Diego Garcia in 1967 as *H. frenatus* (Stoddart, 1971). Dutton (1980)

recorded *H. frenatus* on Middle Brother (Great Chagos Bank Atoll), Isle Anglaise and Boddam (Salomon Atoll), Isle's du Coin and Petite Soeur (Peros Banhos Atoll) and Diego Garcia. During the 1996 expedition this gecko was observed on Isle's Boddam (9, 10, and 18/2/1996) and Poule (10/2/1996) in the Salomon Atoll; Isle's Diamant (19/2/1996), Yeye (24/2/1996) and Moresby Islands (22/2/1996) in the Peros Banhos Atoll; Danger Island (15/3/1996) in the Great Chagos Bank Atoll, and on the island of Diego Garcia at two locations (at the 'Plantation' on 27/2/1996 and Downtown on 6/3/1996). A single specimen of this species (from Isle Boddam) was identified by Dr Colin McCarthy of the British Museum (Natural History) and is now lodged in their collection. Specimens were observed to be active by both day and night, but nowhere could they have been described as common. Dutton (1980) states that this species was loudly vocal, but although the authors of this paper heard many sounds on the islands at night, there was none that they could absolutely guarantee as having been generated by this species of gecko. In 1996 this species was observed to frequent the stems of native trees such as Takamaka *Calophyllum inophyllum* and the introduced Coco Palm *Cocos nucifera*, rotting logs on the ground, and buildings (abandoned or still in use). Dutton (1980) also includes dense, low ground cover such as *Ipomea* and *Canavalia* in the habitats of this species. A few of the specimens observed during 1996 were recorded as preying on large ants (*Camponotus* sp.) which were extremely common in places on some of the islands visited (Barnett & Emms, 1996). Dutton (1980) also noted large ants as prey items, as well as other small insects, chiefly moths, mosquitoes and spiders. One individual was observed by Dutton to prey upon a small scorpion (*Isometrus maculatus*). Natural predators of the gecko included the large hunting spiders that abound in the herbage (Dutton, 1980). This is a widespread species of house gecko that is also recorded from the Maldives (Stoddart, 1971).

Lepidodactylus lugubris: Boulenger (1909) records J. Stanley Gardiner's collection of this house gecko from Diego Garcia in 1905. Gardiner also collected *L. lugubris* on the Salomon and Peros Banhos atolls (Gardiner & Cooper, 1907). Fehlmann (Stoddart, 19761) and Dutton (1980) both failed to locate this species during 1967 and 1978/79 respectively. During the 1996 expedition this gecko was observed on Isle Takamaka (14/2/1996) in the Salomon Atoll; Isle du Coin (22/2/1996) in the Peros Banhos Atoll and on the island of Diego Garcia at two locations (at the 'Plantation' on 29/2/1996 and Downtown between 27/2/1996 and 5/3/1996). A single specimen of this species (from Isle Takamaka) was identified by Dr Colin McCarthy of the British Museum (Natural History) and is now lodged in their collection. Specimens were observed to be active only at night (although one individual was observed in the dark interior of an abandoned building during the day) and this may explain why neither Fehlmann nor Dutton located the species. The gecko was observed hunting on the leaves of *Scaevola sericea* along the edge of the beach, and on *S. sericea* and Coco Palm *C. nucifera* leaves in the interior of islands. On Diego Garcia *L. lugubris* was extremely common around lights within the Downtown area, so much so that each light appeared to have its own gecko. This species was also observed to be highly vocal at night. Prey items that were observed to have been taken by the species include several species of smaller moth (*Endothricha mesenterialis* and *Eilema* sp.) around light traps set up on Isle Takamaka (Barnett & Emms, 1996). This is a Malesian species of house gecko (Stoddart, 1971).

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