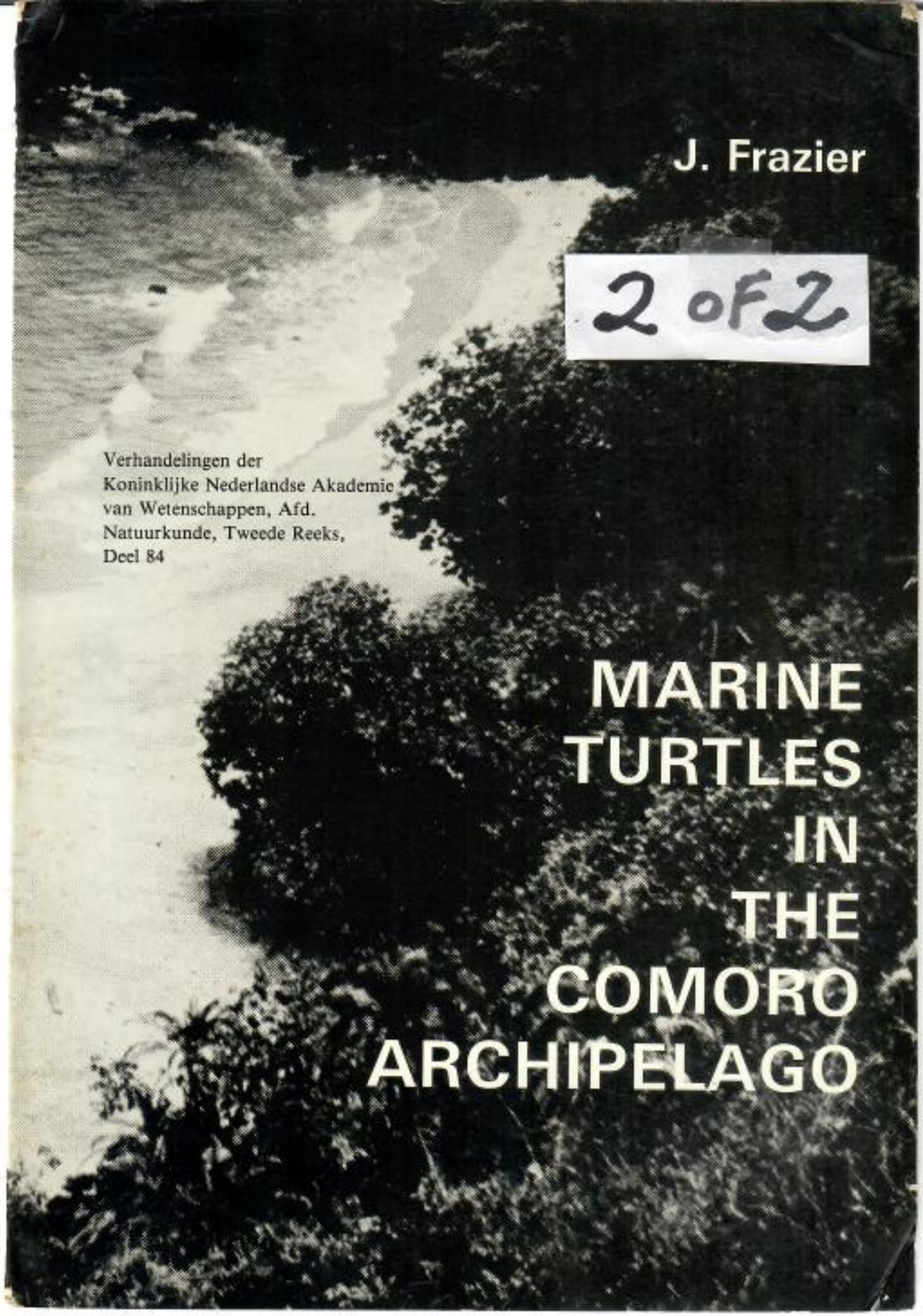
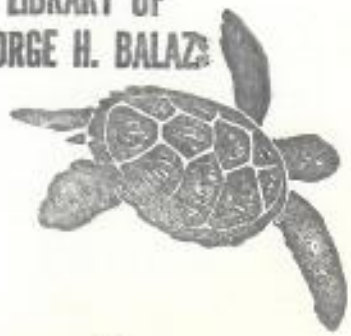


J. Frazier

2 of 2

Verhandelingen der
Koninklijke Nederlandse Akademie
van Wetenschappen, Afd.
Natuurkunde, Tweede Reeks,
Deel 84

MARINE TURTLES IN THE COMORO ARCHIPELAGO



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August 1984

those reported by Carr & Stancyk (1975: 162) – a preponderance of sponges and sessile, soft-bodied invertebrates.

Breeding Biology

Although most specimens were handled at Grande Comore, all information on breeding biology is from Mohéli. Nesting at Grande Comore is not likely to be successful with the large human population.

Nesting season. A Comorian on Mohéli informed me that 'Nyamba' nests from December to March, and this is consistent with my observations. Recent nesting spoor was recorded from 3 March (beach N^{os} 67 & 69) until 31 March (beach N° 47) (Table 34). An emergence of hatchlings on the night of 26 Febru-

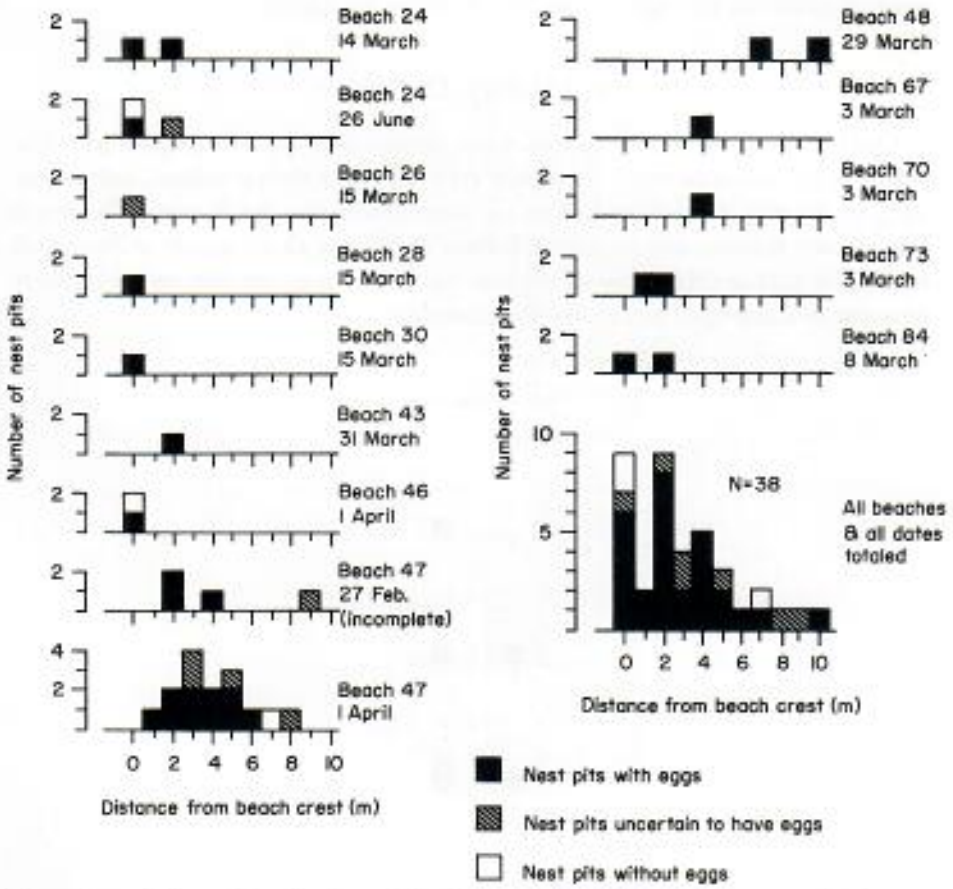

Figure 41 Distance from beach crest distributions of *Eretmochelys imbricata* nest pits from 12 beaches (two each with two dates of observation) at Mohéli, Comores (see also Table 34).

ary indicated a nesting around the end of December (assuming roughly two months for incubation and emergence). There was no sign of recent *Eretmochelys* nesting on any of the major *Chelonia* beaches visited in June. A possible record from beach 43b was made on 8 June 1973, but the beach was not examined from close up, and the tracks may have been from *Chelonia*.

On Mayotte recent nesting spoor was seen in April and May of 1972. At the end of April Dr. R. von Hentig caught a newly hatched *Eretmochelys* at Dzaoudzi, which probably came from a nest made in February or March. The nesting season of *Eretmochelys* at Comores evidently extends from late December, at the latest, until May.

Incubation and emergence success. The nest emergence that was recorded on 26 February took place between 19.00 and 20.30 hrs. Out of approximately 100 hatchlings, at least 10 were captured by *Ocypode* crabs; the remainder evidently made it to the sea (see Section on Non-Human Predation).

Nest Habitat Utilisation

Only 38 nest pits of this species were recorded on Mohéli (Figure 41). The majority occurred between the beach crest and four metres inland; only about 24% of the pits were from five to 10 metres from the beach crest. The mode was at two metres, and as with *Chelonia* there was also a mode at the beach crest. The data are too scant to suggest overcrowding, but this seems unlikely to occur in a dispersed nester like *Eretmochelys*.

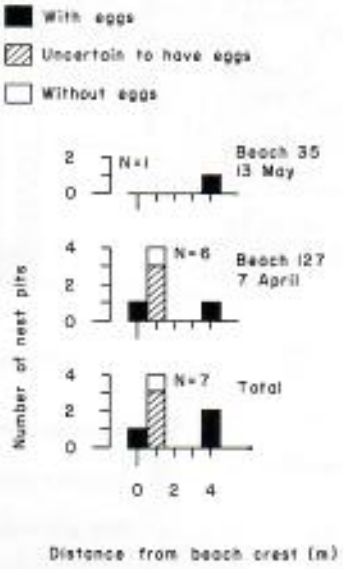

Figure 42 Distance from beach crest distributions of *Eretmochelys imbricata* nest pits on two beaches at Mayotte, Comores.

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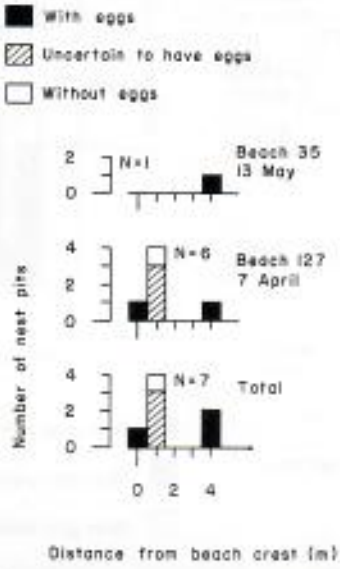

Figure 42 Distance from beach crest distributions of *Eretmochelys imbricata* nest pits on two beaches at Mayotte, Comores.

At Mayotte nesting was done in the first few metres above the beach crest (Figure 42). *Eretmochelys* may nest closer to the vegetation than do *Chelonia*; on Cousin and Maziwi Islands they seek out vegetation for nesting. Since both species nest on the same beaches, this would facilitate niche separation.

Unidentified Species

There is evidently a third species of marine turtle in the Comores, although no specimen was seen. Mr. A. Malida knew of 'M'Rouhie,' a type of turtle distinct from 'Dusi' and 'Nyamba.' It was characterized by having a remarkable beak. A carcass that washed up on a beach (evidently near to Nioumachoua, Mohéli) was eaten by crows (*Corvus albus?*), which died shortly thereafter. From this, the animal is said to be so poisonous that even touching it could be fatal (see Section on Ethnographic Features). Since *Dermochelys* is occasionally reputed to be poisonous (Halstead 1970 (III): 618 ff.) and does have a unique beak, it conforms to this sketchy description. That this is the most pelagic and wide-ranging of all turtles makes it likely to occur as a vagrant. The name 'M'Rouhie' is not obviously related to any other names from the region.

At Saziley village in the southeast of Mayotte, I was told of three types of turtle: 'Kasa,' 'Nyamba Malé' and 'Roye.' The first two names are commonly used for *Chelonia* and *Eretmochelys*, respectively; the third name is phonetically very similar to 'M'Rouhie'.

NON-HUMAN PREDATION

The beaches of the Comores are subject to rather heavy predation, considering these are oceanic islands. *Ocypode* spp., ghost crabs, were recorded on more than half the beaches of Mohéli that also had turtle spoor, and some beaches had as many as three species of crab (Table 2). *O. ceratophthalmus* (Pallas) and *O. madagascariensis* Crosnier (or *O. kuhlii* De Haan) were seen on the littoral beach face. *O. cordimana* Desmarest was thought to be the third species, occurring in the supralittoral. *Ocypode* sp. were also observed on Grande Comore (Table 1) and Mayotte (Table 4), and they are expected to occur on Anjouan.

No turtle nests tunnelled with *Ocypode* burrows were recorded, but egg predation by the crabs is likely to occur. Crab predation on emerging hatchlings of both *Chelonia* and *Eretmochelys* was observed. The tracks of approximately 100 hatchlings that had emerged from under a *Colubrina asiatica* Rich. bush,

three to four metres from the beach crest were recorded on 26 February 1972 at 20.30 hrs. on beach 47, Chissioua Ouénéfou. At least 10 hatchlings were taken by ocypodes; both *Ocypode ceratophthalmus* and *O. madagascariensis* were found with dead or nearly dead turtles. Several of the *O. ceratophthalmus* were buried in the sand, each beside a hatchling. All hatchlings showed head damage, and many of the heads had been crushed from the side, notably near the eyes (cf. Hendrickson, 1958: 521). This predation occurred despite the fact that three dogs had been running on the beach and must have frightened the crabs.

On 31 March 1972, *O. ceratophthalmus* were seen preying on hatchling *Chelonia* on the other side of Chissioua Ouénéfou, at beach 45 (Table 29). At about 18.15 hrs. two crabs approached the site of an emerging nest from which 10 hatchlings had already left and about 50 others were soon to leave; several turtles were exposed on the surface of the sand. One crab passed them by, less than 1 m away. The other moved cautiously toward the depression with turtles and clasped the flipper of one in its chela (I then interfered and rescued the turtle). Minutes after the initial crab attack, the nest emerged and approximately 50 turtles went directly to the sea. About five crabs moved to intercept the turtles and three or four succeeded in capturing a hatchling (again, I interfered and rescued the turtles).

The night of the 31st another nest emerged and the next morning one *Ocypode* was seen with an object thought to have been a turtle; it was chased by a crow which stole the object.

Ocypodes patrol nesting beaches from dusk to dawn, with variations in activity dependent on tide. From the above accounts of their predation, it seems they may take about 10% of the hatchlings, but this predation rate will depend on number of hatchlings and number of crabs involved. On the whole, the crabs may not be inflicting serious damage on the population, for they are likely to be more successful with the individuals that are weak and probably doomed anyway.

Hughes (1974*b*: 10, Table 3) presents data on *Ocypode* predation on *Caretta* emergences in Tongaland, Natal. He found that there was tremendous variation in rate of predation. Although the crabs are important predators, they were particularly successful with the animals that are weak and unable to orient well. Frith (1975) reported predation by *O. ceratophthalmus* on *Chelonia* hatchlings at Aldabra, and it is also reported from Yemen (F.A.O., 1968: 16; Hirth and Carr, 1970: 16).

One Tabanid fly was collected while feeding from the carapace sutures of female JFCm 713, as the turtle completed her nest covering on Chissioua Ouénéfou the morning of 1 April. *Neavella albipectus* (Bigot) was recorded on nesting females on Aldabra (Frazier, 1971: 394). Its effect on the turtle must be minimal, for the fly feeds on diurnal, terrestrial prey; there are few turtles that meet these requirements.

Two other types of dipteran were seen on beach 45 on 31 March. Both oviposited within a cm of exposed hatchling *Chelonia* at about 17.30 hrs., before the main emergence. Presumably one of these flies is a nest parasite; the other may be a parasite on the first. From the damage that occurs to nests on some of the major beaches of Aldabra, dipteran nest parasites can be of considerable importance.

Varanus lizards, although important nest predators on mainland Africa and India, do not occur in Comores.

Frigate birds, *Fregata* spp., are known locally as 'M'Chaco', the general name for large seabirds. Previous records in ornithological publications indicate that frigates concentrate on the two main seabird islands off the south of Mohéli: Chissioua M'Chaco in the east, and Chissioua Magnougni in the west. Records from Grande Comore are few, and from Anjouan, even fewer. Birds are seen at sea, between the islands (Benson, 1960: 104; Pocklington, 1967: 40-41; Forbes Watson, 1969: 8). Previous records were made in the months of September and October. My own sightings are from January to June. The greatest concentrations, of some hundreds of frigates, were seen in March off Chissioua Magnougni. Both *F. minor* (Gmelin) and *F. ariel* (G. R. Gray) were recorded. Breeding is not documented in Comores, although it may well occur.

These birds are efficient predators on emerging and swimming hatchlings and can completely eliminate the entire number that emerge from a nest (Hughes, 1974*b*: 11). However, their activities are restricted to daylight hours, so their overall effect may not be of great significance as most emergences are nocturnal. Furthermore, the concentrations of birds in March probably occur after the peak in *Eretmochelys* hatching and before the *Chelonia* peak. No predation by frigate birds has been recorded in Comores, but it is likely with the birds concentrated near the major nesting beaches in the south of Mohéli.

The Grey Heron, *Ardea cinerea* L., is known on Mohéli as 'Konogondro'. Benson (1960: 31 ff.) recorded it from all of the Comoro islands, mainly at sea level. He indicated it was least common on Grande Comore and most common on Anjouan. The species is clearly resident, although breeding is as yet undocumented. My records are only from Mohéli, but they indicate that the bird occurs all around the Island. Records from nesting beaches are common, especially on Chissioua Ouénéfou where the species was seen from February to June. They evidently fly to beaches around dusk and seem to remain active well after sunset. I suspect they patrol beaches and prey on hatchlings as they emerge, but this was not actually observed. The bird is large and powerful; its crepuscular habit and large size may make it an important potential predator on emerging hatchlings.

The Black Kite, *Milvus migrans* (Boddaert) is generally common throughout the Archipelago and there may be migrant as well as resident populations (Benson, 1960: 36). My records include the west and southwest of Grande Comore

and the South of Mohéli, notably the offshore islands. It was seen from January to June. Benson saw mainly solitary birds, but many of my sightings involved several birds.

A nest emergence was watched on 31 March 1972 on beach N° 45, Chissioua Ouénéfou (Table 29). The first turtle to leave the nest was seen at 12.00 hrs, but it was not until 16.00 hrs, after three other hatchlings had emerged, that predatory birds were seen. Kite predation on hatchlings was recorded at 16.25, 17.00 and 17.05 hrs. Three of 10 hatchlings that left the nest before the main emergence fell prey to *Milvus migrans*. None was taken during the main emergence, but this was probably due to my presence on the beach. These birds are not likely to exert a major predatory pressure; they are limited to the diurnal period and are generally dispersed.

Hughes (1974*b*: 10) mentions that the related *Milvus aegyptius* (Gmelin) occasionally takes *Caretta* hatchlings that emerge by day in Tongaland, Natal. It seems not to be a major predator.

The Barn Owl, *Tyto alba* (Scopoli), is known as 'Bunde' (or 'Bunde Sera'). It is recorded from all islands in the Archipelago, and while there are no breeding records, it is clearly resident (Benson, 1960: 59 ff.). My records are from Chissioua Ouénéfou and M'Samouheo, Mohéli, between February and June. A crepuscular predator with catholic feeding habits, it is suspected to take hatchlings, especially since it occurs near major turtle nesting beaches. The over-all effect of the species is not likely to be great, as the birds are well spaced out.

The Pied Crow, *Corvus albus* Müller, is called 'Gawa'. Benson (1960: 87) reported it as common throughout the Archipelago and documented nesting on Mayotte. My records list it from the west and southwest of Grande Comore and right round Mohéli, including most of the major nesting beaches, which they evidently patrol. Hatchling predation was recorded on 31 March 1972 at beach 45, Chissioua Ouénéfou (Table 29). Of ten hatchlings that emerged between 12.00 and 18.15 hrs, one was taken by a crow. The next morning a crow stole what appeared to be a hatchling from an *Ocypode* crab. On 25 June, on the same beach, a hatchling carcass was found with crow tracks, and its condition was similar to that of crow-eaten hatchlings seen on Aldabra. This is a diurnal bird, so its predation on hatchlings would be limited to daylight emergences. Frith (1975) reported predation by *Corvus albus* on *Chelonia* hatchlings on Aldabra.

The Heron, because it is large and nocturnal is probably the most important single threat, but all of these avian predators taken together could exert considerable predation pressure, if several species work a beach at the same time.

Feral dogs, *Canis familiaris* L., are known as 'Mbwa'. They were not recorded from the beaches of either Grande Comore or Anjouan, but they probably occur. At Mohéli they were especially important nest predators, although there were no signs of dogs on any of the offshore islands. On 3 March 1972

at M'Sanga Nyamba in the southeast (N° 67), 10% of the nest pits thought to have eggs had been dug out, apparently by dogs. On Tsinavouni North (N° 65), two of 11 nests thought to contain eggs, nearly 20%, were dug up by dogs. The dogs were particularly active in this part of the island, and packs were said to kill goats. Fresh spoor was seen only in the southeast of Mohéli, but dug out nests were recorded on most beaches, except those on the offshore islands (Table 2). Because they were able to locate and dig up nests, feral dogs were the most important predators on the main island. A pack of dogs might be able to successfully attack a nesting female, but I know of no evidence for this.

Dog tracks were recorded on 36 of all Mayotte beaches examined. Eight of the 19 beaches with nesting spoor had nests dug up, probably by dogs. These introduced, feral mammals are probably the most important non-human predators on turtles on Mayotte.

Feral dogs are reported to be important predators on mainland Africa (Hughes, 1974*b*: 10), Arabia (F.A.O., 1968: 16; Hirth & Carr, 1970: 16) and Pakistan (Salm, 1975*a*: 7; 1975*b*: 56).

Cat-like animals, probably genets (*Genetta* sp.) in the main, were found generally around the islands. Their spoor was not recorded on beaches of either Grande Comore or Anjouan, but they were expected to occur on both islands' beaches. A third of the Mohéli beaches, including those on offshore islands, had clear footprints (Table 2). Cat-like tracks (*Genetta*?) were recorded on 22 of 129 beaches that were examined on Mayotte. No direct evidence of predation was recorded, but these are swift and efficient predators and could cause havoc at an emergence. There seems to be no displacement by dogs, for spoor of both was commonly seen on the same beach. The 'genets' may be digging up nests in parts of the island where dogs are not common. Hughes (1974*b*: 10) recorded predation on *Caretta* nests by *Genetta rubiginosa* Pucheran, and by the mongoose *Atilax paludinosus* (G. Cuvier) in Tongaland, Natal. Apparently their role is minor. In Kenya, viverrids destroy nearly all nests laid on the mainland (Frazier, in prep.).

The large predatory fishes that abound on Mayotte's reefs are likely to prey on sea-going hatchlings. At the other islands there are smaller fish populations, so they are likely to be less significant.

Predation by all of these animals, except the feral dogs, is 'natural,' and turtle populations have survived for untold ages with these pressures. Control measures are unwarranted and unlikely to be successful, except with the feral dogs, where control programs are not only warranted but needed.

HUMAN PREDATION

Turtles are killed throughout the Comores, and while this is widespread and common, the pattern of exploitation is complex. The eating habits of the Comorians are inhibited because of Moslems beliefs, but there is considerable variation in their habits (see Section on Ethnographic Features). Thus, the people of two villages less than 1 km apart may behave very differently in regard to marine turtles: they may exploit them freely, or they may refuse to even touch them.

When exploited, turtles are nearly always captured while nesting. I was told that copulating animals at the surface could be captured by approaching cautiously in an outrigger canoe and fastening a noose round a flipper. It would be difficult: first, not to frighten the animals and second, not to capsize once the noosed animal sounded. This technique cannot be very successful, or very effective at taking large numbers. Immatures are taken in nets, but usually this is accidental. Small animals may be shot with spearguns, but it is mainly the non-Comorians who have access to these weapons. Petit (1930: 233) claimed that catching turtles by remora sucker fish was practised at 'Moroni' (probably an imprecise reference to Grande Comore or to the Comores in general), but I have no evidence, either direct or verbal, of this practice.

At Grande Comore, where there has been a ready market for the sale of non-comestible turtle products to non-nationals, *Eretmochelys* are captured for sale. There is little demand for this turtle at Mohéli, but there may be a small market at Anjouan. It is unlikely that 'M'Rouhie' would meet with any direct predation, unless it were tangled in a net.

Chelonia is generally taken whenever it is available. The unsophisticated capture techniques are coupled with unsophisticated and wasteful slaughter techniques. Eggs, both shelled and unshelled, flippers, neck, tail and calipee are almost always left on the beach to rot, and often there is a large amount of muscle left in the discarded carapaces (Plate IX: Figure 2). Nine of 13 recent carcasses that were observed on 24 June 1972 at Mohéli beach number 67 had about half of the easily consumable meat wasted. All of six recent carcasses seen on 27 June at beach number 12 were also poorly slaughtered with a great amount of waste.

Rate of predation is variable. On the densely populated and protein-lacking islands of Grande Comore and Anjouan, few nesting turtles would be spared in spite of the fact that very few nest. Comorians and turtles alike fare much better on Mohéli. Yet, predation rate is highly variable from one beach to an-

other and from year to year. Of the 30 beaches on Mohéli with *Chelonia* nesting spoor, 14 had remains of slaughtered turtles and/or bones. Five other beaches had no signs of nesting, but all of these had remains of slaughtered turtles and/or bones (Table 9).

These last five beaches included numbers 13, 22, 38, 59 and 60. The remains of turtles were: a site of old bones, an animal that 'washed up dead', two animals brought in (probably from the offshore islands), an old plastron, and an old carapace. On none of these beaches was there evidence of any significant or recent slaughtering of animals. None of these beaches seems to have a nesting population, so they have not been included in the estimation of predation rate at Mohéli.

Active predation of *Chelonia* at Mohéli is concentrated on twelve beaches (Table 35). These beaches occur all around the Island, and include all the major nesting beaches – with the exception of number 45, on the west side of Chissioua Ouénéfou. Neither of the other Ch. Ouénéfou beaches (numbers 46 and 47) had predation of significance.

There are no figures on rate of exploitation for any of these beaches. An estimate had been made, based on: the number of carcasses found after several visits, proximity of potential turtle hunters, and any local information on the turtles of specific beaches (Table 35). These estimates are very rough, and should be taken only as a preliminary guide. Estimated rate of exploitation varies from 1 to 35% of the estimated annual nesting population on the respective beach. The estimated annual crop at Mohéli is 185. This represents 13% of the estimated annual nesting population from all those beaches with predation and 10% of the estimated total nesting population at Mohéli.

At Mayotte, turtles are evidently killed wherever they are encountered. Bones of sea turtles were seen on 12 beaches, four of which had no sign of nesting. *Chelonia* remains were far more common, occurring on nine beaches while *Eretmochelys* bones were on three. Some bones had knife marks, and the turtle remains found on beaches were assumed to have been left after the animals had been killed by people.

Although slaughtered turtles were found right round the Island, it is difficult to know who is killing them. Those people from villages speaking a Malagassy tongue usually eat turtle meat (as well as many other things seemingly strange for Moslems); but many of the 'Maori' people not claiming descent from the Malagassy and speaking a Swahili tongue, will not eat turtle. The animals were not neccesarily killed by the people living closest to the site of the slaughter. Inhabitants of the Malagassy villages of M'Zamboro and M'Jago in the northwest are said to hunt turtles at Saziley in the south and Pamanzi in the northeast; they may actually camp on these beaches for a few nights while hunting.

Not only *Chelonia* are killed for food, but some people at Mayotte claimed to prefer the meat of *Eretmochelys*. Most slaughter is for personal or family use,

but there are small markets for meat and tortoise-shell (see Section on Commercial Exploitation).

There are no sophisticated techniques for catching turtles at Mayotte; nesting females are simply turned on the beaches. Some animals may be captured at sea with nooses or spear guns, but not many. The use of remora sucker fish, documented in other parts of the region, was not seen or heard of.

The predation at Moya and Papani beaches was some of the most intense in the Archipelago. Between the 7th of April and the 7th of June, a period of 61 days, at least six *Chelonia* were killed on South Moya beach, and three were killed on North Moya (Table 14). Over a two-week period, from 28 May to 10 June, two *Chelonia* were killed at South Moya, and five or six, at Papani beach (Table 15). During six of the 14 nights that I was at Moya, men patrolled the beaches for turtles, killing two of the seven females that came to this beach to nest, or 29%. Because I was working the beach nightly and claiming turtles of my own for measuring and tagging, I was displacing and competing with the turtle hunters. One night I claimed both turtles that nested, and on another night I claimed one of two; on both of these occasions I prevented the fishermen from killing turtles. Hence, the total number killed at Moya might well have been four or five out of seven, or 57% to 71%.

During the same period at least nine animals came to Papani beach and five or six of these were killed. This represents 56% to 67% of the females that arrived to nest.

Whether or not these figures are representative of an average two-week period is unknown, but another factor must be considered: a female does not simply come to a beach, nest and go away. More than half of the nests made on Pamanzi are without eggs; a female may make several nesting attempts before succeeding, and this may take her to the beach several times. In addition, a female may lay not one but two or three clutches in a season. The predation rates reported here are for a single night, not for a season. Every time a female returns to a beach to attempt to nest, she is exposed to the average nightly predation rate. If the average female crawls out onto a nesting beach with a 50% predation rate four times in a season, her chances of surviving through the nesting season are 6% ($= 0.5^4$).

This low rate of survival is coupled with wasteful practices in processing turtles. Usually turtles are slaughtered before they lay eggs, and eggs were almost always discarded. The flippers, neck, tripe and less accessible muscles were always wasted and sometimes 75% of the turtle, including easily accessible meat, was left on the beach to rot.

It must be emphasized that the above estimates are rough. No information comparable to this exists for any other population, and further work in Comores is needed to establish reliable estimates of predation rate.

EPIZOA

Encrusting and filamentous algae were common on *Eretmochelys*. Green filamentous algae also occurred on some *Chelonia*, but systematic records were not kept. Leech and their cocoons (*Ozobranchus* sp.) were found on nesting *Chelonia* at Mayotte.

Barnacles were recorded on one immature and on 10 of the 59 female *Chelonia* handled at Mohéli; they were also on nesting females at Mayotte. Scratched carapaces (Plate XVIII: Figure 1) indicate that barnacles might be knocked off females by mating males, and the occurrence of epizoa, thus reduced. Eight of the 10 immature *Eretmochelys* examined had barnacles; a dead *Eretmochelys* female at Moya had a heavy infestation of *Chelonibia* sp. on the carapace (Plate XVIII: Figure 2). However, observations on the cirripeds were not systematic, and the frequency of their occurrence is greater than indicated by these figures. *Chelonibia testudinaria* (L.) and *Platylepas hexastylos* (O. Fabricius) were recognized, but other species also occur. The numbers of barnacles per turtle ranged from half a dozen to hundreds. There was evidence of niche separation in the distribution of different species of barnacle on specific parts of the turtles (Frazier, in prep.).

Male *Chelonia* seen while skin diving at Mayotte, commonly had remora sucker fish attached to the shell (see also Fourmanoir, 1956: 222). All of these symbionts are common on sea turtles in many parts of the world.

HABITAT DEGRADATION AND DESTRUCTION

Habitat degradation through non-human agents does not seem to be a major factor in the Comores. Beaches must experience seasonal changes in sand movements, but nowhere do these seem to involve large alterations in beach character. Some beaches have zones of beach rock exposed in the littoral beach face, but on the whole these deposits do not seem to be common. The uncovering of what beach rock there is does not create significant barriers to the nesting turtles. Erosion at the beach crest occasionally produces vertical sand cliffs, but rarely are these insurmountable to a turtle.

Erosion of beaches is common at Mayotte, but not of great importance. Listings in Table 4 represent the highest erosional faces visible on each beach, but with few exceptions most of the beaches were stable. Occasionally beach rock, cobble or boulders littered the littoral beach face either preventing or impeding turtles from ascending, but usually the central area of the beach had free access. In general, non-human degradation seemed to be unimportant.

Human disturbance to nesting habitat is concentrated at villages where it is of some importance. The people of Anjouan and Grande Comore favour building houses with rocks and blocks rather than with mud and wattle. The cement for construction is obtained from the limeing of coral, and the coral is collected from live reefs. Mounds of coral or lime are very common in the Mutsamudu area of Anjouan, and it is a wonder that after generations of such exploitation that there is any living coral of significance remaining. Indeed, the west side of the north point of Anjouan is remarkably bare of coral, but it should be pointed out that not all corals are used in limeing.

Destruction of live reefs is the most important form of habitat destruction in the Archipelago, and it is most intense at the islands with the smallest apparent turtle populations. What effect it has on feeding habitats of *Eretmochelys* is unknown, but textural variation and community structure must be greatly simplified by this form of exploitation.

Siltation of reefs and marine pastures may be important on the high, heavily populated islands of Grande Comore and Anjouan. It is not likely to be a major factor on Mohéli or Mayotte which have low and well vegetated slopes that are not badly denuded; their abundant mangrove forests would help to settle out silt that does get washed to the sea.

Beach development is, likewise, most pronounced on the most populated islands; at Mohéli and Mayotte it is hardly significant. For example, beach 35 at Saziley village is one of the most important nesting beaches on Mayotte. Many large villages on Grande Comore and Anjouan are on, or close to, beaches, and while there is no major form of beach destruction, the mere presence of large numbers of humans is deterrent enough to the turtles.

Night fishing with pressure lamps is popular, especially at Grande Comore and Anjouan – so much so that a barely inhabited coast can appear to be a large city from the sea! It is said that turtles are often attracted to these lights. Disorientation of this type may not be of great importance to adults or immatures, but it could be fatal to hatchlings, slowing them and disorienting them on their critical journey to the open ocean and putting them in areas of potential predator concentration, e.g., along Mayotte's barrier reef, where this form of fishing is also common. As with other forms of human disturbance, this practice is not common at Mohéli.

In total, there is not a major problem in degeneration and destruction of turtle habitats at Comores, for it is least in evidence where it would be most critical.

COMMERCIAL EXPLOITATION, PAST AND PRESENT

In discussions of turtle trade, the Comores are rarely mentioned. Their importance has been overshadowed by the other more productive or more enterprising territories in the vicinity. Although Comores have one of the largest *Chelonia* nesting populations in the eastern Africa area, there is not the organization for slaughtering, preparing, transporting and marketing turtle products.

Past Exploitation

Despite the size of the *Chelonia* population there is no evidence that Comores has ever had anything but an incidental trade in this turtle. The historic trade in *Eretmochelys* is difficult to define, for there are no definitive records for the Comores alone. Parsons (1972: 52) in a review of the world tortoise-shell trade, suggests that these islands were important exporters, but he alludes to the problem of export statistics being mixed with those from Madagascar. Thus, he states that in 1863 more than 3,000 kg were exported from Madagascar 'and such offshore islands as Comores and Nosi By' (= Nosy Bé).

Unfortunately, import records from Zanzibar, although detailed, are just as mixed. In 1891, 1892 and 1894 (I have no records from 1893 or other years not mentioned in the span of years under discussion here) imports are listed from 'South' or 'Southern Ports and Islands'; this includes Ibo, Mozambique, Zambezi (all localities in present-day Mozambique), Comoro and other French and Portuguese possessions, including Madagascar (Great Britain, 1892-1894). It is impossible to determine what portion of these exports (Table 36) were from the Comores especially since major producers such as Madagascar and Mozambique are included.

The Zanzibar Blue Book (1917; 1918) lists imports from 'Madagascar and Comores' for the years 1916 and 1917 (Table 36); from 1920 to 1965 Madagascar is listed alone, and Comores is not mentioned. Comores are not ever listed in the F.A.O. Yearbook of Fishery Statistics (FAO, 1969-1978). Although Madagascar is listed in recent records of imports into Hong Kong and Japan, Comores is not.

Because of the administrative link to Madagascar, Comores were considered a dependency and therefore a part of Madagascar. To extract the specific export figures for Comores would be an involved project – if indeed it is now possible. Nevertheless, it does seem likely that the islands once produced significant

quantities of tortoise-shell; the size and richness of live reef at Mayotte probably supports a large population of *Eretmochelys*, and possibly after the French occupation in the 1800's some large crops were taken.

Present Exploitation

The turtle fishery in Comores is of little importance today. There is no *Chelonia* trade of significance at either Grande Comore or Anjouan. On Mohéli, a man was said to butcher nesting females at M'Sanga Nyamba in the northwest (N° 8) and pack the meat into Fomboni, some 15 km by donkey. He probably slaughtered one or two animals per week during the peak nesting season (Table 36). At M'Samouheo in the northwest (N° 12) and M'Sanga Nyamba in the southeast (N° 67), turtles were killed only for consumption in the two villages near each respective beach. *Chelonia* killed at Moya, Mayotte, are mainly for personal consumption, but occasionally a portion of the meat may be sold in the village of Labattoir. Salted meat is sometimes exported from M'Zamboro to other islands in the Archipelago, but the quantities probably never exceed 100 kg.

Eretmochelys are killed for tortoise-shell, and in 1972 this was said to bring a fisherman on Grand Comore about 500 CFA per kg (U.S. $2.50). On Mayotte it was sold to Indian merchants for 300 CFA (US $1.50)/kg. The pleural and vertebral scutes were the only parts collected. The present-day tortoise-shell trade in Comores is not of great importance, but prices have risen substantially in recent years, and there should be greater stimulus to market all the scutes now.

Small turtles are bought by expatriates, preserved with injections of formaldehyde and varnished for display as trophies; a fisherman could make as much as 3,000 CFA (U.S. $15.00) on small intact animals, either *Chelonia* or *Eretmochelys*. At Mitsamiouli, on the northwest of Grande Comore, the owner of the Hotel Maluga bought turtles of either species for about 750 CFA (U.S. $ 3.75). After injecting them with formaldehyde, and perhaps varnishing, turtles could be sold to tourists for 2,000 to 5,000 CFA (U.S. $10.00 – $25.00).

Obviously the fishermen make more by selling directly to the expatriate or the tourist, but even selling to the hotelier is comparatively lucrative, for small *Chelonia* are of little monetary value otherwise. Tortoise-shell from the small *Eretmochelys* is not worth as much as the animal intact. An average-sized, mature animal may produce less than two kg of raw tortoise-shell.

The tortoise-shell trade of antiquity is now competing with the stuffed-turtle trade. However, the lack of figures on either makes it difficult to know how significant this competition is. I have not seen large stocks of turtles stuffed and ready for sale, as are conspicuous in shops in Madagascar. The stuffed turtle tra-

trade has reached tremendous proportions in some places (e.g., Maldives – see Colton, 1977), and this has displaced the traditional tortoise-shell craftsmen.

Nonetheless, it is urgent that at least the nesting populations of both species be monitored at least every few years. Attempts should be made to estimate sizes of other parts of the populations, and tagging studies should be initiated. The level of human exploitation should also be monitored.

There have been interests in 'developing' the turtle fishery in Comores (i.e., increasing the levels of exploitation and production); in preparing a report on marine turtles in the Comores, I was requested by FAO to discuss in detail 'the potential for the development and improvement and projected economic impact.' These details are in an earlier report (Frazier, 1977), and are summarized below.

The turtle fishery in Comores should concentrate on supplying a quality food to its indigenous peoples. There are many reasons *not* to develop an export trade in consumable turtle products. The complexities of providing for an export market in perishable foods are great, especially given the poorly developed systems of transportation and communication in Comores. The annual sustainable crop from the islands is not likely to warrant an export market. The Convention on International Trade in Endangered Species of Fauna and Flora (CITES) makes it unlikely that many of the conventional buyers for luxury goods would be able to legally import turtle products from Comores. Furthermore, and most relevant, there is a critical need to improve the diet of the local people, particularly with proteins. Any plans to develop an export trade must be shelved until a locally based trade is proven successful *and sustainable*.

I do *not recommend* interfering with the turtle fishery in Comores. This applies to both the Federal and Islamic Republic and the Département d'Outre Mer of France.

LEGISLATIVE MEASURES, PAST AND PRESENT

Evidently there is no legislation in the Comores relevant to marine turtles, and there never has been. Resolution J.O. 17/11/23, p. 856, of 24 October 1923 prohibited the capture of marine turtles when nesting or when the carapace was not greater than 0.5 m wide (as measured across the plastron) (Hughes, 1971: 6). This legislation was enacted in Madagascar when the Comores was their dependency. It is not clear if the legislation was meant to apply to these islands, but it seems never to have been applied, and it may be ecologically unsound to protect small animals.

In comparison, the dugong, *Dugong dugon* (Müller), is said to be protected by law, but no details are available.

Mayotte is now a French Department and should therefore abide by the CITES regulations accepted by that country. As France has CITES reservations on *Chelonia* and *Eretmochelys*, however, this does not restrict trade in these species. Furthermore, internal trade with mainland France is not affected, and Mayotte may be able to trade legally with other members of the European Economic Community.

RESERVES

There are no marine reserves in Comores. Forest reserves on the slopes of Kartala and on the other islands were defined prior to independence, but none of these reserves come near to the sea.

The island beaches and reefs of Chissioua Ouénéfou, off the south of Mohéli, would make an excellent reserve system. This would include three of the six major nesting beaches in the Federal and Islamic Republic of Comores together with some very rich reefs.

There are a few forest reserves on Mayotte, but apparently no marine reserves. As well as turtle nesting beaches, mangrove forests and coral reefs need to be protected from excessive exploitation and disturbance. Moya South is the site of an abandoned governor's cottage which would be valuable for guards protecting the Pamanzi beaches.

RECOMMENDATIONS

The first detailed data on marine turtles in Comores are a welcome change from the usual. The situation in the Federal and Islamic Republic of Comores is one of the most hopeful in the Western Indian Ocean Region. The nesting population of *Chelonia* is relatively large, yet it is little exploited in comparison with other populations. Feeding and nesting habitats are generally adequate for the turtles, and there is little disturbance by humans.

The situation with *Eretmochelys* is neither as clear nor as hopeful, but there is the potential for large feeding and nesting populations in the Archipelago. Because of its poorly known, and generally endangered status, this species is not likely to contribute to a sustainable fishery.

The situation at Mayotte, unlike that at Mohéli, calls for immediate remedial measures. The waste that occurs in slaughtering turtles is reproachable. Not only are the animals inefficiently used, but too many are killed. If one in 20 females survives a nesting season, the population is unlikely to sustain this level of exploitation for long.

Nesting females must be protected, and this is critical on the beaches of Pamanzi. These three beaches need complete vigilance and protection at least during the three or four months of peak nesting, and the French Government should provide this.

Once the killing of turtles is controlled, people will have greater reason to make use of what is slaughtered, rather than just removing a few choice cuts, but the practice of killing a reproductive female, weighing more than 100 kg, for just a few kg of meat is intolerable.

Both the breeding and exploitation of marine turtles at Mayotte needs to be carefully monitored. Surveys of the numbers nesting should be made at least every few years, and any form of sea turtle trade into or out of the Island must be compiled.

There is absolutely no rational way to 'develop' the turtle fisheries by increasing takes or markets. It is essential to develop a reliable estimate of population sizes and dynamics. Long term, baseline studies are needed.

GENERAL SUMMARY

The four volcanic islands of the Comoro Archipelago vary considerably in their respective altitudes, sizes, numbers and areas of beaches, extents and types of shallow water habitats, and coral reefs. Only Mohéli and Mayotte, the two older, lower islands, have large expanses of shallow water and also sizeable turtle populations. Although the Comores are not known for their marine turtles, two species are common: *Chelonia mydas* and *Eretmochelys imbricata*. Large marine pastures surround both Mohéli and Mayotte, but far more feeding habitat seems to be available at Mayotte, with its large lagoon and complex reef system. This island also provides the richest area of active coral reefs. Nesting habitat is abundant at Mohéli and Mayotte, but beaches are narrow. The turtles

that were observed at each of the islands have been treated as belonging to four separate populations, for in other studies there is evidence of little interchange between separate island populations.

Chelonia mydas occur at all four islands, and probably throughout the year. This species was most abundant, at least in breeding populations, at Mohéli Island; and there are important nesting beaches at Mayotte. About 2,500 females are estimated to nest annually in the Archipelago, nearly 75% on Mohéli. Nesting females at Mohéli averaged 112.3 cm in curved carapace length and those at Mayotte, 110.8 cm. Carapaces of hatchlings at Mohéli averaged 49.2 mm in length. Various body measurements show allometric change: narrowing of the carapace, shortening of the plastron, and narrowing of the head. Scalation of Comoro females is normal for the species, as is coloration. Few nesting females had injuries. Stomach contents showed a predilection for marine plants, typical of this turtle.

The breeding biology is apparently normal for the species: mating is evidently seasonal and most common at the begining of the nesting season. The nesting seasons on Mohéli and Mayotte appear to be similar, and also comparable with the situation on Aldabra and in East Africa. The peak around May-June, corresponds with the onset of the Southeast Tradewinds and is apparently six months out of phase with the main nesting seasons on islands farther south. How these seasons are influenced by climatic, hydrographic, or planktonic variables is unknown, but strong relationships are expected between environmental variables and the timing of the nesting season. Clutch size averaged about 120, and several clutches are laid each season. Most nesting occurs in the first 5 m of the beach; successful nests are generally farther inland. Some Mohéli beaches were overcrowded with nesting *Chelonia*, and the main area of nesting may move seaward as nesting intensity increases.

Eretmochelys imbricata occur at all four islands. A small amount of nesting spoor was found on Mohéli and Mayotte, but most of these turtles were seen at Grande Comore. Only immatures and hatchlings were measured. Allometric changes were found: carapaces got wider, plastrons, shorter and heads, narrower. Scalation was normal for the species. Keel conditions are related more to size/age than to subspecific status. Stomach contents showed a preponderance of sponges, typical of this turtle.

The main nesting season seems to occur before that for *Chelonia*, usual for the western Indian Ocean. Nests are made in the first few meters of beach, frequently under vegetation; this is also characteristic of this species in this region.

A third species evidently occurs in the Archipelago; it is rarely reported and may be *Dermochelys coriacea*.

Non-human predation was more noticeable at Mohéli than at Mayotte. A variety of crabs, birds, and carnivores are thought to feed on turtle eggs and hatchlings, but feral dogs cause the most destruction on Mohéli. Natives also

slaughter nesting females, but the number killed yearly is relatively small. There was little evidence of non-human predators on Mayotte, but human predation on this island is intense and likely to have far more impact on the turtles than the 'natural' predation that occurs on Mohéli. Wherever it occurs in the Comores, human predation is wasteful, and in many instances, wanton. For this reason, the Mayotte population is evidently threatened.

A variety of epizoa, common to sea turtles, were observed on *C. mydas* and *E. imbricata*. Although beach erosion is common, habitat degradation is of little importance. Human destruction of nesting and feeding habitats is also relatively insignificant, because of the low level of socio-economic development.

There is no organized turtle fishery and most killing is for subsistence. Tortoise-shell has probably been collected and traded for centuries, but it is difficult to estimate the numbers of turtles killed or quantities of tortoise-shell produced. There is little chance, and *no reason*, to increase the numbers of sea turtles caught in the Comores (i.e., to 'develop' the fishery).

Apparently there is no protective legislation for turtles or turtle habitats in either of the two political states in the Archipelago. It is imperative that nesting beaches be protected from intense exploitation – especially on Pamanzi Island, Mayotte. As well as nesting reserves, marine reserves must be set up to protect feeding habitats and rich coral reefs. Regular monitoring of these populations, to establish population sizes and annual crops, is also urgently needed.

Perhaps the most challenging problem is whether or not the two political entities can work together efficiently toward a common goal. Unfortunately, there are few examples of this in the Indian Ocean (Frazier, 1980*b*), but the formation of the Indian Ocean Alliance for Conservation bodes well for a change in international attitudes toward these international resources.

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APPENDIX I

Nesting activity on six major nesting beaches on Mohéli Island (see Table 9).

M'Sanga Nyamba (beach N° 8). This beach was inspected twice in 1972, on 24 February and on 27 June. On the first visit there were 20 nest pits, 11 thought to be with eggs and nine thought to be without. Ten recent sets of tracks crossed the beach. On the second inspection five months later, 63 nest pits were counted. Twenty-four had eggs and 37 did not. Two were questionable. (In other discussions only the numbers of nest pits thought to contain eggs and thought not to contain eggs are listed; nest pits uncertain to have eggs are not listed, but the total number of pits = number with eggs + number without eggs + number uncertain.) Forty-three recent sets of tracks were estimated to be on the beach. Because of the density of tracks it was difficult to read the spoor well, but I estimated that the tracks had been made over a two-week period, and that about half of them were associated with the 24 nests with eggs. It was thus estimated that about 12 nests per week were made on this beach or, in other words, about 1 1/2 nests per night. This estimate was supported by additional observations. Two gravid females (JFCm 857 and 858) had been killed the night of June 26, and one nest had emerged. If this intensity of nesting were maintained throughout the year, there would be about 600 nests annually. The February figures, however, indicate that there may be about half as many nestings per night in certain months, and activity may go even lower than this.

On 12 June 1973 this same beach had 69 nest pits, at least 32 with eggs and 31 without. There were 28 sets of tracks, and 15 were from one (or two) night(s) before. Between 30 and 45 nests were estimated to have been made in the last two-week period, so there seemed to be more intense nesting than in the same month the year before.

The total number of nests per year on M'Sanga Nyamba (N° 8) may vary from 600 to 1,000, depending on the year. Because these estimates were based on peak season activity, the lower figure is probably a better general estimate.

M'Samouheo (beach N° 12). This beach was inspected in greater detail than the above beach, although they are only 2.5 km apart. On 24 February there were 26 nest pits; 15 evidently had eggs and four were without. Ten recent sets

of tracks crossed the beach, and there had probably been about seven nests in the preceding week. On 9 and 10 March I camped on this beach. During this time nine females came ashore and at least five individuals were involved, for that many were tagged; the four animals not handled could have been other individuals or returns of the five. Only three nests were made during this 48 hour period, but this was undoubtedly due to the disturbance caused by my tagging activity (and my 'assistants'). There might have been two or three nests per night during this period.

On 27 June there were 54 nest pits; 30 were with eggs and 23 without. Three turtles had been on the beach the night before and eight other tracks remained from the preceding days. Only one nest was found from the night before and this was evidently without eggs.

Hence, there might have been two or three turtles nesting nightly at one point in the season (March to June) and only one at another (February); possibly there are fewer at other times. There could be about 600 nests in a year.

This beach showed a reduction in nesting activity on 11 June 1973. There was a total of 46 nest pits, and only 18 were estimated to have eggs; 28 evidently did not. About 23 sets of tracks crossed the beach, and these had been made in the last fortnight or so. If there had been ten nestings in the past two weeks, there might be only 250 nests per year. Both years combined indicate that there might be less than 600 nests annually.

Chissioua Ouénéfou, west beach (beach N° 45). On 27 February there were 40 pits; 19 seemed to have eggs and 17 did not. There were recent tracks, but these were too confused to read. On the night of 31 March two females laid and there were emergences of hatchlings from two nest sites; two females also laid on the night of 30 March. On this date there were 60 nest pits; 34 with eggs and 15 without. On 25 June 39 nest pits were recorded. Nineteen were with eggs and 17 without. There were 25 sets of tracks made over the past week or so and another five made the night before; one turtle had laid eggs. There had also been two nest emergences the night before. It is curious that there were fewer nest pits in June than there had been in April, but this is a beach with much activity so it was difficult to read the spoor accurately. The sand was churned up so that many nests were obscured by subsequent nesting. Nevertheless, it seems that two nestings a week was common at least from February to June. On this basis, there were estimated to be 600 annual nestings.

On 10 June 1973 there were 43 nest pits, 20 with eggs and 21 without. There were about 28 sets of tracks that had been made over the past week or two. Nesting activity seemed to be down from the year before, with perhaps seven nests a week (or fortnight), and it was estimated that there might be 300 nestings yearly. However, this single estimate for 1973 is of limited value, especially on such an active and crowded beach.

Chissioua Ouénéfou, north beach (beach N° 46). On 27 February there were

two recent sets of tracks, but otherwise little evidence of recent nesting. On 1 April there were 20 nest pits; nine with eggs and eight without. There had evidently been a nesting the week before. On 25 June there were 67 nest pits, 34 with eggs and 31 without. There had been four nestings the night before. Thirty-nine sets of tracks crossed the beach, six had been made the night before.

The nesting activity on this beach varied from nil to four per night. If the average over the season was between one and two nests per night, there might be 450 nests annually.

A year later, on 11 June 1973, there were 92 nest pits, 21 with eggs and 58 without, a very high proportion of abandoned nest pits. Twenty sets of tracks crossed the beach, and these had evidently been made in the last fortnight. It seemed that there was not much more than one nest a night on average, or 450 nests a year.

Chissioua Ouénéfou, northeast beach (beach N° 47). On 27 February there was evidence of two *Chelonia* having nested two nights before. A portion of the beach (the southern tenth) had 31 nest pits, seven with eggs and 15 without. This low proportion of good nests may not have been representative of the entire beach. On 1 April there were 108 nest pits, 60 with eggs and 26 without. However, nearly one third of the nests thought to have eggs were old, made the year before, perhaps. Although there was one nest without eggs from the night before, there had been few recent nests in the month of March. On 25 June there were 114 nest pits, 82 were with eggs and 29 without. Twenty sets of recent tracks crossed the beach, and six others had been made the night before, but only two animals had laid. Also, there had been four emergences of hatchlings in the past few days.

As with the north beach of the island, there was considerable variation in nesting activity, with daily numbers varying from nil to two. Throughout the season the daily average could not probably be greater than one or two; the estimate was not more than 450 nests per year.

On 10 June 1973 activity was greater than that observed the year before. Over 40 sets of tracks crossed the beach, and most had been made in the last week or two. There were 139 nest pits of which 53 were thought to have eggs; 78 evidently did not. It was difficult to estimate the 'average' daily complement, but there did not seem to be more than two successful nests per day. If this rate were maintained (which is improbable) there would be 600 nests yearly.

M'Sanga Nyamba (beach N° 67). This is the most important beach in Comores. On 3 March there were 165 nest pits; 99 were with eggs and 34 without. One turtle nested on 1 March, and seven beached the 2nd, but only two nested. The last few days in February, six or more animals had nested and two had been slaughtered, but there were many other carcasses about. On 24 June there were 270 nest pits; 131 with eggs and 90 without. The preceding night there

were perhaps seven emergences of nests and 14 beachings, of which 11 turtles were tagged. It was thought that at least 14 females had beached. Only two nested, but certainly they were disturbed by my tagging and measuring activities. There were signs of about 17 nest emergences from the preceding few days, but only one nest had evidently been made the night of 22 June.

The number nesting nightly on this beach varied from two to seven. If the average over the season was five nests per night, there might be 1,800 nests in a year. Unfortunately, this beach was not surveyed in 1973.

APPENDIX II

Collections in the National Museum of Natural History, Washington D. C.

Specimens of *Chelonia mydas* (L.) and of *Eretmochelys imbricata* (L.) from the Comoro Archipelago have been deposited in the Division of Amphibians and Reptiles, National Museum of Natural History, Smithsonian Institution, Washington D.C. In the following lists the Museum's collection number (USNM) is given, together with the collector's field number (in parentheses), for each specimen; 'no #' indicates no field number.

Chelonia mydas (L.)

Grand Comore. One immature skeleton: USNM 231560 (JFCm 787/BZ); and one adult (?) male skull: USNM 231561 (JFCm 862/BW).

Mohéli. Seven wet hatchlings: USNM 231565 – 231571 (JFCm 775 – 781); one dry yearling: USNM 231584 (JFCm 752); one dry immature: USNM 231581 (no #); twelve adult (?) skulls: USNM 231564 (JFCm 919), USNM 231572 – 231580 (no #, JFCm 795/I, 796/J, 850/BK, 851/BL, 853/BN, 855/BP, 856/BQ, 861/BV), USNM 231582 – 231583 (JFCm 798/M, 799/N).

Mayotte. Twenty-six adult (?) skulls: USNM 231587 – 231589 (JFCm 801/P – 803/R), USNM 231590 – 231591 (JFCm 819/AH – 820/AI), USNM 231592 (JFCm 830/AQ), USNM 231593 – 231596 (JFCm 833/AT – 836/AW), USNM 231597 (JFCm 838/AY), USNM 231598 (JFCm 806/U), USNM 231599 – 231608 (JFCm 809/X – 818/AG), USNM 231609 – 231611 (JFCm 822/AK – 824/AM), USNM 231612 (JFCM 804/S). Twenty-five of these skulls are from Pamanzi Island (beaches 125 – 127); the last one is from M'Sanga Nyamba (beach 121).

Eretmochelys imbricata (L.)

Grande Comore. One immature skeleton and shell: USNM 231562 (JFEi 28).

Mohéli. One immature skeleton and scales: 231585 (JFEi 21); one adult (?) skull: USNM 231586 (JFEi 146).

Mayotte. Two adult (?) skulls: USNM 231613 – 231614 (JFEi 138, 139).

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Table 1. Beaches of Grande Comore (see Figure 2 for a map of beaches of Grande Comore)

Beach N°	Locality	Turtle spoor	Human dist.	Crab	Beach						More nests poss?	Date obs. (1972)
					Erosion (cm)	Sand	Slope	Length (m)	Width (m)	Veg		
1	Itsandra	nil	intense: V, R, bb	100	nil	white, coral	gentle	225	30	S, F	yes!	8 Jan.
2	Chindini	reported	intense: V, B	few	little	grey, gravelly	moderate	250	20	S	some	12 Jan.
3	Malé	nil	intense: V, B	nil	nil	red	moderate	400	10	M, S	yes	12 Jan.
4	Foumboudzivouni	-	intense: V ?	-	-	-	-	600	-	-	-	no obs
5	Kouhani	-	rare ?	-	-	-	-	100	-	-	-	no obs
6	Bouni	-	intense: V ?	-	-	-	-	500	-	-	-	no obs
7	Ouéla	-	intense: V ?	-	-	-	-	200	-	-	-	no obs
8	Hantsindzi S	-	intense: V ?	-	-	-	-	400	-	-	-	no obs
9	Hantsindzi N	-	intense: V ?	-	-	-	-	500	-	-	-	no obs
10	N'Droudé S	-	intense: V ?	-	-	-	-	300	-	-	-	no obs
11	N'Droudé	-	intense: V ?	-	-	-	-	100	-	-	-	no obs
12	N'Droudé N	1 Cm nest pit	moderate: B	nil	200	pink	-	900	10	S	yes	2 July
13	no name	-	little ?	-	-	-	-	100	-	-	-	no obs
14 to 16 each:	no name	-	little ?	-	-	-	-	200	-	-	-	no obs
17	Ivoini	-	intense: V ?	-	-	-	-	300	-	-	-	no obs

Table 1 (cont.)

Beach N°	Locality	Turtle spoor	Human dist.	Crab	Beach						More nests poss?	Date obs. (1972)
					Erosion (cm)	Sand	Slope	Length (m)	Width (m)	Veg		
18 to 27 each:	no name	-	rare ?	-	-	-	-	50	-	-	-	no obs
28	Mtsizambé E	-	rare ?	-	-	-	-	300	-	-	-	no obs
29	Mtsizambé W	-	rare ?	-	-	-	-	400	-	-	-	no obs
30	no name	nil	moderate: P	nil	nil	white, granular	gentle	200	2	S, F	few	2 July
31	no name	nil	moderate: B	nil	nil	white !	gentle	200	2	S, M	yes	2 July
32	no name	nil	rare	nil	nil	coral & lava stone	moderate	20	1	S	no	2 July
33	no name	nil	rare	nil	nil	coral & lava stone	moderate	40	1	S	no	2 July
34	Trou du Prophete	nil	little: P	nil	nil	grey	moderate	60	1	S	no	1 July
35	no name	nil	little: P	nil	nil	grey/ white	moderate	50	5	S	few	1 July
36	no name	nil	little: P	nil	nil	white !	gentle	200	10	S	yes	1 July
37	no name	nil	-	-	-	-	-	100	-	-	-	no obs
38	no name	nil	-	-	-	-	-	200	-	-	-	no obs
39	no name	nil	-	-	-	-	-	100	-	-	-	no obs
40	Hotel Maluga	reported	intense: L	nil	nil	white !	moderate	75	25	C	yes	1 July
41	Mitsamiouli	reported	intense: V	nil	nil	brown	gentle	2300	10	S	yes	1 July
42	N'Dzsouzé N	-	intense: V ?	-	-	-	-	100	-	-	-	no obs
43	N'Dzsouzé S	-	intense: V ?	-	-	-	-	100	-	-	-	no obs

Abbreviations for Tables 1, 2, 3 & 4: beaches of the Comoro Archipelago

Turtle spoor: tracks, nests or other spoor of turtles on the beach.
Cm = *Chelonia mydas*;
Cm, Ei = *Chelonia mydas* and *Eretmochelys imbricata*;
Cm/Ei? = spoor not identified to species;
Ei = *Eretmochelys imbricata*;
bones = turtle bones badly weathered and not identified to species;
reported = nesting activities were reported by local people but not observed during the study;
slaughtered = turtles transported to this beach and then slaughtered;
! = large number of this species;
? = species identity not certain;
Special and isolated cases of observations of turtles on certain beaches are indicated (e.g., JFCm 797).

Human dist.: human disturbance on the beach and the chances of a nesting turtle being discovered and disturbed; four conditions in decreasing order of disturbance are: intense, moderate, little and rare. Disturbing factors include:
A = agricultural activities (e.g., banana, coconut, rice) just inland of beach;
B = boats pulled up on beach;
bb = bathing beach;
C = coral limeing on beach;
F = fishermen's camp on beach;
H = huts inland of beach;
L = visitor's lodge or hotel inland from beach;
P = path on or along the beach;
R = road along beach;
T = turtles regularly killed on beach;
V = village on or near beach.

Carn. spoor: carnivore spoor (only Tables 2 & 4).
C = cat-like tracks (*Genetta sp.* ?);
D = dog tracks;
dd = nest dug up (by dogs?).

Crab: ghost crabs, *Ocypode* spp., on the beach, burrows or crabs themselves (only Tables 1, 2 & 4).

Rocks: rocks on the beach (only Table 4).
cobble = beach rock cobble;
boulders = beach rock boulders;
beach = intact strata of beach rock in intertidal zone of beach;
phos. = phosphatic beach rock.

Erosion: erosional cliff at high beach (only Tables 1, 2 & 4).

Sand: sand colour and quality.

Slope: slope of the beach; in order of decreasing slope: steep; moderate; gentle; very gentle.

Length: length of the beach, in metres.

Width: width of the beach, in metres, from beach crest to dense vegetation, or other obstacles to nesting turtles (only Tables 1, 2 & 4).

Veg: vegetation, reported in order of relative importance; symbols indicate:
C = coconut; F = forest; G = grass; M = mangrove; P = plantation; S = strand.

More nest poss?: more nests possible?, in decreasing order of response: yes; some; few; no.

Date obs. (1972): Date(s) of observation in 1972;
no obs = no observation;
no detail = no detailed observations.

General symbols, used throughout the tables:
! = emphatic (e.g., large number of turtles nesting);
+ = presence confirmed;
/ = no observation recorded, but category probably absent;
- = no data.

Table 2. Beaches of Mohéli, Comores (see Figure 3B for a map of beaches of Mohéli)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Beach					Veg	More nests poss?	Date obs. (1972)
						Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
1	M'Batsé	nil	intense: V	/	/	/	brown	gentle	3200	-	-	yes	24 Feb
2	Mombasa	nil	intense: P, V	/	/	/	brown	gentle	2000	-	S	yes	24 Feb
3	Gnambo-Yamsoré E	nil	intense: V	/	/	/	brown	gentle	800	-	S	yes	24 Feb
4	Gnambo-Yamsoré W	Cm	moderate	/	/	30	dark brown	gentle	200	-	S	few	24 Feb, 27 June
5	Fomboni Domoni	-	moderate: P	-	-	-	brown	-	100	-	-	-	no detail
6	Domoni E	Cm	intense: B, P	nil	/	/	grey cobble	-	30	5	S, F	no	27 June
7	Domoni W	nil	intense: V	/	/	/	-	-	350	-	-	few	27 June
8	M'Sanga Nyamba	Cm!	moderate: T	nil	3 spp.	60	pink	gentle	300	7	S, F	yes	24 Feb, etc.
9	Naksambi	Cm	little	/	+	/	grey-pink	-	100	5	S, F, C	no	27 June
10	Kobéla N	Cm	little	C	+	/	-	-	20	5	S, F	few	27 June
11A	Kobéla S	Cm	moderate: B, C	/	/	/	grey	-	20	1	S, F	no	27 June
11B	Kobéla W	Cm	rare	/	/	/	grey	-	5	1	F	no	27 June
12	M'Samouheo	Cm!	intense: T	/	50	/	pink	moder-ate	150	1-13	S	no	24 Feb, etc.
13	Chiconi	bones	intense: V	/	/	150	dark	gentle	350	20	S	yes	23 Feb
14	Calepunda	nil	little	/	+	/	shingle	gentle	100	10	S, F	some	23 Feb

Table 2 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Beach					Veg	More nests poss?	Date obs. (1972)
						Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
15	Foumbani	nil	moderate: P	/	+	/	brown	very gentle	350	10	S, C	some	23 Feb
16	Sangiras	nil	moderate: P	/	/	/	black, shingle	gentle	75	1-5	S, C	few	23 Feb
17	Miringoni	nil	intense: V	/	/	/	-	-	400	-	-	no	no detail
18	Damou N	nil	moderate: P	/	1000	/	dark brown	very gentle	300	-	S, M, C	few	14 March
19	Damou S	Cm	moderate P	/	/	30	grey	very gentle	100	-	S, M, F	few	14 March
20	Madjingouéni	nil	moderate: P	/	/	/	-	gentle	300	30	M	yes	14 March
21	no name	nil	little	/	/	100	-	-	50	-	S, F	no	14 March
22	Ouallah	JFCm 797	intense: V	/	/	little	brown	gentle	900	20	S	yes	23 Feb, 14 March
23	Ouamdjawaché	nil	moderate: R	/	/	60	-	-	75	10	M, S, C	no	14 March
24	Sambadjou N	Cm, Ei	moderate: R	C	+	nil	light red-brown	gentle	200	5	S, C	some	23 Feb, etc.
25	Sambadjou S	nil	moderate: R	/	/	/	coarse	gentle	200	-	-	no	15 March
26	Mirémani W	Cm, Ei	little	/	+	+	shingle, grey-red	gentle	75	1	S, F	few	15 March
27	Mirémani E	nil	intense: B, V	/	/	/	-	-	250	1	S, F	few	15 March
28	Trandrama W	Cm, Ei	little: P	/	/	/	brown	gentle	25	1	-	no	15 March
29	Trandrama E	nil	little	/	/	/	-	gentle	30	-	S, F	few	15 March

Table 2 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Beach					Veg	More nests poss?	Date obs. (1972)
						Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
30	Moini W	Ei	moderate: B	/	+	/	-	very gentle	300	-	S, F	yes	15 March
31	Moini E	Cm	little	/	/	/	cream & black	gentle	100	5	S, F	yes	15 March
32	Hangnatsani W	nil	moderate: H	/	/	300	pink	very gentle	400	2	S	few	22 Feb, 15 March
33	Hangnatsani E	nil	little	/	/	/	-	-	30	-	-	few	15 March
34	Hanvouba	reported	moderate: H	/	/	300	black-brown	gentle	250	2	S, C, M	few	22 Feb
35	M'Boinifoungué	nil	moderate: H, P	/	/	100	red-brown	very gentle	200	2	C, S	yes	22 Feb, 15 March
36	Béramou	nil	moderate: P	/	+	/	dark-brown	gentle	300	-	S, C, M	few	15 March
37	Nioumachoua W	reported	intense: B, V	/	/	/	pink	gentle	200	10	S, F	yes	16 March
38	Nioumachoua (main)	slaughtered	intense: B, V	/	/	/	red-brown	moderate	900	20	S, M	yes	20 Feb, 16 March
39	Nioumachoua E	nil	moderate: P	/	/	/	-	-	50	-	-	no	16 March
40	Bandani	nil	moderate: P	/	/	/	brown	gentle	200	-	M, S	no	16 March
41	Ch. Dzaha S	Cm	rare	/	/	/	white	steep	30	5	nil	few	30 March
42	Ch. Dzaha NW	Cm	little: F	/	/	/	white	gentle	150	1	S, F	yes	30 March
43A	Ch. Canzoni SW	Cm, Ei	little: F	/	/	/	pink	-	30	4	S, F	yes	30 March
43B	Ch. Canzoni NW	Cm/Ei?	little: F	/	/	/	-	-	15	-	-	-	no detail

Table 2 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Beach					Veg	More nests poss?	Date obs. (1972)
						Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
44	Ch. Canzoni E	nil	rare	/	/	/	white	gentle	40	5	S, F	few	30 March
45	Ch. Ouénéfou W	Cm!	rare	C	few	little	white	gentle	100	6	S	no	27 Feb, etc.
46	Ch. Ouénéfou N	Cm!, Ei	little: F	C	few	/	white, fine	gentle	175	10	S, F	yes	27 Feb, etc.
47	Ch. Ouénéfou NE	Cm!, Ei	little: F	nil	3 spp.	little	white	gentle	300	10	S, F	no	27 Feb, etc.
48	Ch. Ouénéfou SE	Cm, Ei	rare	nil	/	/	white	gentle	125	5-10	S, F	few	29 March
49	Ch. Chandzi	Cm	rare	C	+	/	white & black	gentle	100	5	S, G	no	29 March
50	Ch. Méa (Ch. Chosani)	Cm	rare	C	/	100	white	gentle	100	25	S, F	no	1 April
51	M'Bouemdou	-	rare	-	-	-	-	-	100	-	-	-	no obs
52	Mapiachingo	-	moderate: P	-	-	-	-	-	250	-	-	-	no obs
53	Moihani W	nil	moderate: L, R	D	few	/	red-brown	moder-ate, gentle	400	5	S, M	yes	22 Feb
54	Moihani E	nil	intense: B, H, L	D	50	40	brown	gentle	300	20	S	yes	20 Feb
55	Sambia	nil	moderate: V	/	/	40	red-brown	gentle	1800	5	S, C	yes	20 Feb
56	Hamvou	nil	moderate: H, P	/	/	30	dark brown	gentle	150	5	S, M, C	some	20 Feb
57	Hamoignobé W	nil	little	/	20	100-200	dark brown	gentle	75	5	S	some	2 March
58	Hamoignobé E	nil	little	/	/	/	pebble	-	30	2	-	few	2 March

Table 2 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Beach					Veg	More nests poss?	Date obs. (1972)
						Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
59	no name	bones	little	/	/	/	light brown	very gentle	100	10	S, F	yes	2 March
60	Hagnenguélé	bones	little	/	/	/	brown	very gentle	800	2	S, C, F	few	2 March
61	Iconi	nil	little	/	/	/	-	moder-ate	200	5	S	yes	2 March
62A	Kadoni W1	nil	little	/	/	/	-	-	20	2	S	few	2 March
62B	Kadoni W2	Cm/Ei?	little	/	/	/	-	-	300	5	S	few	2 March
63	Kadoni E	Ei	little	/	50-100	/	-	-	300	5	S	some	2 March
64	Tsinavouni W	Cm/Ei?	little	/	/	/	-	-	200	10	S, F	yes	2 March
65	Tsinavouni N	Cm	moderate: P	C, D!	100	/	grey-pink	gentle	150	5	F, S	no	2 March, 24 June
66	no name	Cm	intense: P, T	/	/	/	light brown	gentle	150	5	-	no	3 March, 24 June
67	M'Sanga Nyamba	Cm!, Ei	intense: T, V	C, D	100	/	light brown & pink	gentle	700	10	S, F	few no	3 March, 24 June
68	Itsamia	Cm	intense: B, V	D	/	/	pink	gentle	450	5	S	yes no	3 March 24 June
69	no name	Ei	little: P	/	/	/	shingle	gentle	15	5	-	few	3 March
70	no name	Cm, Ei	little	/	/	200	-	gentle	300	4	S	few	3 March
71	M'Sanga Nyamba	Cm	little	/	/	/	light brown	gentle	50	10	F, S	few	3 March
72	no name	nil	little	/	/	/	shingle	steep	100	-	-	-	3 March
73	Hagnamoida	Cm, Ei	intense: B, V	/	1000	200	brown	gentle	800	5	S, C	yes	3 March
74	no name	nil	little	/	/	/	shingle	-	150	20	S	yes	3 March

Table 2 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Beach					Veg	More nests poss?	Date obs. (1972)
						Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
75	no name	nil	little	/	/	/	shingle	steep	30	5	-	few	3 March
76	no name	nil	little	/	/	/	shingle	-	50	10	S	few	3 March
77	M'Sangararou E	nil	rare	/	/	/	shingle	-	20	20	S	yes	3 March
78	M'Sangararou W	-	rare	-	-	-	-	-	100	-	-	-	no obs
79	no name	nil	rare	/	/	100	shingle	-	60	-	S, F	few	8 March
80	Goudjou-bouéni E	nil	rare	/	/	100-200	black shingle	-	150	5	S, F, M	few	8 March
81	Goudjou-bouéni W	nil	rare	/	/	/	shingle	-	150	-	S, F, C	few	8 March
82	Hamnobi	nil	rare	/	/	/	shingle	-	200	-	S, F	some	8 March
83	Tanaraki	nil	rare	/	/	/	shingle	-	50	-	S, F	few	8 March
84	Mbwamaji	Cm, Ei	little: P	/	/	60	yellow brown	gentle	400	5	S, F, C	few	8 March
85	Oua Madji	nil	little: P	/	/	/	shingle	-	200	5	C	few	8 March
86	Babani	nil	moderate: H	/	+	200	shingle at b.c.	-	300	-	S, C, F	few	8 March
87	Kahioua	nil	rare	/	/	/	-	-	50	-	F	few	8 March
88	Gnombéni	nil	intense: V	D	-	-	brown	gentle	800	-	-	-	no detail
89	Djoièzi	nil	intense: V	D	-	-	brown	gentle	700	-	-	-	no detail

** See Tables 9 and 28 for details.

Abbreviations at end of Table 1.

Table 3. Beaches of Anjouan, Comores (see Figure 4 for a map of the beaches of Anjouan)

Beach N°	Locality	Turtle spoor	Human dist.	*Beach*			Veg	More nests poss?	Date obs. (1972)
				Sand	Slope	Length (m)			
1	Banda M'Tsanga	bones of 2	intense: B, H	coral rubble	steep	15	S, F	no	20 June
2	Pangani	nil	little	grey	-	15	S, C	few	20 June
3	Hajoho	nil	intense: V, B	brown	-	1000	S, C, F	some	20 June
4	Chagnoungouni	nil	little	cobble, no sand	-	-	-	no	20 June
5	Harembo	nil	moderate: P	cobble, no sand	-	-	-	no	20 June
6	Ongoni	nil	intense: V, B	cobble, no sand	-	-	-	no	20 June
7	Gégé	nil	intense: P	brown	-	2100	P	no	3 April
8	Domoni, 1 N	-	intense: V	-	-	500	-	-	no obs
9	Domoni, 2 N	-	intense: V	-	-	250	-	-	no obs
10	Domoni, 3 N	-	intense: V	-	-	150	-	-	no obs
—	Moya	reported	-	-	-	-	-	-	no obs
11	Pagé	nil?	intense: V	brown	gentle	650	-	-	no detail
12	Mirontsi	reported	intense: V	brown	gentle	1200	P	few	no detail
13	M'Tsangamouhouni	nil?	intense: V	brown	gentle	300	P	few	no detail
14	Joumbi	-	little	-	-	300	-	-	no obs

Abbreviations at end of Table 1.

Table 4. Beaches of Mayotte, Comores (see Figure 5 for a map of beaches of Mayotte)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
1	Doujani N	nil	little: P	/	+	cobble	/	grey	gentle	200	< 5	S	few	10 May
2	Doujani S	nil	little: P	/	/	cobble	/	grey	gentle	250	5	F, S	few	10 May
3	Mutsagnougni (A)	nil	moderate: V, C	/	/	/	/	grey	gentle	500	< 5	S, F	few	10 May
4	Mutsagnougni (B)	nil	little: P	/	/	cobble	/	-	-	< 50	-	S, F	few	10 May
5	Mutsagnougni (C)	nil	little: P	/	/	/	/	-	-	75	-	S, F	few	10 May
6	Mutsagnougni (D)	nil	little: B, A	/	/	/	/	grey	gentle	60	-	S, F	few	10 May
7	Mutsagnougni (E)	nil	little: A	D	/	boulders	/	brown	gentle	50	-	S, F	few	10 May
8	Mutsagnougni (F)	nil	little: A	D	/	/	100	grey	gentle	300	< 5	S, F	few	10 May
9	Prosni	nil	little: A	/	/	/	/	-	-	125	-	S, F	few	10 May
10	Chissioi Caroni	nil	rare	/	100	/	/	pink	moderate	125	-	S, F	few	10 May
A	Tsimkoura Titi	/	intense: V, B	-	-	/	100	mud	-	-	-	M, S	no	10 May
B	Caroni	/	intense: V, B	-	-	/	100	mud	-	-	-	M, S	no	10 May
C	Magimécuni	/	intense: V, B	-	-	/	100	mud	-	-	-	M, S	no	10 May
D	M'Jimbiani	/	intense: V, B	-	-	/	/	mud	-	-	-	M, S	no	10 May
E	Agnoundro	/	intense: V, B	-	-	/	/	mud	steep	-	-	M, S	no	10 May
F	Bouéni	/	little	-	-	cobble	/	sand	steep	75	1	S	no	10 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
11	Bouéni N	nil	intense: V, A	/	/	/	/	brown pink	gentle	1000	-	S, F	few	11 May
12	Bouéni S	nil	moderate: P	/	/	/	/	-	-	100	-	F, S	few	11 May
13	M'Taanga (A)	nil	moderate: P	/	/	/	300	soil	-	150	-	F, S	no	11 May
14	M'Taanga (B)	nil	moderate: P, A	D	/	beach	/	-	-	200	-	F, S	few	11 May
15	M'Taanga (C)	Cm	moderate: P, A	/	/	/	/	pink	moderate	200	-	F	some	11 May
16	Bambao-Ouest N	nil	moderate: P	C, D	+	/	/	pink brown	moderate	60	-	F	few	11 May
17	Bambao-Ouest S	nil	intense: V, B	C, D	+	/	/	brown	moderate	600	-	S, F	some	11 May
18	M'Zouazia	nil	intense: V	/	/	/	/	-	moderate	1000	-	S, F	some	11 May
19	M'Tsangamouji	nil	intense: V	/	/	/	/	fine black	moderate	125	-	S, F	some	11 May
20	Boinatsa	nil	intense: V	/	/	/	/	fine black	-	-	-	F	few	11 May
21	Rassi Gouja W	nil	intense: V, B	/	/	/	/	pink brown	steep	600	-	F, S	some	11 May
22	Rassi Gouja E	nil	rare	C, D	/	/	/	-	-	100	-	S, F	few	12 May
23	Rassi Banda-kouni (A)	nil	rare	C, D	/	/	/	fine black	moderate	75	-	S, F	few	12 May
24	Rassi Banda-kouni (B)	nil	rare	/	/	/	/	-	-	50	-	F	few	12 May
25	Rassi Banda-kouni (C)	Cm?	rare	C, d	/	/	/	brown	moderate	200	-	F	few	12 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
26	M'Ronabèja	nil	intense: B	D	/	/	/	dark brown	moderate	400	-	F	few	12 May
27	M'Bouini	nil	intense: V	D	/	/	20	brown	very gentle	600	-	S, F	few	12 May
28	Chariffou (A)	Cm	rare	C, D, d	/	/	/	black	moderate	100	7	S, F	some	13 May
29	Chariffou (B)	Cm	rare	D, d	/	/	/	black	steep	40	-	F	some	13 May
30	Chariffou (C)	Cm	rare	C, D, d	+	/	/	black	moderate	200	-	F	few	13 May
31	Chariffou (D)	Cm	little: B	D	/	/	/	black brown	-	100	-	F	few	13 May
32	Dapani W	nil	little: P	/	/	/	/	black	-	1000	-	M, F	few	13 May
33	Dapani E	nil	little: P	/	/	beach	100	brown + soil	gentle	75	0	S, F	few	13 May
34	Saziley W	Cm	rare	/	/	/	/	black	moderate	175	-	F	few	13 May
35	Saziley E	Cm!, Ei	intense: V	d	/	/	/	grey	gentle	600	-	S, F	some	13 May
36	Magikhavo S	Cm	intense: V	D, d	+	beach	/	pink	moderate	175	-	S, F	some	15 May
37	Magikhavo N	Cm	moderate: B	d	+	/	/	pink	steep	125	-	S, F	few	15 May
38	Magikhavo NE	Cm	rare	/	+	/	/	black	moderate	100	-	S, F	few	15 May
39	Saziley Bé S	Cm	rare	d	/	beach	100	white	-	100	-	F	few	15 May
40	Saziley Bé N	Cm	moderate: B	d	+	phos.	/	-	-	700	15	S, F	yes	15 May
41	M'Samudu	nil	intense: V, B	/	/	/	/	brown	-	500	-	S, F	yes	15 May
42	Miambani	nil	intense: V	C, D	+	/	40	-	-	600	-	S	yes	15 May
BG	Rassi Abambo	nil	rare	/	/	/	/	grey	-	75	0	F	no	15 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
43	Chissioi Bambo	nil	rare	/	30	/	/	white-grey	gentle	40	0	F	no	15 May
44	Bambo-Est	nil	intense: V, B	C, D	+	/	/	brown	gentle	700	-	S, F	some	16 May
45	Tsatoundou	nil	intense: V, B, A	D	/	/	/	brown	moderate	600	-	S, F	some	16 May
46	Chissioi Bandélé (A)	Ei?	rare	/	/	/	/	pink	gentle	30	10	S, F	yes	16 May
47	Chissioi Bandélé (B)	nil	rare	/	/	/	/	pink	gentle	25	0	S	no	16 May
48	Chissioi Bandélé (C)	nil	rare	/	/	/	/	pink	steep	30	0	F, S	no	16 May
49	Chissioi Bandélé (D)	nil	rare	/	/	/	/	-	-	30	0	F, S	no	16 May
50	Chissioi Bandélé (E)	nil	rare	/	/	beach	/	pink	steep	100	15	S	yes	16 May
51	M'Ro Mouhou	nil	moderate: P, A	/	/	/	/	brown	-	50	-	M, S	some	16 May
52	Gnambadao	nil	intense: V, B	/	/	/	/	-	-	60	-	S	some	16 May
53	M'Rafeni W	nil	moderate: P	/	/	/	/	brown pink	-	60	0	F, S	no	16 May
54	M'Rafeni E	nil	moderate: P	/	/	/	/	brown	-	20	0	S, F	no	16 May
55	Sakouli	nil	moderate: P	/	/	/	/	brown	moderate	400	-	S, F	no	16 May
56	Hamouro S	nil	intense: V	D	/	/	/	brown	gentle	300	-	S	some	17 May
57	Hamouro N	nil	little: P	/	/	/	/	brown	-	300	-	S, F	some	17 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
X	Handré	/	intense: V	-	-	/	/	mud	-	-	-	M	no	17 May
Y	Gogorakandza	/	moderate: P	-	-	/	/	mud	-	-	-	M	no	17 May
58	Ilohi S	nil	moderate: P	C	/	/	/	brown	-	200	-	F	few	17 May
59	Ilohi N	nil	intense: V	/	/	/	/	-	-	200	-	M, F	few	17 May
60	Hamaha	nil	little: P	/	/	cobble	100	brown	gentle	200	-	S, F	no	18 May
61	Magikhavo II (A)	nil	intense: V	D	/	/	50	black	moderate	500	-	S, F	few	18 May
62	Magikhavo II (B)	nil	moderate: P	/	/	/	/	black	-	50	-	S, F	few	18 May
63	Magikhavo II (C)	nil	moderate: P	/	/	/	/	brown	-	75	-	M	few	18 May
64	Pointe Kongo	nil	rare	C	/	/	/	pink	-	30	-	S, F	few	18 May
65	Kongo E	nil	moderate: B	D	/	/	/	bown/ grey mud	gentle	300	-	S, F	few	18 May
66	Kongo village	nil	intense: V, B	/	/	/	150	-	-	400	-	-	no	18 May
67	Kongo W I	nil	moderate: P, A	/	/	/	75	pink	moderate	75	-	S	yes	18 May
68	Kongo W II	nil	rare	C	+	beach	30	pink	moderate	50	-	S, F	yes	18 May
69	Trevani E	nil	little: P	C	/	beach	50	pink	-	75	-	S, F	yes	18 May
70	Trevani village	nil	intense: V, B	D	/	/	100	black	gentle	200	-	S, F	few	18 May
71	Trevani W I	nil	moderate: P	C	/	/	/	brown	moderate	200	-	S, F	yes	18 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	*Beach*					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
72	Trevani W II	nil	moderate: P	/	/	/	100	black	-	40	0	F, S	no	18 May
73	Kangani	nil	moderate: P	/	+	/	30	brown grey	-	150	-	S, F	yes	18 May
74	M'Gombani	nil	moderate: P	/	+	beach	/	brown	gentle	60	-	S, F	some	19 May
75	Pointe de Longoni E	nil	rare	D	/	/	100	brown red	gentle	50	0	S, F	no	19 May
76	P. de Longoni	nil	rare	D	+	/	/	brown	gentle	40	-	S, F	yes	19 May
77	P. de Longoni W I	nil	rare	D	+	/	/	brown	gentle	30	4	S, F	yes	20 May
78	P. de Longoni W II	bone	moderate: B	D	/	/	/	pink	-	200	5	S, F	no	20 May
79	Tririni	nil	moderate: B, P	D	/	beach	/	red pink	-	75	-	S, F	some	20 May
Z	West of Ile Vert	-	-	/	/	/	/	-	-	-	-	-	-	20 May
80	Bandaboi	nil	intense: V, B	/	/	/	100	dark brown	-	600	-	M, S, F	no	20 May
81	Chissioi Andréma	nil	rare	/	/	/	/	white	gentle	40	-	S, F	few	20 May
82	M'Tsangumboi	nil	intense: V, B	/	/	/	/	brown	gentle	175	-	S, F	no	20 May
83	Andréma	nil	intense: V	/	/	/	150	course mud	-	300	-	M, S	few	21 May
84	Hamro (Amagouizi)	nil	rare	C	+	/	/	red pink	-	100	-	S, F	some	21 May
85	Magi Mioni	nil	moderate: B, A	/	+	/	/	brown	-	150	-	S, F	few	21 May
86	Douamougno S	nil	rare	C	/	beach	/	pink	-	80	-	S, F	few	21 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
87	Douamougno centre	Ei?	rare	/	/	/	/	pink shells	-	20	-	S, F	few	21 May
88	Douamougno N	nil	rare	/	+	/	/	pink shells	-	35	-	S, F	no	21 May
89	Kadijou W	nil	rare	/	+	/	/	white	-	200	-	S, F	no	21 May
90	Chissioi M'Zamboro NE I	nil	intense: V, B	/	/	/	/	grey	-	400	-	S, F	few	22 May
91	Ch. M'Zamboro NE II	nil	intense V, B	/	/	/	/	grey	-	60	-	S	few	22 May
92	Ch. M'Zamboro W	nil	moderate: B	/	/	/	/	grey white	-	75	-	S, F	some	22 May
93	Ch. M'Zamboro SW	nil	intense: V	/	+	beach	/	white	-	200	4	S, F	yes	22 May
94	M'Tsahara N	nil	intense: V, B	/	/	/	/	grey	gentle	60	5	S, F	yes	22 May
95	M'Tsahara S	Ei bones	intense: V, B, A	/	/	/	/	grey brown	moderate	450	-	S	few	22 May
96	M'Jagu N	nil	intense: P	/	/	/	/	grey brown	gentle	300	-	C	few	22 May
97	M'Jagu S	nil	moderste: P	/	/	/	/	grey brown	gentle	400	-	S, F	few	22 May
98	M'Zamboro N	nil	moderate: V, B, A	/	/	/	/	brown grey	moderate	300	-	C	few	22 May
99	M'Zamboro S	nil	moderate: A, P	/	/	/	/	brown	-	125	-	S, F	yes	22 May
100	M'Zamboro SW	nil	rare	/	/	/	/	brown	moderate	60	-	S, F	yes	22 May
101	M'Tsangadoi N	nil	intense: V, B	/	/	/	/	-	-	100	-	C	no	22 May
102	M'Tsangadoi S	nil	rare	C, D	/	beach	/	pink	moderate	120	5	S, F	yes	24 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
103	Accua	nil	intense: V, B	/	/	/	75	bown	moderate	400	-	S, F	yes	24 May
104	Apondra	Cm bones	moderate: A	D	+	/	/	pink	moderste	120	-	S, F	few	24 May
105	Mutsumbatsu	nil	intense: V, A	/	/	/	/	pink	moderate	75	-	S, F	yes	24 May
106	M'Liha W	nil	intense: V	/	/	/	/	brown	gentle	220	-	S, F	yes	24 May
107	M'Liha E I	nil	intense: B, P	/	/	/	/	brown	gentle	250	-	S, F	some	24 May
108	M'Liha E II	nil	intense: A, P	D	/	/	/	pink	-	40	3	S, F	few	24 May
109	M'Liha E III	nil	little: P	C	/	/	/	pink	-	30	0	S, F	no	24 May
110	Tanaraki W	nil	intense: V	D	/	/	/	brown	gentle	300	-	S, F	no	24 May
111	Tanaraki E	nil	little: P	/	/	/	/	brown	-	30	0	S, F	no	24 May
112	Chembénioumba W	nil	intense: V, B, A	/	/	/	/	-	-	150	-	-	some	24 May
113	Chembénioumba E	nil	little	/	/	/	/	-	-	-	0	-	no	24 May
114	M'Tsangamouji N	nil	intense: V, B	D	/	/	/	grey	gentle	600	-	S, F	yes	24 May
115	M'Tsangamouji S	nil	intense: B	/	/	/	40	brown	moderate	500	-	S, F	yes	24 May
116	Soulou	bones	little: A, H	D	/	besch	/	pink	-	150	0	S, F	no	24 May
117	Chissimani I	nil	little: H	/	+	/	/	grey	-	30	3	S, F	few	24 May
118	Chissimani II	nil	rare	D	+	/	/	red	moderate	30	0	S, F	no	24 May
119	Chissimani III	nil	rare	C	/	/	/	pink	-	40	0	S, F	no	24 May

Table 4 (cont.)

Beach N°	Locality	Turtle spoor**	Human dist.	Carn. spoor	Crab	Rocks	Beach					Veg	More nests poss?	Date obs. (1972)
							Erosion (cm)	Sand	Slope	Length (m)	Width (m)			
120	Dindioni	nil	moderate: B, H	D	/	/	100	brown	-	175	10	M, S, F	yes	25 May
121	M'Tsanga Nyamba	Cm	rare	C	/	/	/	pink	moderate	50	5	S, F	some	25 May
122	Ochoungui S	nil	little: B	D	+	/	/	brown	-	300	-	S, F	some	25 May
123	Sohoa	nil	intense: V	/	/	/	/	grey	moderate	150	-	-	some	25 May
124	Sada	nil	intense: V, B	/	/	/	/	grey	-	500	-	S, F	some	25 May
125	Papani	Cm, Ei	intense: P	/	/	/	/	-	-	-	-	-	some	7 June
126	Moya N	Cm	intense: P	/	/	/	/	grey	gentle	150	5	M, S, F	some	10 June
127	Moya S	Cm, Ei	intense: P	C	500	/	/	pink	moderate	300	10	S, F	some	10 June

** See Tables 10-12 for details of turtle spoor.

Abbreviations at end of Table 1.

Table 5. Sightings of *Chelonia mydas* at Mohéli, Comores

N°	Date	Locality	Time	Dist (1)	Pair (2)	E (3)	Remarks (4)
	1972						
1	26 Feb	Ch. Ouénéfou northeast	c. 1830	500	+	-	
2	27 Feb	Ch. Ouénéfou northeast	0630-0700	500	-	-	numerous individuals breathing
3	27 Feb	Ch. Ouénéfou west	c. 1100	200	+	?	at least 8 individuals, probably 10 to 15
4	27 Feb	Itsamia, 2 km northeast	0700	1,000	+	-	**
5	27 Feb	Itsamia, 1 km southeast	0800	700	+	-	**
6	27 Feb	Itsamia, 3 km southwest	0900	500	+	-	**
7	27 Feb	Itsamia, 3 to 4 km east	before 1200	4,000	-	-	6 sightings of individuals **
8	27 Feb	Mbwamaji	after 1200	?	-	-	1 sighting **
9	10 March	M'Samouheo	1700	200	+	-	
10	27 March	Moïhani	0800	400	+	1	
11	27 March	Moïhani	0900	400	-	-	3 individuals, probably those seen at 0800 hrs.
12	29 March	Ch. Ouénéfou/Nioumachoua	0800	1,000	-	-	1 individual breathes
13	29 March	Ch. Ouénéfou northwest	0830	75	-	-	individual at surface, breathes 5 or 6 times, dives as I approach
14	29 March	Ch. Ouénéfou northwest	0830	300	+	-	
15	29 March	Ch. Ouénéfou northeast	0930	400	+	1	couple breathes 2 times in 5 min., dives after each breath
16	29 March	Ch. Ouénéfou northeast	0930	100	-	-	turtle in 50 cm of water, swims off trashing water as I approach
17	29 March	Ch. Ouénéfou/Ch. Chandzi	0930	500	+	-	couple at surface for c. 30 min.
18	29 March	Ch. Chandzi northeast	1130	400	+	-	couple at surface
19	29 March	Ch. Chandzi northeast	1200	300	-	-	immature
20	29 March	Ch. Chandzi northwest	1200	500	?	?	group of 6, possibly escorts with a copulating pair
21	30 March	Ch. Ouénéfou southeast	0630	25	+	-	by rocks that are awash
22	30 March	Ch. Ouénéfou southeast	0730	50	+	1	couple "still" at surface, same couple as that seen at 0630

Table 5 (cont.)

N°	Date	Locality	Time	Dist (1)	Pair (2)	E (3)	Remarks (4)
23	30 March	Ch. Ouénéfou west	0900	500	+	6	one escort definitely male, one male circles my boat, they all dive
24	30 March	Ch. Ouénéfou west	0915	500	+	-	100 m from previous sighting, probably the same pair
25	30 March	Ch. Dzaha south	afternoon	500	-	-	one surfaces
26	31 March	Ch. Mbouzi south	0900	700	+	-	at surface
27	31 March	Ch. Ouénéfou west	1000	500	?	?	possibly one copulation, at least 4 individuals, possibly 8
28	31 March	Ch. Ouénéfou west	1800	50-75	+	-	
29	31 March	Ch. Ouénéfou west	1800	50-75	+	-	
30	1 April	Ch. Ouénéfou west	0600	50	+	2	
31	1 April	Ch. Ouénéfou west	0600	50	+	6	
32	1 April	Ch. Ouénéfou west	0645	100	+	-	one pair still at surface
33	1 April	Ch. Ouénéfou west	0645	100	+	-	one pair surfaces, probably the same as that seen at 0600
34	1 April	Ch. Ouénéfou west	0800	100	+	-	still at surface, probably a previous pair
35	1 April	Ch. Ouénéfou east	1300	400	+	4-6	at surface, not tightly grouped, one circles the boat
	1973						
36	10 June	Ch. Ouénéfou east	1800	50	-	-	at least 8 individuals in the shallows

"c." = circa;

(1) "Dist" = distance offshore (m);

(2) "Pair" = pair in copula;

(3) "E" = escort males;

(4) ** = data from Dr. F. Malandain, pers. com.

Table 6. Measurements and observations on *Chelonia mydas* at Comores

JFCm N°	Sex/ Age	Date	Locality	*Measurements*				*Scalation*								*Coloration*			Obs
				CCL	CCW	PL	HW	Po l/r	Cp	Pl	Ig	Ax l/r	Ing l/r	Im l/r	Pa	Scutes concs	Conc ches	Rays	
785	? Imm.	23 March 1972	Fomboni, Mohéli	45.0	43.0	-	6.9	4/4	N	N	N	2/2	1/1	4/4	med	all	all	90% C-R	(1)
786	? Imm.	30 June 1969 (30 June 1972)	Mirontsi, Anjouan	81.0	69.5	-	-	-	N	-	-	-	-	-	-	all	all?	- C-R	(2)
787	? Imm.	Sept. 1971 (1 July 1972)	Mitsamiouli, Grande Comore	40.5	39.0	32	6.1	4/4	(3)	N	N	-	1/1	4/4	abs	all	all	80% C-R	(3)
797	Male? Ad.	14 March 1972	Ouallah, Mohéli	102.0	89.0	-	-	-	-	-	-	-	-	-	-	-	-	-	(4)
862	Male Ad.	2 July 1972	Choua-Chandroudé, Grande Comore	98.5	88.5	73	-	-	-	-	-	-	-	-	-	-	-	-	(5)
863	Female Ad.	1969 (30 June 1972)	Mirontsi, Anjouan	111.0	99.0	-	-	-	N	-	-	-	-	-	-	all	all?	-	

(1) probably caught in fishermen's nets; tagged ZZ 224, photographed and released;

(2) shot with speargun and collected by Mr. Chevalier;

(3) Carapace normal except one small square scale between 4th and 6th vertebrals; probably caught in fishermen's nets; prepared by hotelier; collected (USNM 231560);

(4) found dead and rotting on beach; reported to have washed up 10 days before; much marine plant material in body cavity; black spotted, presumed male;

(5) found dead and desiccated on beach of coral rubble; body intact, definitely male; collected (USNM 231561).

Abbreviations to Tables 6, 7, 8, 10, 11, 12 & 33: measurements and observations on marine turtles in the Comoro Archipelago.

Date: date handled or collected (date measured in parentheses if different from date handled or collected); the date the animal was killed is either indicated in footnotes or unknown.

Measurements: CCL = Curved carapace length; CCW = Curved carapace width; PL = Plastron length; HW = Head width;
all measurements in cm to the nearest ½ cm except head width to the nearest mm;
not all measurements are reported in each table.

Scalation: Po l/r = Postoculars, left/right;
Cp = Carapace ("N" = normal = 5 vertebrals, 4 left/4 right pleurals, 11 left/11 right marginals + 1 pair of supracaudals);
Pl = plastron ("N" = normal = 1 pair each of gulars, humerals, pectorals, abdominals, femorals and anals);
Ig = Intergular ("N" = normal = large and single; "abs" = absent);
Ax l/r = Axillaries, left/right; Ing l/r = Inguinals, left/right;
Im l/r = Inframarginals, left/right; Pa = Postanal ("abs" = absent; "vsm" = very small; "sm" = small; "med" = medium; "lg" = large);
X.5 = X scales, one of which is partially divided;
other conditions are described case by case;
not all scale characters are reported in each table.

Coloration: Scutes concs = carapace scutes (pleurals) that have concentrations of dark pigment;
Conc ches = carapace scutes (pleurals) that have concentrations of chestnut-red pigment inside dark concentrations;
1-3 = condition present in 1st, 2nd, & 3rd pleurals;
Rays = percent of dark pigment distributed in rays ("C-R" = chestnut-red is the dominant pigment);
not all colour characters are reported in each table; none of the above are reported in Table 33.

Cop not: copulation notches, in increasing order of size: "nil" = no marks, "ir" = irritations only, "vsm" = very small, "sm" = small, "med" = medium, "lg" = large; reported only in Tables 7, 8, 10 & 11.

Limbs: condition of limbs: fr = front, hn = hind; reported regularly only in Tables 7 & 10.

Epizoa: Barn = barnacles; Alg = algae; reported regularly only in Tables 7 & 10.

Clutch size: number of eggs laid in a nest; reported regularly only in Tables 7 & 10.

Tag N°: front flipper tagged with monel cattle ear tag "Return to Zurich Zoo"; reported only in Tables 7 & 10.

P: photo with J. Frazier; reported only in Tables 7, 8 & 10.

Col: collections, see Appendix II for those deposited in USNM; reported only in Tables 7, 8 & 11.

Obs: other observations, listed case by case.

General symbols: + present; / = no observation, but category probably absent; - = no data.

Table 7. Measurements and observations on nesting female *Chelonia mydas* at Mohéli, Comores in 1972

JFCm N°	Beach N°	Date	*Measurements*			*Scalation*							
			CCL	CCW	PL	Po l/r	Cp	Pl	Ig	Ax l/r	Ing l/r	Im l/r	Pa
702	67	1 March	114.5	109.0	-	4/4	N	-	-	-	-	-	-
703	67	2 March	107.0	102.5	-	4/4	N	N	N	3/4	1/1	4/4	abs
704	67	2 March	111.0	103.0	-	4/4	N	N	N	3/3	1/1	4/4	sm
705	67	2 March	-	-	-	-	-	-	-	-	-	-	-
706	67	2 March	-	-	-	-	-	-	-	-	-	-	-
707	67	2 March	-	-	-	-	-	-	-	-	-	-	-
708	12	10 March	112.5	98.0	90.5	4/4	N	N	N	3/3	1/1	4/4	abs
709	12	10 March	107.0	99.5	83.0	4/4	N	N	N	2/2	1/1	4/4	abs
710	12	10 March	116.0	108.0	88.0	4/4	(2)	N	N	3/3	1.5/1.5	4/4	abs
711	12	10 March	110.0	101.0	89.0	4/4	N	N	N	2/3	1/1	4/4	sm
712	12	11 March	109.0	98.0	84.5	4/4	N	N	N	2/2	1/1	4.5/3	med
864	12	11 March	-	-	-	-	-	-	-	-	-	-	-
713	45	1 April	106.0	95.5	-	4/4	N	-	-	-	-	-	-
721	67	23 June	122.0	107.5	-	5/5	N	-	-	-	-	-	-
722	67	23 June	105.0	99.0	-	4/4	N	-	-	-	-	-	-
723	67	23 June	118.5	115.0	-	4/4	N	-	-	-	-	-	-
724	67	23 June	111.0	102.5	86.0	4/4	N	N	-	3/3	1/1	4/4	med
725	67	23 June	117.0	111.5	-	4/4	N	-	-	-	-	-	-
726	67	23 June	102.5	99.0	83.0	4/4	(5)	N	N	4/3	1/1	4/4	med
727	67	23 June	112.0	105.0	88.0	4/4	N	N	N	3/4	1/1	4/4	lg
728	67	23 June	114.0	105.0	93.0	3.5/4	N	N	N	3/3	1/1	4/4	sm
729	67	23 June	103.0	102.0	79.0	4/5	N	N	N	2/3	1/1	4/4	sm
730	67	23 June	114.0(6)	108.0	89.0	4/4	N	N	N	3/3	1/1	4/5	vsm
731	67	23 June	105.0	99.0	85.0	4/4	N	N	N	3/3	1/1	4/4	vsm
732	67	23 June	108.0	101.5	86.0	4/4	N	N	N	3/3	1/1	4/4	vsm

Table 7 (cont.)

Coloration			Cop not	Limbs		*Epizoa*		Clutch size	Tag N°	P	Col	JFCm N°
Scutes concs	Conc ches	Rays		fr	hn	Barn	Alg					
-	-	-	med	ok	ok	-	-	-	206	-	-	702
all	some	25%	nil	ok	(1)	many	-	101	208	+	-	703
all	all	50%	nil	ok	ok	few	-	158	210	+	-	704
-	-	-	-	-	-	-	-	-	212	-	+	705
-	-	-	-	-	-	-	-	-	215/217	-	+	706
-	-	-	-	-	-	-	-	-	218	-	+	707
some	some	30%	nil	ok	ok	+	+	-	219	+	-	708
some	some	50%	nil	ok	ok	+	+	86	220	+	-	709
all	all	60%	nil	ok	ok	+	+	-	221	+	-	710
all	all	75%	nil	ok	ok	+	+	109	222	+	-	711
all	all	75%	ir	(3)	ok	+	+	-	223	+	-	712
-	-	-	-	-	-	-	-	120	-	-	-	864
-	-	-	ir	ok	ok	-	-	128	225	+	-	713
all	-	-	ir	-	-	+	-	-	236	-	-	721
all	all	-	ir	-	-	-	-	85	237	-	-	722
all	all	-	sm	-	-	-	-	-	238	-	-	723
all	all	95%	vsm	-	-	-	-	-	239	-	-	724
some	some	-	(4)	-	-	-	-	-	241	-	-	725
some	some	-	nil	ok	ok	-	-	-	242	-	-	726
none	none	-	sm	ok	ok	-	-	-	244	-	-	727
all	all	-	med	ok	ok	-	-	-	245	-	-	728
all	all	-	sm	ok	ok	-	-	-	246	-	-	729
all	all	-	sm	ok	ok	-	-	-	247	-	-	730
all	all	-	ir	ok	ok	+	-	-	248	-	-	731
all	all	-	sm	ok	ok	-	-	-	249	-	-	732

(1) right hind limb stumped;

(2) carapace scalation normal except anterior marginals indented;

(3) right distal manus missing;

(4) copulation notches asymmetric - left large, right small;

(5) carapace scalation normal except pleurals 5 left/4 right;

(6) curved carapace length estimated because supracaudals broken.

Abbreviations at end of Table 6.

Table 8. Measurements and observations on specimens of *Chelonia mydas* from nesting beaches on Mohéli, Comores in 1972

JFCm N°	Beach N°	Date	*Measurements*			*Scalation*					*Coloration*			Cop not	P	Obs
			CCL	CCW	PL	Po l/r	Cp	Pl	Im l/r	Pa	Scutes concs	Conc ches	Rays			
788	67	2 March	117.5	105.0	87.0	-	N	-	-	-	-	-	-	-	+	(1)
789	67	3 March	119.5	106.5	-	-	N	-	-	-	all	some	30%	-	+	-
790	67	3 March	114.5	100.5	-	-	-	-	-	-	all	none	5%	-	+	-
791	67	3 March	118.0	106.0	-	-	N	-	-	-	-	-	-	-	-	-
792	67	3 March	118.0	100.5	-	-	-	-	-	-	-	-	-	-	-	-
793	67	3 March	117.0	101.0	-	-	N	-	-	-	-	-	-	-	-	-
794	67	3 March	117.5	108.0	-	-	-	-	-	-	-	-	-	-	-	-
829	70	3 March	110.0	98.5	-	-	N	-	-	-	all	some	40%	lg	+	-
795	12	10 March	108.0	98.0	-	-	(2)	-	-	-	all	some	5%	-	+	(1)
796	12	10 March	113.0	103.0	-	-	N	-	-	-	all	all	75%	med	+	(1)
798	47	1 April	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
839	67	24 June	120.0	102.0	-	-	-	-	-	-	-	-	-	-	-	-
840	67	24 June	116.0	108.0	-	-	-	-	-	-	-	-	-	-	-	-
841	67	24 June	116.5	104.0	90.0	4/4	N	N	4/4	-	all	none	-	med	-	-
842	67	24 June	107.0	102.0	-	-	N	-	-	-	all	all	-	-	-	-
843	67	24 June	113.0	100.0	-	-	-	-	-	-	-	-	-	-	-	-
844	67	24 June	107.0	105.5	91.0	-	N	N	4/4	-	all	none	-	-	-	-
845	67	24 June	106.5	98.0	-	-	N	-	-	-	all	none	-	-	-	-
846	67	24 June	114.0	102.0	86.0	-	-	N	-	-	all	all	-	med	-	-
847	67	24 June	117.0	107.0	-	-	-	-	-	-	-	-	-	-	-	-
848	68	24 June	109.5	100.5	-	-	N	-	-	-	all	all	-	med	-	-
849	12	27 June	111.5	105.0	86.0	4/4	N	N	4/4	med	all	none	-	med	-	-
850	12	27 June	117.0	101.0	-	-	-	-	-	-	all	all	-	lg	-	-
851	12	27 June	118.0	110.0	-	-	N	-	-	-	none	none	-	lg	-	(4)

Table 8 (cont.)

JFCm N°	Beach N°	Date	*Measurements*			*Scalation*					*Coloration*			Cop not	P	Obs
			CCL	CCW	PL	Po l/r	Cp	Pl	Is l/r	Ps	Scutes concs	Conc ches	Rays			
852	12	27 June	108.0	105.0	88.0	4/4	(5)	N	4/4	sm	none	none	-	vsm	-	(6)
853	12	27 June	111.0	100.5	-	-	N	-	-	-	all	-	-	vsm	-	-
854	12	27 June	107.0	106.0	84.5	3/4	N	N	4/4	sm	all	none	-	-	-	(7)
855	12	27 June	-	-	-	-	-	-	-	-	-	-	-	-	+	(3)
856	11A	27 June	-	-	-	-	-	-	-	-	-	-	-	-	+	(3)
857	8	27 June	111.0	95.0	86.0	5/4	N	N	5/4	-	all	all	-	vsm	-	(8)
858	8	27 June	106.5	97.5	84.0	-	-	N	4/4	vsm	all	all	-	lg	-	(9)
859	4	27 June	121.0	108.5	94.0	-	(10)	N	4/4	lg	all	all	-	-	-	-
860	4	27 June	112.5	107.0	89.0	-	N	N	4/4	-	all	all	-	sm	-	-
861	8	27 June	-	-	-	-	-	-	-	-	-	-	-	-	+	(3)

(1) condition of back limbs ok;

(2) carapace scalation normal except pleurals 4 left/5 right;

(3) collections;

(4) hole in first vertebral (harpoon wound?);

(5) carapace scalation normal except 6 vertebrals;

(6) many small *Chelonibia testudinaria* barnacles;

(7) killed night of 26 June, ovaries contain many large (c. 2 cm diameter) follicles;

(8) killed night of 26 June, oviducts contain 157 shelled eggs and ovaries, many follicles;

(9) killed night of 26 June, oviducts contain 158 shelled eggs and ovaries, many follicles of two distinct sizes;

(10) carapace scalation normal except pleurals 5 left/4 right.

Abbreviations at end of Table 6.

Table 9. Spoor and annual estimates of *Chelonia mydas* on 40 beaches, at Mohéli, Comores (see Table 2 and Figure 3B for details of beaches and their spoor)

Beach N°	Nest pits				Sets of tracks	Nests emerged	Sites of egg shells	Slaughtered turtles	Sites of bones	Annual estimate		Date of observation
	+	?	-	T						nests	fems	
4	31	8	14	53	nil	nil	1	5	1	90	30	27 June 1972
6	0	2	10	12	nil	nil	nil	nil	nil	6	2	27 June 1972
**8	11	0	9	20	c. 10	nil	nil	nil	nil	**	**	24 February 1972
**8	24	2	37	63	43	1	5	c. 10(2)	several	**	**	27 June 1972
**8	32	6	31	69	13(15)	nil	12	1	nil	**	**	12 June 1973
9	25	0	25	50	(1)	nil	3	nil	1	90	30	27 June 1972
10	9	2	12	23	2(1)	nil	4	1	nil	45	15	27 June 1972
11A	1	0	1	2	nil	nil	nil	nil	nil	6	2	27 June 1972
11B	1	0	1	2	1	nil	nil	nil	nil	3	1	27 June 1972
**12	15	7	4	26	c. 10	nil	nil	c. 10	nil	**	**	24 February 1972
**12	seven beachings; four females tagged						nil	nil	nil	**	**	9 March 1972
**12	two beachings; one female tagged						nil	2	nil	**	**	10 March 1972
**12	30	1	23	54	8(3)	nil	3	7	nil	**	**	27 June 1972
**12	18	0	28	46	23	nil	1	3	nil	**	**	11 June 1973
13	0	0	0	0	nil	nil	nil	nil	1	0	0	23 February 1972
19	3	0	0	3	1?	nil	nil	nil	nil	15	5	14 March 1972
22	0	0	0	0	nil	nil	nil	JFCm 797	nil	0	0	14 March 1972
24	-	-	-	-	nil	nil	nil	nil	2	-	-	23 February 1972
24	2	1	2	5	nil	nil	nil	nil	2	15	5	14 & 15 March 1972
24	4	0	0	4	nil	nil	nil	nil	2	15	5	26 June 1972
26	3	1	0	4	nil	nil	2	nil	nil	15	5	15 March 1972
28	1	0	0	1	nil	nil	nil	nil	nil	3	1	15 March 1972
31	12	1	3	16	nil	nil	nil	nil	nil	39	13	15 March 1972
34	nesting reported; no spoor seen					/	/	/	/	0	0	22 February 1972

Table 9 (cont.)

Beach N°	Nest pits				Sets of tracks	Nests emerged	Sites of egg shells	Slaughtered turtles	Sites of bones	Annual estimate		Date of observation
	*	?	-	T						nests	fems	
37	one reported beaching March 1972; another animal reported slaughtered											16 March 1972
38	0	0	0	0	nil	nil	nil	2	nil	0	0	19 February 1972
41	0	5	0	5	nil	/	/	/	/	15	5	30 March 1972
42	9	4	6	19	2	nil	nil	nil	nil	36	12	30 March 1972
43A	1	0	0	1	nil	nil	nil	nil	nil	3	1	30 March 1972
43B	0	2	0	2?	6	/	/	/	/	3	1	8 June 1973 no detail
**45	19	4	17	40	/	/	/	/	/	**	**	27 February 1972
**45	34	11	15	60	2(2)	(2)	nil	nil	nil	**	**	1 April 1972
**45	19	3	17	39	25(5)	(2)	4	nil	nil	**	**	25 June 1972
**45	20	2	21	43	28	nil	8	nil	nil	**	**	10 June 1973
**46	-	-	-	-	2	-	-	-	-	**	**	27 February 1972
**46	-	-	-	-	1	-	-	-	-	**	**	29 March 1972
**46	9	3	8	20	1	nil	nil	1	nil	**	**	1 April 1972
**46	34	2	31	67	33(6)	nil	nil	nil	nil	**	**	25 June 1972
**46	21	13	58	92	20	nil	6	1	nil	**	**	11 June 1973
**47	7	9	15	31++	2	/	/	/	/	**	**	27 February 1972
**47	60	22	26	108	(1)	nil	nil	1	nil	**	**	1 April 1972
**47	82	3	29	114	20(6)	4	4	/	/	**	**	25 June 1972
**47	53	8	78	139	45	nil	2	nil	nil	**	**	10 June 1973
48	17	16	21	54	2(2)	1	nil	nil	nil	150	50	29 March 1972
49	1	1	0	2	1	nil	nil	nil	nil	6	2	29 March 1972
50	18	5	1	24!	1	nil	nil	nil	nil	60	20	1 April 1972
59	0	0	0	0	nil	nil	nil	1	nil	0	0	2 March 1972
60	0	0	0	0	nil	nil	nil	1	nil	0	0	2 March 1972

Table 9 (cont.)

Beach N°	Nest pits				Sets of tracks	Nests emerged	Sites of egg shells	Slaughtered turtles	Sites of bones	Annual estimate		Date of observation
	+	?	-	T						nests	fems	
62B	0	3	0	3?	nil	nil	nil	nil	nil	9	3	2 March 1972
64	0	1	0	1?	nil	nil	nil	nil	nil	3	1	2 March 1972
65	11	6	9	26	/	nil	2d	1	1	-	-	2 March 1972
65	26	2	42	70	1(1)	nil	5	nil	nil	120	40	24 June 1972
66	0	0	0	0	nil	nil	nil	nil	nil	-	-	2 March 1972
66	0	0	5	5	(8)	nil	nil	nil	nil	3	1	24 June 1972
**67	99	32	34	165	7(7)	nil	9d	22(2)	/	**	**	4 March 1972
**67	131	49	90	270	1(14)	17(7)	7(1d)	13	nil	**	**	24 June 1972
68	2	0	1	3	(1)	nil	nil	nil	nil	-	-	3 March 1972
68	30	3	25	58	(1)	1(1)	nil	1	nil	150	50	24 June 1972
70	6	1	4	11	nil	nil	2(4d)	1	nil	30	10	3 March 1972
71	13	1	4	18	nil	nil	nil	1	1	45	15	3 March 1972
73	1	0	0	1	nil	nil	nil	1	nil	3	1	3 March 1972
84	15	3	0	18	10	nil	nil	nil	nil	60	20	8 March 1972

** for details see text Section on Population Size and Structure and Appendix I.
! = the majority of the nest pits are several months old.
? = species of turtle that made the spoor is not certain.
d or (d) = sites of eggshells exposed from dogs digging up nests.

Abbreviations for Tables 9, 13 & 34; spoor of nesting turtles in the Comoro Archipelago.

Nest pits: + = with eggs; ? = uncertain to have eggs; - = without eggs; T = total.
++ = the numbers of nest pits recorded represent only about 1/10th of the beach.

Sets of tracks and Nests emerged are spoor usually discovered the morning after the night during which they were made or emerged; numbers in parentheses are various spoor from two nights before the date of observation.

Annual estimate: nests = 4 x the number of nest pits with eggs and uncertain; nesting spoor is assumed to represent a 3-month period of nesting activity.
fems = females, is calculated from 1/3 of the annual number of nest pits; the average female is assumed to nest 3 times in a season.

General symbols: - = no data; / = no data, but category probably absent.

Table 10. Measurements and observations on nesting female *Chelonia mydas* tagged and released on Mayotte, Comores, in 1972

JFCm N°	Beach N°	Date	*Measurements*			*Scalation*								*Coloration*		Cop not	Limbs		Epizoa		Clutch size	Tag N°	P
			CCL	CCW	PL	Po l/r	Cp	Pl	Ig	Ax l/r	Ing l/r	Im l/r	Pa	Scutes conc	Conc ches		fr	hn	Barn	Alg			
714	35	13 May	116.0	106.0	92.0	4/4	N	-	-	3/3	1/1	4/4	lg	all	-	med	-	-	+	+	-	226	-
715	127	1 June	112.0	99.5	88.0	4/4	N	N	N	3/3	1/1	4/4	sm	all	-	med	ok	ok	+	+	-	228	-
716	127	1 June	108.0	97.0	79.0	4/4	N	N	N	3/3	1/1	4/4	sm	all	-	ir	-	-	+	-	104	229	-
717	127	3 June	118.5	109.5	92.5	5/3.5	N	N	N	3/3	1/1	4/4	med	1-3	-	vsm	-	-	+	+	-	230	-
718	127	4 June	111.0	101.5	89.0	4/4	N	N	N	3/3	1/1	4/4	sm	all	-	sm	-	-	+	-	139	231	-
719	127	8 June	113.0	105.0	90.0	4/4	-	-	-	2/3	1/1	4/4	sm	all	all	lg	-	-	+	-	-	232	+
720	126	9 June	121.0	114.0	89.0	4/4	(1)	(2)	N	3/3	1/1	4/4	abs	all	none	lg	ok	(3)	+	+	119	233	+

(1) carapace normal except 6 vertebrals;

(2) plastron normal except anals asymmetric;

(3) left hind limb stumped.

Abbreviations at end of Table 6.

Table 11. Measurements and observations on carcasses of *Chelonia mydas* from nesting beaches on Pamanzi Island, Mayotte, Comores, in 1972

JFCm N°	Beach N°	Date	*Measurements*			*Scalation*						*Coloration*			Cop not	Col	Obs
			CCL	CCW	PL	Po l/r	Cp	Pl	Ig	Im l/r	Pa	Scutes concs	Conc ches	Rays			
800	127	7 April	108.0	102.0	-	-	N	N	-	-	-	some	-	-	-	-	-
802	127	7 April	-	97.0	-	-	N	N	-	-	-	-	-	-	-	+	-
805	125	28 May	116.0	109.0	-	-	-	-	-	-	-	all	-	75	-	-	-
806	125	28 May	110.0	105.0	83.0	-	N	N	(1)	-	-	-	-	60	-	+	-
807	125	28 May	106.5	103.5	-	-	-	-	-	-	-	-	-	-	-	-	-
808	125	28 May	114.0	94.0	-	-	-	-	-	-	-	-	-	-	-	+	-
809	125	28 May	105.0	95.5	82.0	-	N	N	abs	-	-	-	-	-	-	+	-
820	127	3 June	116.0	107.0	86.0	-	(2)	N	N	4/4	sm	1-3	-	-	-	+	(3)
821	127	6 June	112.0	100.5	-	3.5/3.5	N	-	-	4/4	sm	all	all	-	lg	+	(4)
822	125	8 June	108.0	100.5	86.0	-	N	N	N	4/4	sm	all	all	-	-	+	-
823	125	8 June	114.0	100.5	86.0	-	N	N	-	4/4	sm	all	all	-	-	+	-
824	125	8 June	112.0	98.0	85.0	-	N	N	-	4/4	sm	all	some	-	-	+	(5)
825	125	8 June	108.0	104.0	88.0	3/3	-	-	-	4/4	abs	1-3	all	-	lg	+	-
826	125	8 June	107.0	100.0	79.0	-	-	-	-	-	-	all	all	-	lg	-	(6)
827	126	10 June	115.0	102.0	-	-	-	-	-	-	-	all	-	-	lg	+	-
999	125	10 June	103.0	95.0	-	-	-	-	-	-	-	1-3	all	-	-	+	-
830	127	10 June	107.0	101.0	-	-	N	N	-	-	-	all	all	-	lg	+	-
831	127	10 June	112.0	100.0	-	-	N	-	-	-	-	all	all	-	nil	-	-
832	127	10 June	106.0	98.0	-	-	-	-	-	-	-	all	all	-	-	-	-
833	127	10 June	108.0	98.0	-	-	-	-	-	-	-	all	all	-	lg	+	-
837	125	10 June	116.5	107.5	86.0	4/3	-	N	-	-	-	all	all	-	lg	+	-

(1) intergular divided asymmetrically;

(2) humpbacked;

(3) axillaries = 4 left/4 right, barnacles and algae on carapace, 138 shelled eggs in oviducts;

(4) inguinals = 1 left/1 right, photos with J. Frazier;

(5) barnacles on carapace;

(6) 108 shelled eggs in oviducts.

Abbreviations at end of Table 6.

Table 12. Measurements and observations on carcasses of *Chelonia mydas* from nesting beaches on Pamanzi Island, Mayotte, Comores, June 1973

JFCm N°	Beach N°	*Measurements*		*Scales*	*Coloration*	
		CCL	CCW	Cp	Scutes concs	Conc ches
903	127	109.0	101.5	N	all	all
904	127	102.5	93.5	N	all	all
905(a)	127	115.5	103.5	N	all	all
906	127	111.0	102.0	N	all	all
907	127	108.0	95.0	N	all	all
908	127	112.0	109.0	N	all	all
909	127	107.5	102.5	N	1-3	1-3
910	127	108.0	96.0	N	all	all
911	127	111.0	107.5	N	all	all
912	127	111.0	97.0	N	all	all
913	127	100.5	109.5(b)	N	all	all
914	127	117.5	104.5	N	-	-
915	127	106.5	96.0	N	all	all
916(c)	126	108.0	97.5	N	all	all
917(c)	126	110.5	105.0	N	all	nil
918	126	110.5	103.5	(d)	all	all

(a) JFCm 905: Postoculars 3 left/3 right;

(b) JFCm 913: Width > length, thus questionable and excluded from calculations;

(c) JFCm 916 & 917: Postoculars 4 left/4 right;

(d) JFCm 918: carapace normal except 6 vertebrals.

Abbreviations at end of Table 6.

Table 13. Nesting spoor and annual estimates of *Chelonia mydas* on 14 beaches, at Mayotte, Comores (see Table 4 and Figure 5 for details)

Beach N°	*Nest Pits*				*Annual estimate*	
	+	?	-	T	nests	fems
2	0	0	3	3	3	1
25	1	1	0	2	3	1
28	17	0	3	20	69	23
29	4	3	1	8	27	9
30	18	3	5	26	84	28
31	3	0	2	5	12	4
34	11	6	0	17	69	23
35	44	18	7	69	249	83
36	12	17	2	31	117	39
37	8	3	0	11	42	14
38	2	4	0	6	24	8
39	5	0	0	5	21	7
40	14	0	0	14	57	19
121	12	0	3	15	48	16
Total	151	55	26	232	825	275

Abbreviations at end of Table 9.

Table 14. Number of nests and slaughters of *Chelonia mydas* made over a two-month period, 7 April until 10 June, 1972, and annual estimates, at two beaches on Pamanzi Island, Mayotte, Comores.

Beach N°	*7 April*					*10 June*					*Made over a 2-month period*		*Estimates for one year #*				
	C*	*Nest Pits* †				New C*	*Nest Pits* †				C*	nests	C*	nests	nesting females	total females	% total killed
		+	?	-	T		+	?	-	T							
126	1	4	3	3	10	3	6	0	11	17	3	6	18	36	12	30	60%
127	11	12	8	4	24	6	27	12	25	64	6	33	36	198	66	102	35%
Total	12	16	11	7	34	9	33	12	36	81	9	39	54	234	78	132	41%

* "C" = number of turtle carcasses found on the beach.

† Nest Pits:
"+" = with eggs;
"?" = uncertain to have eggs;
"-" = without eggs;
"T" = total.

Estimates for one year:
carcasses and nests = 6 x values from two-month period;
nesting females = 1/3 of annual number of nests;
total females = sum of carcasses + nesting females;
% total killed = number of carcasses/total number of females.

Table 15. Number of nests and slaughters of *Chelonia mydas* made over a two-week period, 28 May until 10 June, 1972, and annual estimates, at three beaches on Pamanzi Island, Mayotte, Comores

Beach N°	*Made over a 2-week period*		*Estimates for one year #*				
	S*	nests	S*	nests	nesting females	total females	% total killed
125	5+	3	130	78	26	156	83%
126	0	3	10	78	26	36	28%
127	2	5	52	130	43	95	55%
Total	7+	11	192	286	95	287	67%

* "S" = number of turtles slaughtered.

Estimates for one year:
slaughters and nests = 26 x values from two-week period;
nesting females = 1/3 of annual number of nests;
total females = sum of slaughtered females + nesting females;
% total killed = number of slaughtered females/total number of females.

Table 16. Summary of morphometric data for nesting females of *Chelonia mydas* on Mohéli and Mayotte Islands, Comores

Measurement [cm]	*Mohéli*			*Mayotte*			*Statistic*	
	n	$\bar{x}$	st. er.	n	$\bar{x}$	st. er.	F*	t*
Curved carapace length	51	112.32	0.704	42	110.76	0.648	1.43	1.61
Curved carapace width	51	103.14	0.603	43	101.50	0.724	1.22	1.76
Plastron length	24	87.05	0.689	16	86.28	1.006	1.42	0.67

* All values are $p > 0.05$

Table 17. Measurements of hatchling *Chelonia mydas* from five clutches on Mohéli, Comores

Clutch N°	Statistics†	Sample size	Beach N°	*Date 1972*		Weight (g)	*Measurements**			
				emerged	measured		SCL	SCW	PL	HW
1		1	47	26 Feb	27 Feb‡	21.5	50.0	41.0	41.0	16.0
2	$\bar{x}$ st. er. range	8	45	31 March (evening)	2 April (morning)	21.65 0.4338 19.0-22.6	48.63 0.4199 47.0-50.5	38.69 0.5972 35.0-40.5	41.31 0.3265 40.0-43.0	15.13 0.1567 14.5-16.0
3	$\bar{x}$ st. er. range	10	67	24 June (night)	25 June (morning)	- - -	50.40 0.2333 49.0-51.5	40.10 0.1944 39.0-41.0	42.45 0.2930 41.0-44.0	15.80 0.0817 15.5-16.0
4	$\bar{x}$ st. er. range	10	67	24 June (night)	25 June (morning)	- - -	49.25 0.5124 47.0-52.0	38.65 0.2986 37.0-40.0	39.80 0.4096 38.0-42.0	15.30 0.1106 15.0-16.0
5	$\bar{x}$ st. er. range	8	67	24 June (night)	25 June (morning)	- - -	48.13 0.2950 47.0-49.0	39.31 0.3772 37.5-40.0	39.19 0.2100 38.0-40.0	15.56 0.1133 15.0-16.0
Total+	$\bar{x}$ st. er. range	36	-	-	-	-	49.18 0.2350 47.0-52.0	39.21 0.2045 35.0-41.0	40.74 0.2691 38.0-44.0	15.46 0.0701 14.0-16.0

† Statistics: $\bar{x}$ = average; st. er = standard error; range = minimum-maximum.

* Measurements: "SCL" = Straight carapace length; "SCW" = Straight carapace width; "PL" = Plastron length; "HW" = Head width; in mm to the nearest ½ mm.

‡ Hatchling dug out of nest; the date is not certain, and, hence, has not been referred to elsewhere.

+ Excluding Clutch 1; mean = weighted average.

Table 18. Tests for homogeneity of variance and analysis of variance in measurements of 36 hatchling *Chelonia mydas* from four clutches on Mohéli, Comores

Test		Carapace length	Carapace width	Plastron length	Head width
Homogeneity of variances					
Bartlett-Box:	F	2.083	2.595	1.388	0.753
	p	0.099	0.150	0.263	0.524
Analysis of variance					
(d.f. = 3,32):	F	6.483	3.611	20.465	6.730
	p	0.002	0.023	<0.001	0.001
Multiple Range Tests					
(Least Significant		4 > 5	3 > 4, 2	2 > 5, 4	5 > 2
Difference, p ≤0.05):		3 > 5, 2, 4	-	3 > 5, 4, 2	3 > 2, 4
Student-Newman Keuls					
(p ≤0.05):	Subset 1	5, 2, 4	4, 2, 5	5, 4	2, 4
	Subset 2	3	5, 3	2	4, 5
	Subset 3	-	-	3	5, 3

Table 19. Variance ratio (F) and t tests comparing hatchling *Chelonia mydas* on Mohéli with other island populations in the western Indian Ocean

Parameter	Statistic†	Mohéli‡	*Populations compared with Mohéli*		
			Aldabra⊖	Europa+	Tromelin+
Weight	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	21.65 ± 0.4338 (8)	28.22 ± 0.1298 (63) 1.42 (7,32), > 0.05 26.32 (69), < 0.001***	22.85 ± 0.2560 (50) 2.18 (49,7), > 0.05 2.61 (56), < 0.05*	23.96 ± 0.3649 (50) 4.42 (49,7), > 0.05 4.07 (19), < 0.001***
Carapace length	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	49.18 ± 0.2350 (36)	50.07 ± 0.0887 (185) 1.37 (35,184), > 0.05 5.33 (219), < 0.001***	48.49 ± 0.1937 (50) 1.06 (35,49), > 0.05 2.31 (84), < 0.05*	48.62 ± 0.2291 (50) 1.32 (49,35), > 0.05 1.69 (84), > 0.05
Carapace width	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	39.21 ± 0.2045 (36)	40.60 ± 0.1002 (185) 1.23 (184,35), > 0.05 7.71 (219), < 0.001***	39.86 ± 0.2758 (50) 2.53 (49,35), < 0.01** 1.90 (83), > 0.05	40.18 ± 0.2828 (50) 2.66 (49,35), < 0.01** 2.78 (82), < 0.01**
Plastron length	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	40.74 ± 0.2691 (36)	40.73 ± 0.1023 (74) 3.37 (35,73), < 0.001*** 0.02 (45), > 0.05		
Head width	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	15.46 ± 0.0701 (36)	16.29 ± 0.1320 (49) 4.83 (48,35), < 0.001*** 5.57 (71), < 0.001***	15.92 ± 0.0509 (50) 1.36 (35,49), > 0.05 5.54 (84), < 0.001***	16.13 ± 0.0948 (50) 2.54 (49,35), < 0.01** 5.70 (83), < 0.001***

† the calculation of t and its degrees of freedom, "d.f.", depends on the significance of the F test (see Nie *et al.*, 1970: 269);

‡ see Table 17;

⊖ raw data from Frazier, 1971: Table 3;

+ raw data from Hughes, 1974a: Table 5;

*, ** and *** = significant p values.

Table 20. Changes in various morphometric values with increasing carapace length in *Chelonia mydas*, Comores

Data set	*Changes with increasing carapace length*			
	Carapace width	Plastron length	Head width	Body weight
Hatchling: individual growth	>	<	<	n.d.
Hatchling: interindividual comparisons	<	<?	<	nil
Female: interindividual comparisons	<	<	n.d.	n.d.
All data	>, <	<	<	n.d.

> = allometric increase;

< = allometric decrease;

>, < = allometric increase followed by decrease;

nil = no obvious allometric change;

n.d. = no data.

Table 19. Variance ratio (F) and t tests comparing hatchling *Chelonia mydas* on Mohéli with other island populations in the western Indian Ocean

Parameter	Statistic†	Mohéli‡	*Populations compared with Mohéli*		
			Aldabra⊖	Europa+	Tromelin+
Weight	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	21.65 ± 0.4338 (8)	28.22 ± 0.1298 (63) 1.42 (7,32), > 0.05 26.32 (69), < 0.001***	22.85 ± 0.2560 (50) 2.18 (49,7), > 0.05 2.61 (56), < 0.05*	23.96 ± 0.3649 (50) 4.42 (49,7), > 0.05 4.07 (19), < 0.001***
Carapace length	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	49.18 ± 0.2350 (36)	50.07 ± 0.0887 (185) 1.37 (35,184), > 0.05 5.33 (219), < 0.001***	48.49 ± 0.1937 (50) 1.06 (35,49), > 0.05 2.31 (84), < 0.05*	48.62 ± 0.2291 (50) 1.32 (49,35), > 0.05 1.69 (84), > 0.05
Carapace width	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	39.21 ± 0.2045 (36)	40.60 ± 0.1002 (185) 1.23 (184,35), > 0.05 7.71 (219), < 0.001***	39.86 ± 0.2758 (50) 2.53 (49,35), < 0.01** 1.90 (83), > 0.05	40.18 ± 0.2828 (50) 2.66 (49,35), < 0.01** 2.78 (82), < 0.01**
Plastron length	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	40.74 ± 0.2691 (36)	40.73 ± 0.1023 (74) 3.37 (35,73), < 0.001*** 0.02 (45), > 0.05		
Head width	$\bar{X}$ ± st. er. (n) F (d.f.), p t (d.f.), p	15.46 ± 0.0701 (36)	16.29 ± 0.1320 (49) 4.83 (48,35), < 0.001*** 5.57 (71), < 0.001***	15.92 ± 0.0509 (50) 1.36 (35,49), > 0.05 5.54 (84), < 0.001***	16.13 ± 0.0948 (50) 2.54 (49,35), < 0.01** 5.70 (83), < 0.001***

† the calculation of t and its degrees of freedom, "d.f.", depends on the significance of the F test (see Nie *et al.*, 1970: 269);

‡ see Table 17;

⊖ raw data from Frazier, 1971: Table 3;

+ raw data from Hughes, 1974a: Table 5;

*, ** and *** = significant p values.

Table 21. Scalation of female *Chelonia mydas* at Comores

Scale(s)	Condition or Numer ‡	*Mohéli*		*Mayotte*		*Total*	
		Frequency	Percent Frequency	Frequency	Percent Frequency	Frequency	Percent Frequency
Cervical	1	41	100.0	33	100.0	74	100.0
Vertebrals	5	40	97.6	31	93.9	71	95.9
	6	1	2.4	2	6.1	3	4.1
Supracaudals	1 pair	41	100.0	33	100.0	74	100.0
Pleurals	4 lf/4 rt	38	92.7	33	100.0	71	95.9
	5 lf/4 rt	2	4.9	0	0.0	2	2.7
	4 lf/5 rt	1	2.4	0	0.0	1	1.4
Marginals	11 lf/11 rt	41	100.0	33	100.0	74	100.0
Inframarginals*	4 lf/4 rt	21	87.5	13	100.0	34	91.9
	4.5 lf/3 rt	1	4.2	0	0.0	1	2.7
	4 lf/5 rt	1	4.2	0	0.0	1	2.7
	5 lf/4 rt	1	4.2	0	0.0	1	2.7
Intergular	one large	14	100.0	6	75.0	20	90.9
	divided asy †	0	0.0	1	12.5	1	4.5
	absent	0	0.0	1	12.5	1	4.5
Plastron ⊖	6 pairs	25	100.0	13	100.0	38	100.0
Postanal	large	2	10.0	1	7.9	3	9.1
	medium	4	20.0	1	7.9	5	15.2
	small	6	30.0	9	69.2	15	45.5
	very small	4	20.0	0	0.0	4	12.1
	absent	4	20.0	2	15.4	6	18.2
Axillaries	3 lf/3 rt	8	53.3	6	75.0	14	60.9
	2 lf/3 rt	2	13.3	1	12.5	3	13.0
	2 lf/2 rt	2	13.3	0	0.0	2	8.7
	3 lf/4 rt	2	13.3	0	0.0	2	8.7
	4 lf/3 rt	1	6.7	0	0.0	1	4.3
	4 lf/4 rt	0	0.0	1	12.5	1	4.3
Inguinals*	1 lf/1 rt	14	93.3	8	100.0	22	95.7
	1.5 lf/1.5 rt	1	6.7	0	0.0	1	4.3
Postoculars*	4 lf/4 rt	21	80.8	8	61.5	29	74.4
	4 lf/5 rt	1	3.8	0	0.0	1	2.6
	4 lf/3 rt	0	0.0	1	7.7	1	2.6
	3.5 lf/4 rt	1	3.8	0	0.0	1	2.6
	3 lf/4 rt	1	3.8	0	0.0	1	2.6
	3.5 lf/3.5 rt	0	0.0	1	7.7	1	2.6
	3 lf/3 rt	0	0.0	2	15.4	2	5.1
	5 lf/5 rt	1	3.8	0	0.0	1	2.6
	5 lf/4 rt	1	3.8	0	0.0	1	2.6
	5 lf/3.5 rt	0	0.0	1	7.7	1	2.6

‡ "lf" = left; "rt" = right.

⊖ 1 pair each of: Gulars, Humerals, Pectorals, Abdominals, Femorals and Anals.

* 1.5 or 3.5 or 4.5 = 1 of 1 or 3 or 4 scales was partially divided.

† "asy" = asymmetrically.

Table 22. Scalation and coloration of hatchling *Chelonia mydas* from 5 clutches on Mohéli, Comores*

Scale(s)	Condition or Number#	Clutch 1		Clutch 2		Clutch 3		Clutch 4		Clutch 5		Total	
		F	%F	F	%F	F	%F	F	%F	F	%F	F	%F
Cervical	single	1	100.0	8	100.0	10	100.0	10	100.0	8	100.0	37	100.0
Vertebrals	5	1	100.0	8	100.0	7	70.00	9	90.0	7	87.5	32	86.5
	6	0	0.0	0	0.0	3	30.0	1	10.0	1	12.5	5	13.5
Supracaudals	one pair	1	100.0	8	100.0	10	100.0	10	100.0	8	100.0	37	100.0
Pleurals	4 lf/4 rt	1	100.0	8	100.0	10	100.0	9	90.0	8	100.0	36	97.3
	5 lf/5 rt	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	1	2.7
Marginals	11 lf/11 rt	1	100.0	8	100.0	6	60.0	10	100.0	8	100.0	33	89.2
	11 lf/12 rt	0	0.0	0	0.0	2	20.0	0	0.0	0	0.0	2	5.4
	12 lf/11 rt	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	1	2.7
	12 lf/12 rt	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	1	2.7
Infra-marginals	4 lf/4 rt	1	100.0	8	100.0	10	100.0	10	100.0	7	87.5	35	94.6
	4 lf/3 rt	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5	2	5.4
Intergular	one large	1	100.0	8	100.0	10	100.0	10	100.0	8	100.0	37	100.0
Plastron †	single	1	100.0	8	100.0	10	100.0	10	100.0	8	100.0	37	100.0
Postanal	large	1	100.0	0	0.0	1	10.0	1	10.0	0	0.0	3	8.1
	medium	0	0.0	1	12.5	2	20.0	0	0.0	2	25.0	5	13.5
	small	0	0.0	6	75.0	0	0.0	5	50.0	5	62.5	16	43.2
	very small	0	0.0	1	12.5	6	60.0	4	40.0	0	0.0	11	29.7
	absent	0	0.0	0	0.0	1	10.0	0	0.0	1	12.5	2	5.4
Axillaries	2 lf/2 rt	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	1	2.7
	4 lf/2 rt	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5	1	2.7
	3 lf/3 rt	1	100.0	3	37.5	10	100.0	6	60.0	4	50.0	24	64.9
	3 lf/4 rt	0	0.0	1	12.5	0	0.0	1	10.0	0	0.0	2	5.4
	4 lf/3 rt	0	0.0	2	25.0	0	0.0	1	10.0	1	12.5	4	10.8
	4 lf/4 rt	0	0.0	2	25.0	0	0.0	1	10.0	2	25.0	5	13.5
Inguinals #	1 lf/1 rt	0	0.0	4	50.0	7	70.0	5	50.0	4	50.0	20	54.1
	1 lf/1.5 rt	0	0.0	1	12.5	0	0.0	0	0.0	0	0.0	1	2.7
	1 lf/2 rt	0	0.0	0	0.0	0	0.0	1	10.0	0	0.0	1	2.7
	1.5 lf/1.5 rt	0	0.0	1	12.5	0	0.0	0	0.0	0	0.0	1	2.7
	1.5 lf/2 rt	0	0.0	1	12.5	0	0.0	0	0.0	0	0.0	1	2.7
	2 lf/1 rt	1	100.0	1	12.5	1	10.0	1	10.0	2	25.0	6	16.2
	2 lf/2 rt	0	0.0	0	0.0	2	20.0	3	30.0	2	25.0	7	18.9

Table 22 (cont.)

Scale(s)	Condition or Number@	Clutch 1		Clutch 2		Clutch 3		Clutch 4		Clutch 5		*Total*	
		F	%F	F	%F	F	%F	F	%F	F	%F	F	%F
Postoculars	4 lf/4 rt	1	100.0	8	100.0	4	40.0	6	60.0	8	100.0	27	73.0
	4 lf/3 rt	0	0.0	0	0.0	4	40.0	2	20.0	0	0.0	6	16.2
	3 lf/4 rt	0	0.0	0	0.0	0	0.0	2	20.0	0	0.0	2	5.4
	4 lf/5 rt	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	1	2.7
	5 lf/4 rt	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	1	2.7
White marginal border begins	middle 2nd	0	0.0	0	0.0	0	0.0	2	20.0	0	0.0	2	5.4
	post. 2nd	0	0.0	0	0.0	1	10.0	0	0.0	1	12.5	2	5.4
	ant. 3rd	0	0.0	1	12.5	0	0.0	0	0.0	1	12.5	2	5.4
	middle 3rd	0	0.0	0	0.0	2	20.0	1	10.0	3	37.5	6	16.2
	post. 3rd	1	100.0	5	62.5	6	60.0	7	70.0	3	37.5	22	59.5
	ant. 4th	0	0.0	2	25.0	1	10.0	0	0.0	0	0.0	3	8.1

* "F" = Frequency; "%F" = percent frequency.

@ "lf" = left; "rt" = right.

† 1 pair each of: Gulars, Humerals, Pectorals, Abdominals, Femorals and Anals.

"1.5" = scale partially divided.

Table 23. Coloration of female *Chelonia mydas* at Comores: number of carapace scutes (pleurals) that have concentrations of dark pigment

Sample		*All*		*1st to 3rd*		*Some*		*All or some*		*None*		*Total*	
		N°	%	N°	%	N°	%	N°	%	N°	%	N°	%
Mohéli	Live	14	74.0	/	/	4	21.0	18	95.0	1	5.0	19	100.0
	Dead	19	90.5	/	/	0	0.0	19	90.5	2	9.5	21	100.0
	Total Mohéli	33	82.5	/	/	4	10.0	37	92.5	3	7.5	40	100.0
Mayotte	1972*	18	78.0	4	17.0	1	4.0	23	100.0	0	0.0	23	100.0
	1973*	14	93.0	1	7.0	0	0.0	15	100.0	0	0.0	15	100.0
	Total Mayotte	32	84.0	5	13.0	1	3.0	38	100.0	0	0.0	38	100.0
Grand total		65	83.3	5	6.4	5	6.4	75	96.2	3	3.8	78	100.0

* Nearly all Mayotte specimens were observed when recently dead.

Table 24. Coloration of female *Chelonia mydas* at Comores: number of carapace scutes (pleurals) that have concentrations of chestnut-red pigment inside dark concentrations

Sample		*All*		*1st to 3rd*		*Some*		*All or some*		*None*		*Total*	
		N°	%	N°	%	N°	%	N°	%	N°	%	N°	%
Mohéli	Live	12	66.7	/	/	5	27.8	17	94.4	1	5.6	18	100.0
	Dead	9	45.0	/	/	3	15.0	12	60.0	8	40.0	20	100.0
	Total Mohéli	21	55.0	/	/	8	21.0	29	76.0	9	24.0	38	100.0
Mayotte	1972*	12	86.0	0	0.0	1	7.0	13	93.0	1	7.0	14	100.0
	1973*	13	87.0	1	7.0	0	0.0	14	93.0	1	7.0	15	100.0
	Total Mayotte	25	86.0	1	3.0	1	3.0	27	93.0	2	7.0	29	100.0
Grand total		46	68.7	1	1.5	9	13.4	56	83.6	11	16.4	67	100.0

* Nearly all Mayotte specimens were observed when recently dead.

Table 25. Stomach contents of three nesting female *Chelonia mydas* at Mohéli, Comores; indicated by estimated percent wet volumetric occurrence ("t" = trace); identifications by J. Norris and S. Fredericq; specimens deposited in U.S. National Herbarium, Smithsonian Institution

	JFCm Number		
	854	857	858
Chlorophyta			
Caulerpa mexicana (Sonder) J. Agardh			1
Chaetomorpha sp.			t
Cladophora sp.			1
Enteromorpha flexuosa (Wulfen) J. Agardh	t	t	t
Halimeda gracilis Harvey ex. J. Agardh	20		1
Halimeda tuna (Ellis & Solander) Lamouroux		2	t
Ulva lactuca L.			t
Phaeophyta			
Dictyopteris delicatula Lamouroux			t
Giffordia mitchelliae (Harvey) Hamel			t
Rhodophyta			
Amansia glomerata C. Agardh	t	t	t
Centroceras clavulatum (C. Agardh) Montagne			t
Champia parvula (C. Agardh) Harvey			t
Coelothrix indica Borg.	t		t
Galaxaura veprecula Kjellman	t		t
Jania sp.			t
Polysiphonia denudata (Dillwyn) Kutzing			t
?*Hypnea* sp.			t
Unknown	t	t	t
Angiospermae (Seagrasses)			
Thalassodendron ciliatum (Forsk.) den Hartog: leaves	1	2	7
Thalassodendron ciliatum (Forsk.) den Hartog: stems		1	7
?*Cymodocea* or *Thalassia*: leaves	t	1	1
?*Cymodocea* or *Thalassia*: stems		1	
Unknown, macerated fibrous material:			
?*Thalassodendron* leaves	75	50	80
?*Cymodocea*/*Thalassia* leaves		30	
Unknown	t		
Eggs, small encrusting			t
Pebbles, calcareous			t

Table 26. Nesting behaviour of *Chelonia mydas* on Mohéli, Comores

JFCm N°	Date 1972	Beach N°	*Tide*		*Time of behaviour*									N° Eggs	*Time between high tide and beaching*
			cycle	time high	first sighted	beached	at crest beach	start front flip. dig	begin egg hole	end egg hole	first egg	last egg	start hind limb cover		
702	1 March	67	spring	17:24	19:45	c.19:45	20:00	<20:10	c.20:25	20:50	†	/	/	/	+2:21
703	2 March	67	spring	17:48	20:38	c.20:00	/	/	/	c.20:58	/	/	<21:05	158	+2:12
704	2 March	67	spring	17:48	c.21:30	c.20:30	/	/	/	/	21:40	21:55	/	101	+2:42
709	9 March*	12	neap	01:22	01:00	c.00:30	/	/	/	/	/	/	/	86	-0.52
711	9 March*	12	neap	01:22	01:30	c.01:30	/	/	/	/	02:40	03:05	/	109	+0.08
713	1 April	45	spring	05:31	06:00#	/	/	/	/	/	06:12	06:38	/	128	bef. sun
722	24 June	67	neap	02:57	<01:30	/	/	/	/	/	/	/	/	85	bef. sun

† Female JFCm 702 abandoned the nest pit, possibly from disturbance by observers.

* Because females JFCm 790 and 711 nested early in the morning of 10 March (before sunrise), they were scored for 9 March.

Female JFCm 713 had already dug 2 abortive nest pits when she was first sighted.

Table 27. Beaching times of nesting *Chelonia mydas* on beach N° 67, Mohéli, Comores, 24 June 1972.

Time when beached	Time before high tide (02:57)
01:00	1:57
01:00	1:57
01:15	1:42
01:30	1:27
01:45	1:12
02:00	:57
02:00	:57
02:15	:42
02:45	:12

Table 28. Egg measurements of *Chelonia mydas* at Comores: Mohéli samples from beach N° 8, 27 June 1972; Mayotte samples from beaches N^{os} 126 & 127, June 1972

Female N° JFCm Locality	857 Mohéli	858 Mohéli	717 Mayotte	720 Mayotte	820 Mayotte	821 Mayotte
a. Clutch size	157	158	31+	119	138	?
sample size	10	10	10	10	10	10
b. Maximum diameter [mm]						
median	/	/	47.500	36.750	44.500	44.929
average ± st. er.	44.25 ± 0.186	43.35 ± 0.198	47.400 ± 0.221	36.300 ± 0.490	44.700 ± 0.260	44.900 ± 0.180
range	43.5 - 45.0	42.0 - 44.0	46.0 - 48.0	34.0 - 38.0	44.0 - 46.0	44.0 - 46.0
c. Middle diameter [mm]						
median	/	/	46.500	35.250	44.333	43.900
average ± st. er.	43.40 ± 0.233	42.95 ± 0.138	46.600 ± 0.306	35.700 ± 0.429	44.400 ± 0.163	43.900 ± 0.233
range	42.5 - 45.0	42.0 - 43.5	45.0 - 48.0	33.5 - 38.0	44.0 - 45.0	43.0 - 45.0
d. Minimum diameter [mm]						
median	/	/	46.071	35.000	43.929	43.083
average ± st. er	42.60 ± 0.277	42.85 ± 0.130	46.000 ± 0.258	35.350 ± 0.511	43.900 ± 0.180	43.350 ± 0.236
range	41.0 - 44.0	42.0 - 43.5	44.0 - 47.0	33.0 - 38.0	43.0 - 45.0	42.5 - 45.0
e. Egg weight [g]						
median	/	/	57.167	26.167	51.833	50.167
average ± st. er.	/	/	56.800 ± 0.646	26.600 ± 1.087	51.800 ± 0.512	50.200 ± 0.416
range	/	/	53.0 - 60.0	21.0 - 32.0	50.0 - 55.0	48.0 - 52.0
f. Calculated egg volume $\frac{\pi}{(6000\,b.c.d)}$ [cm^3]						
median	/	/	53.193	23.418	44.614	44.575
average ± st. er.	42.84	41.77	53.232 ± 0.787	24.091 ± 0.934	45.634 ± 0.531	44.754 ± 0.540
range	39.69 - 46.65	38.79 - 43.59	47.689 - 56.699	19.681 - 28.731	43.589 - 48.773	42.598 - 47.713
g. Calculated clutch weight (a.e) [g]	/	/	/	3,165.40	7,148.40	/
h. Calculated clutch volume (a.f) [cm^3]	6,725.88	6,599.66	/	2,866.83	6,297.49	/

Measurements to the nearest ½ mm or nearest ½ g; diameter measured while applying gentle pressure with thumb and forefinger along a perpendicular axis.

Table 29. Observations on the emergence of a *Chelonia mydas* nest on beach N° 45, Chissioua Ouénéfou, Mohéli, Comores, 31 May 1972

Time	Beach temperature (°C)	HE#	OC†	P*	Comments
12:00	47.0° surface, bulb half covered 48.0° surface, bulb totally covered 38.0° 12 cm deep at nest site	1	-	-	hatchling gets c. 6 m down beach towards sea and drops dead; internal body temperature 49.5°C.
13:30		1	+	-	hatchling heads down beach towards sea; collected.
14:30		1	+	-	hatchling heads down beach towards sea; collected.
15:00		1	-	-	hatchling gets to sea.
15:30		1	+	-	hatchling gets to sea.
16:25		1	+	+	taken on beach by *Milvus migrans*.
16:35		1	-	-	gets to sea.
16:38		1	-	-	gets to sea.
16:45		1	-	+	taken on beach by *Corvus albus*.
17:00		1	+	+	taken on beach by *Milvus migrans*.
17:05		1	+	+	taken on beach by *Corvus albus*.
17:20	36.5° surface 38.0° 12 cm deep at nest site	-	-	-	2 hatchlings have been exposed on the surface of the sand for nearly 30 min.; 2 kinds of diptera appear at the emergence site.
18:10		-	-	+	2 *Ocypode ceratophthalmus* move towards emergence site, one takes a hatchling.
18:15		c.50	?	+	mass emergence, all are in the sea by 18:20; *O. ceratophthalmus* catch 3 or 4.
18:40	30.5° surface, bulb totally covered 36.0° 12 cm deep at nest site				

"HE" = Hatchling(s) emerged;

† "OC" = Orientation circle made by hatchling(s);

* "P" = Predation on hatchling(s).

Table 30. Number of sites of *Chelonia mydas* egg shells assumed to have been dug out by nesting female *Chelonia* on beaches of Mohéli, Comores

Beach N°	*First visit*†		*Second visit*		*Third visit*		*Changes between visits*	
	Date 1972	Sites	Date 1972	Sites	Date 1973	Sites	1^{st} to 2^{nd}	2^{nd} to 3^{rd}
8	24 Feb	0	27 June	5	12 June	>12	increase	increase
12	24 Feb	0	27 June	3	11 June	1	increase	decrease
24	14 March	0	27 June	0	/	/	nil	/
45	27 Feb 29 March	0 0	25 June	4	10 June	8	increase	increase
46	29 March	0	25 June	0	11 June	6	nil	increase
47	27 Feb 1 April	0 0	25 June	5	10 June	2	increase	decrease
65	2 March	0	24 June	3	/	/	increase	/
67	3 March	9*	24 June	8**	/	/	increase***	/
68	3 March	0	24 June	0	/	/	nil	/

† = two beaches each have 2 dates for the first visit, both of which are early in the nesting season;

"/" = no data;

* = all 9 sites were dug out by dogs;

** = 1 of 8 sites was dug out by dogs;

*** = therefore there had been an increase in sites dug out by nesting *Chelonia* between the first and second visits.

Table 31. Seasonal changes in distance to beach crest distributions of *Chelonia mydas* nest pits on Mohéli, Comores; summary of positions of the major mode in February/March/April and June 1972; the occurrence of a seaward shift in the major mode; and the presence of a mode seaward of the beach crest

Beach N°	Nest pits	*Major mode(s)*			*Seaward mode*	
		Month(s)		seaward shift?	*Month(s)*	
		Feb-April	June		Feb-April	June
8	with eggs	0, 2, 4	3	nil	0	0
	total	2	1	yes	0	nil
12	with eggs	1, 2	3	no	nil	0
	total	2	0, 3	nil	nil	0
24	with eggs	1	-1	yes	nil	-1
	total	1	-1	yes	nil	-1
45	with eggs	4	2	yes	0	-2
	total	3	2	yes	0	-2
46	with eggs	2	0	yes	nil	0
	total	0	0	nil	0	0
47	with eggs	2, 4	3	nil	nil	nil
	total	2, 4	2	yes	nil	nil
65	with eggs	3, 4	0	yes	nil	0
	total	5	0	yes	nil	0
67	with eggs	4	2	yes	0	0
	total	4	2	yes	0	0

All numbers refer to distance from beach crest in metres.

Table 32. Sightings of *Eretmochelys imbricata* at Comores

Island	Date	Locality	Time of the day	Distance offshore	Remarks
Grande Comore:					
	28 May 1973	Iconi	c. noon	700 m	small animal (c. 30 cm long) at surface several minutes, lifts head breathing; N. Cornfield, pers. com.
Mohéli:					
	27 Feb	Ch. Ouénéfou northeast	morning	400 m	large individual seen underwater; T. Laurette, pers. com.
	30 Mar 1972	Ch. Ouénéfou southeast	c. 08:00	50 m	at surface.
	31 Mar 1972	Ch. Canzoni	c. 08:00	500 m	at surface breathing for a few minutes, takes 4 to 6 breaths then dives.
	8 June 1973	Ch. Canzoni	afternoon	50 m	large animal (c. 1 m long) at surface for 5 minutes, lifts head a few times a minute, breathing.

Table 33. Measurements (in cm) and observations on *Eretmochelys imbricata* at Comores

JFEi N°	Date 1972	Locality	*Measurements*				*Scales*							
			CCL	CCW	PL	HW	Po l/r	Cp	Pl	Ig	Ax l/r	Ing l/r	Im l/r	Pa
Grande Comore														
20	2 January (7 January)	Itsandra	39.0	35.0	28.0	6.0	3/3	N	N	N	2/2	1/2	4/4	med
25	29 June (1 July)	Mitsamiouli	36.5	33.5	27.0	5.2	3/3	N	N	N	3/3	1/1	4/4	sm
26	? (1 July)	Mitsamiouli	40.0	36.5	28.0	5.5	3/3	N	N	N	2/3	1/1	4/4	sm
27	January (1 July)	Mitsamiouli	47.0	38.5	34.5	6.6	3/3	N	N	N	3/2	0/1	4/4	sm
28	Sept 1971 (2 July)	Mitsamiouli	34.0	29.5	25.5	-	-	N	N	N	3/2	1/1	4/4	sm
29	Sept 1971 (2 July)	Mitsamiouli	47.0	44.0	36.5	6.5	3/3	N	N	N	3/3	1/1	4/4	sm
*136	17 July	Moroni	67.0	58.0	50.0	9.0	-	-	-	-	-	-	-	-
*137	9 December	north of Moroni	57.0	48.5	43.5	7.5	-	N	-	-	-	-	-	-
156	27 June (2 July)	south of Choua-Chandroudé	39.0	35.5	28.0	-	3/3	N	N	-	2/2	1/1	4/4	med
Mohéli														
21	19 Dec 1971 (25 Feb)	Moihani	37.5	33.0	-	-	-	N	-	-	-	-	-	-
22	3 March	Itsamia	51.5	43.0	38.5	-	3/3	N	N	N	2/2	1/1	4/4	-
23	16 March (17 March)	Fomboni	37.5	34.0	-	-	3.5/3.5	N	N	N	2/3	1/1	4/4	sm
Anjouan														
24	June 1969 (30 June 1972)	Mirontsi	39.0	36.0	28.0	5.3	3/3	N	N	N	3/3	1/1	4/4	med

Table 33. (cont.)

Keels			1st Dent	*Coloration*				*Epizoa*		Tag N°	Col	P	Original Collector	JFEi N°
Vert	Pleurals	Pl		Dors Appen	Ig	Ax & Ing	Pl	Barn	Alg					
Grande Comore														
2-5! V	2-4!	H-A	5	B	BC	BC	Y	many	fil & enc	-	+	+	Pichard**	20
1-5	1-4	H-A	4	B	BC	BC	Y	few	+	235	-	-	Hotel Maluga	25
2-5	2-4	H-A	5	B	BC	BC	Y	-	-	-	+	-	Hotel Maluga	26
2-5	2-4	Ab-A	8	B	BC	BC	Y	pit	-	-	+	-	Hotel Maluga	27
1-5	2-4!	H-A	4	B	BC	BC	Y	few	enc	-	+	-	Hotel Maluga	28
2-5	4	Ab-A	5	B	BC	BC	Y	-	enc	-	+	-	Hotel Maluga	29
-	-	-	-	-	-	-	-	-	-	213	-	-	Richeaux	136*
-	-	-	-	-	-	-	-	-	-	234	-	-	Richeaux	137*
1-5	3-4	-	5	B	-	-	Y	-	-	-	-	-	Richeaux**	156
Mohéli														
1, 2-5!	3-4!	-	5	-	-	-	-	many	enc	-	+	+	Malandain**	21
	-	-	-	B	2BS	-	Y	-	-	211	-	-	Frazier	22
1-2, 3-5!V	2-3, 4!	H-A	5	B	BC	BC	Y	many small	fil & enc	-	-	+	Doushang**	23
Anjouan														
1-3 4-5!	4!	H-A	-	B	-	BC	Y	many small	+	-	-	-	Chevalier**	24

Table 33 (cont.)

Keels: Vert = vertebrals, Pleurals, Pl = plastron; indicates scutes on which keels are present; ! if very strong, and V if V-shaped.

1st Dent = first, most anterior, denticulate marginal.

Coloration: Dors Appen = dorsal surface of appendages, Ig = intergular, Ax & Ing = axillaries & inguinals, Pl = plastron; B = black, BC = black centres, 2BS = 2 black spots, Y = yellow.

Epizoa: Barn = barnacles, pit = burrowing barnacle; Alg = algae, fil = filamentous, enc = encrusting.

** Specimen kept by original collector.

Abbreviations at end of Table 6.

Table 34. Spoor of *Eretmochelys imbricata* on 17 beaches at Mohéli, Comores (see Table 2 and Figure 3B for details of the beaches and their spoor)

Beach N°	*Nest Pits*†				Sets of tracks	Nests emerged	Bones	Date of observation
	+	?	–	T				
24	2	0	0	2	1	nil	nil	14 March 1972
24	1	1	1	3	nil	nil	nil	26 June 1972
26	0	1	0	1	nil	nil	nil	15 March 1972
28	1	0	0	1	1	nil	nil	15 March 1972
30	1	0	0	1	nil	nil	nil	15 March 1972
43A	1	0	0	1	nil	nil	nil	31 March 1972
43B	–	–	–	2?	6	–	–	8 June 1973
46	1	0	1	2	nil	nil	nil	1 April 1972
47	3	1	0	4++	nil	(1)	nil	27 Feb 1972
47	10	4	1	15	(1)	nil	nil	1 April 1972
48	2	0	0	2	2	nil	nil	29 March 1972
62B	–	–	–	3?	nil	nil	nil	2 March 1972
63	–	–	–	2	nil	nil	1	2 March 1972
64	–	–	–	1?	nil	nil	nil	2 March 1972
67	1	0	0	1	1	nil	nil	3 March 1972
69	0	0	0	0	1	nil	nil	3 March 1972
70	1	0	0	1	nil	nil	nil	3 March 1972
73	2	0	0	2	nil	nil	nil	3 March 1972
84	2	0	0	2	nil	nil	nil	8 March 1972

Abbreviations at end of Table 9.

Table 35. Estimated rate of human predation on *Chelonia mydas* at Mohéli, Comores

Beach N°	*First visit*			*Second visit*			*Third visit*			*Fourth visit*			*Estimated predation rate*			Estimated nesting population	Percent of population taken yearly
	Date #	corpses old	corpses new	Date #	corpses old	corpses new	Date #	corpses old	corpses new	Date #	corpses old	corpses new	peak season +	off season	annual rate		
4	27 Jun	2	2	-	-	-	-	-	-	-	-	-	2-3/mo	0	7	30	23%
8	24 Feb	0	0	27 Jun	10	2	12 Jun	0	1	-	-	-	1-2/wk	0	20	200	10%
10	27 Feb	0	1	-	-	-	-	-	-	-	-	-	1/mo	0	3	15	20%
12	24 Feb	0	0	9/10 Mar	0	2	27 Jun*	2	7	11 Jun*	0	3	2/wk	1/wk	70	200	35%
24	23 Feb	0	0	14 Mar	0	0	26 Jun	-	0	-	-	-	1/yr	0	1	5	20%
46	27 Feb	-	0	1 April	0	1	25 Jun	0	0	11 Jun*	0	1	1/mo	0	3	150	2%
47	27 Feb	-	0	1 April	1	0	25 Jun	0	0	10 Jun*	0	0	1/yr	0	1	150	1%
65	2 Mar	1	1	24 Jun	0	0	-	-	-	-	-	-	1/mo	0	3	40	8%
67	3 Mar	0	25	24 Jun	0	13	-	-	-	-	-	-	2/wk	1/wk	70	600	12%
68	3 Mar	0	0	24 Jun	0	1	-	-	-	-	-	-	1/yr	0	1	50	2%
70	3 Mar	1	0	-	-	-	-	-	-	-	-	-	1/mo	0	3	10	33%
71	3 Mar	2	0	-	-	-	-	-	-	-	-	-	1/mo	0	3	15	20%
Total							all beaches with human predation								185	1,465	12.6%
							all Mohéli beaches								185	1,800	10.3%

all dates are 1972 unless indicated *, otherwise they are 1973;

+ peak season is assumed to last 3 months;

"-" no data;

The occurrence of bones (see Table 9) was not applicable to corpses unless a large number of bones was included.

Beaches with little evidence of human predation are not included (i.e., N°s 9, 13, 22, 38, 59, 60 and 73).

Table 36. Tortoise-shell imports into Zanzibar from territories including Comores

Import from	Date	*Weight*		*Value*			Source
		originally recorded	kg equivalent	originally recorded	equivalent Pounds Sterling	equivalent Dollars	
South†	16 Oct 1890 to 17 Aug 1891	62 packages	4,921.5	Rs 92,225*	6,567.5	43,400.00	Great Britain, 1892
Southern ports+	1892	49 packages	3,839.6	Rs 11,816	844.0	5,560.47	Great Britain, 1893
nil	1893	/	/	/	/	/	Great Britain, 1894
Southern ports+	1894	55 packages	4,365.9	Rs 14,613	1,044.0	6,876.71	Great Britain, 1895
French South Africa	1914	392 pounds	177.8	£ 320	320.0	1,557.28	Zanzibar, 1915
Madagascar & Comores	1916	3,052 pounds	1,384.4	£ 2,386	2,386.0	11,611.47	Zanzibar, 1917
Madagascar & Comores	1917	413 pounds	187.3	£ 202	202.0	983.03	Zanzibar, 1918

† South = "Ibo, Mozambique, Zambesi, Comoro and other Portuguese and French Possessions to the south".

+ Southern ports = "Southern ports and islands, including Madagascar".

* Average export value for 62 packages.