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Editor's note: The following note is an excerpt taken from *La Tortue* 39 (1997). The original French text describes a visit to Aldabra made by the French tortoise conservation organisation SOPTOM, in May 1997. During the visit small scale studies were made into some aspects of giant tortoise biology. In order to draw these studies to the attention of a wider audience we translate excerpts from the text with the authors' permission. Text translated by G. Gerlach.

The forgotten in Aldabra

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Three short studies were undertaken during our stay on Aldabra. One on the presence or absence of the cervical scute by B. Devaux, another on the diet of the tortoises in different areas, by J. Dupré and the third, completely new, on faecal bacteriology by F. Bonin and P. Strohl.

The second study has been followed up by Dr. Perrin of the Ménagerie of the Jardin des Plantes and the third by Philippe Strohl's doctoral thesis on the faecal flora of reptiles at the Ecole Vétérinaire at Lyons. We summarise these studies, which are not fully completed. If you wish for more detailed information, contact SOPTOM.

The Aldabran tortoise has often been compared to those of the Galapagos (*Chelonoidis nigra*), both being large and living in more or less similar conditions, although at two extremes of the planet. What differentiates them is primarily the presence of a cervical scute in *D. elephantina* while *C. nigra* has none. In fact this criterion is not absolute as a small population of tortoises on Aldabra have a complete absence of the cervical scute.

I have personally carried out an assessment of this subject on the atoll, at three sites, Picard, Dune d'Messe and Cinq Cases. One can distinguish the absence of the cervical on the top, therefore a relative absence, and the total absence of the cervical both above and below, therefore identical to the condition in *C. nigra*. For the relative absence, on the top, I counted 19 tortoises out of 352, that is about 5% of the animals lack a cervical. For the total absence, considered by P. Pritchard as the only valid state, there were only 5 cases out of 352, that is 1.8% of the tortoises lack a cervical.

B. Devaux

Feeding was observed "in natura" on Aldabra on three contrasting sites: the Station on Picard Island, Cinq Cases and Dune d'Messe on Grande Terre. Appreciable biotope differences exist on each of these three sites, which leads to differences in the tortoises' diets. The daily cycle is the same on Cinq Cases and Dune d'Messe, but slightly different on Picard... The tortoises mainly eat between 8-9h. and from 16h., until nightfall. Between times they remain in the shade of big leafy trees (*Guetarda speciosa*...) or under

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bushes where available. Otherwise, they shelter in crevices of dead coral. Rain does not seem to worry them, indeed on the contrary they appreciate it and leave their shelter to take advantage of it.

On Picard, it must be taken into consideration that the tortoises were formerly exterminated by the first colonists and were reintroduced from other "islets". These tortoises are almost domesticated and feed exclusively on natural vegetation. It is the only population observed which seems to prefer dry food to green. The tortoises first eat the dry leaves, the dry grass and, only if there is no more dry food around, they go towards fresh leaves and fresh grass. The principal plants eaten are *Pandanus tectorius*, *Casuarina equisetifolia*, *Caparis carilaginea*, *Hedyotis* sp.

At Cinq Cases the animals are smaller than elsewhere on Aldabra. The vegetation is harsh on the edge of the sea, with a low grass (*Sproobolus virginicus*...). Here *Guettarda speciosa* also grows which serves both as food and shelter. The tortoises eat green and dry leaves, but also the buds, the highly scented flowers and the fruits. When the rain beats down the foliage the tortoises rise upon their back legs to eat the lowest leaves. Further inland the species are more diverse. The tortoises feed on low and twisted bushes with dense foliage (*Pemphis acidula*) from small clumps of tall herbs (*Cyperus dubius* or *bigibbosus*...), and from a type of yucca with spiny and sharp leaves which they particularly like (*Lomatophyllum aldabrense*). In the lakes and pools they eat filamentous algae (*Naias graminea*...).

At Dune d'Messe the vegetation is almost identical to that at Cinq Cases, with a coastal band of tortoise turf (*Sproobolus virginicus*). One finds here a very dry grass, sharp and pointed which grows in little dense tufts and of which the tortoises eat particularly the shoots and seeds (*Sclerodactylon macrostachyum*...). The tortoises pass most of the day here resting under the *Guettarda* as at Cinq Cases, but we have also seen some walking on the sand on the beach and digging a hole to lie in. When the temperature seems favourable, between 16-17h., they go into the crevices of dead coral to take more succulent herbs, like *Asystasia*.

Therefore one sees that the feeding conditions for the tortoises are harsh. When looking at the immense coral concretions as far as one can see, one often asks oneself how they find anything to eat. Although the feral goats have been eradicated and no longer compete with them, the tortoises live and die in difficult conditions. Besides, the corpses stay amongst the living tortoises, at the bottom of a crevice, or in the water of a pool. witnesses to the hard life of *D. elephantina* on Aldabra.

Judith Dupre

The collection of faeces on Aldabra was carried out by Dr. Bonin. The samples came from three *D. elephantina* tortoises, of which one was female and two male. One living at the station on Picard could be in contact with humans. My work, carried out at the Ecole Vétérinaire at Lyons focuses on two aspects: research into Salmonella for my doctoral thesis and a more general study of the faecal flora of these tortoises. The method

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can be replicated in a classical bacteriology laboratory. 15 days separated sample collection and culture which resulted in the elimination of the most sensitive bacteria from the faeces.

We will not describe these methods here, but these are the results. The research on *Salmonella* was positive and will be present in my doctoral thesis.

The main floral study concerned GRAM negative and GRAM positive bacteria. We have only considered bacteria of which the API plaques give at least "a good identification". Given that these levels of identification are designed for human medicine and that the tortoises studied are exotic we cannot discriminate between acceptable, doubtful or poor identifications.

We have classed the bacteria by tortoise. We note that the three animals carry haemolytic bacilli and invasive *Proteus* (*P. vulgaris*, *P. mirabilis*) which are difficult to culture from our material and which we have not isolated. The GRAM negative bacteria were, for tortoise No. 1: with Oxydase API 20E: *Escherichia coli*, *Citrobacter freundii*, with Oxydase API 20NE: *Aeromonas sobria*, *Aeromonas hydrocaviae*, *Pseudomonas stutzeri*. For tortoise No. 2: with API 20E: *Escherichia coli*, *Citrobacter freundii*, with API 20NE: *Aeromonas hydrocaviae*, *Xanthomonas maltophilia*. For tortoise No. 3: with API 20E: *Escherichia coli*, *Klebsiella pneumoniae*, *Enterobacter* spp., *Citrobacter freundii*, *Salmonella* spp., with API 20NE: *Pseudomonas* spp., *Pseudomonas vesicularis*, *Acinetobacter* spp., *Flavobacterium breve*.

For the GRAM positive bacteria we have only obtained reliable identification for two strains. Again it is necessary to be cautious with the results because the APILAB system indicates that several biochemical tests are needed to confirm identification. We note for tortoise No. 1, with API 20-Coryne, *Listeria* spp. (found in 2 tests), for tortoise No. 2. nothing, for tortoise No. 3, *Rhodococcus equi* (found in 3 tests).

Our conclusion is that producing evidence of GRAM positive bacteria has been very difficult and the results are questionable. The GRAM negatives profiles of tortoises 1 and 2 are very different from those of tortoise 3. This tortoise lives close to the settlement on Picard. One can therefore imagine human contamination, directly or indirectly (domestic animals). It is always necessary to be prudent as the samples were 15 days old and had transported by air. Furthermore, the small number obscures any statistical differences. In summary, this work could give some information on the "normal" faecal flora of the tortoises of Aldabra, but should be repeated, with a greater number of samples, in better conditions.

Philippe Strohl