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New Localities for *Pyxis planicauda* in West-Central Madagascar

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The geographic distribution of the Madagascan flat-tailed tortoise, *Pyxis planicauda* (Cryptodira: Testudinidae), locally called *kapidolo*, is poorly known. The species is endemic to the dry deciduous lowland forests of west-central Madagascar, which lie in the rain shadow of the eastern mountains (Fig. 1). Bour (1981) and Durrell et al. (1989) reported that *P. planicauda* has been recorded only from the Andranomena and Amborompotsy forest reserves situated 20 km and 50 km, respectively, northeast of the coastal town of Morondava. These forest tracts are characterized by canopies generally 12-15 m high, and are dominated by baobab (*Adansonia* sp.) and bursera (*Commiphora* sp.) trees that may exceed 25 m in height. Except for edge situations, the herb-layer is depauperate, leaving the earth bare save for a carpet of dead leaves. Kuchling and Bloxam (1988) esti-

mated that total remaining habitat for this tortoise is about 15,000 ha.

Knowledge of the distribution of *kapidolo* tortoises has been hampered by climatic conditions, the inaccessibility of potential habitat, and the species' cryptic behavior. The region experiences a prolonged dry season of 7-8 months (April-October) when most trees shed their leaves. Field experience (Kuchling and Bloxam, 1988) has shown that the tortoises bury into the leaf litter during the dry season and are not seen at this time. During the wet season, the Morondava area may receive in excess of 800 mm of precipitation, with peak rainfall occurring January-February. In the investigators' collective experience, tortoise movement is most pronounced at this time, and local woodsmen are most apt to see them. Unfortunately, villages near forest blocks, or logging camps within them, are isolated by flooded streams and impassable dirt tracks. Travel in west-central Madagascar during the wet season peak-activity time of *P. planicauda* is problematic and opportunities for field investigations correspondingly rare.

In December 1992 - January 1993, fieldwork was carried out in the Amborompotsy ("Kirindy") Forest concession held by the Swiss Forestry Department (C.F.P.F.), which operates Le Centre de Formation Professionnelle Forestière de Morondava (see Kuchling and Bloxam, 1988; Bloxam and Hayes, 1991 for details of previous studies) 50 km NNE of Morondava. Because the onset of heavy rain was delayed and roads were still passable, the investigators had possession of the 4-wheel drive JWPT vehicle, and Mala-

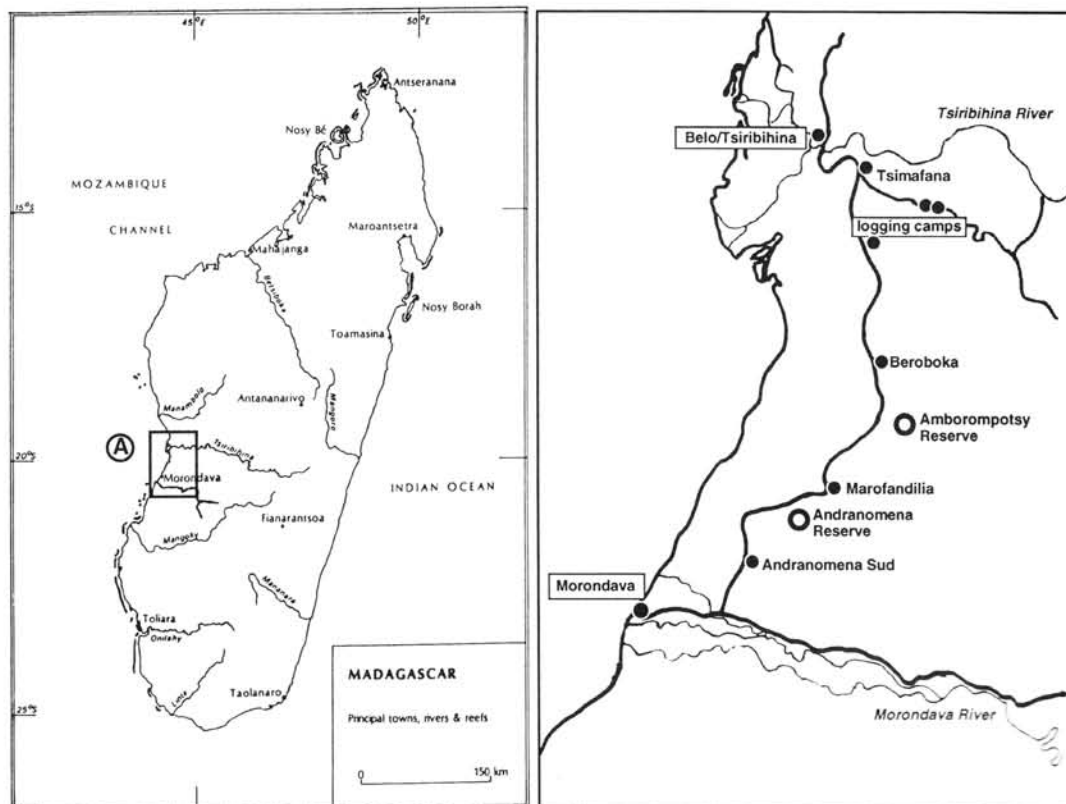


Figure 1. Map showing location of study area northeast of Morondava in west-central Madagascar. Square marked A on left map enlarged at right to show localities between the Morondava and Tsiribihina Rivers.



Figure 2. *Pyxis planicauda* adult female. Photo by J.L. Behler.



Figure 3. *Pyxis planicauda* adult male, showing large, flattened tail. Photo by J.L. Behler.

gasy speaking team members were available, they decided to visit remote camps and villages between the Morondava and Tsiribihina rivers, possible geographic barriers to *P. planicauda*. In January, one of us (E.R.R.) with extensive forestry experience in this region, directed the investigators to intact forest blocks between Morondava and Tsimafana with characteristics similar to those of known kapidolo habitat. There, local people were interviewed about the presence of tortoises in surrounding forests. "Kapidolo" proved to be a familiar word in this region and the tortoise was well-known to woodsmen, whom we engaged to collect small series of specimens. The logging camps and villages were revisited within 72 hours. Live specimens collected were returned to our Kirindy Forest camp for blood sampling (for genetic characterization) and morphometric measurement. They were then returned to original capture locations and released. Collected skeletal remains were saved for museum deposition. Additionally, permits were obtained from Eaux et Forêts to take 8 live specimens for a cooperative propagation project involving Jersey, New York, and Knoxville zoos. Upon their death, these specimens will be deposited in the collection of the American Museum of Natural History.

Specimens were obtained from the following localities: (2m,1f,1f shell - AMNH 139287) two logging camps (19°45'S, 44°41'E and 19°45'S, 44°42'E) near the Tsiribihina

River, 13 and 14.5 km E of Tsimafana on 7 January 1993; (1m,2f, 1f shell - AMNH 139286) logging camp in the Mahabilo Forest (19°48'S, 44°37'E) 26 km N junction C.F.P.F. camp road 7 January 1993; (1m) Beroboka village (19°58'S, 44°37'E) 7 km N junction C.F.C.P. camp road 7 January 1993; (2f) approximately 8 km E of Beroboka (19°58'S, 44°40'E) 12 January 1993; (1J - NYZS 930073) Marofandilia (20°06'S, 44°35'E) 43 km NE of Morondava 26 January 1993; and (1m - KZG TU222, 1f - NYZS 930063, 1J - KZG TU225) village of Andranomena Sud (20°12'S, 44°27'E) 27 January 1993.

During the December 1992 - January 1993 fieldwork period, 60 *P. planicauda* (19 males, 18 females, 23 juveniles) were handled from known Amborompotsy and Andranomena habitats and new locations well beyond these reserves (Figs. 2-5). This work served to locate additional occupied kapidolo habitat and establish a northerly range extension of 45 km for the species. Anecdotal information collected suggests that the species is also seen in degraded and remnant forest areas at least as far as 22 km east of Morondava. Distributional limits in lowland forests east of the Morondava-Tsimafana road need further exploration. Little herpetological fieldwork has occurred in potential tortoise habitat in remote localities north of the Tsiribihina River or in forested areas south of the Morondava River. Whether these rivers represent geographic barriers to *P. planicauda* remains to be determined.

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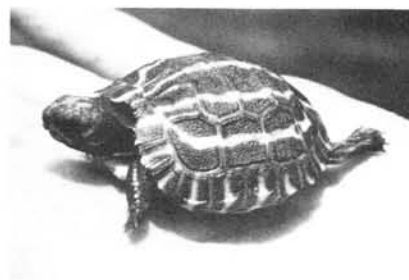


Figure 4. *Pyxis planicauda* hatchling. Photo by J.L. Behler.



Figure 5. *Pyxis planicauda* hatchling. Photo by J.L. Behler.

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Literature Cited

- Bloxam, Q.M.C. and K.T. Hayes. 1991. Further field observations on the Malagasy flat-tailed tortoise *Pyxis planicauda*. Dodo. J. Jersey Wildl. Preserv. Trust 27:138-145.
- Bour, R. 1981. Étude systématique du genre endémique malgache *Pyxis* Bell, 1827 (Reptilia, Chelonii). Bull. Mens. Soc. Linn. Lyon. 50(4-5):132-144,154-176.
- Durrell, L., B. Groombridge, S. Tonge, and Q. Bloxam. 1989. *Acinixys planicauda*, Madagascar flat-tailed tortoise, kapidolo. In: Swingland, I.R. and M.W. Klemens (Eds.). The Conservation Biology of Tortoises. Occas. Pap. IUCN Species Survival Commission 5:94-95.
- Kuchling, G. and Q. Bloxam. 1988. Field-data on the madagascan flat tailed tortoise *Pyxis (Acinixys) planicauda*. Amphibia-Reptilia 9:175-180.

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Réunion Island – Still a Land of Tortoises

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Réunion is an island of volcanic origin located 800 km east of Madagascar, and 220 km southwest of Mauritius. The island constitutes a French "Department d'Outre Mer", and has maximum dimensions of about 60 km by 45 km. Until the late eighteenth or early nineteenth century it was the home of the now extinct giant tortoise *Cylindraspis borbonica*.

It appears that, even after the extinction of the endemic tortoise species, tortoises did not pass from the consciousness of the people of Réunion, and for many years the inhabitants have imported live tortoises from neighboring islands, sometimes keeping large numbers of them in backyards. Most commonly, these imported tortoises are representatives of the beautiful Malagasy species *Geochelone radiata*, but some Aldabra tortoises (*Geochelone gigantea*) and even a few of the Malagasy spider tortoise (*Pyxis arachnoides*) are kept on the island.

It has been rumored for some time that ethnic Chinese residents of Réunion import or keep radiated and other tortoises primarily for food. However, my information suggests that the tortoises are kept primarily as "pets," although it does seem hard to reconcile this with the sheer numbers kept by some people on Réunion.

Prestige and pride of ownership seem to accrue to those who keep large collections of tortoises on Réunion, there being a definite feeling of "the more the better," without any particular drive towards greater diversity of species such as

motivates many tortoise hobbyists. A certain level of captive breeding occurs, and the hatchlings may be sold to friends or neighbors.

Although hundreds – even thousands – of tortoises are kept on the island, the casual visitor or even resident is unlikely to see any of them. They are almost never allowed to roam at liberty in gardens or yards, but rather are enclosed in pens behind the house, out of sight from the street.

In spring 1992, I visited six Réunion families who kept tortoises. Their combined collections totaled about 300 radiated (*G. radiata*), three Aldabra (*G. gigantea*), five spider (*P. arachnoides*), and two leopard (*G. pardalis*) tortoises, as well as two three-toed box turtles (*Terrapene carolina triunguis*), one red-footed (*G. carbonaria*), and two spur-thighed tortoises (*Testudo graeca*). Many other individuals reported that they, too, had collections of radiated tortoises. Unfortunately, time constraints did not allow me to visit their "backyard pens". I was left with the impression that there were literally many thousands of live radiated tortoises kept in captivity on Réunion. Some of these tortoise keepers reported that their animals reproduced every year; on the other hand, two individuals who had long-established groups of 10-15 radiated tortoises had never had successful captive reproduction.

Tortoises were often maintained at high density, with both sexes together, and active manipulation was required if captive reproduction was to be successful. When an adult female is seen to be behaving unusually (e.g., pacing along perimeter of pen), it is taken out so that it can find a suitable place to excavate a nest in the garden. Often the owner will dig and moisten an area of soil and then place the female over this spot. She generally "takes the cue" and nests right there.

A typical nest will contain only three eggs, but clutches of up to seven are seen on occasion. Females are reported to nest every month of the year except during the (southern) summer, which is when hatching occurs. After oviposition is completed, the eggs are removed from the nest and placed in a receptacle filled with sand; this is kept indoors, but without special attention, until the eggs hatch.

Two of the most successful tortoise breeders on the island claimed that, despite the wide span of months over which nesting occurred each year, hatching generally occurred during the summer - whether the eggs had been laid four, six, or even eight months earlier. We did, however, visit one family whose tortoise eggs had hatched in May. Growth of the hatchlings is reportedly slow on Réunion.

I was greatly surprised to encounter two captive-hatched hybrid tortoises (Fig. 1) that were the product of a mating between a female radiated tortoise (*G. radiata*) and a male South American red-footed tortoise (*G. carbonaria*). The hybrids were about five years of age and seemed to be healthy, and had grown faster than typical hatchling radiated tortoises on Réunion. A third hybrid died shortly after hatching.

A nuchal scute was present in one of the hybrids, absent in the other (it may also be absent in *G. radiata*). The shape of the young tortoises was intermediate between that of the