

New opportunities and hazards brought by humans to the island habitat of the skink *Euprepis atlanticus*

JOÃO LUIZ GASPARINI¹, PEDRO LUIZ PELOSO^{1,3} and IVAN SAZIMA²

¹ Departamento de Ciências Biológicas, Universidade Federal do Espírito Santo, Av. Marechal Campos 1468, Maruípe, 29040-090 Vitória, ES, Brasil

² Departamento de Zoologia and Museu de História Natural, C.P. 6109, Universidade Estadual de Campinas, 13083-970 Campinas, SP, Brasil

³ Corresponding author: pedropeloso@terra.com.br

THE Noronha skink, *Euprepis atlanticus* (see Mausfeld & Vrcibradic, 2002; Mausfeld *et al.*, 2002; Whiting *et al.*, 2005 for taxonomic accounts), is endemic to Fernando de Noronha Archipelago, off northeast Brazil, where it is the most abundant terrestrial vertebrate (Carleton & Olson, 1999). The generalist diet of *E. atlanticus* along with the lack of natural predators on the island may have contributed to the large population density of this lizard on the island. The skink feeds on various prey items including arthropods, conspecific eggs and juveniles, dead vertebrates, plant material, and human leftovers (Silva-Jr. *et al.*, 2005). During the dry season the skink seeks water and sugar from the flower nectar of a leguminous tree (Sazima *et al.*, 2005).

We report here on new and unusual food sources for *E. atlanticus*, brought to Fernando de Noronha Island by human influence and comment on the presumptive importance of these sources (new opportunities), as well as of introduced predators (new hazards), to the presently large population of this skink on the island.

In January 2006 (end of the dry season) we recorded *E. atlanticus* feeding on dry seeds of the leguminous shrub *Acacia* sp. ($n = 5$) and on the faeces of the Rock cavy *Kerodon rupestris* ($n = 2$) (Figure 1). In June 2006 (wet season) we recorded the skink deftly catching calliphorid carrion flies that swarmed on dead nestlings of the Noronha dove *Zenaida auriculata noronha* ($n = 5$) on the ground. We also recorded the Noronha skink chasing and preying on juveniles of the House gecko *Hemidactylus mabouia* ($n = 3$) during this period. Although nocturnal, in the relatively cold wet season this gecko sunned on low branches,

wooden stakes, and on occasions crawled on the ground. The geckos were chased while they were on the ground or on sunning perches (see Sazima *et al.*, 2005 for the climbing abilities of the skink). Another unusual food source for skinks was provided by tourists, who attracted these lizards with cookie crumbs at some of the most visited sites (Figure 2).

Notwithstanding the fact that the Noronha skink is regarded as an ultimate food generalist (Sazima *et al.*, 2005; Silva-Jr *et al.*, 2005), the food items here presented add considerably to the resources presently available to this lizard. The Rock cavy, House gecko, carrion flies, and the *Acacia*, all are introduced organisms on Fernando de Noronha (Carleton & Olson, 1999; pers. obs.) and presently occur at high densities on several sites of the island. Tourism is steadily increasing on the island as well, with the arrival of large ship cruises and jet planes about four years ago (pers. obs.).

Lizards that dwell in insular or desert habitats often have broad feeding habits (Pianka & Vitt 2003, Vitt & Pianka, 2005). For instance, when arthropod availability is low, raising the amount of plant material intake is one solution (Robinson & Cunningham, 1978; Pianka & Vitt, 2003). In some cases low prey availability may have been caused by high lizard densities, which would increase intraspecific competition unless new resources are sought (Schoener 1968; Pianka & Vitt 2003). The dry season in Fernando de Noronha archipelago likely lowers arthropods' availability, although this assumption remains to be tested. The lacertid *Meroles anchietae*, which lives in sand dune habitats in the Namib Desert switches to plant seeds when insect abundance is low (Robinson &



Cuningham 1978) and a similar situation may be occurring with *E. atlanticus* while feeding on acacia seeds. The Rock cavy feeds on plants and thus the Noronha skink may take its faeces for plant material.

Euprepis atlanticus is regarded as ‘incredibly abundant’ at Fernando de Noronha (Carleton & Olson 1999; see one figure in Silva-Jr *et al.*, 2005). A major factor that may have contributed to such large population could be the historical absence of lizard predators on the island. Following human colonisation several predators were brought to the island: rats (*Rattus norvegicus* and *R. rattus*), mice (*Mus musculus*), domestic cats (*Felis catus*), and lately the large Tegu lizard (*Tupinambis meriana*), all of which prey on the Noronha skink (Silva-Jr *et al.*, 2005). The introduction of exotic species on Fernando de Noronha Archipelago, along with human occupation likely changed the population dynamics and density of *E. atlanticus* on the island.

Figure 1. The Noronha skink *Euprepis atlanticus* mouthing a dry seed of the leguminous shrub *Acacia* sp. (A), and sitting on a pile of faeces of the Rock cavy *Kerodon rupestris* (B).

One of two different historical processes may have occurred on Fernando de Noronha Archipelago: (1) lizard densities were lower there than in present days and went through an increase following human colonisation due to introduction of new food resources, or (2) lizard densities were high even before human colonisation. Considering the evolutionary trend of organisms living in isolated habitats free of predators, it seems to us that the second assumption is more realistic (see Pianka, 1973; Bennett & Gorman 1979; Schoener & Toft 1983; Vitt & Pianka 2005). Several lizard

Figure 2. *Euprepis atlanticus* foraging on cookie crumbs provided by tourists at one of the island’s most visited sites.



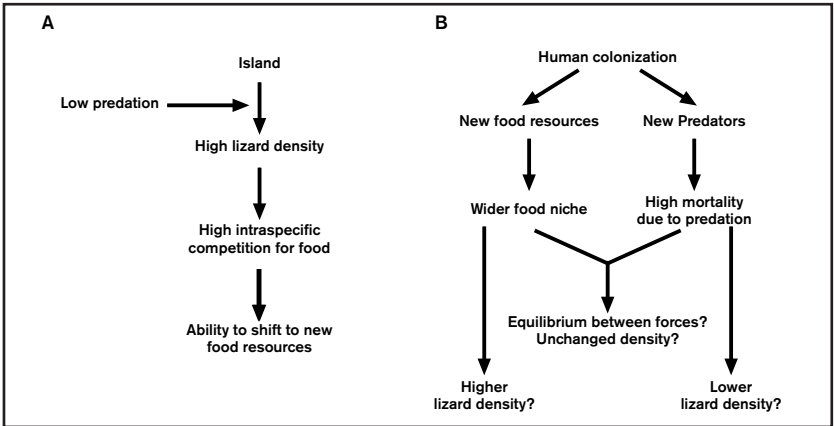


Figure 3. Historical processes that may have influenced the population of *Euprepis atlanticus* in Fernando de Noronha Archipelago; before human colonisation (A) and after human colonisation (B) and introduction of several exotic food sources and predators.

populations on islands without predators increase their densities (see Figure 3A), which likely increases intraspecific competition, especially for food, usually resulting in a broader dietary niche (Pianka & Vitt, 2003; Olesen & Valido, 2003). The introduction of predators on the island, however, likely reduces local lizard abundance (Figure 3B). This latter assumption seems to hold true especially at sites where domestic cats and Cattle egrets (*Bubulcus ibis*) are abundant (Silva-Jr *et al.*, 2005). A deft predator and a recent migrant and coloniser, the Cattle egret benefits from regular weeding, horse breeding, and man-made open spaces, and thus its numbers are steadily increasing on the island (pers. obs.). Cavies, acacias, geckos, and carrion flies are presently abundant at several sites on Fernando de Noronha and thus may act as important additional and/or alternative food sources for the Noronha skink, enabling it to thrive there even with increase of predators and low arthropod prey availability (Fig. 3B). We suggest here that the skink population may depend on food sources provided by human activities past and present to persist at the current density in the long run.

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