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Unusual frugivory in the Black River Turtle, *Rhinoclemmys funerea* (Cope, 1875): consumption of non-native *Morinda citrifolia* in a Costa Rican swamp forest

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Rhinoclemmys funerea (Cope, 1875) is a semi-aquatic geoemydid turtle distributed through the Caribbean slopes of southern Honduras, Nicaragua, Costa Rica and Panama (Rhodin et al., 2021). Although generally associated with aquatic habitats, it frequently undertakes terrestrial movements and has a broad diet including fruits, leaves, and invertebrates (Ernst and Barbour, 1989; Savage, 2002; McCranie, 2018). However, direct observations of foraging behaviour in the wild remain rare, and the consumption of non-native plant species is undocumented.

On 18 March 2012 at 20:05 hr, an adult *R. funerea* was observed during terrestrial activity on the grounds of the Caño Palma Biological Station (10.5936°N, -83.5274°W; 3 m elevation) in northeastern Costa Rica. The habitat was a seasonally inundated swamp forest dominated by *Manicaria saccifera* (Lewis et al., 2010). The turtle was actively feeding on a ripe fruit of *Morinda citrifolia* (known locally as Noni), which had fallen to the forest floor within the station's garden area (Fig. 1). Over the course of several minutes, the turtle consumed approximately two-thirds of the fruit before retreating slowly to a nearby water body. The individual's sex was not determined to avoid disturbance.

The diet of *R. funerea* includes a wide range of plant materials, and the species is often considered primarily herbivorous in the wild. Stomach-flushing and faecal analysis studies from Tortuguero National Park have identified leaves and fruits of both aquatic and terrestrial plants, predominantly *Dieffenbachia longispatha, Ipomoea trifida* and *Panicum aquaticum* (Jansen, 1993; Moll and Jansen, 1995). These studies also suggest the species plays a role in seed dispersal. Additional sources note consumption of other native forest fruits and broad-leaved vegetation, while some invertebrates may be ingested opportunistically (Ernst and Barbour, 1989; Savage, 2002; McCranie, 2018; Freedman, 2025). In captivity, individuals have accepted meat, though this is likely not typical of wild diets (Bonin et al., 2006). Folt (2020) further postulates that individuals may forage among leaf litter or debris for invertebrates, particularly in terrestrial or edge habitats. A summary of documented dietary items is presented in Table 1.

Morinda citrifolia is native to Southeast Asia and the Pacific but has been widely introduced to the Neotropics for its medicinal properties and is now naturalised in parts of Costa Rica. Its fruit is known for a strong odour, bitter taste, and bioactive alkaloid content, and is often avoided by native vertebrates (Nelson and Elevitch, 2006). The observed consumption by *R. funerea* may indicate either a tolerance for the fruit's chemical

Figure 1. *Rhinoclemmys funerea* consuming *Morinda citrifolia* fruit. Photo by Michelle Haines.

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Table 1. Documented diet items of *Rhinoclemmys funerea*.

Food Category	Specific Items / Examples	Notes / Sources
Fruits	*Ceiba pentandra, Dieffenbachia longispatha, Ficus* spp., *Ficus glabrata*, *Ipomoea trifida*, *Passiflora foetida*, *Solanum ochraceo-ferrugineum*, *Spondias mombin*	Native fruits; seeds often defecated intact (Jansen, 1993; Moll and Jansen, 1995)
Leaves	Broad-leaved plants; *Cecropia* sp., *Dieffenbachia longispatha, Miconia* sp., grasses	Common in field and stomach contents (Ernst and Barbour, 1989; Moll and Jansen, 1995)
Aquatic plants	*Eichhornia crassipes, Panicum aquaticum*	Frequent in swamp habitats (Moll and Jansen, 1995)
Seeds	*Ipomoea trifida*, unidentified seeds	Found in faeces; viable germination observed (Jansen, 1993; Moll and Jansen, 1995)
Invertebrates	Earthworms (occasionally), insects	Opportunistic, possibly more frequent in juveniles or terrestrial contexts (McCranie, 2018; Folt, 2020)
Meat (captivity)	Carrion, commercial food	Observed in captivity; not typical of wild diet (Bonin et al., 2006; Freedman, 2025)
Non-native fruits	*Artocarpus altilis, Morinda citrifolia*	First documented wild record – this study

defences or dietary opportunism.

This observation provides a rare field record of frugivory in *R. funerea* and, to the best of our knowledge, represents the first documented instance of *M. citrifolia* consumption by this species. It highlights the turtle's capacity to exploit novel food resources in human-influenced or edge environments and contributes to our understanding of dietary flexibility in Central American freshwater turtles. Given its known role as a potential seed disperser of native plants (Moll and Jansen, 1995), further observations of interactions with introduced fruits like *M. citrifolia* could provide insights into novel ecological roles, or non-native species distribution, across disturbed landscapes.

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