GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Varanus indicus***

Varanus indicus **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Squamata	Varanidae

Common name erebachi (Marovo), Pazifikwaran (German), regu (Roviana), kalabeck monitor (English), varan des indes (French), Indian monitor (English), Pacific monitor (English), Indian monitor lizard (English), mangrove monitor (English), sosi (Touo), ambon lizard (English), flower lizard (English), stillahavsvaran (Swedish), varano de manglar (Spanish), George's island monitor (English), varan des mangroves (French)

Synonym
Monitor chlorostigma
Monitor douarrha
Monitor kalabeck
Tupinambis indicus
Varanus guttatus
Varanus tsukamotoi
Monitor doreanus
Monitor indicus
Varanus chlorostigma
Varanus indicus indicus
Varanus leucostigma
Varanus indicus kalabecki
Varanus indicus spinulosis

Similar species *Varanus doreanus, Varanus indicus spinulosus*

Summary Varanus indicus (mangrove monitor) is a terrestrial-arboreal monitor lizard that has been introduced to several locations for its meat, skin or as a biological control agent. It has created a nuisance on many islands preying on domesticated chickens and scavenging the eggs of endangered sea turtles. Bufo marinus (cane toad) was introduced to control mangrove monitor populations in several locations, but this has led to devastating consequences. In many places both of these species are now serious pests, with little potential for successful control.

view this species on IUCN Red List

Species Description
Varanus indicus (mangrove monitor) is darkly coloured with small yellow spots. It has a long, narrow head attached to a long neck. It has four strong legs, each with five sharp claws. The tail of *V. indicus* is very strong and highly compressed. Large scales cover the face, giving it a glassy appearance, while the rest of the body has oval-shaped, keeled scales. (HJHS, undated). *V. indicus* can weigh between 500g and 1900g, while reaching lengths between 50cm and 200cm. Males are much larger than females. (Bennett, 1995) *V. indicus* has a dark drown iris with a golden ring around it. It has an exceptional ability to enlarge its mouth significantly by spreading its hyoid apparatus and dropping its lower jaw for large prey consumption. The mouth is outlined in red, a result of blood mixed with saliva, which may frighten predators or attract prey, similar to Komodo dragons. \"The teeth are serrated along their anterior and posterior edges with the dentary teeth directed slightly laterally and the maxilliary teeth directed vertically.\" *V. indicus* has taste buds on the roof of the mouth and the tongue is frequently protruded, functioning as a chemical sensor. (HJHS, undated). *V. indicus* can live to be 15 years old. (Brook *et al*, 2004).

Notes
Varanus indicus (mangrove monitor) can have parasitic nematodes (round worms) on their body (Greer, 2006). They are very shy animals and are wary of humans when accustomed to human habitation. (HJHS, undated). In captivity, males are more aggressive than females. Instead of biting when threatened, *V. indicus* will defecate on an attacker. Nocturnal nesting has been reported for *V. indicus* while in captivity. (Greer, 2006). *V. indicus* is said to be a protected species in Indonesia. (Bennett, 1995).

Lifecycle Stages
The eggs of *Varanus indicus* (mangrove monitors) are 3.5-5cm in length, oblong and white, and take approximately 7-8 months to hatch. No parental care is given to the young when they hatch. (HJHS, undated).

Uses
The skin of *Varanus indicus* (mangrove monitors) is used on ceremonial drums and as leather (Bennett, 1995). *V. indicus* was introduced to Micronesia during the Japanese occupation as a food source and for rat population control (Buden, 2000). *V. indicus* was popular in the international pet trade in the late 1970's and early 1980's. In 1980, 13,000 mangrove monitors were traded around the world (Bennett, 1995).

Habitat Description
Varanus indicus (mangrove monitors) are tropical reptiles that can be found in mangroves, forests, swamps, and rainforests. They are most often found close to a water source. They prefer open areas to thick forests and have the capability to climb with great agility, dive, swim, and jump from high places. They have also been known to dig quite efficiently. In some areas they spend most of their time in the water, resting or looking for food. *V. indicus* may also take shelter in a tree, under a rock, in the hollow of a log or branch, or seldom in higher elevations and dry regions. In captivity they prey on fish but have no problem catching fish in deep water when not in captivity. (Bennett, 1995). Brook *et al* (2004) reports that *V. indicus* occupies/forages mainly around back swamps and paleochannels of floodplain. A male mangrove monitor has a home range of .4ha, while the female has a range of .9ha. (Bennett, 1995)

Reproduction
Male *Varanus indicus* fight for females prior to courtship. (HJHS, undated). Males in combat are upright, in a grappling/dancing posture. (Uetz, 1996) Male *V. indicus* mount the females during copulation and orient themselves head to head with their mate. The pair then travel 360° in a slow rotation, the male remaining on top of the female. After copulation, male mangrove monitors will rub the dorsum of female monitor's head and forequarters with their chin. Female mangrove monitors are smaller than most varanids, and therefore yield a smaller clutch size, between 2-12 eggs. (HJHS, undated). When food is abundant, *V. indicus* may reproduce quickly, producing a large number of small clutches. (Brook *et al*, 2004). In New Guinea, recently hatched specimens have been collected every month of the year. (Bennett, 1995). Ovarian mass is greater during the dry season for females. Male mangrove monitors have testicular sperm all year round and their fat body mass does not differ between seasons, unlike females who have higher fat contents during the dry season, mainly for egg production. (HJHS, undated).

Nutrition
Varanus indicus (mangrove monitor) is a carnivorous, terrestrial-arboreal predator (Uetz, 1996) that primarily feeds on snails, carrion (rotting eggs), (Greer, 2006), piglets (Buden, 2000), frogs, lizards, crabs, fish, insects, birds and their eggs, and other reptilian eggs. (Brook *et al*, 2004). A study was conducted in Guam that provided a specific breakdown of *V. indicus's* diet over three years. The study found that *V. indicus* ate 45% arthropods, 27.2% scincid and gekkonid lizards and their eggs, 13.6% terrestrial crabs, 9.1% rats and 4.5% Brahminy blind snakes. HJHS (undated) reports that, in urban settings the diet of *V. indicus* consisted of domesticated chickens and their eggs, squid (from fishing bait) and aluminum butter wrappers. As an opportunistic feeder, *V. indicus* can change its prey class based on abundance or availability, allowing it to adapt to many habitats. (HJHS, undated).

General Impacts
Varanus indicus (mangrove monitor) feeds on domesticated chickens and their eggs in many locations where it has been introduced. (Bennett, 1995). On Tetepare Island in the Western Province of the Solomon Islands, *V. indicus* is known to scavenge the nests of turtles, including the endangered leatherback sea turtle (see *Dermochelys coriacea* in IUCN Red List of Threatened Species) (Read & Mosby, 2006).

Management Info
Biological: *Varanus indicus* (mangrove monitor) was introduced to the island of Kosrae in Micronesia for ant control. Populations grew significantly, and the country introduced *Bufo marinus* to regulate the burgeoning populations of *V. indicus*. Now both species exist on the island and are considered pests. (Howarth, 1990). A similar situation occured on the Marshall Islands as *V. indicus* was introduced prior to World War 2, probably for their skins, food and rat control. *V. indicus* began raiding chicken houses and their numbers increased drastically. *Bufo marinus* was introduced to regulate the lizard population. As populations of *V. indicus* dropped, the rat populations on the island rose. *Bufo marinus* was similarily introduced to Palau Island for mangrove monitor control. Lizard popluations declined on Palau but an increase was evident in the population of beetles known to be a major coconut pest. (Bennett, 1995)
Physical: *V. indicus* is seen as a threat to domesticated fowl and is trapped, poisoned, or killed near developed or agricultural areas. (HJHS, undated).

Pathway
Varanus indicus (mangrove monitor) was introduced to the island of Kosrae in Micronesia for ant control. (Howarth, 1990)In 1980, 13,000 *Varanus indicus* (mangrove monitors) were traded around the world. (Bennett, 1995).

Principal source: Bennett, D. 1995. A Little Book of Monitor Lizards. Viper Press, Aberdeen, U.K.

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review:

Pubblication date: 2007-01-09

ALIEN RANGE

[5] AUSTRALIA
[1] GUINEA
[1] IRELAND
[1] MARSHALL ISLANDS
[1] NEW GUINEA
[3] PALAU
[1] TIMOR-LESTE
[2] GUAM
[3] INDONESIA
[1] JAPAN
[6] MICRONESIA, FEDERATED STATES OF
[3] NORTHERN MARIANA ISLANDS
[5] SOLOMON ISLANDS

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Brook, B., Whitehead, P., & J. Dingle. 2004. Potential cane toad short to medium term control techniques-the biological feasibility and cost of exclusion as a mitigation control strategy. Commonwealth of Australia.
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General information

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Buden, D. 2000. The Reptiles of Pohnpei, Federated States of Micronesia. *Micronesica* 32(2):155-180, 2000
Summary: This report gives information regarding diet, distribution, and basic characteristics.

Greer, A.E. 2006. Encyclopedia of Australian Reptiles. Australian Museum Online
Summary: Summarizes information about Australia s reptiles.
Available from: http://www.amonline.net.au/herpetology/research/pdf/varanidae.pdf [Accessed 11 December 2006]

Hopwood Junior High School. Undated. *Mangrove Monitor Lizard*. Commonwealth of the Norther Mariana Islands Public Scools System.
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Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
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