

REPTILE RAP

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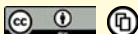
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Artificial incubation, hatching and release of the Indian Rock Python *Python molurus* (Linnaeus, 1758), in Nilambur, Kerala

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Image 1. Cluster of eggs of Indian Rock Python deserted by the mother due to human disturbance

The Indian Rock Pythons *Python molurus* (Linnaeus 1758) are large, heavy-bodied non-venomous snakes that kill their prey by constriction. The species is widely distributed through out the Indian Subcontinent and east to the Malay Peninsula and western Indonesia (Smith 1943; Das 2002). It occupies a wide range of habitats from dry and rocky scrub to moist forests. It has been listed in Schedule I of the Indian Wildlife Protection Act 1972, and also listed under CITES, subsequent to severe habitat loss and poaching for the skin, meat and pet trade. However, the species is listed under the Lower Risk-Near Threatened IUCN Redlist category (World Conservation Monitoring Centre 1996).

Little is known about the status, ecology and reproduction of the natural populations of Indian Rock Python (Bhupathy & Vijayan 1989). However, a large number of studies describe the breeding (Yadav 1967; Acharjyo & Misra 1976; Dattatri 1990; Kalaiarasan & Rathinasabapathy 1991; Urfi 1997; Vyas 1996, 2002; Joshi et al. 2001; Walsh & Murphy

2003) growth, development and management (Acharjyo & Misra 1980; Sekar & Jagannadha-rao 1995; Vyas 1998) of captive populations. In majority of these captive breeding studies, the incubation was done by the female itself. However, other studies used moist cotton wool/vermiculite substrate method (Dattatri 1990; Vyas, 1996, 2002) or slate-bottomed aquariums in which the eggs were placed on the surface of soil in small crockery or plastic cups (Walsh & Murphy 2003) for artificial incubation.

Ambient temperature variations are known to influence the growth and development of python embryos (Vinegar 1973, 1974; Branch & Patterson 1975). The eggs incubated at low and fluctuating temperatures are reported to have a lower hatching success and produced juveniles with abnormal colour patterns (Vinegar 1973; Walsh & Murphy 2003). Thus maintenance of optimal environmental conditions is important while incubating the eggs artificially, but which is often difficult in the aquariums or zoo enclosures (Walsh & Murphy 2003). For a precise

control over the environmental parameters, climate-controlled environmental chambers are commonly used for the artificial incubation of several species of reptiles (Damme et al. 1992; Spotila et al. 1994; Joanen & McNease 2009). In this note, we report the use of climate-controlled environmental chambers for the artificial incubation of Rock Python eggs which is, to our knowledge not yet reported in the literature.

On 02 May 2008, we received an abandoned egg mass of Indian Rock Pythons, containing 17 eggs from the officials of Kerala Forest Department, Nilambur (Image 1). The eggs were obtained whilst clearing out an erstwhile unattended patch of reserved forest (11°17'N & 76°15'E) near to human habitation at Nilambur Forest Range, Kerala.

The average measurements of the eggs were as follows: 102.7±3.3 mm length (range = 98-108 mm; n = 7) and 58.6±3.1 mm width (range = 57-62 mm; n = 5). Several eggs were in bad condition due to prolonged absence of incubation. The eggs were



Image 2. Well-developed python embryo with yolk sac in a damaged egg



Image 3. Indian Rock Python hatchling after 10 days of hatching and before release

placed in a sterilized jute sack within the climate-controlled environmental chamber (1m^3) at the Entomology Laboratory, Kerala Forest Research Institute, Nilambur. The environmental chamber was set at a temperature between 28 to 32 °C, relative humidity between 70 to 90% and on a 12 light: 12 dark photo period. These environmental parameters were set based on the previous studies (Vinegar 1973; Walsh & Murphy 2003). Discoloured and malodorous eggs were removed periodically from the environmental chamber.

A single egg hatched on 28 May 2008. The remaining eggs were maintained in the environmental chamber but all of them failed to hatch. The dead eggs were dissected and found to contain well-developed embryos (Image 2). The mass and measurements of the hatchling after 24 hours of hatching was: mass = 132gm, snout to vent length (SVL) = 480mm and tail length (TL) = 70mm. The hatchling was maintained in a 1m^3 wooden and wire-mesh chamber containing hide pots

and logs. This chamber was kept in room temperature and the photoperiod was maintained at 10 (light):14 (dark) hours using artificial lights. The chamber was covered with glass to reduce heat loss.

Ecdysis occurred on 06 June 2008. The hatchling looked like the adult snake except for the size (Image 3). The snake was offered live chicks and mice but it did not eat till the release. The mass and measurements (mass = 134.7g, snout to vent length (SVL) = 515mm and tail length (TL) = 75mm) taken after 10 days of fledging indicate the growth in python is slow as reported in other studies (Vyas 2000). On 09 June 2008, the snake was handed over to the local forest department officials and it was released in an evergreen forest at Chathamborai ($11^{\circ}16'\text{N}$ & $76^{\circ}13'\text{E}$), Nilambur North Forest Division.

As we received the eggs which were deserted by the female during incubation due to human disturbance, the exact incubation period and

the exact success rate cannot be calculated. The single egg hatched was on the 25th day of artificial incubation and we are not aware about the natural incubation received under the mother and number of days the eggs left unattended. The incubation period in pythons range between 66-85 days in artificial conditions (Vyas 2002; Walsh & Murphy 2003). If these periods are applied here, the egg laying may have occurred in the first fortnight of March.

The environmental conditions are known to influence the growth and development of python embryos (Vinegar 1973, 1974; Branch & Patterson 1975). Previous studies have documented the optimal environmental conditions required for the artificial incubation of python eggs (Vinegar 1973, 1974; Branch & Patterson 1975; Walsh & Murphy 2003). However, it is often difficult to maintain these conditions in the traditional methods used for artificial incubation (Walsh & Murphy 2003). The present

study proved the usefulness of climate-controlled environmental chambers for the artificial incubation of python eggs. The advantage of this method over other methods could not be discerned, because of the fact that the eggs we used in our study were partially damaged. They were also deserted by the female during incubation due to human disturbance. Further experiments using fresh eggs are required to test the efficiency of this method as other artificial incubation methods yielded low hatching success (Vyas 1996, 2002).

Although large number of pythons were caught in the lowland areas in Nilambur and translocated by the forest department, a significant number of adults were killed and eggs remain unattended or destroyed. Though the success rate was low due to the poor condition of eggs while they were received, in a conservation point of view, our method proved successful for incubation of the python eggs in such situations. A regional conservation education and awareness programme along with the captive management of injured snakes and eggs may help to save the pythons and other non-venomous snakes in this area.

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Dead King Cobra *Ophiophagus hannah* found near Srikakulam in North Coastal Andhra Pradesh

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Ramana Murthy, Green Mercy, pers. comm.)

On the morning of 28 July 09, a 14 foot long dead King Cobra was spotted in the dense forest of Sitampet agency area in Srikakulam. It was presumably killed by locals as clear, deep lacerations could be seen on the head

King Cobras *Ophiophagus hannah* inhabit thick primary forests and estuarine mangrove swamps with heavy rainfall (Whitaker & Captain 2004). These large reptiles were reported earlier from Duggeru and Makkuvu forest areas in Vizianagaram District of northern coastal Andhra by local field staff of the forest department and villagers. Of late, King Cobras were sighted by locals near Sunnapu Gedda Waterfalls in the adjoining Sitampet mandal of Srikakulam District (18°18'00.13"N & 83°53'59.73"E) which lies at Andhra-Orissa border (K.V.



Image 1. A dead king cobra *Ophiophagus hannah* with puncture marks on its head. A pair of large occipital shields behind parietals can be clearly seen.