LABORATORY INCUBATION OF *Calotes versicolor* (DAUDIN) EGGS AND A NOTE ON MORPHOMETRICS OF EGGS AND HATCHLINGS

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ABSTRACT

A clutch of *Calotes versicolor* (Daudin) eggs was incubated under controlled conditions of temperature, light and humidity. All the eggs did not develop, however the length of incubation period was considerably reduced. The hatchlings were subjected to morphometric investigations and released in the garden on attaining a suitable length.

INTRODUCTION

The Reptilian fauna of the oriental region has a right component of Agamids (Daniel, 1983). Agamids in contrast with other oriental lizards have specialised dentition. Members of the family Agamidae have a wide distribution in India and occupy all biotopes from sea level to above 5000 metres, (Daniel, 1983), reflecting their adaptability and tolerance to a wide range of environmental conditions.

Reptiles in general are characterised by innovative reproductive strategies though majority lay soft shelled eggs in the soil for incubation. Reportedly 13 species of calotes exist in India (Vyas, 1995). However, very little information is available on their breeding habits. The Agamid, *Calotes versicolor* studied by us is locally known as Sheddo, Shillo or Toppyo. Its breeding behaviour has been studied in wilderness by Asana J.J. (1931). But practically no information is available on captive breeding or laboratory incubation of eggs of this species. The present study was envisioned to fill up this lacuna.

MATERIALS AND METHODS

A clutch of soft shelled eggs was found in a pit within soft garden soil by our field Collector. (The clutch was left undisturbed to prevent change in the orientation of embryos within the egg). The soil temperature was noted and the nest dimension was recorded. The eggs were carefully shifted to a petridish with minimum disturbance, to prevent change in the orientation of the embryo within the egg. After recording the number of morphometric data, they were incubated at a temperature of 38°C. The hatchlings emerged from the eggs after twenty days of incubation. They were also subjected to morphometric analysis, immediately after their emergence from the eggs.

OBSERVATIONS AND DISCUSSIONS

A total of 28 eggs were shifted to the laboratory for incubation under controlled temperature light and humidity. The eggs were white with a leathery shell and oval in shape. All the eggs were in the length range of 1.1 to 1.5 cms whereas their weights varied from 0.51 g. to 0.81g. The mean length and the mean weight were 1.34 cm. and 0.6907 g. respectively (Table 1). The variation in egg size is reportedly related to water absorption by developing eggs. A similar variation of egg dimension has also been reported in *Calotes rouxi* eggs bred in captivity (Vyas, 1995). All the eggs did not develop following laboratory incubation, as evident from shrivelled and cracked, shells in some. A considerable egg mortality was observed and hatching success was 31%. Such a failure of captive incubation could be credited to artificialisation of egg environment in the laboratory and lack of desired natural nest ecology. Hatchlings started emerging after 20 days of laboratory incubation. This shortened incubation period in contrast with that of 47 days in nature could be on account of constancy in desired temperature of laboratory. Reportedly the length of incubation period is chiefly influenced by ambient temperature. The hatchlings were feebly irridescent golden yellow with brown patterns, characteristic of *versicolor* species. These were subjected to morphometric analysis recording various parameters (Table 2). The hatchlings were reared in petridishes covered with wire meshes and fed on black ants. After having attained a length of about 11 cm., the young ones were released in our botanical garden. The released animals were monitored for their activities for the first few hours after release, to ensure that they were not preyed upon by birds.

Little is known about the influence of environmental condition and the breeding of reptiles. Presumably, temperature light and humidity are involved, their relative importance being species specific. In view of this sensitivity of reptiles to their surroundings, it might theoretically be possible to make reptiles breed in the laboratory outside their breeding season as well, by providing appropriate environment (Bellairs, 1969). This has been experimentally verified at least with one species of garden lizar *Lacerta vivipera* that was induced to mate and produce fertilized eggs during winter by shifting them to warm, well lit enclosure with plentiful food (Panigel, 1956).

However, most of the experimenters have reported the failure of the embryos to develop properly and emergence of very few normal hatchlings. The findings of the present investigation are in conformity with these reports. Perhaps the lizards failure to reproduce successfully is due to the absence of some unknown but essential factor from their surroundings. The mechanism by which the environmental influence is transmitted to the reproductive organs, to initiate breeding in lizards is less understood and needs investigation from other angles.

Despite a poor success of laboratory incubation of the eggs of these Agamids; this exercise assumes importance, considering the factor that this species of lizard is heavily destroyed by the religious fantasies of a particular tribe in Goa. Such a negative anthropogenic influence is a detriment for the survival of the species which has its own role to play. Such a loss can be made good by laboratory incubation of eggs and the release of hatchlings in places where the number has declined seriously. This "ranching" strategy could in

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the long run stabilize the *Calotes* population in the region.

If the procedure for laboratory incubation of Agamid eggs are standardised to increase the hatchling success, one would counter the natural egg decimation factors such as nest predation or dessication.

Table 1. Morphometric Measurement of C. versicolor *or Eggs*

No	Length cm	Weight cm
1	1.51	0.7000
2	1.30	0.6280
3	1.32	0.7298
4	1.41	0.8139
5	1.25	0.7250
6	1.42	0.7672
7	1.38	0.5749
8	1.44	0.7643
9	1.30	0.6322
10	1.16	0.7357
11	1.23	0.6400
12	1.14	0.5128
13	1.45	0.6518
14	1.22	0.7600
15	1.41	0.7100
16	1.34	0.6768
17	1.36	0.7157
18	1.43	0.6810
19	1.52	0.7056
Mean length =1.34 Mean weight =0.6907		

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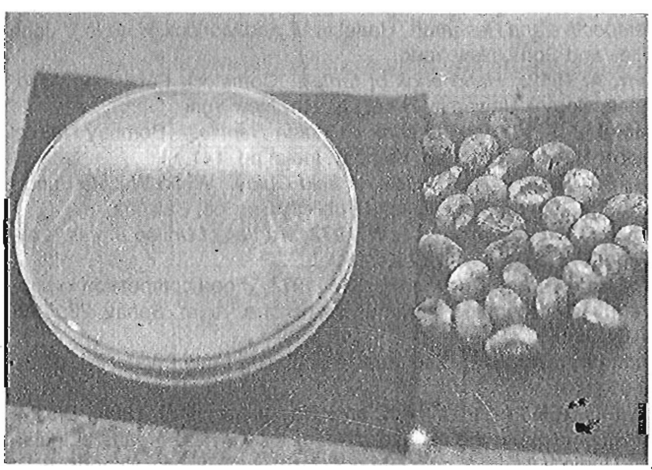
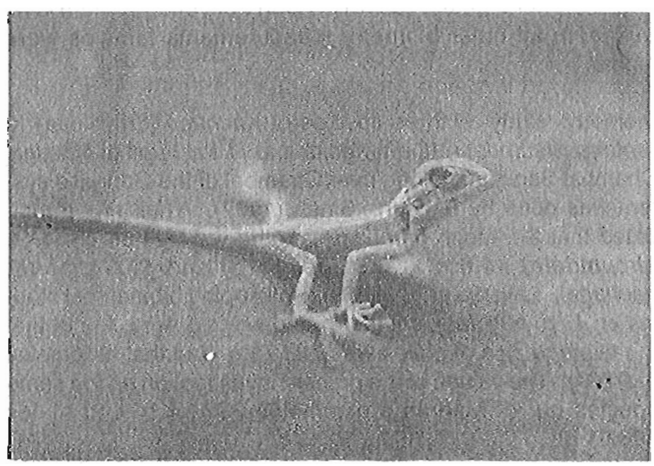
Table 2. Morphometric measurements of C. versicolor *hatchlings*

No.	VL	CL	TL	Individual Lime L.		Strected Lime span		Total
				Fore	Hind	Fore	Hind	Weight
	cm	cm	cm	cm	cm	cm	cm	gm
1.	3.4	5.3	8.7	1.2	1.8	3.3	4.4	0.3844
2.	3.6	5.1	8.7	1.6	1.9	3.4	4.5	0.3935
3.	3.7	5.5	9.2	1.6	2.2	3.8	4.5	0.4122
4.	3.5	5.5	9.0	1.6	2.2	3.5	4.5	0.4190
5.	3.6	5.4	9.0	1.7	2.0	3.6	4.6	0.3727
6.	3.5	5.3	8.8	1.7	2.3	3.9	5.1	0.3944
Mean	3.56	5.35	8.9	1.56	2.06	3.58	4.6	0.3960

VL = Snout to Vent Length; CL = Caudal Length; TL = Total Length



C. Versicolor ***eggs and hatchlings covered beneath a petridish***



A hatchling immediately after its emergence from the egg.