A NEW LOCALITY AND MICROHABITAT USAGE BY

**CALODACTYLODES AUREUS (BEDDOME, 1870) FROM TAMIL NADU, EASTERN GHATS, SOUTHERN INDIA**

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**Abstract:** We studied the Indian Golden Gecko, *Calodactylodes aureus*, at a new locality in the hill ranges of Tamil Nadu. The highest numbers of geckos were recorded from Valli Malai, followed by Shyed Basha Malai and the Sathgar Hill. Geckos were encountered at an elevation range of 185–702 m a.s.l. A total of 70 geckos were recorded in 20 rocky caves, and 72 egg deposition sites were noted, bearing signs of hatched and unhatched eggs. The number of egg deposition sites varied from 2 to 8 in the surveyed caves. A total of 477 unhatched live eggs were observed during the study. *Psammophilus dorsalis* is the most commonly encountered lizard species locally; *Cnemaspis otai* and *Hemidactylus graniticolus* were also found in sympatry.

**Key words:** Reptilia, Sauria, Gekkonidae, Indian Golden Gecko, distribution, egg-deposition sites, ecology.

**INTRODUCTION**

The Eastern Ghats represent broken and isolated hills of the Deccan plateau. These hills extend over 1750 km from south of the Chota Nagpur plateau, Odisha, to southwestern peninsula in Tamil Nadu (Mani 1974). They are included under 6C eastern highlands of the Deccan plateau, one of the biologically richest biogeographic zones of India (Rodgers et al. 2008). Studies on the distribution of reptiles in the Eastern Ghats are scanty, in contrast to those in the Western Ghats (Daniels and Kumar 1998). Geckos are found throughout the world and belong to one of the most species-rich lizard families, second only to skinks (Daniel 2002; Das 1994, 2001; Pough et al. 2004). Gekkonidae are a basal lineage (Vidal and Hedges 2005) and the genus *Calodactylodes* consists of large, distinctive geckos endemic to rocky habitat in Peninsular India and Sri Lanka (Bauer and Das 2000). The genus *Calodactylodes* consists of two species, the Indian Golden Gecko *Calodactylodes aureus* (Beddome 1870) and the Sri Lankan Golden Gecko *Calodactylodes illingworthorum* (Deraniyagala 1953). The Indian Golden Gecko was discovered in Tripatty (= Tirupati) hills in North Arcot District, Madras Presidency (Beddome 1870, Boulenger 1890) and rediscovered after 115 years in Tirupati Hills, Chittor District, Andhra Pradesh (Daniel and Bhusan 1985, Daniel et al. 1986).

In Andhra Pradesh this species is found at the following sites: Papikonda hills (Perantalapally) in Khammam district, Maredumilli in East Godavari District, Araku valley and Ananthagiri Hills in Vishakapatnam district (Javed et al. 2007, Sreekar et al. 2010, Chetri and Bhupathy 2011), Niyamgiri hill ranges of Rayagada, Kalahandi districts in Odisha (Dutta et al. 2005), and
unconfirmed record from Castle Rocks, Karnataka, Western Ghats (Bauer and Das 2000). In Tamil Nadu, the Indian Golden Gecko was only known from Vellore Hill Fort and Balamathi Hill (Bauer and Das 2000) and it has subsequently been recorded in Otteri, Vannankulam, Kulavimedu, Nayaganer, Kanyakapuram and Chennai highway rock boulders in the Vellore District (Rajasekhar and Nandakumar 2007). The Indian Golden Gecko is a protected species included under Schedule-I (Part II) of the Indian Wildlife (Protection) Act, 1972. Furthermore, the genus Calodactylodes is of interest, being of Gondwanan origin (Bauer and Das 2000). In this paper, we provide new locality and microhabitat information for the Indian Golden Gecko from Tamil Nadu.

MATERIALS AND METHODS

Study Area. The study took place on four hills in Tamil Nadu (Fig. 1). Sathgar Hill (12°57’N and 78°44’E, elevation 620 m a.s.l) and Valli Malai (13°04’N and 79°15’E, elevation 366 m a.s.l) in Vellore District, Shyed Basha Malai (12°32’N and 78°12’E, elevation 700 m a.s.l) in Krishangiri District and Nedumkunam Hill (12°28’N and 79°23’E, elevation 244 m a.s.l) in Tiruvanamalai District. The vegetation of Sathgar Hill is dominated by Euphorbia sp., Lantana camara and Annona squamosa. A thorny scrub forest with large rock boulders covers Valli Malai and Nedumkunam Hills. Krishnagiri, Shyed basha hill, is also dominated by Euphorbia sp. with historical forts and sacred temples (Fig. 2). All these hills are chiefly connected with Palar, Thenpennai and Ponnai River.

Methods. This paper is mainly based on the data collected by the authors from October 2011 to March 2012, during opportunistic field visits to the Eastern Ghats of Tamil Nadu. We located Golden Geckos by identifying their vocalization and egg deposition sites (Rajashekhar and Nandakumar 2007). Furthermore, we spotted geckos using powerful flash-lights and geckos were visually identified in the field based on their characteristic digits, overall body shape and size, as well as color pattern.

Data set was collected during day time and the following data were noted: number of individuals, number of live (unhatched) eggs, number of egg deposition sites, nearest water source (seasonal water pools, ponds and channels of river). The presence of other lizard species present with Golden Gecko were also noted, and we identified them by using key provided in Smith (1935), Agarwal et al. (2011), and Das and Bauer (2000). Geckos were photographed using a Panasonic Lumix DMC-FZ 10 digital camera. Geographic coordinates and altitude (in meters above sea level) were taken from Google Earth, version 6.2 beta.

FIG. 1. Map showing the location of Calodactyloides aureus encountered in Tamil Nadu, India, between October 2011 to March 2012. Mapa que muestra la localización de Calodactyloides aureus encontrado en Tamil Nadu, India, entre octubre 2011 y marzo 2012.
RESULTS AND DISCUSSION
A total of 70 Calodactylodes aureus were recorded in 20 rocky caves. Of these, 11 were bright golden yellow in color (Fig. 3). The highest numbers of geckos were recorded from Valli Malai, followed by Shyed Basha Malai and Sathgar Hill (Table 1). The geckos were found in both vertical and horizontal crevices in the rocks and caves, and temperature was slightly less and more humid than rocky surface areas compared to caves and crevices, as reported by Rajashekhar and Nandakumar (2007). This gecko prefers rocky areas with deep stream valleys (Sreekar et al. 2010). We also found them residing in nearby perennial water sources on the hill tops such as naturally generated water from the rocks and small water pools. The distance from nearest water source was found to be 0.1–180 m, with an average of 64.6 m. The geckos were encountered at an elevation range of 185 –702 m a.s.l. The Golden Gecko is found to extend the altitudinal distribution up to 1000 m a.s.l in the Araku Valley and the border area between Andhra Pradesh and Odhisha (Chettri and Bhupathy 2010).

The gecko has been reported to lay eggs in communal egg deposition sites (Bauer and Das 2000, Javed et al. 2007) on rocky surfaces. In the present survey, 72 egg deposition sites were recognized with hatched and unhatched eggs (Fig. 4). The number of egg deposition sites varied from 2-8 in the surveyed caves. A total of 477 unhatched active eggs were observed during the study. The species was found to lay eggs both horizontally and vertically inside the caves and eggs

FIG. 2. Habitat of Calodactylodes aureus in Shyed basha Malai, India.
Hábitat de Calodactylodes aureus en Shyed basha Malai, India.

FIG. 3. Adult male of Calodactylodes aureus.
Macho adulto de Calodactylodes aureus.
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are well protected from sunlight and heavy rain. In Valli Malai, the crevices of cave temple were blocked with cement, and Golden Geckos were found to lay eggs in gaps between the fluorescent tube lamp frames. The habitat characteristics of *Calodactylodes aureus* appear similar to that of the Sri Lankan Golden Gecko, *Calodactylodes illingworthorum*, which also inhabits granite rock caves and is restricted to eastern and south-eastern parts of the dry zones of Sri Lanka, between circa 125 to 800 m a.s.l (Karunarathna and Amarasinghe 2011).

*Psammophilus dorsalis* is the most commonly encountered lizard species, and *Cnemaspis otai* and *Hemidactylus graniticolus* are also found to reside along with Golden Geckos. Apart from that, a bat *Rhinopoma hardwickii* was found to roost in the caves of Shyed Basha Malai and Valli Malai, where the Golden Geckos were encountered.

The Indian Golden Gecko is facing various anthropogenic threats, such as mining activities in Niyamgiri Hills of Odisha (Dutta et al. 2005) and construction of dams in the Papikonda Hills (Javed et al. 2007). In Tamil Nadu, Rajashekhar and Nandakumar (2007) found that rock boulders are being blasted for construction of roads and for buildings near Vellore town. They also mentioned two large metal manufacturing industries, namely Kalai Blue Metals and VCE metals, destroying the Golden Gecko habitat in Vellore. Shyed Basha Hill is under Archaeological Survey of India (ASI), but its foothills are surrounded by human habitations. In this hill, caves are polluted with polythene bags and in one instance it was found that visitors had written their names on a previous egg-deposition site (Fig. 5) while surrounding rock boulders are being blasted for developmental activities. Valli Malai also comes under the Archaeological Survey of India. Most of the crevices in cave temples in this hill were sealed with cements where geckos were found. At Sathgar Hill and Nedumkunam Hill the major threat of the habitat is cattle grazing and disturbances due to human activity such as man-made fires. Trade was considered to be a major threat to the Indian Golden Gecko

### TABLE 1.

<table>
<thead>
<tr>
<th>District</th>
<th>Place</th>
<th>GPS location</th>
<th>Ind.</th>
<th>E. marks</th>
<th>E. live</th>
<th>Elev.</th>
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<tbody>
<tr>
<td>Krishnagiri</td>
<td>Shyed Basha Malai</td>
<td>Cave 1 12°32’07.66”N 78°12’48.53”E</td>
<td>1</td>
<td>150</td>
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<td>540</td>
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<td></td>
<td>Cave 2</td>
<td>12°32’10.05”N 78°12’46.45”E</td>
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<td>1500</td>
<td>0</td>
<td>574</td>
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<td></td>
<td>Cave 3</td>
<td>12°32’13.00”N 78°12’46.60”E</td>
<td>14</td>
<td>2000</td>
<td>3</td>
<td>683</td>
</tr>
<tr>
<td></td>
<td>Cave 4</td>
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<td>2500</td>
<td>0</td>
<td>702</td>
</tr>
<tr>
<td>Vellore</td>
<td>Sathgar Hill</td>
<td>Cave 1 12°37’42.49”N 78°44’06.63”E</td>
<td>0</td>
<td>1200</td>
<td>0</td>
<td>520</td>
</tr>
<tr>
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<td>Cave 2</td>
<td>12°37’43.26”N 78°44’11.44”E</td>
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<td>150</td>
<td>0</td>
<td>588</td>
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<td>Cave 3</td>
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<td>9</td>
<td>2500</td>
<td>0</td>
<td>620</td>
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<td>Vellore</td>
<td>Valli Malai</td>
<td>Subramanya Temple cave</td>
<td>13°04’24.40”N 79°15’38.14”E</td>
<td>0</td>
<td>300</td>
<td>0</td>
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<td>860</td>
<td>15</td>
<td>322</td>
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<td>8</td>
<td>800</td>
<td>0</td>
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<td>600</td>
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<td></td>
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<td>13°04’30.85”N 79°15’39.54”E</td>
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<td>60</td>
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<td>Tiruvanamalai</td>
<td>Nedumkunam Hill</td>
<td>Suriyan Kana Sunai</td>
<td>13°04’38.45”N 79°15’31.44”E</td>
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<td>600</td>
<td>450 +</td>
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<td>Cave 1</td>
<td>12°28’01.40”N 79°23’03.68”E</td>
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<td>450</td>
<td>0</td>
<td>185</td>
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<tr>
<td>Cave 2</td>
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<td>1500</td>
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<td>212</td>
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<tr>
<td>Cave 3</td>
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<td>8</td>
<td>85</td>
<td>0</td>
<td>235</td>
<td></td>
</tr>
<tr>
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<td>12°27’59.59”N 79°23’07.77”E</td>
<td>3</td>
<td>200</td>
<td>0</td>
<td>244</td>
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</tr>
</tbody>
</table>
(Molur and Walker 1998), but we did not come across any of these circumstances during the surveyed period. The distribution of the Indian Golden Gecko is restricted to the Eastern Ghats of Andhra Pradesh, Odhisha and Tamil Nadu, and the present paper gives the distribution hill ranges nearby Karnataka state. Further surveys are needed to reveal many interesting facts about this species.

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