

## ON THE OCCURRENCE OF GOLDEN GECKO *CALODACTYLODES AUREUS* (BEDDOME, 1870) IN PAPIKONDA HILLS, EASTERN GHATS, ANDHRA PRADESH, INDIA

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**plus web supplement of 4 pages**

The Gekkonoidae are the most primitive living saurians and the genus *Calodactyloides* consists of large, distinctive geckos endemic to rocky habitat in peninsular India and Sri Lanka (Bauer & Das, 2001). This genus is diagnosable on the basis of derived digital structure, the presence of paraphalanges, bright yellow gular patch (in adult males) and distinctive vocalization. The Golden Gecko is of special interest to herpetologist's world wide as it represents one of the two known species in the genus *Calodactyloides*, which are considered as Gondwanan relics (Bauer & Das, 2001).

The Golden Gecko *Calodactyloides aureus* (Beddome, 1870), a Schedule I (Part II) species of the Indian Wildlife (Protection) Act, 1972 is endemic to the Eastern Ghats. A small but viable population of this gecko was found in the Perantalapally locality of Papikonda hills in the northern Eastern Ghats, Khammam district, Andhra Pradesh.

The Papikonda hills is a group of hill ranges in the northern parts of Eastern Ghats. It is an unbroken chain of rugged hills and plateaus that spreads over an area of about 700+km<sup>2</sup>. The river Godavari bisects the hill ranges. These hills include one protected area, namely the Papikonda Wildlife Sanctuary, established in 1978. The sanctuary spreads over an area of 590.68km<sup>2</sup>, covering three districts that is, Khammam, West and East Godavari of Andhra Pradesh. The Papikonda hills possess typical southern tropical dry deciduous and southern tropical moist deciduous forest types intermingled with scrub (Champion & Seth, 1968). The importance of this landscape has been recognized internationally with the eastern Deccan plateau moist forests of northern Eastern Ghats being designated as a "Global 200 Ecoregion" (WWF, 2007). The Papikonda hills are rich in biodiversity. The flora is dominated by *Cleistanthus collinus*, *Chloroxylon swietenia*, *Tectona grandis*, *Terminalia tomentosa*, *Adina cordifolia*, *Hardwickia binata*, *Anogeissus latifolia*, *Ficus* sp., *Dalbergia sissoo*, *Butea monosperma* with undergrowth consisting of *Helecteris isora* and *Grewia hirsute*. The fauna is represented by species such as *Panthera tigris*, *P. pardus*, *Bos gaurus*, *Tetraceros quadricornis* and *Anthraceros coronatus*. The overall climate of this region is hot and dry most of the year. The temperature fluctuates between 45°C in summer and 6°C in winter. The annual rainfall ranges from 900-1500mm.

World Wide Fund for Nature - India (WWF), Andhra Pradesh State Office organized a Nature Camp for the Nature Club students to generate awareness on local environmental

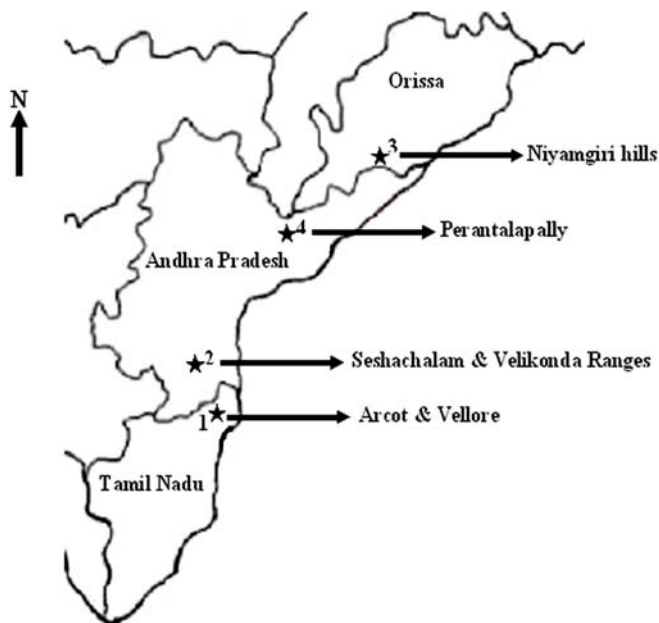
issues, in this case, the impact of Polavaram Dam on the biodiversity of the Papikonda hills. During the nature trek on 9 February 2007, around 0735hr, the second author sighted a gecko on a boulder at Perantalapally locality (17°27'06"N & 81°46'46"E, elevation 53m), which was identified as a Golden Gecko *Calodactyloides aureus* (Beddome, 1870).

Until now, the Golden Gecko had been recorded only from southern Andhra Pradesh, from the Seshachalam and Velikonda ranges (Daniel & Bhushan, 1985; Daniel *et al.*, 1986) and Smith's (1935) interpretation of Beddome's (1870) original 'Tripartty hills' locality. Records of Bauer & Das (2001) from the Vellore region of the north Arcot district, Tamil Nadu represent the first confirmed records from this state. However, according to Bauer & Das (2001) it is possible that Smith's (1935) interpretation was incorrect, and that the type locality reported by Beddome corresponds to Truppatur (also spelled Tirupattur or Tiruppattur), which is also in the northern Arcot district, south-west of Vellore. This interpretation was first proposed by Deraniyagala (1953b) and was accepted by Satyamurthi (1962) and Murthy (1990). Recently, Golden Gecko was recorded in Niyamgiri hills, Rayagada and Kalahandi districts, Orissa (Dutta *et al.*, 2005). Our record from Perantalapally locality of Papikonda hills, Andhra Pradesh (Fig. 1) further confirms range extension of the Golden Gecko towards the northern ranges of the Eastern Ghats as predicted by Bauer & Das (2001).

After the finding of the Golden Gecko, authors surveyed the area for two days. During the survey, seven geckos and five egg laying sites were encountered. A single male specimen was captured and released after examination and recording morphometry (Table 1). The specimens of the gecko were not collected. However, a detailed examination was made and photographs were taken in support of the present report. The head is large, oviform and very distinct from the neck (Image 5<sup>w</sup>). A strong rounded supraorbital and canthal ridge; five concavities, via frontal, two postnasals and two loreals are observed (Image 8<sup>w</sup>). The pupil is vertical (Image 6<sup>w</sup>). The snout is longer than the distance between the eye and the ear opening. The ear opening is vertical (Image 6<sup>w</sup>), measuring half the diameter of the eye. The body is slightly flattened and the limbs are long and slender. The width of the digital expansion measures about half the diameter of the eye. The head is covered with very small granules, largest on the canthal ridges. The rostral is four-sided, twice as broad as high and its posterior border is concave. The nostril is pierced between the rostral, the first labial and three nasals. Twelve upper and lower labials are present (Image 7<sup>w</sup>). Mental is as large as the adjacent labials or smaller than them. No regular chin-shields, but small polygonal scales passing gradually into the granules that cover the gular region. The upper surface is covered with minute granules; back with scattered, scarcely prominent, smooth, round, larger tubercles, hardly as large as the ventral scales. Ventral scales are flat, smooth, squarish, juxtaposed and arranged like the bricks of a wall. The tail is long, cylindrical, remarkably slender, and covered with squarish scales which are much larger beneath (Image 13<sup>w</sup>). Digits are slender at the base, free, with squarish scales beneath, with

<sup>w</sup> See Images 1-16 in the web supplement at [www.zoosprint.org](http://www.zoosprint.org)

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**Figure 1. Map (not to scale) showing four distribution sites of Golden Gecko *Calodactylodes aureus* in the Eastern Ghats of three Indian states of Orissa, Andhra Pradesh and Tamil Nadu**

large trapezoidal penultimate and distal expansions, the lower surface of each of which is covered by two large plates separated by a longitudinal groove; all the digits clawed, the claw retractile between the distal plates; in the inner digit the penultimate expansion is absent (Image 9-11<sup>w</sup>). The body is covered above with small granular scales, intermixed with larger tubercles; abdominal scales juxtaposed (Smith, 1935) (Image 14<sup>w</sup>). Preanal or femoral pores were absent (Image 12<sup>w</sup>). Bauer and Das (2001) reported preanal pores to be present in males of *Calodactylodes aureus*. Colouration of Golden Gecko is variable, the golden colour was not present in juveniles and was most pronounced in adult males (Bauer & Das, 2001) (Image 4<sup>w</sup>).

During the study we recorded habitat details and monitored geckos on different days to observe their behaviour and activities during day and night. We spent about six hours a day and three hours during the night. The habitat is dry and hot, having some open forest, hilly terrain, adjacent to a small hamlet and a tribal temple on the right bank of the river Godavari. The area where the population of the Golden Gecko was recorded is about 150m away from the temple. The habitat of Golden Gecko is riparian, consisting of boulders covered with dense vegetation (Image 1-3<sup>w</sup>) all along a stretch of about 600m. The vegetation comprises of ferns, grasses, mango, tamarind and other tree species. The temperature during day was 24°C and about 14°C at night.

We observed territorial behavior among the adults. They vocalized and displayed defensive arch posture (Image 16<sup>w</sup>) and bit each other. About five egg laying sites were located on different boulders under the shade. Most of the eggs had hatched and no hatchling or juvenile was encountered. The eggs were laid on the roof of the boulders closely attached

**Table 1. Morphometry of Golden Gecko *Calodactylodes aureus* Beddome, 1870 male from Perantalapally, Papikonda hills, Eastern Ghats of Andhra Pradesh**

Particulars	Measurements (in mm)
Head	8 W & 14 L
Eye diameter	2.5
Distance between Eyes	5
Distance between Nostrils	1.5
Distance between Nostril & Eye	4
Distance between Eye & Ear	3.5
Ear opening	1.2 W & 2 L
Labials	12U & 12L
Neck	4 W
Abdomen	7 W
Fore limb length	6 FL & 7 TL = 13 TFLL
Hind limb length	9 FL & 9 TL = 18 THLL
Fore limb digits length (Starting from smallest digits)	2, 3, 4, 4.5, 4
Hind limb digits length (Starting from smallest digits)	2, 3, 4.5, 6, 5.5
Snout to vent length	51
Tail	49 L & 5 W (at base)
Total body length	100

W - Width; L - Length; FL - Femur length; TL - Tibia length; TFLL - Total fore limb length; THLL - Total hind limb length; U - Upper & L - Lower. All measurements were taken by standard vernier calipers.

with each other (Image 15<sup>w</sup>). At some locations, the eggs were laid near or on the same site where previously laid. The average egg measured about 10-14mm in diameter; clusters of 4-50+ eggs were recorded. The cluster size and remains of eggs laid during previous seasons indicates that the egg laying in this species is probably a combined effect of site fidelity and communal nesting. In the largest clutch, a few eggs were putrefied. The eggshell was very tough.

The present communication confirms the occurrence of the Golden Gecko *Calodactylodes aureus* (Beddome, 1870) in northern Eastern Ghats of Andhra Pradesh. However, the habitat in Perantalapally Reserve Forest from where this species was recorded will be submerged by the construction of the Indira Sagar Multi-purpose Project (Polavaram Dam). The Andhra Pradesh Forest Department has recommended diversion of about 88.81ha forest land of Perantalapally Reserve Forest (Shukla, 2006). Our observations have revealed the presence of an important and endangered species from an area that will be adversely impacted by a large irrigation project. This study further substantiates the inadequate information on the presence of rare, endemic and endangered faunal species of this Global 200 Ecoregion, which can influence conservation priorities and save this biodiversity rich habitat from decimation.

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#### NOTE

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## SOME NOTES ON THREE SPECIES OF BATS OF JAHANGIRNAGAR UNIVERSITY, BANGLADESH

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The chiropteran fauna of Bangladesh could exceed the number of species reported until now. Siddiqui (1961) and Ahmed & Hussain (1982) might have provided the first lists of bats of Bangladesh. Sarker & Sarker (1988, 2005) reported 17 species and later 29 bats from the country. Bates & Harrison (1997) reported 16 species of bats from Bangladesh while Khan (2001) provided a detailed account on 31 species of bats. Srinivasulu & Srinivasulu (2005) after reviewing the previous works mentioned as many as 38 species of bats to be occurring in Bangladesh and speculate that the chiropteran diversity could be more than what is presently known.

In the present project we studied the diversity and morphometry of bats in different habitat types and vegetation cover of Jahangirnagar University.

#### Study Area

Jahangirnagar University (JU) (30°16'N-90°26'E), an area of about 280ha, is situated at the central region of Bangladesh, about 32km north of Dhaka city. The undulating land of the

study area has many low lying areas which in monsoon accumulate water and become marshy, but dry up in winter and are used for cultivation (Sultana, 2002). There are 11 permanent lakes in the study area which harbour a huge number of migratory birds during winter season (September-March). JU with its diverse ecological habitats such as open grasslands, scrub jungles, cultivated rice fields, small woodlands, permanent and temporary freshwater bodies provides habitats for various kinds of mammals, birds, reptiles, amphibians, fishes and innumerable insects. A total of 233 species of plants belonging to 168 genera under 62 families are reported from the campus (Hossain *et al.*, 1995). The dominating plant species in the campus are Mahua (*Madhuca latifolia*), Chapalish (*Artocarpus chaplasha*), Debdaro (*Polyalthia longifolia*), Amlaki (*Phyllanthus embelica*), Bot (*Ficus bengalensis*), Jam (*Syzygium cumini*), Kadam (*Anthocephalus chinensis*), Kathal (*Artocarpus heterophyllus*), Mahagoni (*Swietenia mahagoni*), Tal (*Borassus flabellifer*), Raintree (*Samania saman*), Krishnachura (*Delonix regia*), Am (*Mangifera indica*) etc. The climatic condition of JU campus is similar to Dhaka city and enjoys hot, humid and rainy summer and cool winter. The highest temperature recorded during April (32.7°C) and the lowest during January (14.1°C) with mean rainfall 100.89mm.

**Methods and Materials:** The study was conducted from March to August 2005. The phenological cycles of most of the dominating fruit yielding plants in the study area as well as the paddy season coincided with the study period, which ensured the maximum catch of the bat specimens. Mist nets were used for capturing bats in different habitat types and vegetation cover including light post surroundings, old buildings areas and gardens, following Jones *et al.* (1996). Mist nets were deployed between 1730-1930hr; bats were collected from the net as soon as they were trapped, measured, weighed and photographed, and released as soon as possible from where they were collected. A total of 46 mist net nights were spent