

## New locality records of the recently described gecko *Hemidactylus aaronbaueri* Giri, 2008 with additional notes on natural history

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**ABSTRACT.**– A new gecko, *Hemidactylus aaronbaueri* Giri, 2008 was recently described from the northern Western Ghats of Maharashtra, India. This is a chiefly rupicolous species and only known from the type locality and type series. Recently we recorded this species from a few new localities in the northern Western Ghats. This appears to be a habitat specific gecko and is mostly seen on rocky cliffs. Our observations from these new localities provide new insights into habitat and natural history of this species. Morphological and meristic data is largely consistent with the data published along with the original description on this species.

**KEYWORDS.**– *Hemidactylus aaronbaueri*, new locality, natural history, habitat, distribution.

### Introduction

*Hemidactylus aaronbaueri* is one of the largest Indian *Hemidactylus*, reaching a snout-vent length of at least 128 mm (Giri 2008). Giri described this species in 2008 based on a series of four adult and one sub-adult specimens collected from near Ghatghar, Taluka Junnar, District Pune, Maharashtra, India (19°17'28 N, 73°40'36 E; 248 m a.s.l.).

According to the original description *H. aaronbaueri* is a rock dwelling, nocturnal and very active gecko which is usually found on rocky cliffs. The species is currently only known from the type locality and type series. During recent survey work, we recorded the occurrence of this species from six new localities, all of which are hill forts surrounded by mixed deciduous forest in the northern Western Ghats. The rocky walls and caves of these forts are inhabited by this species. Apart from this a few individuals

were also observed on rocks near a small stream in forest.

In spite of its large size and occurrence at a well frequented tourist spot, this gecko was overlooked as it was long subsumed under *Hemidactylus giganteus* Stoliczka, 1871 (Soman 1966; Chopra 1968), a species mostly known from the Eastern Ghats. *Hemidactylus aaronbaueri* has also been confused with its sympatric but much more widespread congener *H. maculatus* Duméril & Bibron, 1836, which is commonly found in the northern Western Ghats. Thus, *H. aaronbaueri* still remains a very poorly known species. Here we provide ancillary information on new localities, habitat and natural history of this gecko based on recent observations.

### Material and Methods

Specimens of *Hemidactylus aaronbaueri* were collected from Peth Fort (BNHS 1872), near

Ambivili village, Raigad District; Gorakghad (BNHS 1874), Taluka Murbad, Thane District; Sudhagad (BNHS 1893), Taluka Pali, Raigad District and Naneghat (CESL 092, CESL 128 and CESL 130), Taluka Junnar, Pune District, Maharashtra, India by Saunak Pal, Prathamesh Ghumare and Mrugank Prabhu. Apart from this, we have also added three previously collected individuals of *H. aaronbaueri* housed in the ZSI (Kolkata) collection in this study. These specimens were collected from Bhairavgadh Fort (ZSI 21648A, ZSI 21648B and ZSI 21648C), Karjat Taluka, Pune District (formerly Kolaba District), Maharashtra, India (19°19'06.24" N; 73°42'51.13" E; 680m msl) on 27 January 1965 by P. W. Soman. The data is gleaned based on material in the collection of the Bombay Natural History Society (BNHS), Mumbai; Zoological Survey of India (ZSI), Kolkata and Centre for Ecological Sciences (CES), Bangalore.

Hand collected specimens of *Hemidactylus aaronbaueri* were euthanized, fixed in 10% formalin, and transferred into 70% ethanol. Measurements were taken with a Mitutoyo dial caliper (to the nearest 0.05 mm) following Giri (2008). Scale counts and external observations of morphology were made using a Wild M5 dissecting microscope.

### Results

All the new localities for *Hemidactylus aaronbaueri* are situated in the northern Western Ghats and are surrounded by mixed deciduous forests (Fig. 1). Raigad Fort is ca. airline 130 km south-west of Ghatghar, the type locality, and represents the southernmost locality for *H. aaronbaueri*. In most of these new localities *Hemidactylus aaronbaueri* is abundant and is found in hill forts, except at Bhimashankar Wildlife Sanctuary, in the Pune District, Maharashtra, where it was observed on rocks near a small stream.

Peth/Kotligad (Fig. 2A) is a small fort located in the Raigad District, Maharashtra (18°59'55" N, 73°30'73" E; 650 m.) with a small cave at its base. On 28 June 2008 the first author (SP) observed five large geckos on the rocky cliff of this fort at 12h40. An adult male was collected (BNHS 1872) and confirmed as *Hemidactylus aaronbaueri*. Most of the geckos were found motionless near crevices in the rocky cliffs and

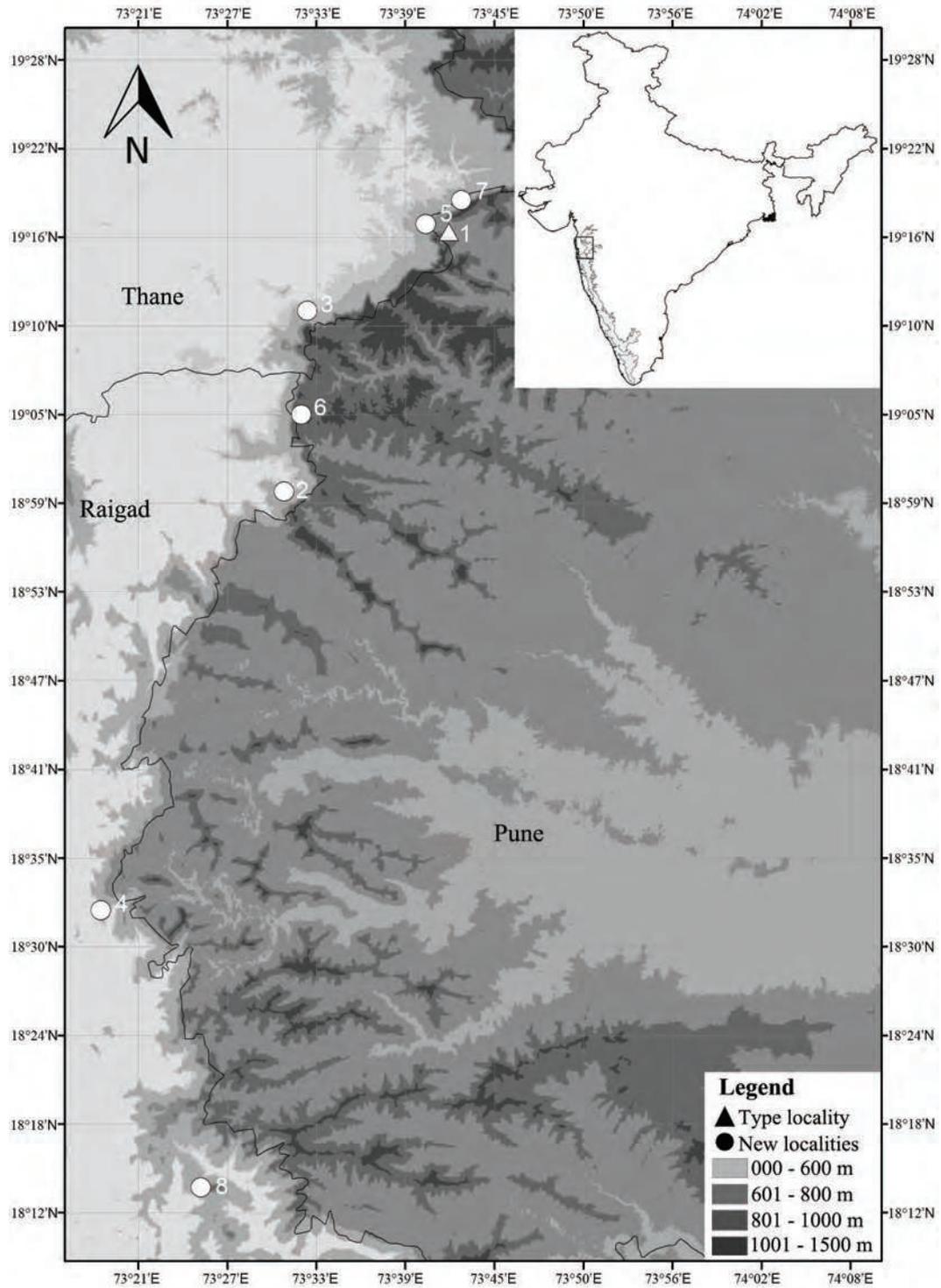
moved inside when approached. Although *H. maculatus* was also seen sharing this habitat with *H. aaronbaueri*, it was found about 5 m away on a stone arch (gate) of the fort. *Hemidactylus cf. brookii* was also seen in the same habitat.

Sudhagad is another fort near Pali in the Raigad district, Maharashtra (18°32'24" N, 73°19'12" E; 645 m). On 7 August 2008, five individuals of *Hemidactylus aaronbaueri* were observed in a hole in the rocky arch (Mahadarvaja) of Sudhagad. More individuals were observed on the ceiling of an old rocky water tank situated on the slopes of the hill (Fig. 2C). A single individual (BNHS 1893) was positioned upside down under a large rock adjacent to the tank and was collected at 13h30. No other gecko species were seen in the vicinity.

Gorakghad (Fig. 2B) is a fort in the Thane District, Maharashtra, India (19°11'50" N, 73°32'44" E; 620 m.). On 26 June 2008 SP observed an adult male gecko on a rocky cliff adjacent to the trail towards the fort. Another six individuals were observed at 13h10 on the rocky walls of a small cave at the base of this fort. Of these, one (BNHS 1874) was collected and identified as *H. aaronbaueri*. All others escaped inside crevices when disturbed. Three eggs, each ca. 20 mm long, along with an adult female (Fig. 2D) were observed in June 2008 at Gorakghad, inside a crevice in a small cave ca. 2.5 m above the floor. These geckos were found sympatrically with *H. cf. brookii*.

Naneghat is a mountain pass in the Western Ghats near Vaishakhare village in the Thane District, Maharashtra, India (19°17'32" N, 73°40'29" E; 744 m msl). On 27 July 2010, 17 individuals of *Hemidactylus aaronbaueri* were observed on the rocky cliffs near the man-made caves in the vicinity of the pass at 19h50. One individual was also observed inside a cave. Three individuals were collected, of which two were male and one female (CESL 092, CESL 130 and CESL 128, respectively). One individual of *H. maculatus* was also collected from a nearby rocky boulder (CESL 094) and another one was seen on a tree trunk. These geckos were found sympatrically with *H. cf. brookii*.

On 25 October 2008, two geckos (*H. aaronbaueri*) were observed on rocks near a small stream in Bhimashankar Wildlife Sanctuary,



**Figure 1.** Topographic map of the localities of *Hemidactylus aaronbauerii*. Inset map of India showing the enlarged region of Northern Western Ghats. Numbers indicate each locality as follows: 1. Ghatghar; 2. Peth fort; 3. Gorakhgad; 4. Sudhagad; 5. Naneghat; 6. Bhimashankar; 7. Bhairavgadh and 8. Raigad.

Pune District, Maharashtra, India (19°08'06" N; 73°53'81" E; 983 m msl) at about 16h40. One of these geckos was captured, measured, photographed and then released. No other gecko species were seen in the area but three Brahminy Skinks, *Eutropis carinata* (Schneider, 1801), were found sharing the same habitat.

On 8 October 2011, five *H. aaronbaueri* were seen hiding inside crevice of a stone arch of Raigad Fort, Raigad District, Maharashtra, India (18°14'09" N; 73°25'45" E; 466 m msl) at about 11h20. One of these geckos was captured, photographed and then released.

Night searches to Gorakhgad and Peth on 22 November 2008 and 9 December 2008, respectively revealed nine and seven geckos, respectively. Almost all of these were observed to be most active between 18h20 to 23h30. The geckos were stationary or moving slowly on the rocky walls foraging on insects. They would crawl rapidly for a short distance when approached, and then remained still. When an insect landed near a gecko it would move quickly towards it. The prey species observed in these two localities included mainly orthopterans and lepidopterans. One individual was also seen feeding on an odonate. A large *H. aaronbaueri* in Gorakhgad was seen eating a juvenile of *H. cf. brookii*. In Peth five *H. maculatus* were also seen, but were restricted to the forest floor and nearby tree trunks. On previous occasions two *H. maculatus* were found to be sharing a similar habitat to *H. aaronbaueri* during day (one in a cave, another on a stone arch).

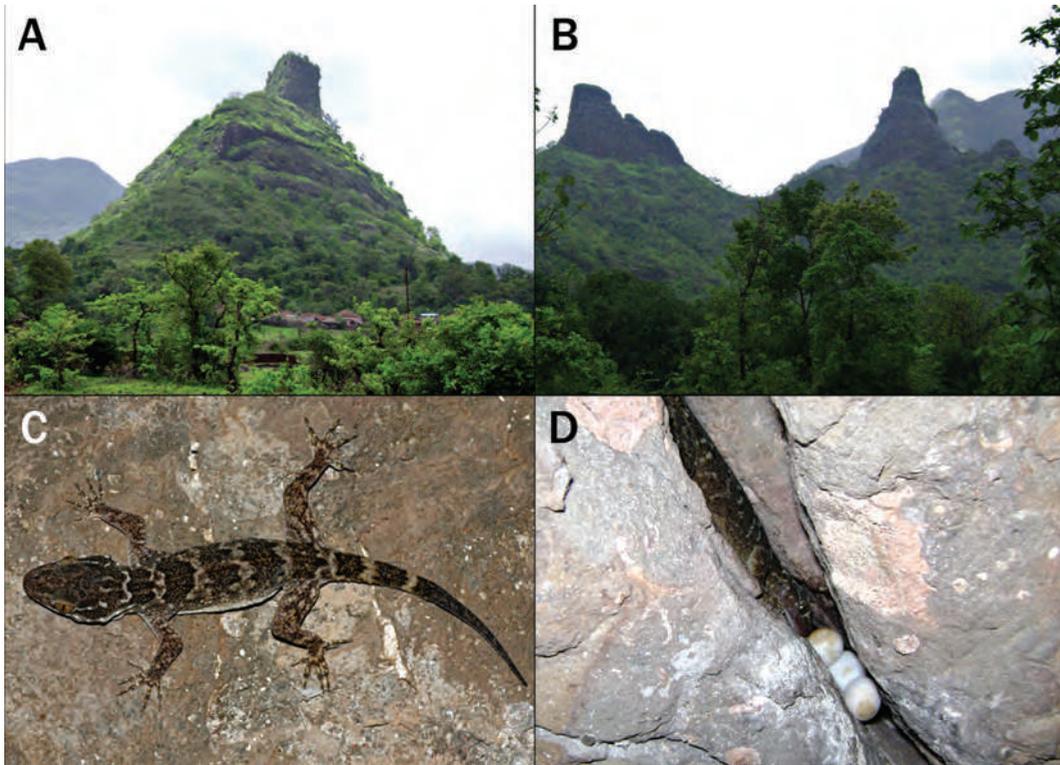
The specimen collected from Sudhagad on 7 August 2008 (BNHS 1893) was retained in captivity for brief observations for a week. It was kept in a wooden box with small stones as a substrate and provided with grasshoppers, mantises and moths, which it readily fed on at night. The gecko hid under the rocks during the day and became active at dusk.

Our morphological data of the new specimens from the BNHS, CES and ZSI collection is largely in consistent with the data published by Giri (2008) in the original description of this species. The only variation observed was related to the specimen from Sudhagad (BNHS 1893), which has 14 lamellae under fourth toe of right pes.

## Discussion

Our new records and observations of *Hemidactylus aaronbaueri* from Peth, Gorakhgad, Sudhagad, Naneghat, Bhimashankar and Raigad, Maharashtra suggest that this gecko appears to be common in appropriate habitat. Because of its superficial resemblance to the Rock gecko *H. maculatus* or other large geckos (*H. giganteus*), this species might have been overlooked until now. In Maharashtra, *H. giganteus* has been reported from Pandava Caves, Kolaba District (Soman 1966) and Ozar, Nasik District (Chopra 1968). Giri (2008) mentioned that as these related specimens were not traceable and fresh material from these two localities, needs to be examined to determine if indeed the geckos found here are *H. giganteus*, or actually *H. aaronbaueri*. Interestingly P. W. Soman deposited three specimens of *Hemidactylus* in the collection of Zoological Survey of India, Kolkata, which were collected from Bhairavgadh Fort, Karjat Taluka, Kolaba District (now Pune District), Maharashtra, India on 27 January 1965. These specimens were eventually identified as *H. giganteus* and were mentioned in a note published by Soman (1966). These specimens are indeed *H. aaronbaueri* and are included in this publication. The other locality mentioned by Chopra (1968), Ozar in Nashik district is also close to the type locality of *H. aaronbaueri* and shares a similar habitat. Given the habitat preference, this species may also be present in other suitable regions of in the Northern Western Ghats.

Despite its distinctive coloration/pattern and high local density, the species has escaped the notice of herpetologists and has remained unknown. This situation parallels that of the *Calodactylodes aureus* Beddome, 1870 a large, brightly colored and highly vocal gecko of the Eastern Ghats; *Hemidactylus giganteus* Stoliczka, 1871 another large, widespread gecko in Peninsular India; *Hemidactylus prashadi* Smith, 1935 yet another large, conspicuous, widespread gecko in central and northern Western Ghats; *Hemidactylus albofasciatus* Grandison & Soman, 1963 a small ground dwelling gecko from southern Maharashtra; and *Hemidactylus scabriceps* Annandale, 1906 a recently rediscovered medium sized gecko from the eastern coast of Tamilnadu. Despite their conspicuousness and occurrence near human settlements,



**Figure 2.** Habitat of *Hemidactylus aaronbauerii* surrounded by deciduous forest at (A) Peth Fort and (B) Gorakhgad (at right of photo). (C) Life photograph of adult *Hemidactylus aaronbauerii* seen on the ceiling of an old rocky water tank in Sudhagad (D) A female *H. aaronbauerii* with three eggs inside a crevice in a cave at Gorakhgad.

these species were until recently considered as among the rarest of Indian geckos (Bauer & Das 2001; Giri *et al.* 2003; Giri & Bauer 2006; Gaikwad *et al.* 2010; Ganesh & Chandramouli 2010).

The landscape in Peth, Gorakhgad and Sudhagad comprises altered habitats of forts with rocky ruin walls surrounded by patches of deciduous forests. The specimens from Bhimashankar were found between boulders near a small stream surrounded by semi-evergreen forest. A nearly exclusive association with rocky surfaces suggests that *H. aaronbauerii* is habitat specific and strictly rupicolous.

The forests in Peth, Gorakhgad, and Sudhagad are mixed deciduous and have huge rocky outcrops and caves, whereas that in Bhimashankar is of semi-evergreen type with boulders and streams. This shows that *H. aaronbauerii* may exist in different kinds of forests. We observed three eggs in June 2008 at Gorakhgad, inside a crevice in a small cave. The eggs were ca. 20 mm long. This shows the breeding season

of these geckos to coincide with the monsoon. The occurrence of the adults throughout the year shows that this gecko is active throughout the year.

As a result this paper presents new additional localities for this gecko in the recently described, restricted-range species. However this data is preliminary and additional information on natural history, distribution and threats should be collected from throughout the range for the conservation of this large, regionally endemic gecko.

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### Literature Cited

- BAUER, A. M. & I. DAS. 2001.** A review of the gekkonid genus *Calodactylodes* (Reptilia: Squamata) from India and Sri Lanka. *Journal of South Asian Natural History* 5(1): 25–35.
- CHOPRA, R. N. 1968.** On a new locality and habitat of *Hemidactylus giganteus*. *Science & Culture* 38: 376.
- GAIKWAD, K. S., H. KULKARNI, R. BHAMBURE & V. B. GIRI. 2010.** Notes on the distribution, natural history and variation of *Hemidactylus albofasciatus* (Grandison and Soman, 1963) (Squamata: Gekkonidae). *Journal of the Bombay Natural History Society* 106: 305–312.
- GANESH, S. R. & S. R. CHANDRAMOULI. 2010.** Rediscovery of *Hemidactylus scabriceps* (Annan-dale, 1906) (Reptilia: Sauria: Gekkonidae) from Eastern Tamil Nadu, India. *Russian Journal of Herpetology* 17: 70–74.
- GIRI, V. B. 2008.** A new rock dwelling *Hemidactylus* (Squamata: Gekkonidae) from Maharashtra, India. *Hamadryad* 32: 25–33.
- GIRI, V. & A. M. BAUER. 2006.** Notes on the distribution, natural history and variation of *Hemidactylus prashadii* Smith, 1935. *Hamadryad* 30: 54–59.
- GIRI, V., A. M. BAUER & N. CHATURVEDI. 2003.** Notes on the distribution, natural history, and variation of *Hemidactylus giganteus* Stoliczka. *Hamadryad* 27: 217–221.
- SOMAN, P. W. 1966.** A new gekkonid in Maharashtra. *Science & Culture* 32: 427.

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