



The Common House Gecko, *Hemidactylus frenatus* Schlegel in Dumeril & Bibron 1836 (Reptilia: Gekkonidae) in Gujarat, India

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The species-rich gekkonid genus *Hemidactylus* comprises at least 143 currently recognized species (Uetz et al. 2016), of which at least 30 occur in India (Lajmi et al. 2016). These geckos are widely distributed throughout most of the tropical and subtropical regions of the Eastern Hemisphere, the Mediterranean region, and the Americas. In southern Asia, these are the most abundant and diverse nocturnal geckos. The majority of species have relatively small distributions, largely confined to southern Asia and Africa, and just eight species (*H. mabouia*, *H. turcicus*, *H. brookii*, *H. frenatus*, *H. garnotii*, *H. persicus*, *H. flaviviridis*, and *H. bowringii*) are responsible for most of the huge geographical area occupied by the genus (Carranza and Arnold 2006). The first five of these are widely distributed and are present in both the Eastern and Western Hemispheres. Despite considerable variation of shapes and sizes of species within the genus,

karyotypic and molecular phylogenetic analyses have revealed cryptic species within taxa (e.g., *H. bowringii*, *H. brookii*, *H. frenatus*, *H. garnotii*, and *H. platyurus*) once thought to be well defined (Carranza and Arnold 2006; McMahan and Zug 2007; Bauer et al. 2010a; Lajmi et al. 2016).

Many species of *Hemidactylus* are known to have been introduced outside of their native range by human activity, and at least nine species function effectively as human commensals (Carranza and Arnold 2006; Bauer et al. 2010a), leading to the common name (House Gecko) applied to most of these species. Four of the commensal species (*H. brookii*, *H. parvimaclulatus*, *H. frenatus*, and *H. flaviviridis*) are purported to have originated on the Indian Subcontinent (Bansal and Karanth 2010; Bauer et al. 2010b).

The Common House Gecko (*Hemidactylus frenatus*; Fig. 1) is native to southern and southeastern Asia and the Indo-



Fig. 1. An adult female Common House Gecko (*Hemidactylus frenatus*; NCBS AQ031) from Valsad, Gujarat, India. Photograph by H. Patel.

Australian Archipelago, but it has been widely introduced throughout tropical and subtropical regions of the world (Bauer 1994). The current range of the species includes portions of eastern Africa, Madagascar, many of islands of the South Pacific, Hawaii, Mexico, Central America, and the United States (Rooij 1915; Bauer 1994; Case et al. 1994; Vences et al. 2004).

Unfortunately, very little is known about the distribution of this commensal species in its native habitat, which is further complicated by uncertainties regarding its taxonomic status. Recent phylogenetic studies (Carranza and Arnold 2006; Bansal and Karanth 2010) revealed that *H. frenatus* belongs to the Tropical Asian clade and shows high genetic variability within different populations, suggesting that it is a species complex.

In India, the species, as currently defined, has been recorded from states in southern and eastern parts of the country (Srinivasulu et al. 2014). No confirmed record of *H. frenatus* from the state of Gujarat existed until Vyas (2005) reported this species from four islands of the Marine National Park in the Gulf of Kutch, Gujarat (Fig. 2). Our recent survey revealed its existence for the first time on mainland Gujarat (Fig. 2).

Materials & Methods

Three geckos were collected from three different locations in southern Gujarat. All were euthanized, fixed in 10% formaldehyde, preserved in 70% alcohol, and deposited in the collection of the National Centre for Biological Sciences (NCBS) in Bangalore: NCBS AQ030, adult male collected from Bilimora, Navsari District, Gujarat, India; NCBS AQ031, subadult female (Fig. 1) collected from Nanakwada, Valsad District, Gujarat, India; NCBS AQ032, juvenile collected from Vesu, Surat District, Gujarat, India. All were collected by H. Patel and V. Naik. In addition to these specimens, we received photographs of a similar gecko taken in Junagadh, Gujarat, from Mr. Pranav Vaghshiya (Fig. 3). Specimens were identified as *Hemidactylus frenatus* based on descriptions and keys available in the literature (Smith 1935; Vyas 2005; Giri and Bauer 2008; Lajmi et al. 2016).

We made the following measurements using digital callipers (to the nearest 0.01 mm): Snout-vent length (SVL; from the tip of the snout to the vent), trunk length (TRL; distance from axilla to groin measured from the posterior edge of the forelimb insertion to the anterior edge of the hindlimb insertion), body width (BW; maximum width of the body),

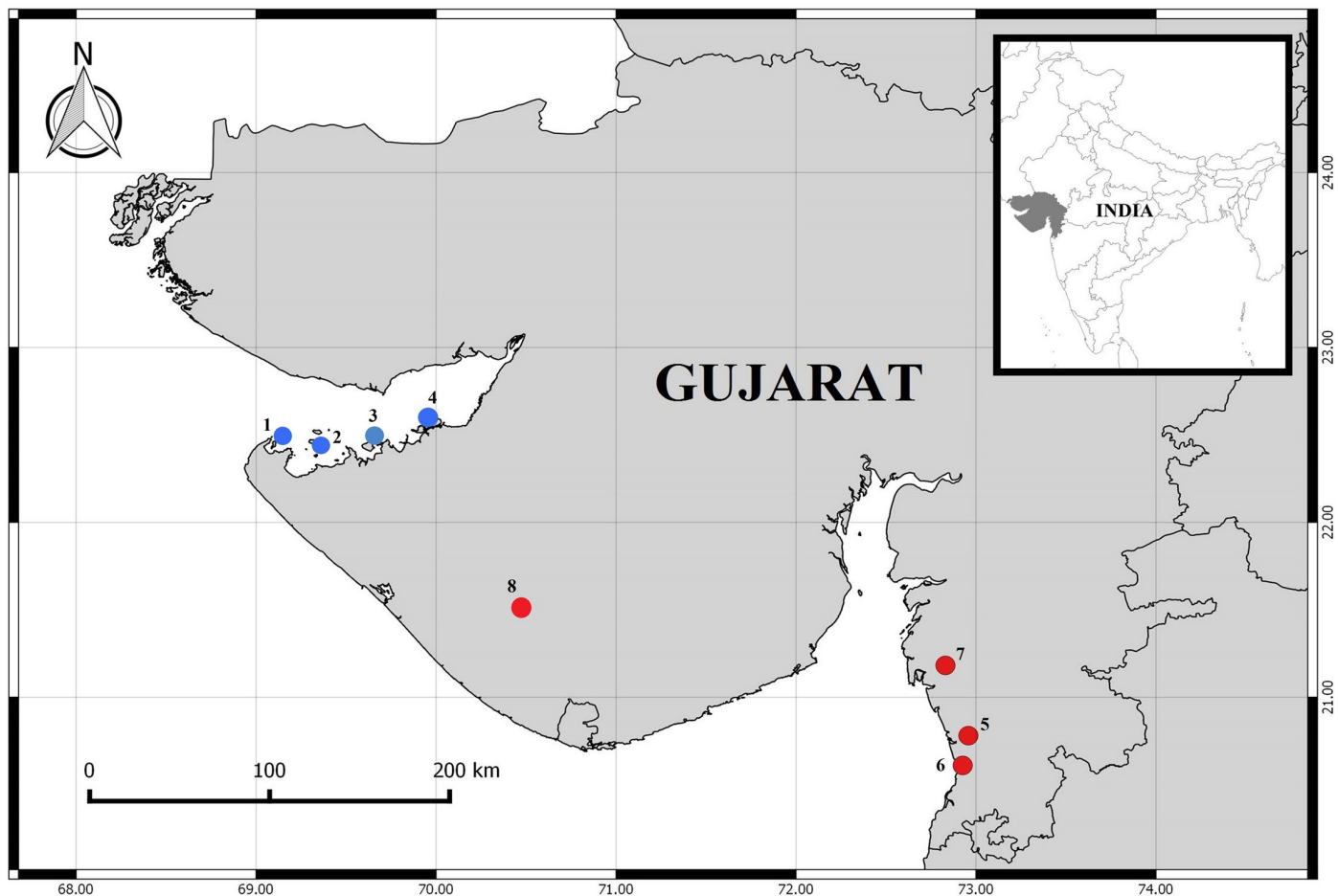


Fig. 2. The known distribution of the Common House Gecko (*Hemidactylus frenatus*) in Gujarat, India. Blue dots indicate insular populations reported in Vyas (2005); red dots represent new records reported herein. For details, see text and Table 2).



Fig. 3. An adult Common House Gecko (*Hemidactylus frenatus*) from Junagadh, Gujarat, India. Photograph by P. Vaghashiya.

crus length (CL; from the base of the heel to the knee), tail length (TL; from the vent to the tip of the tail), tail width (TW; measured at the widest point of the tail), head length (HL; distance between retroarticular process of the jaw and the tip of the snout), head width (HW; maximum width of the head), head height (HH; maximum height of the head from the occiput to the underside of the lower jaws), forearm length (FL; from the base of the palm to the elbow), orbital diameter (OD; greatest diameter of the orbit), nares to eye distance (NE; distance between the anteriormost point of the eye and the nostril), snout to eye distance (SE; distance between the anteriormost point of the eye and the tip of the snout), eye to ear distance (EE; distance from the anterior edge of the ear opening to the posterior corner of the eye), ear length (EL; longest dimension of the ear), internarial distance (IN; distance between the nares), and interorbital distance (IO; shortest distance between the left and right supra-ciliary scale rows). Scale counts and external observations of morphology were made using a Leica S4E stereomicroscope. Some abbreviations used to describe characters include SL (= supralabials) and IL (= infralabials).

Results and Discussion

Mensural and meristic data of the collected specimens are presented in Table 1. All exhibited features characteristic of the species: Dorsum with small granular, heterogeneous, juxtaposed scales intermixed with regularly arranged, relatively large, conical, smooth tubercles arranged in longitudinal rows on dorsolateral region, extending from the middle of the trunk; ventrolateral skin fold is present on trunk and thigh. Digits moderately dilated, slightly webbed, with lamellae beneath first toe and finger 5; fourth finger 8 and

Table 1. Morphometric and meristic data for three specimens of Common House Geckos (*Hemidactylus frenatus*) collected on the mainland of Gujarat State, India. All measurements are in mm. L = left, R = right; the asterisk (*) indicates that the tail was broken and partially regenerated.

Character	NCBS AQ030	NCBS AQ031	NCBS AQ032
SVL	48.24	36.48	30.04
TRL	20.98	13.49	11.9
BW	9.94	8.2	6.92
CL	7.31	5.33	4.96
TL	34.56*	40.69	34.43
TW	5.07	3.57	3.58
HL	13.22	11.84	9.48
HW	9.82	8.48	6.73
HH	5.26	4.44	3.74
FL	5.09	4.14	3.63
OD	3.02	2.58	2.32
NE	11.03	9.45	8.51
SE	12.14	10.71	9.25
EE	4.56	3.26	3.02
EL	1.07	0.89	0.65
IN	1.96	1.6	1.33
IO	4.9	4.54	2.74
Sex	Male	Female	Not Determined
L Manus	5-6-7-8-8	5-6-8-8-8	5-7-7-8-8
R Manus	5-6-7-8-8	5-6-7-8-8	5-6-7-8-8
L Pes	5-7-8-10-9	5-7-9-10-9	5-7-8-10-9
R Pes	5-7-8-10-9	5-7-9-10-9	5-8-9-10-9
SL L/R	10/11	10/10	10/10
IL L/R	10/10	9/9	9/9

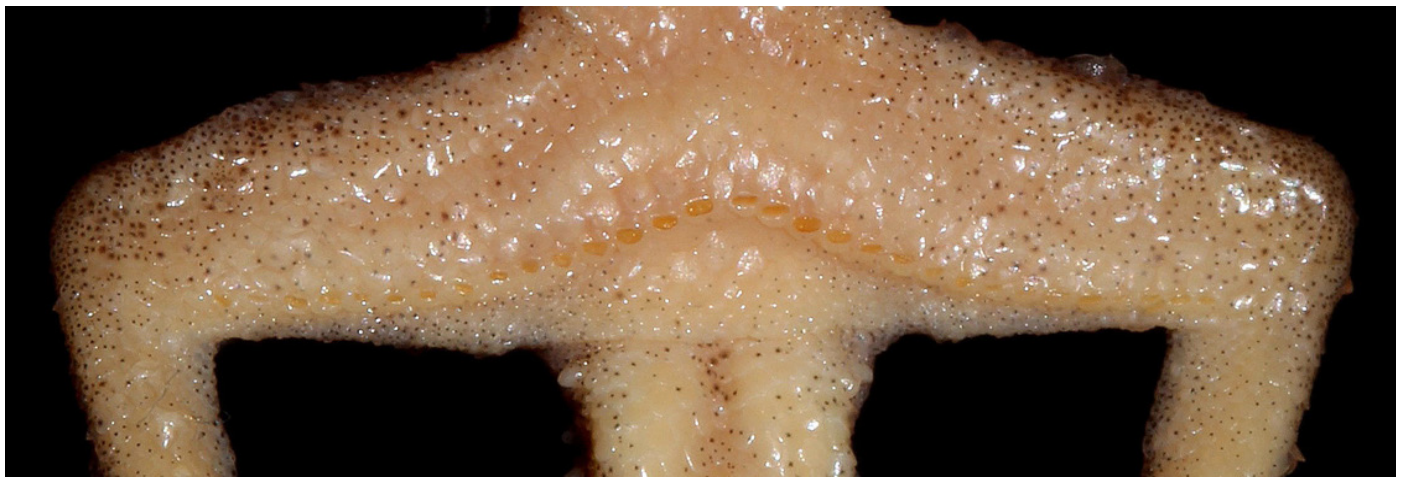


Fig. 4. The preloacal region of an adult male Common House Gecko (*Hemidactylus frenatus*; NCBS AQ030) showing a series of 31 preloacal-femoral pores, separated medially by one poreless scale. Photograph by H. Patel.

fourth toe 10. Supralabial scales 10 to 11, infralabial scales 9 to 10. Outer postmental in direct contact with infralabials. Preloacal-femoral pores present in a series of 31, interrupted medially by one poreless scale (Fig. 4). Tail moderately depressed, oval in cross section with a series of six enlarged, conical tubercles.

In life, the dorsum was pinkish yellow, slightly darker on the distal half of digits, with indistinct white or creamy white light spots on body and limbs; undersides of the head, body, and most of the limbs were lemon yellow, the underside of the tail was pinkish white.

The present study and information in Vyas (2005) show that this species is distributed in at least three regions of Gujarat: Southern Gujarat, Saurashtra, and islands in the Gulf of Kutch (Table 2). The three specimens we collected were captured after sunset between 2000 to 2200 h. NCBS AQ 030 was in a mango orchard, and NCBS AQ 031 and 032 were edificarian.

Gujarat, the westernmost state of India (Fig. 2), is topographically and ecologically diverse. Most of the major

mountain ranges of peninsular India (i.e., Aravalli, Vindhya, Satpura, and the Western Ghats) terminate in Gujarat. The rainshadows of those ranges include extensive xeric regions that are contiguous with those of Rajasthan and Pakistan. However, excepting a few preliminary surveys, Gujarat remains herpetologically unexplored. The recent descriptions of a new gecko, *Hemidactylus gujaratensis* (Giri et al. 2009), and a new genus of snakes, *Wallaceophis* (Mirza et al. 2016), from Gujarat indicate that dedicated surveys across the state could yield additional herpetological discoveries.

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Table 2. Known localities for Common House Geckos (*Hemidactylus frenatus*) in Gujarat, India. Numbers correspond to those in Fig. 2.

No.	Locality	Coordinates	District	Source
1	Bet Dwarka	22.44°N, 69.09°E	Devbhoomi Dwarka	Vyas (2005)
2	Ajad Island	22.37°N, 69.32°E	Devbhoomi Dwarka	Vyas (2005)
3	Kalubhar Island	22.43°N, 69.61°E	Devbhoomi Dwarka	Vyas (2005)
4	Pirotan Island	22.59°N, 69.95°E	Jamnagar	Vyas (2005)
5	Bilimora	20.78°N, 72.97°E	Navsari	This study (specimen)
6	Nanakwada	20.59°N, 72.92°E	Valsad	This study (specimen)
7	Vesu	21.15°N, 72.78°E	Surat	This study (specimen)
8	Junagadh	21.56°N, 70.45°E	Junagadh	This study (photograph; Fig. 3)

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