



## A new ground-dwelling *Hemidactylus* (Squamata: Gekkonidae) from Maharashtra, with a key to the *Hemidactylus* of India

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### Abstract

A distinctive new species of ground-dwelling gecko of the genus *Hemidactylus* is described from the plateaus of the Western Ghats of Maharashtra, India. It is a member of a group of chiefly terrestrial Indian *Hemidactylus* species that have undivided, or only partly divided subdigital lamellae. The new species is most similar in appearance to the lowland-inhabiting *Hemidactylus albofasciatus* Grandison & Soman, 1963, but can be distinguished by its larger size and a suite of distinctive scalation and coloration characters. A key to the species of *Hemidactylus* currently known from the Republic of India is provided.

**Key Words:** *Hemidactylus*, Gekkonidae, India, Maharashtra, description, northern Western Ghats

### Introduction

The genus *Hemidactylus*, with at least 85 recognized species is the second most speciose genus of gekkonid lizards in the world (Kluge 2001; Bauer & Pauwels 2002; Henle & Böhme 2003; Baha El Din 2003, 2005; Bauer et al. 2007). The genus is widely distributed throughout much of the Old World tropics and subtropics as well as in the Mediterranean region and in the Americas. However, the great majority of *Hemidactylus* species have relatively small distributions confined to southern Asia and Africa. In India this is one of the dominant genera of nocturnal geckos and is represented by 21 species. Smith (1935) listed 14 species of Indian *Hemidactylus*: *H. maculatus* (in part) Duméril & Bibron, 1836; *H. triedrus* Daudin, 1802; *H. subtriedrus* Jerdon, 1853; *H. brookii* Gray, 1845; *H. prashadi* Smith, 1935; *H. gracilis* Blanford, 1870; *H. reticulatus* Beddome, 1870; *H. frenatus* Duméril & Bibron, 1836; *H. leschenaultii* Duméril & Bibron, 1836; *H. flaviviridis* Rüppel, 1835; *H. giganteus* Stoliczka, 1871; *H. bowringii* (Gray, 1845); *H. garnotii* Duméril & Bibron, 1836; *H. karenorum* (Theobald, 1868). Loveridge (1947) considered *Lophopholis* as a synonym of *Hemidactylus* and thus added one more species to this genus, *H. scabriceps* (Annandale, 1906). Grandison and Soman, 1963 described *H. albofasciatus* from Maharashtra. This species has often been allocated to the genus *Teratolepis* (e.g., Kluge, 1967, 2001; Das, 2003), but current phylogenetic data reveals that this genus should be subsumed within *Hemidactylus* (Bauer et al. 2008). Later, Sharma (1981) described *H. porbandarensis* from Porbandar, Gujarat and in 1983, Shukla described *H. mahendrai* from Kanpur, Uttar Pradesh. Based on the similarity in digital morphology, the monotypic Indian genus *Dravidogecko* was synonymised with *Hemidactylus* by Bauer and Russell (1995), making *H. anamallensis* the nineteenth representative of the group. The most recent addition to the Indian *Hemidactylus* fauna resulted from the discovery of *H. persicus* from Gujarat

(Vyas et al. 2006). Recent studies revealed the occurrence of one more new species, *Hemidactylus aaronbaueri*, from the Western Ghats of Maharashtra (Giri 2008). However, the validity of two of the species described from India, *H. subtriedrus* and *H. mahendrai*, has recently been questioned (Zug et al. 2007) and the occurrence of *H. karenorum* outside of Myanmar has also been called into doubt (Zug et al. 2007; Mahony & Zug 2008).

The Western Ghats of India is considered as one of the biodiversity hotspots in the world which is also known for its rich and endemic diversity of herpetofauna. Rigorous efforts in the southern parts of the Western Ghats have yielded many new species of amphibians and a few reptiles (Biju 2001, Gower et al. 2004, Mukherjee et al. 2005). With their varied topography and geography, the northern Western Ghats, which run through Maharashtra and parts of Goa and Gujarat, are also home to some unique species of reptiles and amphibians, although this region remains relatively poorly explored with respect to the herpetofauna. Nonetheless, with only moderate efforts at a few localities there have been some notable additions to the known amphibian and reptile fauna in the last five years (Giri et al. 2003, Giri et al. 2004, Giri, in press). It is likely that the recognized species level diversity will increase further with more intensive efforts in unexplored areas. As one such contribution in this regard, we here describe a distinctive new species of terrestrial *Hemidactylus* from Maharashtra.

## Material and methods

The following measurements were taken with Bruder Mannesmann Werkzeuge digital calipers (to the nearest 0.1 mm): snout-vent length (SVL; from tip of snout to vent), trunk length (TRL; distance from axilla to groin measured from posterior edge of forelimb insertion to anterior edge of hindlimb insertion), body width (BW; maximum width of body), crus length (CL; from base of heel to knee); tail length (TL; from vent to tip of tail), tail width (TW; measured at widest point of tail); head length (HL; distance between retroarticular process of jaw and snout-tip), head width (HW; maximum width of head), head height (HH; maximum height of head, from occiput to underside of jaws), forearm length (FL; from base of palm to elbow); orbital diameter (OD; greatest diameter of orbit), nares to eye distance (NE; distance between anteriormost point of eye and nostril), snout to eye distance (SE; distance between anteriormost point of eye and tip of snout), eye to ear distance (EE; distance from anterior edge of ear opening to posterior corner of eye), internarial distance (IN; distance between nares), interorbital distance (IO; shortest distance between left and right supraciliary scale rows). Scale counts and external observations of morphology were made using a Wild M5 dissecting microscope.

## Systematics

### (Reptilia: Squamata: Gekkonidae)

#### *Hemidactylus sataraensis* sp. nov.

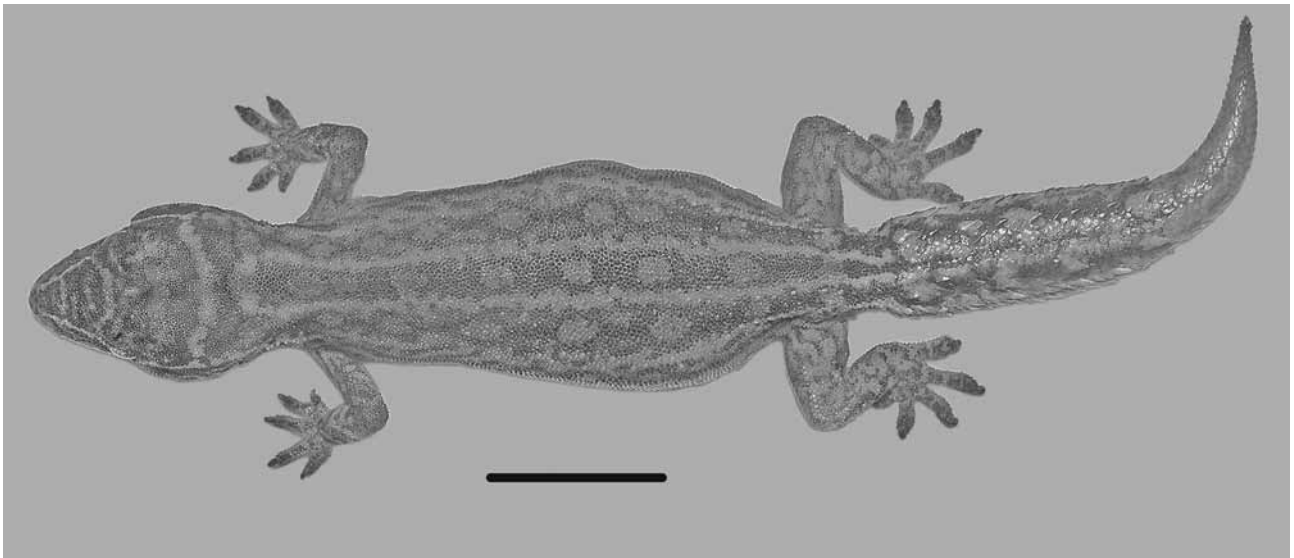
Figs. 1–9

**Holotype**—Bombay Natural History Society, Mumbai (BNHS) 1743, adult female; under a rock near Chalakewadi, Satara District, Maharashtra, India (17°34'40" N, 73°49'28" E) on 22 January, 2006. Collected by Varad Giri, Dilipkumar Dongare and Rajan More.

**Paratype**—BNHS 1742 collected from the same locality on 18 September 2005 by Varad Giri, Dilipkumar Dongare, V.Y. Deshpande, Yashodhan Parakhe and Rajan More.

**Diagnosis**—A small sized *Hemidactylus*, snout-vent length at least 46.4 mm. Back with small, keeled and granular scales, intermixed with irregularly arranged, enlarged keeled tubercles (Fig. 4). First supralabial

touching nasal (Fig. 5). Two well developed postmentals, the inner pair is larger and in extensive contact behind the mental. Ventrolateral folds very feebly developed, about 26–28 scale rows across venter between lowest rows of tubercles. Free distal phalanx of all digits short and about half as long as its lamellar pad (dilated portion); ten to eleven enlarged scansors beneath fourth toe of pes, of which the penultimate and two more proximal plates are notched but undivided (Fig. 6). Original tail depressed, oval in transverse section, constricted at base, swollen distal to constriction, then tapering to a fine point, with a median dorsal furrow; scales on the tail much larger than dorsals of body, smooth, strongly imbricate, with a series of two or four longitudinal series of enlarged, keeled scales on either side of the median dorsal furrow (Fig. 7). Coloration highly distinctive, dark background colour with pale yellow to bright white paravertebral and lateral stripes and orangish-red to brown or buff oval spots on the head, dorsum, flanks and limbs (Figs. 1, 3, 8–9). Venter white with pronounced blackish longitudinal stripes and throat and chin markings (Fig. 2).



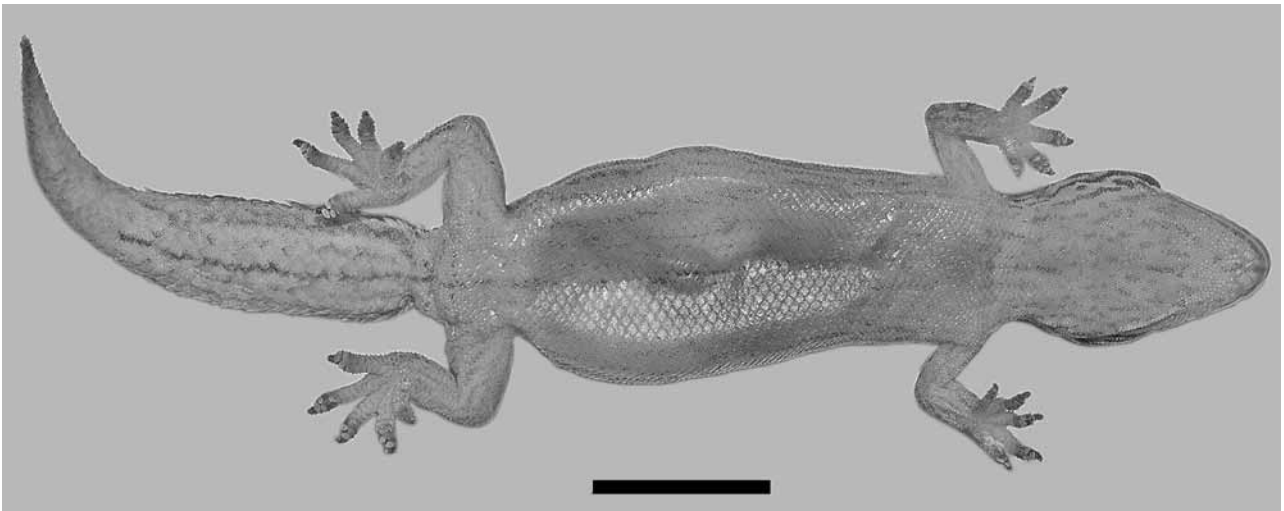
**FIGURE 1.** Dorsal view of holotype of *Hemidactylus sataraensis* **sp. nov.** (BNHS 1743). Scale bar = 10 mm.



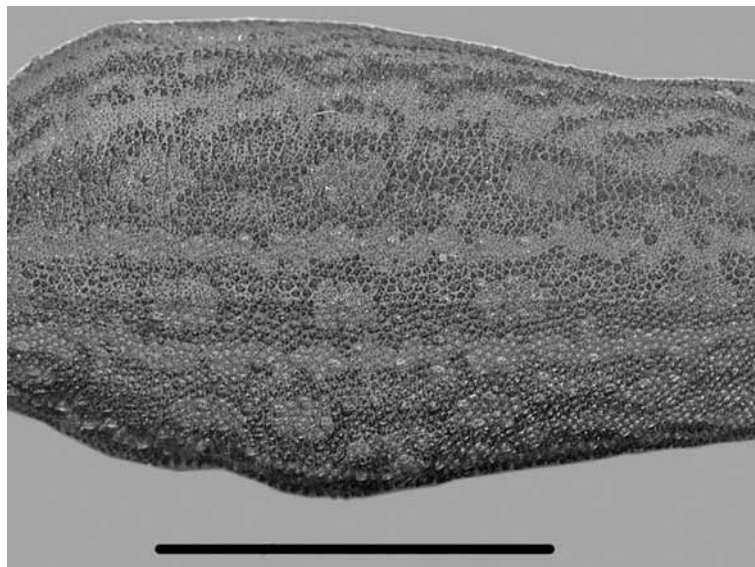
**FIGURE 2.** Dorsal view of paratype of *H. sataraensis* **sp. nov.** (BNHS 1742) with regenerated portion of tail missing. Scale bar = 10 mm.

*Hemidactylus sataraensis* may be distinguished from all other mainland Indian congeners on the basis of (sympatric taxa with differing or non-overlapping character states indicated parenthetically): free distal pha-

lanx of all digits short, less than half as long as corresponding dilated portion of subdigital pad, subdigital lamellae undivided except for the penultimate and two or three more proximal plates which are notched (subdigital lamellae undivided in *H. anamallensis*; free distal phalanx of all digits at least half as long as subdigital pad, subdigital lamellae divided in *H. maculatus*, *H. persicus*, *H. porbandarensis*, *H. triedrus*, *H. subtriedrus*, *H. brookii*, *H. prashadi*, *H. leschenaultii*, *H. flaviviridis*, *H. giganteus*, *H. aaronbaueri*, *H. bowringii*; only distal phalanx of digit I short, lamellae divided in *H. frenatus*, *H. garnotii*, *H. karenorum*), back with small, keeled and granular scales, intermixed with irregularly arranged, enlarged keeled tubercles, smaller than those on belly (back with uniform, imbricate, slightly elongated, striated and feebly keeled scales, a little larger than those on the belly in *H. scabriceps*; back with small irregular scales and 10 to 20 longitudinal series of more or less oval, strongly keeled tubercles in *H. gracilis*; with small, more-or-less erect, keeled granules, intermixed with larger pointed, keeled tubercles in *H. reticulatus*).



**FIGURE 3.** Ventral view of holotype of *H. sataraensis* **sp. nov.** showing two large eggs visible through the body wall as well as the dark stripes on throat, tail and (more faintly) trunk. . Scale bar = 10 mm.



**FIGURE 4.** Dorsal view of trunk of holotype of *H. sataraensis* **sp. nov.** showing pholidosis. Note the small tubercles and flattened granular scales. Scale bar = 10 mm.

This new species is most similar in general appearance to *Hemidactylus albofasciatus*, but differs with respect to (*H. albofasciatus* versus *H. sataraensis*): maximum size (36 versus 46 mm maximum SVL), tail

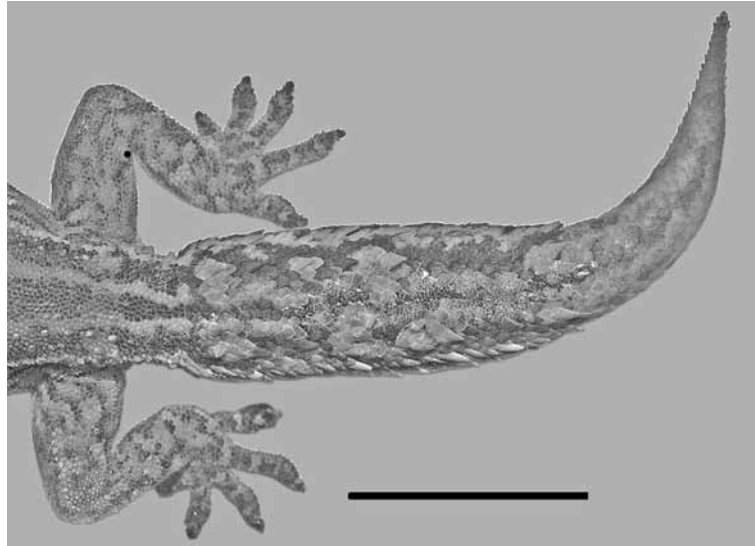
(round in section, tapering, verticillate, covered above with faintly keeled, pointed, imbricate scales, two longitudinal rows of larger, pointed, keeled scales on either side of median furrow versus smooth, pointed, strongly imbricate scales, two to four rows of much larger, pointed, keeled scales on either side of median furrow), scansors beneath the fourth toe (9 versus 10–11). The new species also differs markedly from *T. albofasciatus* in dorsal and ventral colour pattern. *Hemidactylus sataraensis* sp. nov. is similar in colour pattern to the Pakistani species *Teratolepis fasciata* (currently under taxonomic revision and known to be embedded within *Hemidactylus*, Bauer et al. 2008), but differs from this species in its less broadly-dilated and more finely-scaled tail, absence of imbricating scales on the dorsum and flanks, and more vibrant coloration.



**FIGURE 5.** Right lateral view of head of holotype of *H. sataraensis* sp. nov. showing color patterning and scalation. Scale bar = 10 mm.



**FIGURE 6.** Ventral view of right pes of holotype of *H. sataraensis* sp. nov. showing the narrow, undivided proximal scansors typical of this species. Scale bar = 10 mm.



**FIGURE 7.** Dorsal view of hindlimbs and tail of holotype of *H. sataraensis* **sp. nov.** illustrating the clearly imbricating caudal scales that this species shared with *Teratolepis fasciata*, *H. albofasciatus*, and *H. scabriceps*. The short free portion of the digit emerging from the toepads can also be seen. Scale bar = 10 mm.

**Description**—The holotype is in generally good condition. The body shape somewhat dorsoventrally flattened. The terminal portion of the tail is slightly bent as an artefact of preservation (Fig. 1). The skin on the belly is bit loose. Mouth is slightly open. The paratype is likewise in good condition, although the tail has been broken after preservation (Fig. 3). The description is based chiefly on the holotype; the paratype differs significantly from the holotype only in features indicated.

Head short (HL/SVL ratio 0.27), wide (HW/HL ratio 0.21), not strongly depressed (HH/HL ratio 0.47), and markedly distinct from neck. Loreal region slightly inflated, canthus rostralis not prominent.

Snout short (SE/HL ratio 0.39); longer than eye diameter (OD/SE ratio 0.46); scales on snout and fore head granular, keeled, larger than those on occipital region, which are smaller and granular; scales on canthus rostralis slightly larger than those on snout and keeled (Fig. 5). Eye small (OD/HL ratio 0.18); pupil vertical with crenulated margins; supraciliaries small, pointed, those at the anterior end of orbit slightly larger. Ear opening semicircular and small; eye to ear distance much greater than diameter of eye (EE/OD ratio 2.00). Rostral slightly wider (1.9 mm) than deep (1.2 mm), incompletely divided dorsally by weakly developed rostral groove; one enlarged supranasal, internasal single and slightly smaller than supranasal, two postnasals, of which the posterior is larger; rostral in contact with nostril, supralabial I, supranasal, and internasal; nostrils circular, each surrounded by supranasal, rostral, supralabial I and postnasals; 2-3 rows of scales separate orbit from supralabials. Mental triangular; two pairs of postmentals, inner pair single, larger and in contact behind mental; there is a scar on right inner postmental which vaguely continues anteriorly onto the mental; outer postmental small, half the length of the inner; inner postmental bordered anteriorly by first infralabial, medially by mental, anterolaterally by postmental and posterolaterally by a series of three enlarged chin shields, of which the anteriormost, which also contacts the outer postmental, is slightly larger; outer postmental bordered anteriorly by first and second infralabials, medially by inner mental and laterally by four chin shields. Infralabials bordered by a row of equal sized enlarged scales. Supralabials (to midorbital position) 7 (right) – 7 (left); supralabials (to angle of jaw) 9 (right) - 9 (left); infralabials (to angle of jaw) 7 (right) - 7 (left).

Body moderately elongate (TRL/SVL ratio 0.54), with inconspicuous ventrolateral folds without denticulate scales. Dorsal scales heterogeneous, with small, keeled granules, intermixed with irregularly arranged, slightly larger, trihedral tubercles extending from occipital region to tail; tubercles more or less uniform across dorsum, somewhat less prominent on flanks (Fig. 4); 2-4 smaller scales between two adjacent enlarged tuber-

cles. Ventral scales larger than dorsal, smooth, roughly pentagonal to rounded, imbricate, a bit larger on abdomen than on chest (Fig. 3); midbody scale rows across belly to lowest row of tubercles 27; gular region with still smaller and granular scales, anterior gular scales are much larger than the rest. There are no precloacal or femoral pores.

Scales on palm and sole smooth, rounded; scales on dorsal aspect of fore limb larger than trihedral tubercles on the back, keeled, imbricate; those on the hind limbs heterogeneous, larger than those on the back, intermixed with still larger trihedral tubercles.

Fore- and hindlimbs relatively short, stout; forearm short (FL/SVL ratio 0.13); tibia short (CL/SVL ratio 0.15); digits moderately short, strongly clawed; all digits of manus and digits I-IV of pes indistinctly webbed, moderately dilated; terminal phalanx of all digits curved, arising angularly from distal portion of expanded lamellar pad, short — less than half as long as associated toepad; scancers beneath each toe undivided, the lamella adjacent to terminal scantor is, however, deeply notched and the two next proximal lamellae are less strongly so (Fig. 6); scancers from proximal most at least twice diameter of palmar scales to distalmost divided/notched scantor: 5-7-7-7-7 (right manus), 6-7-8-9-7 (right pes) in holotype, 6-6-8-8-8 (right manus), 6-7-8-9-7 (right pes) in paratype.

Relative length of digits (measurements in mm in parentheses): IV (3.15) > III (2.94) > II (2.87) > IV (2.86) > I (2.54) (right manus); IV (4.30) > III (3.81) > V (3.50) > II (3.28) > I (2.31) (right pes).

Tail strongly constricted at base, notably swollen distal to constriction, tapering to a fine point, tubercular, with a median dorsal furrow, original portion of tail (18.8 mm) slightly depressed, oval in section, flat beneath; regenerated portion (13.60 mm) not depressed; length of partly regenerated tail less than snout-vent length (TL/SVL ratio 0.70); original part of the tail covered above with large (much larger than those on the dorsum), smooth, pointed, strongly imbricate scales; a series of two to four rows of much larger, pointed, keeled scales on either side of median furrow, beginning on swollen part; constricted portion is covered above with small scales with larger keeled and pointed scales, which are continued from dorsum (Fig. 7); ventral scales much larger than above, smooth, pointed and strongly imbricate; one enlarged cloacal spur on either side of tail base. Regenerated portion of tail is covered above with small, pointed, smooth scales, without enlarged keeled scales, below with smaller (than original portion) imbricate, smooth scales.

Mensural data (holotype/paratype; in mm). SVL 46.4/40.8; TRL 24.9/18.8; BW 11.8/8.4; TL (including regenerated portion) 32.4/36.0; TW 6.3/6.4; FL 6.2/5.9; CL 7.0/6.2; HL 12.5/12.1; HW 9.8/8.2; HH 5.8/5.3; OD 2.2/2.3; EE 4.5/3.6; SE 4.9/4.7; NE 3.7/3.6; IO 4.2/3.8; IN 1.6/1.3.

**Coloration (in preservative)**—Dorsal background coloration reddish-brown. A pair of prominent, narrow, cream paravertebral stripes extending from the occiput, where each terminates in a white circular spot, to the sacrum, where they converge somewhat, and onto the original portion of the tail (Fig. 1). A series of eight oval markings along the dorsal midline between the pale stripes (nine in paratype; Fig. 3); each oval pale orange with a narrow dark brown border; anterior two ovals above shoulder and in close proximity, with dark borders in contact; sacral marking smaller than others, rounded, contacting both paravertebral stripes; central five ovals subequal and evenly spaced along the body axis. A similar series of oval spots lateral to each paravertebral stripe; seven on left side, eight on right; anteriormost at level of occiput; ovals above shoulder small, increasing in size onto posterior trunk, smaller again over sacrum; each approximately equal in size to corresponding vertebral oval marking. Lateral rows of ovals bordered laterally by a thick, cream colored stripe that bears a series of irregular, dark reddish brown longitudinal dashes and short stripes.

Dorsum of head reddish brown. Lateral pale body stripes continue onto head, becoming narrower and brighter white, passing above ear and through orbit to rostral scale. Pale lateral stripes bordered below by a thick, dark brown stripe that passes above the ear and through the ventral part of the orbit onto the snout. Posterior to the angle of the jaw a dark narrow stripe passes obliquely beneath the ear opening and onto the anterior forelimb insertion. A second narrow dark stripe parallels the first and extends from the posterior lower jaw onto the ventrolateral margin of the neck (Fig. 5). A few small, irregular brown spots occupy the whitish

area between these dark stripes and between the dorsal of the stripes and the lower margin of the broad dark lateral stripe. A posteriorly bowed, cream band extending across parietal region from one white lateral stripe to the other, just anterior to the level of the ear. Another, similarly bowed, more whitish transverse band just anterior to eyes, and a third, narrower, straighter band halfway between anterior margin of orbit and tip of snout. Addition, less regular and less pronounced whitish markings above eyes and between the two antorbital transverse bands. In paratype there are two light transverse markings between the occipital and antorbital bands. These, along with the occipital band are incomplete, each consisting of a series of three discrete, dark-edged spots representing the continuation of the three rows of ovals of the body dorsum onto the head. Upper half of supralabials and lower half of infralabials with dark brown markings; labial margins pale except for first and second supralabials and rostral.

Forelimbs predominately reddish brown with irregular, narrow white bands above and below elbows and on hands and digits. Beneath mostly buff above elbow, irregularly striped below elbow, with scattered dark flecks on the base of the palm and distal subdigital scansors. Hindlimbs mottled dark brown on a buff background, resulting in pale, irregular spots above and below knee and alternating banding on feet and digits (Fig. 7). Beneath with mottling continuing on thigh and faint dark stripes on shank; scattered fine dark punctuations on sole and subdigital scansors. Light markings on dorsum of limbs forming more discrete spots in paratype.

Tail dorsum dark reddish brown with a pair of whitish-cream paravertebral stripes and a pair of similar lateral stripes continuing from sacrum. Enlarged, flattened, triangular scales between paravertebral and lateral stripes also whitish, yielding broad, incomplete transverse bands on original portion of tail. Regenerated portion of tail similarly striped, but lacking enlarged whitish scales and resulting transverse markings (Fig. 7).

Body venter greyish-buff, semi-translucent, bearing approximately seven, more-or-less complete narrow, brownish longitudinal stripes. Midventral stripe continues across groin and vent and onto tail. Tail venter with a series of five narrow, charcoal stripes, midventral boldest, paraxial faintest, lateral pair intermediate in definition (Fig. 2). Venter of chin whitish with numerous faint brown markings, mostly longitudinally oriented. A midventral brown stripe extends from anterior portion of mental scale onto anterior chin shields.

**Coloration (in life)**—Holotype with dark, almost black dorsal background coloration (Fig. 8). Pale paravertebral and lateral stripes a dull pale yellow, lateral stripes on head bright white. Dorsal oval spots and dorsal head markings orangish-red, bolder along vertebral line and on head, lateral rows of ovals and markings on tail and limbs paler. Pale banding on limbs whitish to pale rose. Venter white with pronounced blackish longitudinal stripes and throat and chin markings. Paratype with background color less dark: dark brown to dark reddish-brown with blackish margins surrounding dorsal ovals (Fig. 9). Ovals and other light markings duller orangish-red, becoming buff faintly tinted with orange on the shoulders, limbs and head. Paler stripes on tail dull reddish-brown alternating with dark brown, almost blackish ground colour. Enlarged scales of tail dorsum a pale yellowish-buff. Iris silvery.

**Etymology**—The species is named for Satara, the district in the Indian State of Maharashtra within which the type locality is located.

**Distribution**—At present this species is only known from the type locality, which lies in the south-central part of the Western Ghats of Maharashtra (Fig. 10). This region is unique in the presence of large laterite or basaltic plateaus on the crests of mountains. Mostly semi-evergreen forest characterises the valley vegetation. Most of the plateaus support sparse vegetation, which is mostly evident in monsoon and in summer they look barren. Apart from their unique ecological features, these plateaus have a unique floral and faunal diversity. The herpetofaunal species seen on these plateaus are mostly the representatives of drier regions such as *Ophisops* sp., *Lygosoma* sp. and *Echis carinata*. But a few plateaus are also home to some unique and uncommon species of amphibians including *Bufo koyanayensis* and *Indotyphlus maharashtraensis* (Giri et al. 2004, pers. obs.). At present, this species appears restricted to the type locality. It has not been seen on other plateaus near the study area.





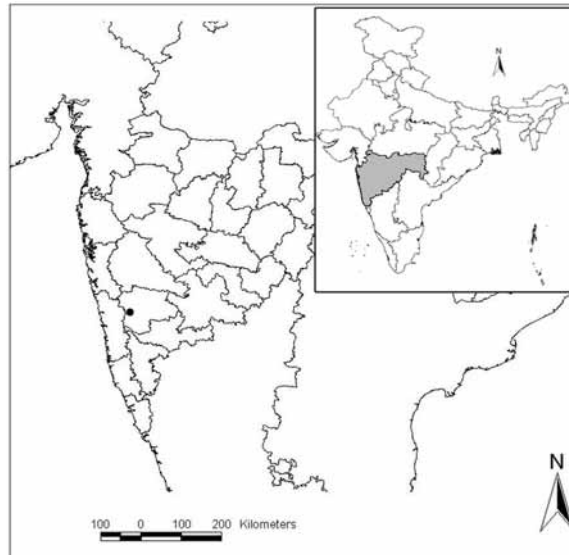
**FIGURE 8.** Life photograph of holotype of *H. sataraensis* **sp. nov.** showing the bold and highly contrasting life colours of this species.



**FIGURE 9.** Life photograph of paratype of *H. sataraensis* **sp. nov.** illustrating an equally complex but less contrasting general coloration pattern than the holotype.

*Natural history*—The type locality is a well known tourist destination due to the presence of windmills on the plateau (Fig. 11). The holotype was caught during daylight hours (10h30) under a small rock on an extensive rocky slope which is bordered by sparse vegetation. The gecko was seen sitting in an ‘S’ shape and remained motionless after its covering rock was removed, making no effort to escape. The paratype was collected from the same locality in a heap of small rocks. It was quite active. Locals indicated that this gecko is

always found under rocks and that it is commonly seen in the drier months of the year. This is reflected in the fact that first author visited this locality twice, once in monsoon and second visit was in winter and encountered only the two type specimens. Two eggs (minimum maximum dimension 6 mm as measured through intact body wall) were seen in the holotype which was collected in November 2007, suggesting that this is the breeding season for this species and that oviposition occurs in early winter. The types were found sympatrically with *H. cf. brookii* and *Sitana ponticeriana*.



**FIGURE 10.** Map of Maharashtra with district boundaries indicated. A solid dot in the Satara District indicates the type locality of *H. sataraensis* sp. nov. Inset map of India indicates the relative position of Maharashtra.



**FIGURE 11.** Type locality of *H. sataraensis* sp. nov. in highly degraded habitat near Chalakewadi, Satara District. The types were collected under the rocks like those in the foreground. This photograph was taken during the monsoon when vegetation is lushest.

**Discussion**—Carraza and Arnold (2006) established patterns of relationship among several major groups within *Hemidactylus*. This study, however, did not sample the majority of Indian species and of those sampled, none were endemic. The smaller size, relatively elongated body and unique toe morphology indicates that this is a member of the ground dwelling group of *Hemidactylus*. These characters are also present in *H. gracilis*, *H. reticulatus* and *H. albofasciatus*, as well as the Indus Delta plain species *Teratolepis fasciata* (taxonomy of this species is under revision, Bauer et al. 2008). All of these taxa are ground dwelling and mostly

found sheltering under rocks or other cover objects on the ground (Smith, 1935, Grandison & Soman 1963; Anderson 1964; Tikader & Sharma 1992; Bauer et al. 2005). Together these species form a monophyletic group (Bauer et al. 2008) to which *H. sataraensis* probably also belongs. Based on superficial resemblance, scale pattern, and overlapping numbers of supralabials and digital scancers, *H. sataraensis* may be most closely allied to *H. albofasciatus* or perhaps *T. fasciata*.

Apart from differences in morphology and colouration, *H. sataraensis* and *H. albofasciatus* also have differing ecological parameters. *Hemidactylus sataraensis* sp. nov. is known only from the type locality in the Western Ghats. *Hemidactylus albofasciatus* is known from Dorle, Dabhil and Gavkhadi in the Ratnagiri District (Grandison & Soman, 1963). Recently the first author also recorded this species from near Malwan in the Sindhudurg District. Thus, the distribution of *H. albofasciatus* is in two coastal districts of Maharashtra. These localities are separated from the type locality of *H. sataraensis* by approximately 100 airline km. The altitude is also considerably different as *H. albofasciatus* is known from sea level to an elevation of about 50 m ASL, whereas the type locality of *H. sataraensis* is at 1159 m ASL.

Similar ecological parameters distinguish *H. sataraensis* from *Teratolepis fasciata*, with which it shares the same general habitus and colour pattern (a combination of longitudinal stripes and transversely arranged oval markings). The latter species occurs near sea level in the Indus River Delta of Pakistan (Anderson 1964; Minton 1966; Mertens 1969), hundreds of kilometres from the Western Ghats. It is worth noting, however, that there are several questionable records of *T. fasciata* from the Republic of India. Smith (1935) recorded a specimen from Shillong in the Khasi Hills of Assam and Tikader and Sharma (1992) repeated this record as well as one from an unspecified locality in Tamil Nadu. Most interestingly, although Blyth (in Jerdon 1853) did not specify the origin of the type(s) of *T. fasciata*, Theobald (1876) subsequently stated that the type locality was “Jaulnah,” Hyderabad Province [=Jalna, Maharashtra]. The specimen regarded as the holotype (Das et al. 1998), ZSI 5981, is now in terrible condition and its identity cannot be determined. However, Blyth’s description of “large, imbricated, keeled and pointed scales” on the body dorsum clearly confirms that the type of *T. fasciata*, whether truly from Maharashtra or not, is not referable to *H. sataraensis* sp. nov.

The northern Western Ghats, especially the parts in Maharashtra, are herpetologically relatively unexplored (Giri et al. 2003). This is evident from the fact that in the recent past there were additions of three new species of caecilians and one lizard from this region (Giri et al. 2003, 2004; Giri 2008; Ravichandran et al. 2003). All these new discoveries were the result of localised surveys with moderate search efforts. With intensive and systematic surveys it will be possible to further increase our knowledge of reptiles of the northern Western Ghats. In Maharashtra, there are excellent examples of the highly diverse and intact Western Ghats forests, but in the Satara district the forest is more fragmented and is increasingly degraded by human exploitation (Rodgers & Panwar 1988). Though herpetologically unexplored, the occurrence of a new ground dwelling *Hemidactylus* highlights the uniqueness of this region. As this area has large expanses of plateaus, efforts are now being made to confirm the occurrence of this species from other likely areas. In view of tremendous anthropogenic pressure at the type locality, immediate attention should be paid to protect this and other likely localities of this species.

### Key to the genus *Hemidactylus* Oken, 1817 from India

Modified after Smith (1935). Excludes *H. mahendrai*, the validity of which has been questioned (see Zug et al. 2007) but does include *H. karenorum*, which may not actually occur within the borders of India (Mahony & Zug, 2008).

- 1a. Digits narrow or moderately dilated with undivided transverse lamellae, or with only distal lamellae divided or deeply notched.....2
- 1b. All but single terminal lamellae paired.....6

2a.	All subdigital lamellae undivided.....	<i>anamallensis</i>
2b.	Only distal lamellae divided or notched; free distal phalanx of each digit less than half the length of its associated subdigital pad; femoral pores absent.....	3
3a.	Median subcaudal scales forming a series of transversely enlarged plates; dorsal granules small, irregular, intermixed with 10 to 12 longitudinal series of more or less oval strongly keeled tubercles; dorsum with quadrangular spots .....	<i>gracilis</i>
3b.	Tail venter without transversely enlarged plates .....	4
4a.	Original tail clearly divided into segments; dorsum with dark reticulations .....	<i>reticulatus</i>
4b.	Original tail not obviously segmented; dorsum without dark reticulations .....	5
5a.	Dorsal granules small, intermixed with irregularly arranged, enlarged tubercles; back and tail cross-banded with light streaks; maximum SVL 36 mm.....	<i>albofasciatus</i>
5b.	Dorsal granules small, intermixed with irregularly arranged, enlarged tubercles; back with four stripes and transversely arranged spots; maximum SVL 46 mm.....	<i>sataransis</i> sp. nov.
6a.	Digits relatively narrow; scales of dorsum uniform, imbricate, slightly elongated, striated and feebly keeled.....	<i>scabriceps</i>
6b.	Digits moderately to broadly dilated; dorsal scales not imbricate.....	7
7a.	Dorsum with numerous, strongly keeled, enlarged tubercles arranged in more or less regular longitudinal series .....	8
7b.	Dorsal tubercles absent or, if present, rounded, smooth, or feebly keeled, not regularly arranged .....	14
8a.	Males with preloacal pores only .....	9
8b.	Males with preloacal-femoral pores.....	10
9a.	12–14 lamellae under the fourth toe; 9–13 preloacal pores in males.....	<i>persicus</i>
9b.	10–11 lamellae under the fourth toe; 6 preloacal pores in males.....	<i>porbandarensis</i>
10a.	Very large (> 100 mm SVL); subdigital lamellae in straight, transverse series 9–10 lamellae under first toe; dorsal tubercles large, trihedral, arranged in ~20 fairly longitudinal series .....	<i>maculatus</i>
10b.	Small to moderately sized (< 85 mm SVL); subdigital lamellae in oblique series; 8 or fewer lamellae under first toe .....	11
11a.	Dorsum with enlarged trihedral dorsal tubercles; dorsal pattern with transverse markings .....	12
11b.	Dorsal tubercles conical, keeled, or subtrihedral; dorsal pattern of spots or blotches .....	13
12a.	7–10 lamellae under the fourth toe; 7–8 infralabials .....	<i>triedrus</i>
12b.	12 lamellae under the fourth toe; 10 infralabials .....	<i>subtriedrus</i>
13a.	Digits distinctly webbed at base, males with 17–20 preloacal-femoral pores on each side; dorsal pattern of white spots on a dark background.....	<i>prashadi</i>
13b.	Digits not webbed, males with 7–16 preloacal-femoral pores on each side; dorsal pattern of dark spots or blotches on a pale background .....	<i>brookii</i>
14a.	Digit I of manus half or less the length of digit II .....	15
14b.	Digit I of manus more than half the length of digit II.....	17
15a.	Tail weakly depressed, without denticulate lateral edge; male with a continuous series of 26–36 preloacal-femoral pores; 9–10 lamellae under fourth toe.....	<i>frenatus</i>
15b.	Tail strongly depressed, with sharply denticulated lateral edge; males (when present) with medial interruption of preloacal-femoral pore series; 11–13 lamellae under fourth toe .....	16
16a.	Dorsum with uniform small granules; second postmentals do not contact infralabials; all-female species .....	<i>garnotii</i>
16b.	Dorsum with small granules and numerous larger rounded tubercles; second postmental contact infralabials; males with 18–20 preloacal-femoral pores on each side .....	<i>karenorum</i>
17a.	Tail and sometimes body dorsum with enlarged tubercles .....	18
17b.	Dorsum and tail lacking enlarged dorsal tubercles.....	20

- 18a. Dorsal scalation of small granules, intermixed with 18–20 rows of irregularly arranged enlarged tubercles; 11–13 lamellae under fourth toe; 15–19 femoral pores on each side in males..... *aaronbaueri*
- 18b. Enlarged tubercles (if present), few, scattered .....19
- 19a. 9–11 lamellae under the fourth toe; 10–17 femoral pores on each side ..... *leschenaultii*
- 19b. 11–14 lamellae under the fourth toe; 5–7 femoral pores on each side..... *flaviviridis*
- 20a. 13–15 lamellae under the fourth toe; 18–22 femoral pores on each side in males; SVL to 115 mm ..... *giganteus*
- 20b. 9–11 lamellae under fourth toe; 12–15 femoral pores on each side in males; SVL to <60 mm *bowringii*\*

\*It is probable that the Indian populations currently assigned to this species do not represent true *H. bowringii*, which has its type locality in Hong Kong (McMahan & Zug, 2007)

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