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A misunderstood new gecko of the genus *Hemidactylus* from Socotra Island, Yemen (Reptilia: Squamata: Gekkonidae)

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Abstract. A new endemic gecko of the genus *Hemidactylus* is described from Socotra Island (Yemen). It is a rupicolous species characterized by: medium-large size (SVL up to 60 mm), back with large trihedral, raised, strongly keeled tubercles intermixed with small granular scales, males with 6-10 preanal pores arranged in two short rows separated by 2-3 scales. In East Africa, Arabia, the Middle East and India the only other tuberculated *Hemidactylus* with preanal pores arranged on two separate rows is the Somali *H. granchii* Lanza, 1978, which differs for the comparatively deeper and shorter head, the nostril separated from the first upper labial, less preanal pores, less upper and lower labials, more tubercles at midbody and more lamellae under the inner toe.

Keywords. Socotra, Yemen, *Hemidactylus*, new species.

INTRODUCTION

The herpetological investigation of Socotra started in 1880 with the expedition of Isaac Bayley Balfour; in the following twenty years a few British, German and Austrian expeditions collected zoological specimens on the island, including new reptile species that were later described by William Thomas Blanford (1881), Albert Günther (1881), Wilhelm Peters (1882), Franz Steindachner (1899, 1903) and particularly by George Albert Boulenger (1899, 1903). The latter author described many species collected during the most important Socotran expeditions, such as those of William R. Ogilvie-Grant and Henry O. Forbes. Moreover, a few new species collected by these explorers passed unnoticed and were described only 90 years later.

No other herpetological expedition was carried out until 1953, when George B. Popov visited the island and collected reptiles, including some of the undescribed species already

collected by Ogilvie-Grant and Forbes. Other reptiles were collected in 1956 during the Oxford expedition, including a new worm-snake described by Hahn (1978). A few more undescribed species were collected in 1967 by Kenneth M. Guichard, during the Middle East Command expedition.

About 20 years later Arnold (1986) described two new semaphore geckoes of the genus *Pristurus* on the basis of old specimens caught during these expeditions and held in the collections of the British Museum of Natural History (now The Natural History Museum).

For a complete review of the herpetological survey of Socotran reptiles and a complete list of the pertinent literature, see the monograph by Schätti and Desvoignes (1999).

Finally, during the period of the Arab Democratic Republic of Yemen, a few zoological expeditions visited Socotra, most of them promoted by German zoologists (cf. Wranik 1996, 1998; Rösler 1998c; Rösler and Wranik, 1998, 1999, 2000; Schätti and Desvoignes 1999). Some of this research also resulted in the description of new species: *Pristurus samhaensis, Pristurus obsti* and *Hemidactylus dracaenacolus* by Rösler and Wranik (1999) and *Mesalina kuri* by Joger and Mayer (2002); other new species have been tentatively identified, but not formally described.

Among them there is a really misunderstood *Hemidactylus* species that is formally described in this paper. This taxon was recorded for the first time by Schätti and Desvoignes (1999) (as *H. granti*), and then also cited by other herpetologists on the basis of a single living specimen that was alternately listed as a slightly different form of *H. turcicus* or possibly a new unnamed taxon (cf. Rösler and Wranik, 2003, 2004, 2006).

Between 2007 and 2009, five scientific surveys were organized by the University of Pavia to collect data in the framework of the "Socotra Conservation and Development Project", founded by the Italian Cooperation – Ministry of Foreign Affairs, and under the auspices of the United Nations Development Programme, with the aim of improving sustainable development and the biodiversity conservation of the Socotran Archipelago.

During these surveys many areas of the island were investigated and a large number of distributional and ecological data for Socotran reptiles were collected (Sindaco et al. 2008), including many specimens of an undescribed species of the genus *Hemidactylus*, that represents the subject of this paper.

MATERIALS AND METHODS

Herpetological data were collected during four field surveys (for a total of 53 days of search effort, by three observers on average).

Data on reptiles were collected during more than 150 diurnal and nocturnal transects of 30 minutes each, based on the Systematic Sampling Surveys, time-constrained, protocol (Heyer et al. 1994). The transects were conducted in all main habitats, distributed over most of the island. Moreover, additional opportunistic censuses were conducted to observe as many species as possible in each surveyed locality. During the transects, more than 4000 reptile individuals belonging to all 25 terrestrial reptiles known on the island were recorded. Some individuals were collected, measured, photographed and then released.

Since the taxonomic status of some taxa is still uncertain, and some species are only known on the basis of a very few, often old, specimens, a small number of specimens for each species were collected for further morphological and genetic analyses. To avoid suffering, the collected specimens

were anaesthetized by ether, then fixed in 95° ethanol and thereafter preserved in 75° ethanol. The collected specimens are now deposited in the herpetological collections of the Museo Civico di Storia Naturale di Carmagnola, Torino (MCC), and the Museo di Storia Naturale of the University of Pavia (MSNPV), Italy.

The new species was compared to all the other *Hemidactylus* species with similar characteristics living on the Socotran Archipelago, East Africa, the Middle East and Indian Subcontinent. We also checked the collections of several museums (see Appendix 1), the original descriptions, and taxonomic reviews (see References).

RESULTS

Hemidactylus inintellectus Sindaco, Ziliani, Razzetti, Pupin, Grieco - sp. nov. (Figs. 1-4)

Synonyms

Hemidactylus granti – Schätti and Desvoignes (1999: 108-109; fig. 30)
Hemidactylus aff. *turcicus* – Rösler and Wranik (2000: 24; tab. 1)
[*Hemidactylus*] *turcicus*-like – Rösler and Wranik (in Wranik 2003: 133)
Hemidactylus sp. – Rösler and Wranik (in Wranik 2003: pl. 74 up)
Hemidactylus sp. B – Rösler and Wranik (2004: 518; pl. 5, fig. 20)
Hemidactylus sp. B – Rösler and Wranik (2006: 127; tab. 1)
Hemidactylus granti – Sindaco et al. (2008: tab. 1)

Type material

Holotype – MCC-R1470, adult male, Yemen, Socotra Island, Wadi Ayhaft (12°36'47"N– 53°57'52"E), about m 200 a.s.l., U. Ziliani, E. Razzetti, R. Sindaco, C. Carugati, C. Grieco leg., 3.I.2008.

Paratypes – 15 specimens from Socotra Island, Yemen, collected in the following localities:

MSNPV-CR866, 1 adult male, Wadi Ayhaft (12°36'47"N– 53°57'52"E), same data of the holotype.

MCC-R1437, MSNPV-CR867, 2 adult females, between Hadibo and Qadub (12°38'22"N – 53°57'45"E), m 80 a.s.l., C. Grieco, F. Pupin, R. Sindaco leg., 27.XII.2008.

MCC-R1441, 1 adult female, Temedeh area (12°36'41"N – 54°18'12"E), m 10 a.s.l., 29.XII.2008, C. Grieco, F. Pupin, E. Riservato, R. Sindaco leg.

MCC-R1471 + MSNPV-CR868, 2 adult males, Wadi Kilisan south of Afafes m 264 a.s.l. (Momi Plateau) (12°29'32"N– 54°20'57"E), 7.I.2008, C. Grieco, F. Pupin, E. Razzetti, O. Sacchi, R. Sindaco, U. Ziliani

MCC-R1472 (1-4), 1 male, 2 females, 1 immature; MSNPV-CR869-872, 1 male, 2 females, 1 immature, Dhero area (12°28'59"N – 54° 1'35"E), m 400 a.s.l., 29.XII.2007, C. Grieco, F. Pupin, R. Sindaco, E. Riservato, U. Ziliani leg.

MCC-R1469, 1 adult female, NW foothills of the Jebel Ma'li, about 6 km SW of Qalansiyah (12°39'32"N – 53°26'38"E), m 250, 27.I.2009, D. Pellitteri, U. Ziliani leg.

Derivatio nominis

The specific epithet *inintellectus* is a latin adjective meaning "misunderstood", because the species was observed and/or collected by different authors (including us during the first surveys), but was confused with other taxa or was suspected to be a new taxon, but remained undescribed for about ten years.

We suggest "Socotran rock gecko" as English name for this species.

Diagnosis

A rather robust *Hemidactylus* (maximum SVL: male = 59.5 mm, female = 60.5 mm), easily distinguishable from the others Socotran *Hemidactylus* by the following combination of characters: back covered by large, trihedral, strongly keeled tubercles intermixed with a few small, irregular shaped granules (Fig. 1d), forming 12-16 (mode 14) irregular transversal rows from axilla to groin (counted along a paravertebral line); nostril in contact with the rostral, the 1st supralabial and 3 postnasals; 6 lamellae under the 1st toe (Fig. 1c) and 9-11 (media 10.2 ± 0,54, mode = 10) under the 4th toe (Fig. 1e).

Chin shield subtriangular; first pair of enlarged post-mentals in broad contact each other and with the first and second lower labial; second pair in contact with the second lower labial and usually with small paralabials (Fig. 1b).

Males with 3/3 to 5/5 preanal pores in two short rows, separated medially by 2-3 scales (Fig. 1f); females without pores.

Pattern with more or less irregular, narrow transversal bands on back and unregenerated tail, sometimes indistinct. Ventral part of the tail with transversely enlarged scales intermixed with smaller ones (Fig. 1g).

Description of the holotype

Head rather depressed (ratio between head length to the mandibular angle and head depth = 2.48), its length 1.55 times its width; snout subacuminate, concave between the nares and the eyes, swollen in front of the eyes, 1.76 times as long (to the anterior margin of the eye, measured in a diagonal line) as the distance between the posterior margin of the eye and the anterior margin of the ear-opening; ear opening elliptical, its major axis subvertical and a little more than 1/3 that of the exposed eye. Major diameter of the exposed eye about 1/4 the head length (to the mandibular angle); pupil a vertical slit with lobed margins.

Rostral subquadrangular, nearly 1.7 wide as high, divided longitudinally for half of its length in the superior part; nostril in contact with the rostral, the 1st supralabial and 3 enlarged postnasals; the post-rostrals separated by a smaller scale by its fellow; 12/11 upper (10/9 before the centre of the eye) and 9/8 lower labials; mental large, subtriangular, longer than the anterior chin-shields; anterior chin-shields broadly in contact along the median line and with the lst sublabial (in narrow contact with second sublabials). A second pair of chin-shields clearly smaller than the first pair touching the 2nd pair of sublabials and 1 rows of paralabials.

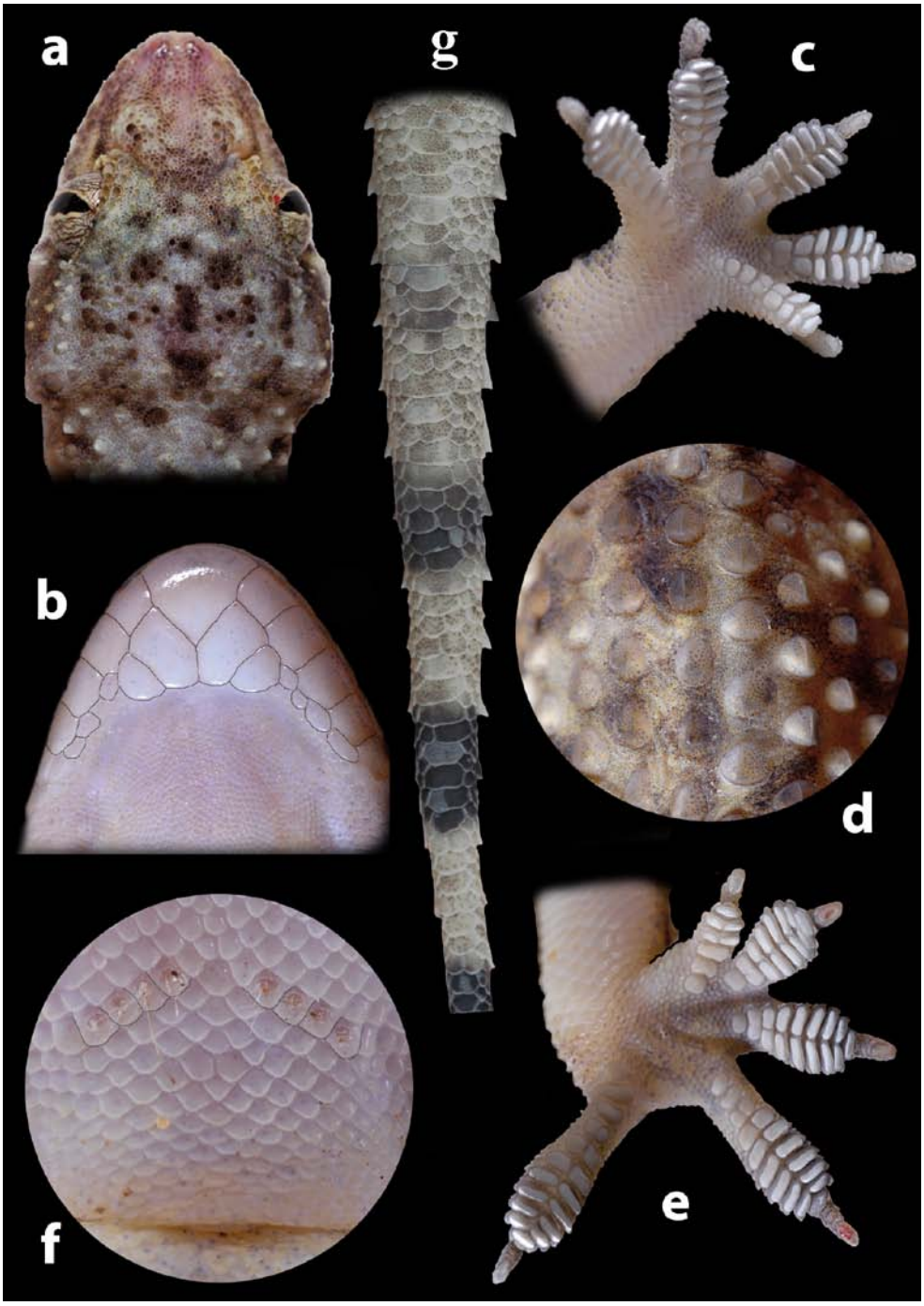

Fig. 1. Morphological characters. a – Head from above; b – Chin shields arrangement; c – Right hand; d – Dorsal tubercles; e – Left foot; f – Anal region; g – Ventral side of the tail

Snout covered by rather irregularly sized, roundish, juxtaposed, more or less convex scales (few of them slightly keeled). Posteriorly the scales grade into small, irregular granules in the interorbital region; nape and temporal region with conical or subtrihedral strongly keeled (especially on neck) tubercles. Trunk rather depressed, covered dorsally by large, trihedral, strongly keeled and often striated tubercles, arranged in about 12-13 irregular longitudinal rows (6-7 between the hindlimbs), about 14-15 in a straight paravertebral line between axilla and groin; the tubercles are separated by 3-5 small, subimbricate, heterogeneous scales. Ventral scales small, flat, smooth, and imbricate, about 40 in a transverse row at midbelly, about 70 between axilla and preanal pores along a line on the middle of the belly; 11 ventral scales in an eye diameter in the middle of the belly, counted longitudinally. Throat covered by subimbricate scales (about 25 in an eye diameter in the middle of the throat, counted longitudinally). 10 (5/5) preanal pores arranged in a curved line, interrupted by two scales.

Antero-dorsal side of forearm, dorsal side of tibia and postero-dorsal side of thigh with very heterogeneous scalation, with large keeled tubercles, the ones of the forearm are smaller than the other ones.

Limbs rather long: the tip of adpressed hindlimb reaches the elbow of adpressed forelimb. Digits free, moderately dilated, slightly webbed at the base with free undilated terminal portion clearly projecting beyond the dilated part (that of 4th toe with 12 scales along the dorsal edge); lamellae beneath the toes from lst to 5th (undivided+divided+entire apical; right / left if different): hands 3+3+1, 1+5+1, 1+6+1/1+5+1, 1+6+1, 2+5+1. Feet : 2+3+1, 2+5+1, 1+6+1, 3+6+1, 4+6+1.

Hemipenial bulges well developed.

Tail unregenerated, conical, without basal constriction, with a single series of strongly keeled and raised tubercles on the dorsal and lateral sides for each tail segment, 6 near the base and 4 on the distal part; ventral side of the tail with arranged transversely enlarged scales irregularly alternating with un-enlarged ones.

Measurements. See Tab. 1.

Colouration. In alcohol, greyish with irregular, rather distinct transverse dark bars; tail with 7 distinct dark-light rings; limbs almost uniform. Underparts are off-white.

Variation

Measurements of the paratypes are given in the Tab. 1.

There is little variation both in either proportions and scale counts.

The ratio head length / head depth ranges from 2.2 to 2.5 (mean 2.4 ± 0.1); ratio head length / head width from 1.4 to 1.5 (mean 1.44 ± 0.05); ratio snout / eye-ear opening distance from 1.5 to 1.8 (mean 1.66 ± 0.08).

The ear opening is more or less elongated, its maximum diameter is 0.3-0.4 times the horizontal diameter of the eye (mean 0.32 ± 0.04). The eye is 0.2-0.3 times the length of the head from the tip of the snout to the mandibular angle (mean 0.24 ± 0.01).

The arrangement of scales around the nostril is very constant: in all the specimens the

Tab. 1. Measurements and scale counts. **1** = Sex / age; **2** = Snout to vent length (SVL); **3** = Tail length (TL); the asterisk indicates the regenerated tails; **4** = Head length (from the tip of the snout to the mandibular angle); **5** = Head width; **6** = Head depth; **7** = Distance between the tip of the snout and the anterior edge of the eye (in lateral view); **8** = Orizontal eye diameter; **9** = Distance between the posterior edge of the eye and the anterior edge of the ear opening; **10** = Maximum diameter of the ear opening; **11** = Ratio between head length and head depth; **12** = Ratio between head length and head width; **13** = Ratio between snout length (character 7) and the eye-ear distance (character 9); **14** = Ratio between diameters of the ear opening and eye ; **15** = Ratio between the eye diameter and the head length; **16** = Number of upper labials (right / left if different); **17** = Number of lower labials (right / left if different); **18** = Number of gularia in the eye diameter; **19** = Number of ventralia in the eye diameter; **20** = Longitudinal rows of enlarged tubercles at midtrunk; **21** = Number of tubercles between hindlimbs; **22** = Number of tubercles between axilla and groin; **23-27** = Subdigital lamellae under fingers from 1st to 5th (right / left if different); **28-32** = Subdigital lamellae under toes from 1st to 5th (right / left if different) – are indicated basal undivided ones + divided + undivided apical lamella.

Character	MCC-R1437	MSNPV-CR867	MCC-R1441	MSNPV-CR866	MCC-R1470	MSNPV-CR868	MCC-R1471	MSNPV-CR871	MSNPV-CR869	MSNPV-CR870	MCC-R1472	MCC-R1472	MCC-R1472	MSNPV-CR872	MCC-R1472	MCC-R1469
1	F	F	F	M	M	M	M	imm.	M	F	M	F	F	F	imm.	F
2	57.0	56.0	52.0	52.5	49.0	51.0	56.0	41.0	57.0	56.0	59.5	53.0	51.0	60.5	45.0	52.0
3	59.0*	lost	56.0	45.0*	57.0	52.0	52.0*	lost	68.0	truncated	lost	57.0	56.0	lost	50.0	58.0*
4	18.2	17.5	16.3	16.8	16.4	16.2	17.6	13.8	18.1	17.2	17.9	15.6	15.1	18.0	14.8	16.0
5	12.3	12.4	11.8	11.6	10.6	11.1	12.5	9.2	12.2	11.8	12.8	11.1	10.9	12.5	9.8	11.6
6	7.8	8.0	7.0	7.0	6.6	6.8	7.1	5.7	7.1	7.1	7.4	6.8	6.5	7.8	6.0	6.3
7	7.8	7.8	7.4	7.2	7.1	7.0	7.8	5.9	8.0	7.5	8.2	6.9	6.8	7.7	6.3	6.8
8	4.6	4.5	4.2	4.1	4.1	3.9	4.4	3.6	4.2	4.0	4.4	4.2	3.9	4.8	3.7	4.1
9	4.4	4.7	4.4	4.6	4.0	4.2	4.9	3.7	4.8	4.6	4.6	3.8	4.3	4.5	3.9	4.4
10	1.4	1.3	1.4	1.2	1.6	1.2	1.2	1.1	1.5	1.1	1.3	1.3	1.6	1.6	1.3	1.5
11	2.33	2.19	2.33	2.40	2.48	2.38	2.48	2.42	2.55	2.42	2.42	2.29	2.32	2.31	2.47	2.54
12	1.48	1.41	1.38	1.45	1.55	1.46	1.41	1.50	1.48	1.46	1.40	1.41	1.39	1.44	1.51	1.38
13	1.67	1.71	1.67	1.55	1.76	1.70	1.54	1.66	1.65	1.55	1.74	1.79	1.61	1.72	1.65	1.53
14	0.30	0.28	0.33	0.29	0.38	0.30	0.27	0.30	0.35	0.27	0.29	0.30	0.40	0.33	0.34	0.36
15	0.24	0.25	0.25	0.24	0.24	0.23	0.24	0.25	0.22	0.23	0.24	0.26	0.25	0.26	0.24	0.25
16	11/11	10/11	11/12	13/12	12/11	11/10	12/10	13/11	12/12	12/12	11/11	11/11	12/12	10/11	11/11	11/11

Character	MCC-R1437	MSNPV-CR867	MCC-R1441	MSNPV-CR866	MCC-R1470	MSNPV-CR868	MCC-R1471	MSNPV-CR871	MSNPV-CR869	MSNPV-CR870	MCC-R1472	MCC-R1472	MCC-R1472	MSNPV-CR872	MCC-R1472	MCC-R1469
17	10/9	9/9	9/9	9/9	9/8	9/9	9/9	9/9	10/10	9/9	10/10	9/9	10/10	8/9	11/10	9/8
18	22	24	21	23	25	23	19	24	20	22	21	22	19	18	26	22
19	15	15	13	13	11	11	11	14-15	13	12	10	11	10	11	13	13
20	~12	~12	14	14	12-13	13-14	~12	14	13-14	16	12	13-14	12	12-13	13-14	14
21	5-6	6-7	5-6	6	6-7	6-7	5-6	8	7-8	8	7-8	6-7	5-6	5	7-8	7-8
22	15	12	13	14	14-15	12-13	17	14	13	14	14	15	15	15-16	15	14-15
23	2+4+1	3+3+1	2+3+1 / 3+3+1	3+3+1	3+3+1	3+3+1	3+3+1 / 2+3+1	2+3+1 / 2+4+1	3+3+1	2+4+1	3+3+1 / 4+3+1	3+3+1	3+3+1 / 2+3+1	2+3+1 / 3+3+1	3+3+1	3+3+1
24	1+6+1	1+6+1 / 2+5+1	1+6+1	2+5+1 / 1+5+1	1+5+1	1+5+1	1+5+1 / 0+6+1	1+5+1	2+5+1 / 1+6+1	1+5+1 / 1+6+1	2+5+1	2+5+1 / 1+6+1	1+5+1	1+5+1	0+6+1	1+6+1
25	0+7+1	1+6+1	1+6+1	1+6+1	1+6+1 / 1+5+1	1+5+1 / 0+6+1	0+6+1	1+6+1 / 0+6+1	1+6+1	1+6+1	1+6+1 / 2+5+1	1+6+1	1+6+1 / 2+5+1	0+5+1 / 1+5+1	0+6+1	1+6+1
26	1+7+1	1+6+1	2+6+1	1+6+2 / 1+6+1	1+6+1	1+6+1	1+6+1	1+6+1	2+6+1 / 1+6+1	0+7+1 / 2+6+1	3+5+1 / 1+6+1	2+5+1 / 1+7+1	1+6+1	3+5+1 / 1+5+1	1+6+1	1+6+1
27	1+7+1	2+6+1	2+6+1	3+5+1	2+5+1	3+5+1	2+6+1	2+6+1 / 3+5+1	2+6+1	3+6+1 / 2+6+1	4+5+1	3+5+1 / 2+6+1	2+6+1 / 1+6+1	1+6+1 / 1+5+1	2+7+1 / 1+7+1	2+6+1
28	1+4+1	2+3+1	2+3+1	2+3+1 / 3+2+1	2+3+1	2+3+1	2+3+1	2+3+1	1+4+1	2+3+1	2+3+1 / 3+2+1	3+2+1 / 2+3+1	2+3+1	3+2+1 / 2+3+1	1+4+1 / 2+3+1	3+2+1
29	2+8+1	1+6+1	1+6+1	2+5+1 1+6+1	2+5+1	1+6+1	1+6+1	1+6+1	1+6+1 / 2+6+1	1+6+1	1+6+1	2+6+1	2+5+1	2+5+1	1+6+1	1+6+1
30	1+7+1	2+6+1 / 1+7+1	1+7+1	2+6+1	1+6+1	1+6+1	1+6+1	1+6+1 / 0+7+1	1+7+1	1+7+1	2+6+1	1+7+1	2+6+1	1+6+1	3+6+1 / 1+6+1	0+7+1
31	2+8+1	2+7+1	2+7+1	2+7+1	3+6+1	3+6+1	2+7+1 / 3+6+1	3+6+1	3+6+1 / 4+6+1	4+6+1	2+7+1	2+7+1 / 3+7+1	4+6+1	2+6+1	2+7+1 / 3+6+1	2+7+1
32	3+7+1 / 2+8+1	3+7+1 / 4+6+1	4+6+1	3+6+1 / 4+6+1	4+6+1	3+6+1 / 5+5+1	2+7+1 / 4+6+1	3+6+1	4+6+1 / 3+7+1	4+6+1 / 2+6+1	5+5+1 / 3+7+1	4+6+1	4+6+1	4+6+1 / 4+4+1	4+7+1 / 3+6+1	5+6+1 / 4+7+1

nostril is pierced between the rostral, the first upper labial and three nasals; the two upper nasals are separated by a small scale in two specimens only out of 16.

The number of upper labials ranges from 10 to 13 (mode 11, mean 11.32 ± 0.79), the lower labials from 8 to 11 (mode 9, mean 9.22 ± 0.66).

The arrangement of chin shields is rather constant: the first pair of enlarged postmentals is in broad contact in all specimens; they touch both the first and the second lower labials in 14 specimens at least on one side, but asymmetry is present in four specimens. The second postmentals usually touch the second lower labial, very rarely also the third, and in one case the first (at a single point).

The number of gulars in the middle of the throat contained in the eye diameter is from 18 to 26 (mean 21.94 ± 2.24), the ventrals from 10 to 15 (mean 12.64 ± 1.68).

The longitudinal rows of enlarged tubercles on back counted across midbody are 12-16 (mode 14), between the hindlimbs 5-8 (mode 6), the number of enlarged tubercles in a paravertebral line from axilla to groin 12-17 (mode 14) although they are very irregular and sometimes difficult to count.

The subdigital lamellae under the first toe are 6 in all specimens, under the fourth toe are 9-11 (mean 10.19 ± 0.54, mode 10).

In the 6 males studied, the preanal pores are 3+3 in one specimen, 4+4 in two specimens, and 5+5 in three specimens; the two rows of preanal pores are separated by 2 scales in three specimens and by 3 scales in the other three.

Colouration in life

Ground color pinkish (sometimes greyish), with more or less distinct transverse, thin, irregular brown bands, often reticulated. In some specimens these bands are interrupted and are replaced by irregular spots. Unregenerated tail very distinctly banded, with about seven dark bands alternating with light ground color; the ground color is pinkish in the basal half, whitish in the distal half (Figs. 2-3).

Pupil vertical, black, with slightly lobed shape; iris cream coloured, with a complex pattern of brown reticulated veins (Fig. 1a).

Distribution and habitat

Besides the localities where the type-specimens have been collected, *H. inintellectus* was recorded in the following localities: Wadi Ma'nifoh, m 100-200 a.s.l. (ab. 12°35'N - 54°18'E; Schätti and Desvoignes, 1999); Homhil ab. 400 m a.s.l. (ab. 12°32'N-54°27'E; Schätti and Desvoignes, 1999); Diksam 12°29'N-53°59'E, 695 m a.s.l. (Rösler and Wranik, 2004); Jabal Falanj near Hamero (12°32'N-54°27'E), 324 m a.s.l.; Wadi Mityaf near Afafes (12°29'N-54°23'E), 292 m a.s.l.; Firmihin (12°28'N-54°01'E), 610 m a.s.l.; north of Shibroh (12°29'N-53°59'E), 100 m a.s.l.; Neet, 20 m a.s.l. (12°27'N-53°27'E). As shown in Fig. 4, the new species has been observed in different areas of the island, ranging from near the sea level to about 695 m a.s.l.; its occurrence is expected in most of the rocky places of the island, excluding the higher peaks.

This species is mainly a rock dwelling gecko. Individuals were observed active after dusk, usually climbing on cliffs, deep crevices, large boulders, palm tree trunks, generally

Fig. 2. Immature, Socotra, Temedeh env., 29.XII.2008.

Fig. 3. Adult, Socotra, Dhero area, 29.XII.2007.

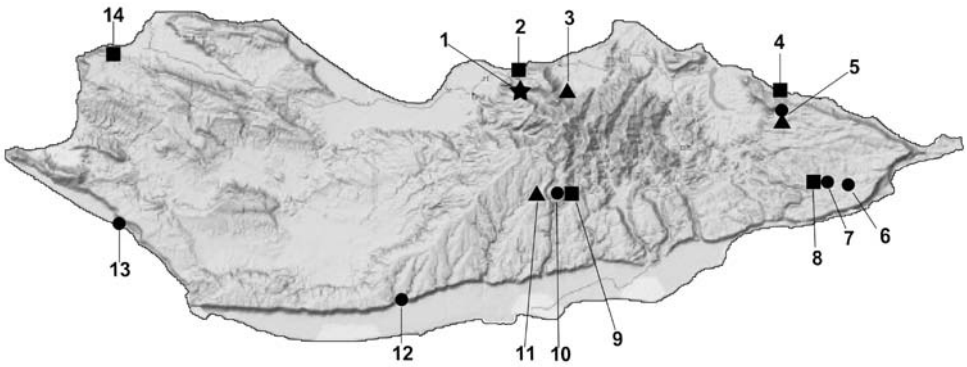

Fig. 4. Distribution of *Hemidactylus inintellectus*. Star = Locus typicus; squares = examined specimens; triangles = bibliographic data; circles = original observations. Localities: 1 - Wadi Ayhaft; 2 - Betw. Hadibo and Qadub; 3 - Wadi Ma'nifoh; 4 - Temedeh; 5 - Homhil; 6 - Near Hamero; 7 - Near Afafes; 8 - South of Afafes; 9 - Dhero; 10 - Firmihin; 11 - Diksam; 12 - North of Shibroh 13 - Neet; 4 - Jebel Ma'li near Qalansiyah.

in well vegetated areas. An individual was also caught on an *Adenium obesum* trunk; the specimen depicted by Rösler and Wranik (2004) was observed on a *Dracaena* trunk.

H. inintellectus was found in syntopy with the following nocturnal reptiles: *Hemidactylus homoeolepis* (91% of sites), *Haemodracon riebecki* (45%), *Ditypophis vivax* (18%), *Haemodracon trachyrhinus* (9%), *Hemidactylus pumilio* (9%). Diurnal reptiles found at the same places were *Pristurus sokotranus* (73%), *Pristurus insignis* (55%), *Trachylepis (?) socotrana* (36%), *Chamaeleo monachus* (18%), *Mesalina balfouri* (18%), *Pristurus guichardi* (9%).

DISCUSSION

Hemidactylus is one of richest genera of the family Gekkonidae in terms of species number, and Somalia and its adjoining areas are one of the main centres of speciation, as pointed out by Joger (1985): more than 40 species occur, most of them endemic, in Somalia, Kenya, Ethiopia and Eritrea (cf. Parker, 1942; Loveridge, 1947; Lanza, 1983; Spawls et al., 2002; Sindaco et al., 2007). The geographically close Socotran Archipelago is a center of speciation, with nine species, all but three endemic; most of them somewhat resemble one or the other Somalian species (Joger, 2000: 341). The island of Socotra in particular is inhabited by seven species species of *Hemidactylus*, two of them almost surely introduced by man (*H. flaviviridis* and *H. robustus*), and one possibly introduced in Arabia from Socotra (*H. homoeolepis*).

Comparison with other species

The new species is easily distinguishable from all other *Hemidactylus* of the Socotran Archipelago, except from *H. oxyrhinus* and *H. robustus*, due to the presence of large, raised

and strongly keeled tubercles on the back. Some authors (see synonyms) confused it also with *H. granti* even if this species lacks the evident large and raised tubercles on the back.

It differs from *H. oxyrhinus*, an endemic species from Abd al-Kuri Island, by the presence of preanal pores in males (males *H. oxyrhinus* lack preanal pores) and by the presence of small granular scales among the dorsal enlarged tubercles (back covered by large tubercles only, each of them in contact with the others, in *H. oxyrhinus*).

The new species can be distinguished from *H. robustus* by the obvious larger size (max SVL up to 60.5 mm versus 44 mm; grams to 5.8 versus 2.3), by the arrangement of preanal pores in two rows separated by 2-3 scales in *H. inintellectus*, instead of a single series of 5-9 preanal pores in *H. robustus* (8 males from Socotra). Compared with *H. robustus*, the new species has larger dark spots, often forming some more or less well defined transverse bands on trunk (small scattered spots in *robustus*), furthermore the unregenerated tails of the new species has few evident dark and light bands (spotted and without well defined bands in *H. robustus*, at least in adult specimens); the dark stripe across the eye typical for *H. robustus* is only weakly evident in *H. inintellectus.*

In northeastern Africa, Arabia and India, the only other *Hemidactylus* that shows raised, strongly keeled enlarged tubercles on the back, and preanal pores arranged in two short rows separated by two scales is the Somali *H. granchii*; this species can be differentiated by the comparatively deeper and shorter head, the nostril not touching the first upper labial, fewer preanal pores (3+2), fewer upper (9/10) and lower (6/7) labials, more tubercles at midbody and more lamellae (7) under the inner toe (Lanza, 1978).

The following species are morphologically quite similar to *H. inintellectus* but they show preanal pores arranged on a single row and differ also for other characters.

H. macropholis (Boulenger, 1896) from Ethiopia, Somalia and northern Kenya, has very enlarged and differently shaped dorsal tubercles mostly on flanks, second pair of post-mentals much smaller, larger size (SVL up to more than 80 mm in both sexes), fewer supralabials (mode 9) and infralabials (mode 7), fewer ventrals in an eye diameter (mode 9) and a different colour pattern (Lanza, 1978).

H. turcicus (Linnaeus, 1758), widely distributed along the Mediterranean shores is usually smaller, the dorsal tubercles are arranged in regular longitudinal rows, and has a different colour pattern. The postmentals have narrower contact or, very rarely, they are separated by small plates, the number of supralabials (mode = 8) and infralabials (mode 6), is lower as is the number of ventrals in an eye diameter (mode 6) (Lanza, 1978).

H. sinaitus (Boulenger, 1885) (from Sudan to northern Somalia, and Arabia), very similar to *H. turcicus*, is smaller (maximum SVL = 49 mm), has fewer supralabials (mode = 8), infralabials (mode = 7), fewer ventrals in an eye diameter (mode 7) and a different colour pattern (Lanza, 1978). *H. sinaitus* is also very distinctive in having reduced subdigital lamellae counts, and very narrow toe pads as well as uniform subcaudal scales (S. Baha El Din *in litt.*).

H. yerburii (Anderson, 1895) from Arabia and northern Somalia is a variable species (Fritz and Schütte, 1987) with a single row of preanal pores, composed by 4-8 pores in some populations, while 11-17 in Yemen; the tail is rather strongly depressed; in Somalia the first upper labial is excluded from the nostril in about 50% of specimens (Lanza, 1978); the specimens studied by Lanza show also dorsal tubercles arranged in regular longitudinal rows; the colour pattern is different.

Few other *Hemidactylus* species in nort-eastern Africa show large triedral tubercles on back and males with preanal pores and can be distinguished by the following characters: *H. bavazzanoi* Lanza 1978, *H. barbierii* Sindaco, Razzetti and Ziliani, 2007 and *H. foudaii* Baha El Din, 2003 are smaller (SVL to 44 mm), with very distinctive dorsal patterns that consists of well marked transverse bands, and preanal pores in a uninterrupted row. *H. citernii* Boulenger, 1912, is smaller (SVL to 36 mm), and together with *H. foudaii*, is unique among other East African *Hemidactylus* in being characterized by short free distal joints of the digits of the hand and fewer subdigital lamellae under the first toe (4-5). *H. arnoldi* Lanza, 1978, from northwestern Somalia is larger (SVL to 82 mm) and has broad dark transverse bars on back; the arrangement of the pores is unknown because any adult male has been discovered until now. *H. barodanus* Boulenger, 1901 is larger (SVL about 78 mm), has a pattern of brown dark-edged bands across the body, tail strongly depressed with the outermost row of tubercles forming a sharp ventro-lateral edge proximally, and preanal pores arranged in a single row. *H. taylori* Parker, 1932 (northeastern Somalia) has the unregenerated tail root-shaped, with the swollen basal portion marked by a basal constriction.

Also the only two Middle East and Indian "tuberculated" species with preanal pores only (see Giri and Bauer, 2008), *H. persicus* Anderson, 1872 and *H. porbandarensis* Sharma, 1981, are characterized by pores arranged in a single row, as well as *H. mindiae* from Sinai (Baha El Din, 2005).

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APPENDIX

Comparative material examined

H. angulatus, MCC R0570, MCC R1035
H. bavazzanoi, MZUF 21886 (holotypus)
H. barbierii, MSNPV-CR849 (holotypus), NMK-L/3054 (paratypus)
H. dracaenacolus, 3 specimens (MCC, MSNPV)
H. flaviviridis, 2 specimens (MCC, MSNPV)
H. granchii, MZUF 21189 (holotypus), MZUF 21114-18 (paratypi)
H. granti, 4 specimens (MCC, MSNPV)
H. homoeolepis, 20 specimens (MCC, MSNPV)
H. mabouia, MCC R803, R805, R902, R0903(1-2)
H. macropholis, MCC R1224(1-2); 1 es. MSNPV
H. platycephalus, MCC R1225
H. pumilio, 15 specimens (MCC, MSNPV)
H. robustus, 16 specimens (MCC, MSNPV); MZUF (many specimens)
H. yerburii pauciporosus, MZUF 6245 (holotypus) + many additional specimens
H. yerburii yerburii, MCC R0814