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# A new species of *Ophiomorus* (Squamata: Scincidae) from Maranjab Desert, Isfahan Province, Iran, with a revised key to the genus

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***Abstract.*—A new species, *Ophiomorus maranjabensis*, is described from Maranjab in the Kavir Desert in Iran. This new species is distinguished from other three-fingered, three-toed species by having parietals in contact posteriorly; prefrontals not in contact with upper labials, 22 scale rows at midbody, a large fifth supralabial, and a long preocular. A revised key to the genus is presented.**

**Key words.** New species, *Ophiomorus*, Iran, Isfahan Province, Maranjab, habitat

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## Introduction

The nocturnal burrowing skinks of the genus *Ophiomorus* have been collected less often than most other lizards in Iran. The first revision of the genus was that of Boulenger (1887) and not reviewed again until 1966 when Anderson and Leviton (1966) undertook the task and added an additional three species. They recognized an eastern group of the genus inhabiting the desert areas from Iran through southern Afghanistan and Pakistan to the Punjab, and a western group extending through the more mesic areas from Greece to the Zagros Mountains of Iran. These authors provided diagnoses and synonymies for all then-known species. Anderson (1999) summarized the Iranian species following the description of another species from the Iranian Plateau, *O. nuchalis* Nilson and Andrén 1978. A phylogenetic cladistic analysis was published by Greer and Wilson (2001). Their analysis confirmed *Ophiomorus* as a monophyletic genus and the eastern species clade as monophyletic. The western group of species was judged, somewhat tentatively, as polyphyletic in origin.

Three specimens of *Ophiomorus* were collected by Masood Farhadi Qomi and Seyed Mahdi Kazemi on 17 May 2011, in the Maranjab, south of Daryache Namak (salt lake), north of Isfahan, Iran. This site is situated about 52 km southwest of the type locality for *O. nuchalis*, the westernmost known species of the desert group.

Our specimens differ distinctly from other three-fingered species in several morphological aspects, and we here describe it as a new species.

The new species brings the number of species in the genus to 11. The genus is distributed from Greece to western India (see Sindaco and Jeremcenko 2008, for spot maps of all known museum specimens and published locality records of the genus).

## Diagnosis of the genus *Ophiomorus* (from Greer and Wilson 2001)

> The genus *Ophiomorus* may be diagnosed *vis-a-vis* the generally primitive scincid genus *Eumeces* on the basis of the following derived character states: nostril between an upper and lower nasal scale, both of uncertain homology …; prefrontal scales separated; frontal scale hour-glass shaped due to constriction of frontal by first supraocular (except in *O. latastii* …) …; supraoculars three (as opposed to four); supraciliary row incomplete lateral to most posterior supraocular, i.e., most posterior supraocular enters supraciliary row: frontoparietals separated;

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pretemporal single: lower eyelid with clear central disc; postsupralabial single; postmentals two (variable in *Eumeces*, hence possibly primitive in skinks): dorsal and lateral body scales with one or sometimes two (in tandem) minute pits in central posterior part of scale; digits 4/3 or less and phalanges 2.3.4.2/2.3.4 or less; premaxillary teeth modally < 6; presacral vertebrae > 45; sternal/mesosternal ribs < 3/l; inscriptional chevrons > 7…; thoracic and sometimes anterior lumbar ribs with dorsoanterio accessory processes.

## *Ophiomorus maranjabensis* Kazemi, Farhadi Qomi, Kami and Anderson

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**Holotype:** ZMGU (Zoological Museum Gorgan University) 2570, an adult female from Maranjab, south of Daryache Namak, Iran, N 34°19’52.78”, E 51°53’20.44”. Collected 17 May 2011 by M. Farhadi and S. M. Kazemi.

**Paratypes:** ZMGU 2571 and 2572, adult females, from Maranjab, about 1 km southwest of holotype, N 34°18’56.50”, E 51°52’45.15”.

### Diagnosis

An *Ophiomorus* with three fingers, three toes; distinctly enlarged nuchals; snout bluntly spatulate; interparietal broader than long; frontonasal septagonal; six supralabials, the fifth, greatly enlarged, below the eye. Parietals in contact behind interparietal; nuchals in contact behind parietals. Preocular very large, about two-thirds distance between eye and nostril, and in contact with third, fourth, and fifth supralabials. Twenty-two scales round the middle of the body.

### Description of holotype (ZMGU 2570)

Head depressed; snout cuneiform, with sharp angular labial edge; mouth inferior. Rostral with a triangular, convex, superior portion equal in length to two-thirds the width, the inferior portion slightly concave, lying entirely in front of the mouth, and equal in length to about two-thirds the width; the posterior angle of the rostral does not partially separate the supranasals; frontonasal septagonal, two thirds as broad as long, twice as long as the suture formed by the supranasals; frontal ten-sided, broader than long, interparietal slightly broader than long, equal with frontal, its straight anterior border forming a broad suture with the straight posterior border of the frontal; a pair of elongate, curved parietals, about one-third as broad as long, obliquely arranged, meet behind the interparietal to form a short suture; a pair of enlarged nuchal shields, in contact behind parietals. Nostril in the suture between the nasal and the supranasal, narrowly separated from the rostral: nasal three-fourths the length of the supranasal, as high as long; supranasal broader than long; prefrontals quadrangular and elongate, in broad contact with preocular, not in contact with supralabials; preocular very large, about two-thirds distance between eye and nostril, and in contact with third, fourth, and fifth supralabials; loreal as high as long, smaller than the preocular, three small supraoculars, size is 2 > 1 > 3; no frontoparietal; four or five elongate supraciliaries on each side; upper eyelid rudimentary; lower lid with a larger transparent scale, two postoculars. Six supralabials, fifth is very large, presumably as a result of fusion with the supralabial behind it, twice or more the size of adjacent labials and in contact with eye, postocular and preocular (below the eye, postocular and preocular), the 1st much smaller. No ear opening. Parietal eye not discernable.

Three toes, three fingers. Four scales on longest finger, seven scales on longest toe.

Mental quadrangular, the posterior border concave; two azygous postmentals, the posterior (second) much larger, first postmental in contact with first pair of sublabials, second postmental in contact with first, second, and third pairs of sublabials; a series of three enlarged shields on either side of the chin, bordering the infralabials, six supralabials, six sublabials.

The tail is broken approximately at one half its length, and the broken part has been retained.

### Color pattern

As in most of the eastern species, dorsal ground color golden tan, venter cream-white without markings. A dark stripe runs from nostril through eye along the length of body and tail. A dark roughly Y-shaped mark on the frontal and prefrontal; an approximately L-shaped mark on the front and center of the interparietal and a spot on the posterior part of that scale, ill defined spots on parietals and nuchals. Each paravertebral scale with a dark spot, these coalescing to form two dark lines down body onto tail, where they break up into lines of discrete dots that run the length of tail; two dorsolateral lines of discrete dots on either side of body and tail (Table 1; Figs. 2-5).

**Paratype (ZMGU 2571):** same as holotype, except a series of four enlarged shields on either side of the chin. Parietal eye visible in interparietal.

**Paratype (ZMGU 2572):** same as holotype, except third supralabial scale smallest, scales of second and forth in contact with each other on the right side. Parietal eye visible in interparietal.

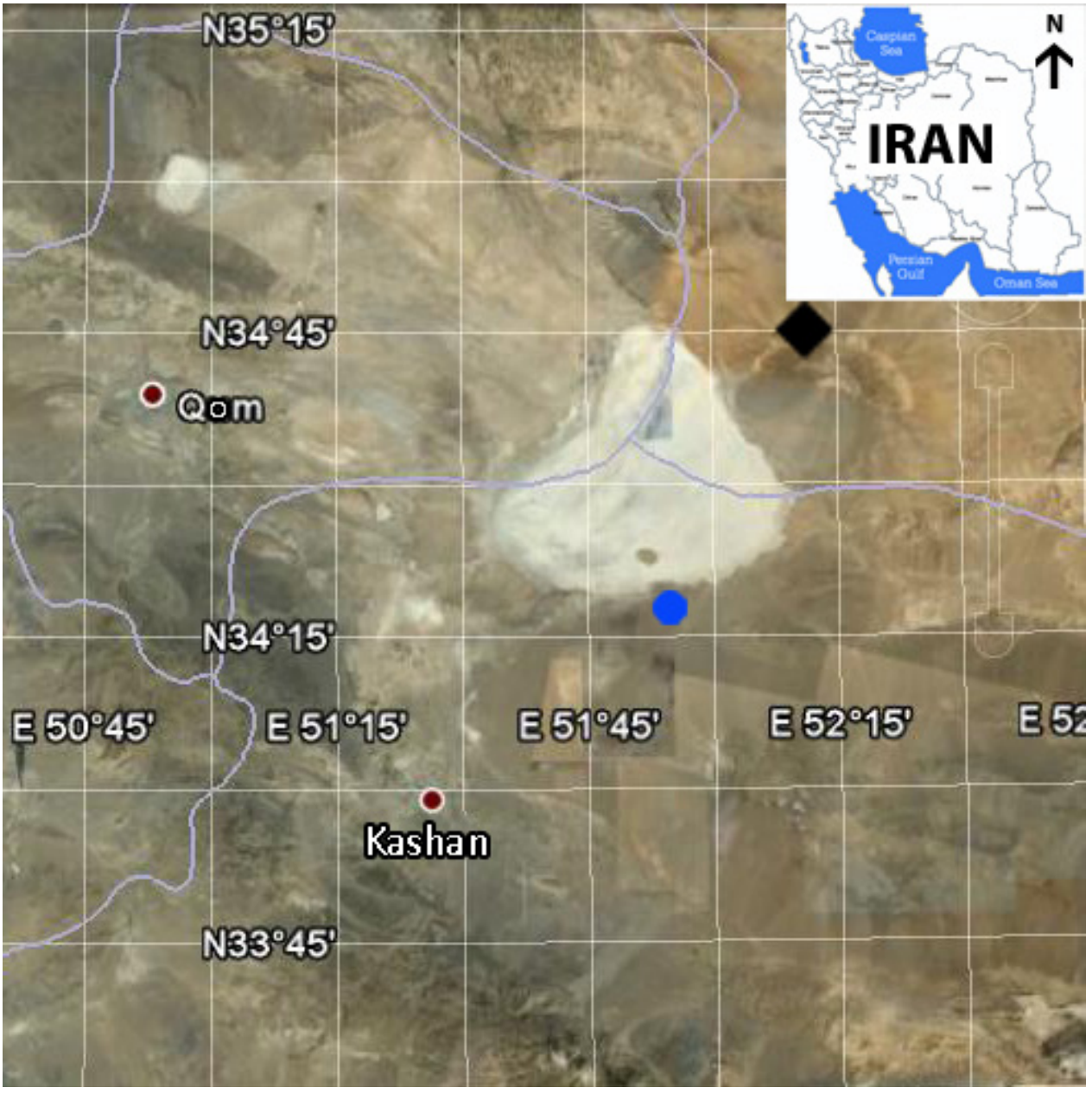
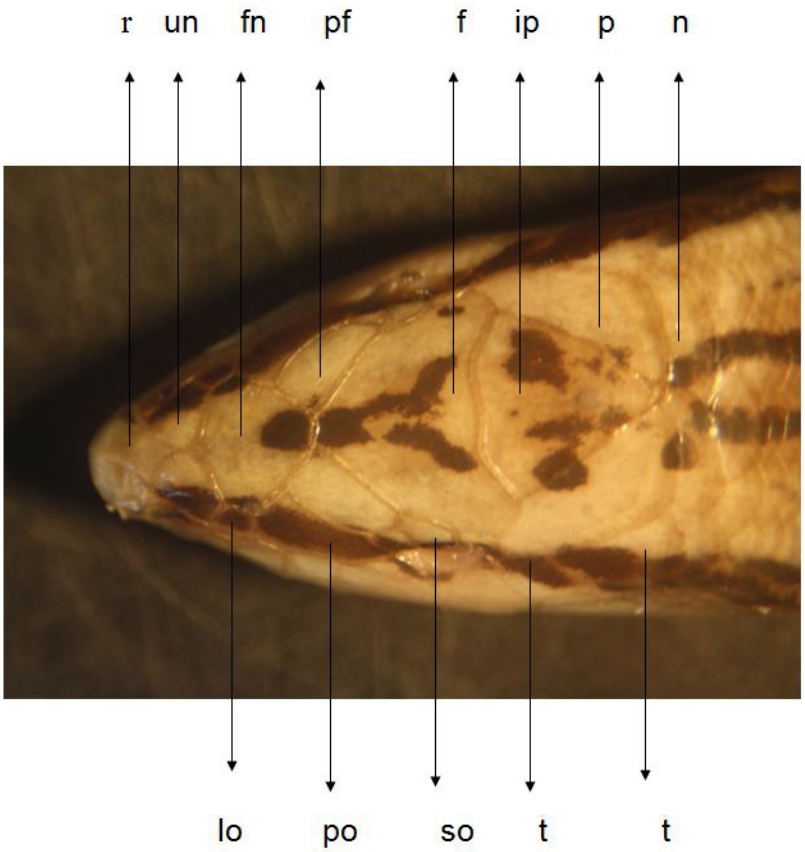
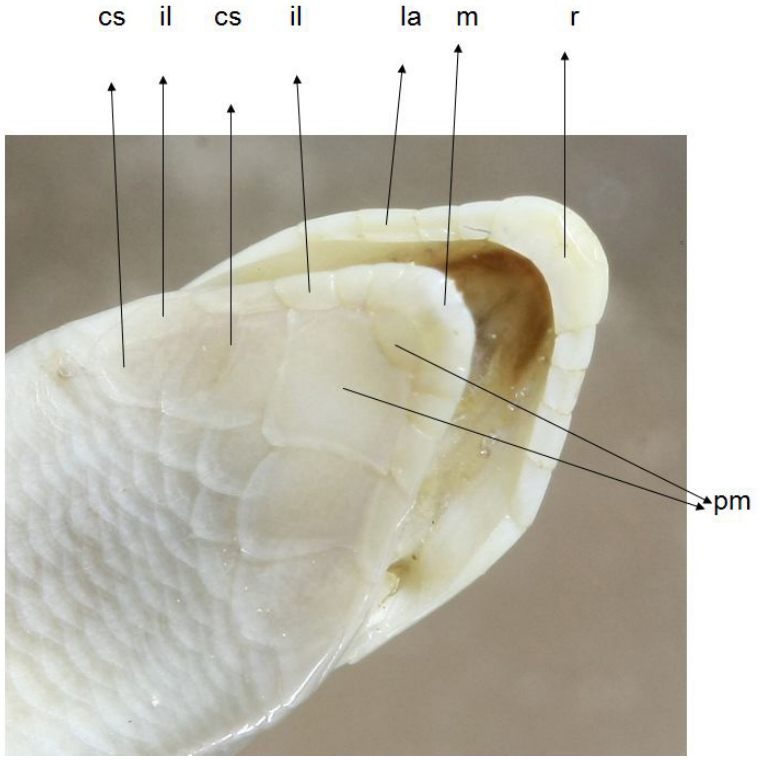



**Figure 1.** Places of specimen collection: black diamond, type locality of *Ophiomorus nuchalis* Nilson and Andrén, 1978; blue circle, type locality of *Ophiomorus maranjabensis* from Maranjab.

**Figure 2.** Live specimen. Holotype of *Ophiomorus maranjabensis* (ZMGU2570).




**Figures 3a and 3b.** Head scale nomenclature for *Ophiomorus maranjabensis*: cs – chin scale; fn–frontonasal; il – infralabial; ip – interparietal; la --upperlabial; lo – loreal; m – mental; n – nuchal; p – parietal; pm – postmental; po – preocular; ps – postsupralabial; r – rostral; so – supraocular; t – temporal; un – upper nasal.

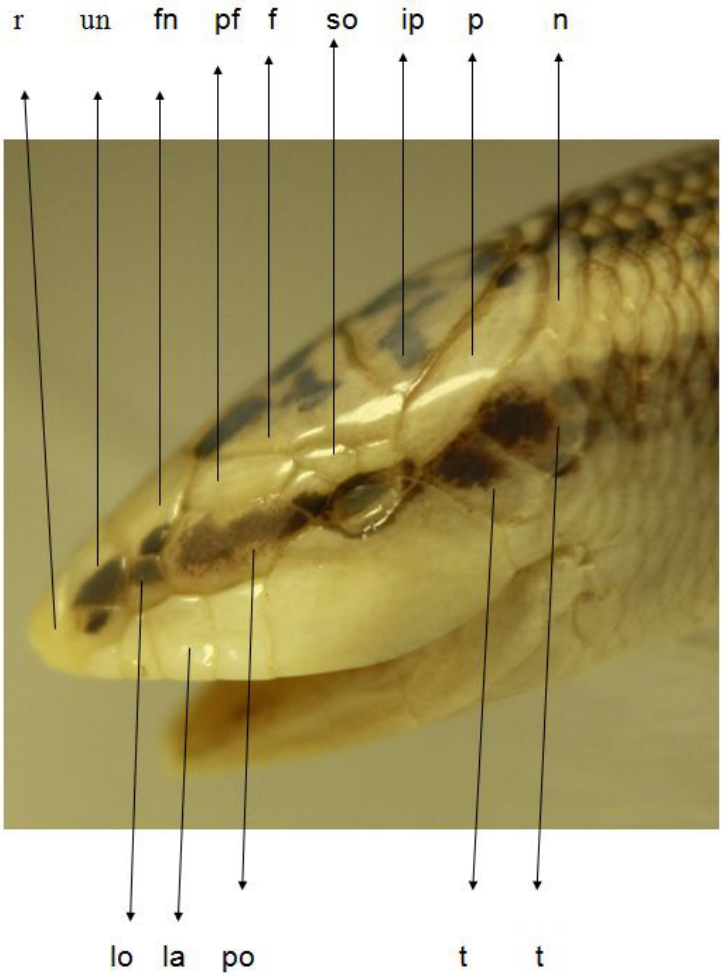



**Figure 3c.** Head scale nomenclature for *Ophiomorus maranjabensis*: cs – chin scale; fn–frontonasal; il – infralabial; ip – interparietal; la --upperlabial; lo – loreal; m – mental; n – nuchal; p – parietal; pm – postmental; po – preocular; ps – postsupralabial; r – rostral; so – supraocular; t – temporal; un – upper nasal.

**Figure 4.** *Ophiomorus maranjabensis*, forelimb.

**Figure 5.** *Ophiomorus maranjabensis*, hindlimb.

## Distribution

Known only from the holotype and paratypes (Map, Fig. 1). Gören Nilson (pers. comm.) reports finding tracks of an *Ophiomorus* (Fig. 7) in large numbers in a nearby region of the Kavir, Central Province, east of Abu Zeidabad at N 33º58'7.36", E 51º98'9.77" on 7 June 2000. They spent one night searching for it unsuccessfully. He was convinced, at the time, that it must have been an undescribed species, because the sand dune habitat was very different from that of *O. nuchalis* habitats, and geographical distance from other species. See Greer and Wilson (2001) for comparative characters and measurements for all species of the genus.

## Habitat

The type locality is in the Maranjab, north of Isfahan, Iran, situated south of salt lake (Daryache Namak).

Average yearly precipitation is 170.69 mm at the nearest meteorological station in Kashan, about 55 km to the southwest. During the hot summer months the mean recorded summer maximum air temperature is 40.39ºC and the mean minimum winter temperature 0.54ºC. The highest recorded temperature was 46ºC, and a minimum temperature of -9ºC. The collection site is in the lower hills at the southern border of the salt lake, about 185 km north of Isfahan.

The vegetation is low density. The vegetation includes *Alhagi*, Boraginaceae, *Heliotropium aucheri*, *Peganum harmala*, Poaceae, and *Rosularia*. Soil loose sandy, similar to substratum where other three-fingered, three-toed species of the genus are found.

## Natural History

The specimens collected were found at night in pitfalls. ZMGU 2571 was dead, probably owing to the daytime heat in the pitfall. Other reptile species, observed in the same habitat and living syntopically with *O. maranjabensis* are *Trapelus agilis agilis*, *Phrynocephalus maculatus maculatus*, *Eremias persica*, *Teratoscincus keyserlingii*, *Varanus griseus caspius*, and *Spalerosophis diadema shiraziana*.*

*Note on syntopy vs sympatry: As used here, *syntopy* refers to species living in the same locality and habitat that may hypothetically constrain the fundamental niches of one another. *Sympatry* refers to species that share all or part of their distributional ranges. Sympatry, while it may reflect historical biogeography, has little ecological relevance except, perhaps, at the most general biome level (See Anderson 1999).

## Discussion

The new species is closest morphologically to *Ophiomorus raithmai*, following the characters listed by Greer and Wilson (2001) and used in their cladistic analysis, and along with *O. raithmai* is separated from other members of the genus at their node 12. It is clearly distinct from that species in its much larger preocular, which blocks contact of the prefrontal with the supralabials, the parietals in contact behind the interparietal, and the nuchals in contact behind the parietals. This morphological resemblance is curious in light of the fact that *O. maranjabensis* is the westernmost species of the eastern clade, while *O. raithmai*, found in Sind Pakistan, and in western India, is the southeasternmost.

We were unable to obtain radiographs, and to compare skeletal characters with those examined by Greer and Wilson (2001) would require destructive dissection. This comparison must wait for a later study. We are not able to say what the similarities imply phylogenetically or biogeographically. One might speculate that the most evident head scale autapomorphies of the new species are derived character states.

The substrates into which the three-fingered species burrow are, at least superficially, similar. At this stage it is not fruitful to speculate as to how the various morphological specializations may be adaptively related to substrate differences. Detailed studies of the habitats of each of the species would be highly desirable.

For a detailed discussion of possible morphological evolution in the genus see Greer and Wilson (2001). There has not yet been a molecular study of the genus, and we hope that such a study may help to resolve aspects of the phylogeny, particularly about possible character reversals, and to establish at least a tentative timeline of speciation. *Ophiomorus tridactylus* is the most widely, but discontinuously distributed species; molecular studies may reveal distinct populations or cryptic species within this nominal taxon. To find most of the literature dealing with *Ophiomorus* see the bibliography of Southwest Asian herpetology by Leviton and Anderson (2010).

**Figure 6.** Habitat of *Ophiomorus maranjabensis*.

**Figure 7.** Tracks of *Ophiomorus maranjabensis* (courtesy of Gören Nilson).

**Table 1.** Counts and measurements for specimens examined.

| Measurements | ZMGU2572 Holotype | ZMGU2571 | ZMGU2570 |
|---|---|---|---|
| Supralabials | 6 | 6 | 6 |
| Infralabials | 6 | 6 | 6 |
| Supraoculars | 3 | 3 | 3 |
| Postoculars | 2 | 2 | 2 |
| Preoculars | 1 | 1 | 1 |
| Loreal | 1 | 1 | 1 |
| Mental | 1 | 1 | 1 |
| Postmental | 2 | 2 | 2 |
| Parietal | 1+1 | 1+1 | 1+1 |
| Frontoparietal | 0 | 0 | 0 |
| Scales round the middle of the body | 22 | 22 | 22 |
| One third of anterior | 22 or 23 | 21 | 22 |
| One third of posterior | 20 | 21 | 22 |
| Scales between interparietal and level of vent | 110 | 110 | 110 |
| Preanals | 2 | 2 | 2 |
| Fingers | 3 | 3 | 3 |
| Toes | 3 | 3 | 3 |
| Snout-vent (mm) | 75.25 | 69.6 | 84 |
| Tail (mm) | 43.7 | 51.4 | 64 |
| Length of head, from end of snout to angle of jaw (mm) | 6.6 | 5.9 | 7.2 |
| Length of snout, from tip of snout to anterior corner of eye (mm) | 4.15 | 3.6 | 4.3 |
| Hind limb length (mm) | 14.4 | 12.8 | 15 |
| Forelimb length (mm) | 5 | 4.6 | 5.4 |
| Width of head (mm) | 5 | 4.8 | 4.9 |
| Height of head (mm) | 4.4 | 4.4 | 4.7 |
| Axilla - groin (mm) | 56.5 | 51.9 | 65.5 |

## Revised key to the genus *Ophiomorus*

Based on Anderson and Leviton (1966), Nilson and Andrén (1978), Anderson (1999).

1a. Limbs absent, scale rows less than 20 at midbody ……. 2
1b. Limbs present, scale rows 20 or more at midbody ……. 3

2a. Prefrontals small; frontonasal half or less than half as long as the frontal; scale rows 18 around posterior third of body ……. *O. punctatissimus*
2b. No prefrontals; frontonasal much more than half as long as the frontal; scale rows 16 around posterior third of body ……. *O. latastii*

3a. Fingers 4, toes 3 …….. 4
3b. Fingers 3, toes 2 or 3 ……... 7

4a. Scale rows 20 at midbody …… *O. blanfordi*
4b. Scale rows 22 or more at midbody ……..... 5

5a. Scale rows 22 ……. 6
5b. Scale rows 24 …… *O. chernovi*

6a. Nuchals equal to or about 1-1/2 times size of dorsal scales …….. *O. brevipes*
6b. Nuchals about 2-1/2 times size of dorsals ……..….. *O. nuchalis*

7a. Toes 2 ……. *O. persicus*
7b. Toes 3 ..…… 8

8a. Parietals in contact posteriorly; prefrontals not in contact with upper labials ……... 9
8b. Parietals not in contact; prefrontals in contact with upper labials ……... 10

9a. 20 scales at midbody ……..……..……..……... *O. streeti*
9b. 22 scales at midbody ……..……..…….. *O. maranjabensis*

10a. Parietal in contact with anterior temporal; postocular scale about as large: as posterior suboculars; usually 7 or 8 scales on third (longest) toe ……..... *O. tridactylus*
10b. Parietal not in contact with anterior temporal (posterior temporal intervenes); postocular scale much larger than posterior suboculars; usually 4 scales on third (longest toe) ……...…...…… …… *O. raithmai*

**Etymology:** The species name refers to the name of the locality where it was discovered.

***Acknowledgments.***---We thank Gören Nilson for his remarks cited above and for the photograph of the tracks (Fig. 7).

## References

Anderson, S. C. 1999. *The Lizards of Iran*. Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA. 137 text-figs., distribution maps [unnumbered], 25 col. pls., 442 p.

Anderson, S. C. and Leviton, A. E. 1966. A review of the genus *Ophiomorus* (Sauria: Scincidae) with descriptions of three new forms. *Proceedings of the California Academy of Sciences*, Series 4, **33**(**8 July**):499-534, 8 figs.

Boulenger, G. A. 1887. Les espèces du genre Opiomore. *Bulletin de la Société zoologique de France* **12**:519-534. (In French).

Greer, A. E. and Wilson, G. D. F. 2001. Comments on the scincid lizard genus *Ophiomorus*, with a cladistic analysis of the species. *Hamadryad* **26**(**December**):261-271, figs. 1-5, 2 tables.

Leviton, A. E. and Anderson, S. C. 2010. *The Herpetological Literature for Southwest Asia an Indexed Bibliography*. Occasional Papers of the California Academy of Sciences, no. 67, 9082 entries, 622 p.

Nilson, G. and Andrén, C. 1978. A new species of *Ophiomorus* (Sauria: Scincidae) from Kavir Desert, Iran. *Copeia* **1978**(**December**):559-564.

Polaszek, A., Agosti, D., Alonso-Zarazaga, M., Beccaloni, G., de Place Bjørn, P., Bouchet, P., Brothers, D. J., Earl of Cranbrook, Evenhuis, N. L., Godfray, H. C. J., Johnson, N. F., Krell, F. T., Lipscomb, D., Lyal, C. H. C., Mace, G. M., Mawatari, S. F., Miller, S. E., Minelli, A., Morris, S., Ng, P. K. L., Patterson, D. J., Pyle, R. L., Robinson, N., Rogo, L., Taverne. J., Thompson, F. C., van Tol, J., Wheeler, Q. D., and Wilson, E. O. 2005a. Commentary: A universal register for animal names. *Nature* **437**:477.

Polaszek, A., Alonso-Zarazaga, M., Bouchet, P., Brothers, D. J., Evenhuis, N. L., Krell, F. T., Lyal, C. H. C., Minelli, A., Pyle, R. L., Robinson, N., Thompson, F. C., and van Tol, J. 2005b. ZooBank: the open-access register for zoological taxonomy: Technical Discussion Paper. *Bulletin of Zoological Nomenclature* **62**(**4**):210-220.

Sindaco, R. and Jeremcenko, V. K. 2008. *The Reptiles of the Western Palearctic.1. Annotated Checklist and Distributional Atlas of the Turtles, Crocodiles, Amphisbaenians and Lizards of Europe, North Africa, Middle East and Central Asia*. Monografie della Societas Herpetologica Italica. Volume I. Edizioni Belvedere, Latina, Italy. 248 col. photos, 226 col. maps, 579 p.

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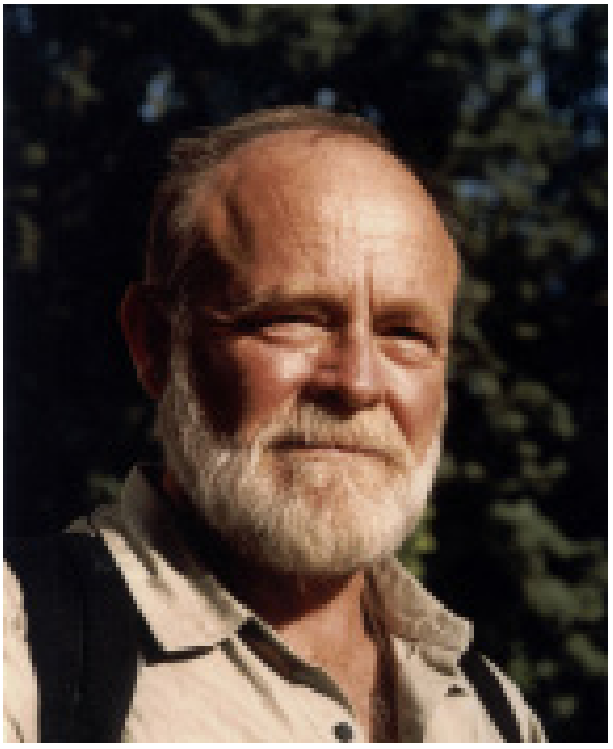
**Haji Gholi Kami** earned his bachelor of science degree in biology from Gilan University, Rasht city, Iran in 1987, and his masters of science degree in animal sciences from Tehran University, Tehran, Iran in 1991, where he studied amphibians of Turkmen Sahra and reviewed other Iranian amphibians. He began his Ph.D. program in Gorgan (Iran) and Astrakhan (Russia) universities in 2001, under the advisement of Professor Bahram Hassanzadeh Kiabi, and graduated in 2007. His research interests include taxonomy and ecology of Iranian amphibians and reptiles.

**Steven C. Anderson** has been involved with the herpetology and biogeography of Southwest Asia for more than 50 years. He first visited Iran, for nine months, in 1958 to collect material and make observations for his Ph.D. dissertation. At that time, his focus was on Khuzistan Province in southwestern Iran. Steve received his doctorate from Stanford University in 1966. Since that time, he has visited all of the principal geographical regions of Iran, as well as worked in Afghanistan and Turkey. Dr. Anderson has published well over 100 papers on the herpetofauna of Southwest Asia and three books. Many of these works were written with his co-author and collaborator, Dr. Alan E. Leviton of the California Academy of Sciences. From 1963 to 1970 Anderson worked as an associate curator at the California Academy of Sciences in San Francisco,



followed by 26 years as a professor at the University of the Pacific, while continuing as a research associate and fellow of the Academy. Since retirement in 1996, he has focused on promoting herpetology in Iran and encouraging and collaborating with students and faculty there. Dr. Anderson has also been a contributor and consulting editor (fauna) with *Encyclopaedia Iranica* since its inception.

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