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A NEW SPECIES OF THE WESTERN INDIAN OCEAN GECKO *AILURONYX* (REPTILIA; GEKKONIDAE)

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A new species of gecko of the genus *Ailuronyx* is described from the Seychelles islands of Mahé and Praslin. This species, *Ailuronyx tachyscopaeus*, differs from previously described species in being smaller, having fewer femoro-anal pores in the males and distinct squamation. Some ecological observations are made concluding that the species is locally abundant in native palm forest.

INTRODUCTION

The genus *Ailuronyx* is recorded from the Seychelles islands and Madagascar. Two species have been described previously: the type species *A. seychellensis* (Duméril & Bibron, 1836) from several of the Seychelles islands and *A. trachygaster* (Duméril & Bibron, 1851) which is known only from the holotype. The provenance information for the latter is "Madagascar"; collection data are lacking and it is possible that Madagascar may have been its port of shipment to Paris rather than its collection locality (Bauer, 1990; Ineich *pers. comm.*). Thus the genus may be endemic to the Seychelles islands.

Since the original description of the genus there have been few published studies of it. A small number have included the genus in broader taxonomic studies (Russell, 1972) and there have been some preliminary ecological investigations (Cheke, 1984; Evans & Evans, 1980; Henkel & Zobel, 1987). The most detailed of these (Henkel & Zobel, 1987) included observations of both wild and captive geckos, and suggested that up to three species may be present in the Seychelles. A karyological study of two colour morphs failed to demonstrate specific differences (Volobouev & Ineich, 1994).

In 1993 several small *Ailuronyx* were observed in a house at Anse Royale, Mahé by M. Kirkpatrick. This is an unusual habitat for the genus on Mahé (although it is frequently anthropophilic on Fregate, Praslin and Aride, *pers. obs.*). One was caught on 1 January 1994 and photographed. Subsequent comparisons with specimens in the British Museum (Natural History) suggested that it was not a typical *A. seychellensis*. The photographs appeared to resemble the dwarf form described by Henkel & Zobel (1987). In July 1994 searches were made for this dwarf form at La Reserve, Mahé, where small *Ailuronyx* had been observed in previous years. Five specimens were caught, measured and kept for four weeks, one of these was preserved, the others released. A number of 'dwarf' specimens were also observed in the Vallée de Mai, Praslin, where the dwarf form had been reported (Henkel & Zobel, 1987). Comparisons were made with *A. seychellensis* revealing differences that led to the conclusion that the dwarf form should be regarded as a distinct species. The differences between the species are discussed and the two Seychelles species described below.

MATERIALS AND METHODS

A number of characters were recorded and compared with specimens of *A. seychellensis* in the British Museum (Natural History) and the Muséum national d'Histoire naturelle, Paris. The characters used were measurements of snout-vent length, snout length (the distance between the tip of the snout and the anterior margin of the eye), eye diameter, eye-ear distance (between the posterior margin of the eye and the anterior margin of the ear), head width and counts of the number of supra-ocular spines, upper and lower labials, femoro-anal pores and lamellae on the 4th toe of the right hind foot. Lamellae were defined as scales that were at least twice as long as wide. For labials, all scales along the mouth edge that were distinct from granular scales were included. In addition, the squamation was examined under a binocular microscope on preserved museum specimens and on skin fragments from museum specimens and from the live collected individuals.

MEASUREMENTS

No significant measurement differences were detected between the two forms or any of the island populations using *t*-tests of the data collected.

COUNTS

The numbers of upper and lower labials, lamellae and femoro-anal pores were compared to snout-vent length using Pearson's correlation coefficients. No significant correlations were found ($P>0.1$ in all cases)

indicating that these counts do not change with growth.

t-tests comparing data from *A. seychellensis* and the 'dwarf' specimens were performed on the counts of lamellae, labials and femoro-anal pores. Significant differences were found in the number of upper labials ('dwarf' = 15.6±0.2, *A. seychellensis* = 17.2±0.7, t=2.66, P=0.011); and femoro-anal pores ('dwarf' = 14.8±1.3, *A. seychellensis* = 23.9±5.2, t=8.32, P=0.001). This difference in counts of femoro-anal pores could indicate either that the 'dwarf' and typical forms represent different taxa or that the 'dwarf' form is a sub-adult stage. In order to distinguish between these possibilities the femoro-anal pores of the captive males were examined daily to determine whether or not pore development was complete. Two specimens had fully developed continuous rows of 15-16 large, darkly pigmented pores on capture, the number of pores remained constant during the period of observation. The remaining male lacked any detectable pores when collected but had a continuous row of 15 pores when released. These developed from the centre and edges of the row. A week before the specimen was released new pores stopped developing (all gaps in the row having been filled) and dark pigmentation appeared. This pattern of development suggests that maturity in 'dwarf' males is reached at a snout-vent length of approximately 68 mm. A female of 76 mm snout-vent length had obvious enlarged endolymphatic sacs confirming that these are not immature *A. seychellensis*. Sexual maturity of the 'dwarf' form is further demonstrated by the captive reproduction recorded by Henkel & Zobel (1987).

SQUAMATION

Significant differences were apparent between the two forms. The 'dwarf' was noticeably smoother skinned than equivalent sized *A. seychellensis* demonstrating that this difference is not explicable by ontogenetic processes although some minor squamation differences were detectable between juvenile and adult *A. seychellensis*. Scales from the backs and tails of adult and juvenile *A. seychellensis* and from a 'dwarf' are shown in Fig. 2. These are described in full in the descriptions below.

Museum specimens allowed comparisons to be made between individuals from a number of islands (Aride, Cousin, Cousine, Fregate, Mahé, Praslin and Silhouette). No significant differences could be found between the island samples using *t*-tests of the characters described above. 'Dwarf' specimens were identifiable in Mahé and Praslin samples based on the squamation differences described above. Museum specimens of *A. seychellensis* covered a broad ontogenetic range, allowing the separation of phylogenetically significant characters from those related to development.

These comparisons demonstrate that two forms of *Ailuronyx* are recognisable in Seychelles. One of these corresponds to the species *A. seychellensis* and is found on many islands. No significant morphological variation is detectable between islands. The second form has previously been recorded as a 'dwarf' form (Henkel & Zobel, 1987). This is present on at least two islands (Mahé and Praslin) where it coexists with *A. seychellensis* (Henkel & Zobel, 1987; *pers. obs.*). The consistent differences in squamation and scale counts indicate that this 'dwarf' form is taxonomically distinct from *A. seychellensis*; its presence on two islands and its sympatric occurence with *A. seychellensis* demonstrate that the two forms are not merely local variants and are distinct at the species level. Accordingly the 'dwarf' form is described below, following a full description of the type species of the genus, *A. seychellensis*.

SPECIES DESCRIPTIONS

GENUS

Ailuronyx Fitzinger, 1843

TYPE SPECIES

Ailuronyx seychellensis (Duméril & Bibron, 1836)

DIAGNOSIS

Predominantly nocturnal geckos with granular dorsal scales; supra-ocular spines usually present. Pupil vertical. Lamellae on toepads undivided; a large claw is present on each digit, claws asymmetrically positioned. Femoro-anal pores and hemipenial pouches present in males; cloacal spurs may be present in large specimens.

Ailuronyx seychellensis (Duméril & Bibron, 1836)
Platydactylus Seychellensis Duméril & Bibron, 1836: 310
Thecodactylus (Ailuronyx) sechellensis Fitzinger 1843: 19
Teconyx sechellensis Gray 1845: 159
Aeluronix seychellensis Agassiz 1846: 9
Ailuronyx seychellensis Rendahl 1939; 257

SYNTYPES

Two adult male syntypes in the Muséum national d'Histoire naturelle, Paris (MNHN 2269 & 6677). Collected by Péron & Lesueur; locality given as Seychelles without further details. Described by Duméril & Bibron (1836).

MATERIAL STUDIED

Forty-one specimens in the British Museum (Natural History) and 12 in the Muséum national d'Histoire naturelle, Paris.

TABLE 1. Morphometric data of *Ailuronyx* spp.

A. seychellensis	Range	Mean	SD	*n*	Syntype MNHN 2269	Syntype MNHN 6677
Snout-vent length	81-116	101.5	7.6	53	111	114
Head length	18-31	26.1	3.2	53	24	25
Head width	17-25	21.5	1.8	53	22	24
Snout length	8-14	11.9	1.5	53	10	11
Eye diameter	4-7	5.3	0.8	53	6	6
Eye-ear distance	6-10	7.9	0.9	53	8	8
Snout angle	30-42	40.5	0.5	53	42	40
Upper labials	12-19	15.2	0.8	53	15	15
Lower labials	12-16	13.5	0.9	53	13	13
Postmental number	7-9	8.5	0.3	53	9	8

A. tachyscopaeus	Range	Mean	SD	*n*	Holotype MNHN 1994.3109	Paratype BMNH 1907.10.15.54
Snout-vent length	56-84	69.2	9.1	7	68	84
Head length	13-20	17.8	2.5	7	18	19
Head width	12-18	14.9	2.2	7	14	16
Snout length	6-10	8.7	1.5	7	9	10
Eye diameter	3-4	3.9	0.4	7	4	4
Eye-ear distance	4-6	5.0	0.6	7	5	5
Snout angle	15-25	20.0	4.0	7	18	20
Upper labials	15-19	18.2	0.5	7	18	18
Lower labials	13-19	17.0	0.3	7	16	17
Postmental number	9	9.0	0	7	9	9

DISTRIBUTION

Endemic to Seychelles; Mahé, Praslin, Aride, Cousin, Cousine, Silhouette, Fregate.

DIAGNOSIS

Large adult size (up to 116 mm snout-vent length); rostral contacts nostril; snout descending steeply; body covered with conical granular scales, rough in appearance; caudal scales regular, pentagonal, with longitudinal ridges on their posterior edges; 20-34 femoro-anal pores.

DESCRIPTION

Measurements, body and squamation. Measurements are given in Table 1. The snout descends rapidly, forming an angle of almost 45° with the lower jaw (range = 30-42°). The rostral always contacts the nostril, which is contacted at its anterior border by the rostral, nasal, supranasal and postnasal (Fig. 1.). Upper labials number 12-19 and lower labials 12-16. The mental is pentagonal and equal in size to the adjacent labials. There are 7-9 postmentals. These data are summarised in Table 1.

The scales on the head, dorsal surface of the body and limbs are granular, those on the tail and ventral surfaces flat and angled posteriorly. On the head the scales are small (approximately 0.3 mm wide in adults) and conical, irregular in size and arrangement. Those on the back are larger and more elevated (up to 1.2 mm wide and 1.4 mm high in adults). On the midline of the body the scales are regularly arranged, trapezoid in basal section and slightly depressed on the posterior facets, resulting in their projecting backwards. This regularity is also found on the scales of the limbs which are smaller and do not project backwards. All granular scales have a regular ornamentation of fine radial ridges, at a density of approximately 32 mm^{-1}. Juvenile specimens lack the regular arrangement on the midline but share the arrangement and density of ridges. The tail and underside have regularly arranged pentagonal flat scales, those on the underside being smooth whereas the tail scales are ornamented with six longitudinal ridges on the posterior margin. The scales

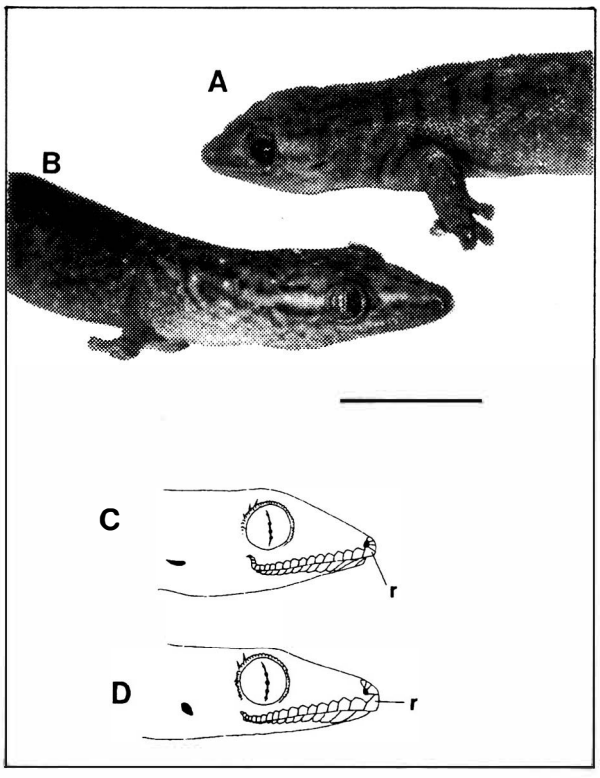

FIG. 1. Heads of Seychelles *Ailuronyx*. A, *A. seychellensis* (MNHN6677). Scale bar = 40 mm. B, *A. tachyscopaeus* (MNHN1994.3109). Scale bar = 20 mm. C, *A. seychellensis* showing arrangement of scales on the snout (r = rostral). D, *A. tachyscopaeus* showing arrangement of scales on the snout (r = rostral).

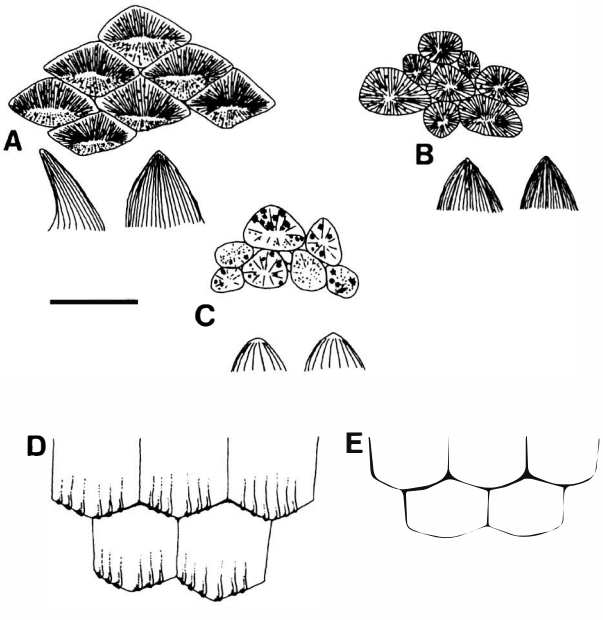

FIG. 2. Scales of Seychelles *Ailuronyx*. A, *A. seychellensis* (adult) - dorsal mid-line scales in dorsal, lateral and anterior views. B, *A. seychellensis* (juvenile) - dorsal mid-line scales in dorsal, lateral and anterior views. C, *A. tachyscopaeus* (adult) - dorsal mid-line scales in dorsal, lateral and anterior views. D, *A. seychellensis* - tail scales. E, *A. tachyscopaeus* - tail scales. Scale bar = 1mm.

on the base of the tail of adult specimens are up to 0.9 mm wide, 0.8 mm long at the margins and 0.9 mm long at the centre. One to seven supra-orbital spines are present above each eye in some specimens (41.5% of those examined lack spines; if spines were present they numbered on average 3.3); on average these are 0.9 mm long, but they may approach 2 mm. There are 20-28 lamellae on the 4th right hind toe. Femoro-anal pores are present in adult males only, numbering 20-34 (mean = 23.9±5.2). The smallest individuals with detectable femoro-anal pores had a snout-vent length of 73 mm. Fully developed pores were not observed in specimens below 95 mm snout-vent length. A single pair of cloacal spurs is present in some males.

Colouration. Two colour patterns are apparent; one is a pale fawn colour with paler speckling, the other is a complex pattern of dark brown, fawn and white spots. A pale band along each side of the head is visible in both forms. These two patterns are exhibited by the same individual, the pale colour being the normal pattern and the darker corresponding to the alarm pattern described by Henkel & Zobel (1987). The two patterns are shown in Fig. 1., where (A) (*A. seychellensis* syntype) exhibits the normal patterning and (B) ('dwarf' form) exhibits the alarm pattern. The conspecificity of specimens with different colour patterns (and hence their lack of phylogenetic significance) has been confirmed from karyological data (Volobouev & Ineich, 1994).

Ailuronyx tachyscopaeus sp. nov.

HOLOTYPE

Holotype in the Muséum national d'Histoire naturelle, Paris (MNHN 1994.3109); caught at La Reserve, Mahé 26/6/94, died in captivity 13/7/94 - adult male.

PARATYPE

Paratype in the British Museum (Natural History) (BMNH1907.10.15.54); collected at Anse Marie Louise, Praslin by the Percy Sladen Memorial Expedition 1907 - adult male.

MATERIAL STUDIED

One specimen caught and released at Anse Royale, Mahé 1/1/93. Five specimens, including holotype, caught (all released except for holotype) at La Reserve, Mahé 26/6/94 & 23/7/94. One specimen (paratype) in the British Museum (Natural History) (BMNH 1907.10.15.54). In addition nine specimens were observed but not caught at La Reserve, Mahé, 23/7/94 and Vallée de Mai, Praslin 27/7/94.

DISTRIBUTION

Identity confirmed on Mahé (La Reserve, Anse Royale) and Praslin (Vallée de Mai, Anse Marie Louise).

DIAGNOSIS

Small adult size (up to 84 mm snout-vent length); rostral not contacting nostril; snout tapering gradually; granular scales, small low cones; caudal scales regular, smooth with curved posterior margins; five supraorbital spines, the third directed posteriorly; 13-16 femoro-anal pores.

ETYMOLOGY

The specific name *tachyscopaeus* is a composite of *tachys* (Greek for swift) and *scopaeus* (Latinization of the Greek *skopaios*, meaning dwarf). This refers to the rapid movements and agility of the species in comparison to the more inactive *A. seychellensis* and to its original identification as a dwarf form of that species.

DESCRIPTION

Measurements, body and squamation. Measurements are given in Table 1. The snout tapers gradually, its angle with the lower jaw not exceeding 25° (range = 15-25°). There are 15-19 upper labials and 13-19 lower labials. The rostral does not contact the nostril, which is bounded on its anterior border by the nasal, supranasal and post-nasal (Fig. 1.). The mental is pentagonal in shape and equal in size to the adjacent labials. There are nine postmentals. These data are compared to *A. seychellensis* in Table 1.

As in *A. seychellensis* the scales on the head, dorsal surface of the body and limbs are granular and those on the tail and ventral surfaces are flat and cycloid. The scales on the head are small (less than 0.25 mm wide) and conical, irregular in size and arrangement. Those on the back are distinctly flatter than those of *A. seychellensis* (being at most only 0.3 mm high, compared with 1.4 mm and 0.8 mm in adults and juveniles of the former species respectively). There are no regions with regular granular scales. The ridges on the granular scales are less dense than they are on *A. seychellensis*, numbering fewer than 12 mm^{-1}. The tail and underside have regularly arranged pentagonal flat scales with curved posterior margins; all are smooth. The scales on the base of the tail are equal in width to those of *A. seychellensis* (0.9 mm) but are shorter, being only 0.6 mm at the longest point. The number and arrangement of supra-orbital spines appears to be highly conservative in this species. All the specimens examined possessed five spines, the third of which is posteriorly directed. At their longest the spines measure 0.42 mm; up to two of the spines may be only 0.1mm long and are hard to detect. There are 20-24 lamellae on the 4th right hind toe. All the digits are terminally expanded and clawed. Femoro-anal pores are present in adult males only, numbering 13-16 (mean = 14.8±1.3, n=5). The smallest male caught (61 mm snout-vent length) had detectable femoro-anal pores. Fully developed pores were only found in males over 68 mm snout-vent length. No cloacal spurs have been observed.

Colouration. The colour patterns of *A. seychellensis* are also found in *A. tachyscopaeus*.

SUMMARY OF DIFFERENCES

A. tachyscopaeus differs from *A. seychellensis* in its smaller adult size, less steeply angled snout, the rostral not contacting the nostril, the flatter and smoother squamation, the cycloid shape of the ventral and tail scales and the lower number of femoro-anal pores. These differences are constant and cannot be attributed to ontogenetic, sexual or geographical factors.

ECOLOGICAL NOTES

The surveys undertaken in June-July 1994 involved the collection of live specimens and the counting of all individuals along transect lines. Specimens caught were identified using the diagnostic characters in the species descriptions. Other specimens were examined closely and identified on the basis of the smoothness or roughness of the scales. In most cases the geckos could be approached closely enough to be examined with a hand-lens even if they eventually evaded capture. At La Reserve on Mahé only *A. tachyscopaeus* were found; these were in the partially rolled-up leaves of the palm-like hypoxidacean shrub *Curculigo sechellensis*. The species had previously been encountered at the same site between hanging dead leaves of the palm *Phoenicophorium borsigianum*. A total of nine were found in eight clumps of *C. sechellensis* (or 42% of the clumps along a 100 x 2.5 m transect), giving a density of 400 per hectare. This may be an under-estimate as it does not include individuals living in the palm leaves overhead. On Praslin *C. sechellensis* is uncommon and all *Ailuronyx* were seen on the trunks and leaves of the palm *Lodoicea maldivica*. Only five (four *A. tachyscopaeus* and one *A. seychellensis*) were seen along a 1900 x 6 m transect, giving a density of 0.9 per hectare for *A. seychellensis* and 3.4 for *A. tachyscopaeus*. The transect method does not provide reliable estimates in this habitat, due to the vegetation structure.

Previous reports have claimed that *Ailuronyx* are rare on Mahé (Evans & Evans, 1980; Cheke, 1984; Gardner, 1986), this study demonstrates that they are locally abundant in areas of suitable palm forest. However, it should be noted that this habitat type is very restricted on Mahé. These data, and the recent rediscovery of *A. seychellensis* at four different localities on Silhouette (*pers. obs.*; Gerlach 1993; Oxford University Silhouette Expedition 1990; Matyot *pers. comm.*) where it had been believed to be extinct (Cheke, 1984; Gardner 1986), suggest that *Ailuronyx* spp. are dependent on palm forest on the larger islands and that the restriction of this habitat has resulted in their being overlooked on Mahé and Silhouette, rather than that

they have declined as a result of the introductions of rats (*Rattus rattus*, *R. norvegicus*) or tenrecs (*Tenrec ecaudatus*).

Observations on captive *A. tachyscopaeus* show that, like *A. seychellensis,* it is predominantly, although not exclusively, nocturnal. The behaviour of "alarm skin-shedding" (Bauer *et al.*, 1989; Evans & Evans, 1980; Henkel & Zobel, 1987; McKeown & Miller, 1985) is found in both species. Captive *A. tachyscopaeus* consumed moths and a large earwig but refused a variety of large and small dipteran flies.

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