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Formal description of the new lizard species inhabiting in Eastern Anatolia, Turkey

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Abstract

Acanthodactylus Wiegmann, 1834 is one of the widespread lizard genus in North Africa, southern Europe, Asia Minor to the Iberian Peninsula and east through the Arabian Peninsula and western India. We recently discovered *Acanthodactylus ilgazi* from Eastern Anatolia Turkey. However, a nomenclatural clause for electronic publishing of species names according to the Code of International Nomenclature caused the new name has been unavailable up to now. Therefore, here we formally describe *A. ilgazi*. In addition to that, the description of the male specimen is given for the first time for this species.

Keywords: Reptiles, taxonomy, *Acanthodactylus ilgazi*, nomenclature

Introduction

In one of the recent issues of the peer-reviewed scientific online-only journal “Journal of Wildlife and Biodiversity” (Kurnaz and Şahin, 2021) ^[1], we described a new fringe-toed lizard from Yazlıhan, Malatya (Eastern Anatolia, Turkey). We introduced the new lizard species to the scientific world with two fundamental methodologies. Firstly, we presented the new lizard species morphological characters and how it differentiates from other close *Acanthodactylus* species. Secondly, based on genetic data, we demonstrated where the new taxon as a unique clade, is located in the phylogenetic tree.

Therefore, our paper on the contribution to the taxonomic knowledge of *Acanthodactylus* through an extensive nomenclature search (see below) and detailed analysis, it was obvious that the new clade needed to be named in a species level. As a consequence of these evaluations, we described this new lizard species as *Acanthodactylus ilgazi*, a tribute to Çetin Ilgaz, who dedicate himself for exploring Anatolian herpetology.

However, although our description (Kurnaz and Şahin, 2021) ^[1] provided all preconditions to describe the new species, including morphology and phylogenetic relationships, genetic diversity (comparison to other *Acanthodactylus* species), etymology, geographic distribution, habitat pattern and threats, etc., it was brought to our attention that one criterion from the Code of Zoological Nomenclature was not met. The registration in the Official Register of Zoological Nomenclature (ZooBank) was approved after the publication date of the species description (Kurnaz and Şahin, 2021) ^[1]. Namely, Article 8.5.3.3 of the Code states “An error in stating the evidence of registration does not make a work unavailable, provided that the work can be unambiguously associated with a record created in the Official Register of Zoological Nomenclature before the work was published.” Due to our study (Kurnaz and Şahin, 2021) ^[1] was published earlier than the Zoobank registration (online early access), the name *Acanthodactylus ilgazi* has become unavailable (*nomen nudum*) under these circumstances. Therefore, to become the species name valid, a description with a proper Zoobank registration in a printed publication for species description is required. For instance, the Ticinese tree frog, *Hyla perrini*, was described as a new species with remarkable scientific evidences, however, due to its publication process could not follow the Code of International Nomenclature, the researchers needed to document this situation via a new paper for the formal description of the new frog species (Dufresnes *et al.*, 2018) ^[2]. Therefore, we here formally describe the new fringe toed lizard species like how Dufresnes *et al.*, 2018 did for the Ticinese tree frog.

***Acanthodactylus ilgazi* sp. nov. (Text partially cited from Kurnaz and Şahin, 2021)**
Identity and diagnosis

Acanthodactylus ilgazi sp. nov. is medium sized (SVL: 73.60-77.40 mm; Total length

144.40-157.30 mm) and robust body. The head is relatively more convex in all specimens; parietals and supraoculars are moderately keeled; suboculars on both sides reach the mouth, four supralabials (rarely three) in anterior of suboculars; two supraocular plates on the head, 1st and 4th supraoculars fragmented. One or two rows of granules are present between supraoculars and supraciliaries; four unpectinated scales on the ear opening; medium sized circle of unkeeled temporals; suboculars keeled in upper side; 23-28 gularia between third inframaxillary and collars. The last 3-4 rows of gularia are as collars; generally, 10 longitudinal rows of ventral plates, and 28-31 ventral series in a longitudinal row along the belly between collar and preanal; 48-50 (mean 49) dorsal midbody scales, imbricated and not keeled. They are larger in the middle of the dorsum and are smaller towards the lateral sides; 19-23 femoral pores on the right side. The tail length is almost equal to SVL in all specimens. Four rows of scale series on the fingers (one smooth scale in upper side, two pectinated scales in lateral side and one scale with three carina underside); toes with three carinated scales on the subdigital lamellae; 21-22 pectinated lamellae beneath 4th toe.

Acanthodactylus ilgazi sp. nov. is a typical member of the tristrami species-group, differing from the other members of the species-group by the following characters: *Acanthodactylus ilgazi* sp. nov. differs from *A. orientalis* in that there are two unfragmented supraocular plates (vs. three in *A. orientalis*); four rows of scale series on the fingers (vs. three in *A. orientalis*); reddish coloration of the underside of the tail, and the white or grayish stripe on the dorsum. *Acanthodactylus ilgazi* sp. nov. differs from *A. robustus* in that the subocular plates contacts the lower lip between 4th and 5th supralabials; lower number of ventral plates (10 vs. 12, respectively); lower number of dorsal scale (max. 50 vs 51-60, respectively) and lower number of unfragmented supraocular plaques (2 vs. 3, respectively). *Acanthodactylus ilgazi* sp. nov. differs from *A. tristrami* in that there is lower number of dorsal scales (max. 50 vs. 52-64); four rows of scale series on the fingers (vs. three in *A. tristrami*); reddish coloration of the underside of the tail, and the white or grayish stripe on the dorsum.

Holotype

An adult female specimen (ZDEU 2/2020-1), collected from a rural area in Yazihan, vicinity of Boztepe and Koşar villages, Malatya Province (Lat: 38° 41' 32" N - Long: 38° 10' 13" E and about 950 m a.s.l.) in Eastern Anatolia, Turkey, during a field study on 16 August 2020, by Kurnaz and Şahin. Full details, including morphological measurements and photos are available in Kurnaz and Şahin, 2021 ^[1].

Paratypes

A female (ZDEU 2/2020-2) and juvenile specimen (ZDEU 2/2020-3) with collection details as the holotype. Full details, including morphological measurements and photos are available in Kurnaz and Şahin, 2021 ^[1].

Description of the male specimen

The morphological characteristics of the male specimen are as follows (Figure 1): A robust but not depressed, body shape. Head length (17.12 mm) and head width (13.12 mm); the length-width ratio of the head is 1.31. The ratio of tail length (109.05 mm) to SVL (66.45 mm) is relatively equal,

that is 1.64. The ratio of the pileus length (15.40 mm) to width (6.57 mm) is twice higher; scales above and on sides of tail relatively smooth (except for those of the vertebral row which are mostly weakly keeled). Limbs are relatively slender: forelimbs 22.76 mm, about 35% of snout-vent length; hind limbs 37.99 mm, about 1.7 times of forelimbs and 50% of snout-vent length. Forelimbs have larger imbricate shields in dorsal surface and small granules ventrally; conversely, dorsal surface of hind limbs (on thigh and tibia) have small scales, similar to dorsalis, and enlarged, smooth and imbricate shields in ventral surface of hind-limbs. The head shields are relatively convex; supraoculars and parietals moderately keeled. Rostral and frontonasal are not contacted; supranasals block the connection between them with a deep suture. Rostral is rather round, not pointed; snout not very pointed. Nasal region is not swollen. Nostril is bordered by postnasal, supranasal and first supralabial. The frontonasal plate is large with width almost longer than 1.4 times the length. Two intact supraoculars, the second and third; the first and fourth supraocular plates fragmented, the first separating prefrontal-supraocular contact; Two prefrontal plates with medial contact; Frontal is wedge shaped, widest anteriorly, bordered by second and third supraocular laterally, by frontonasals anteriorly and by frontoparietals posteriorly; parietals are nearly as wide as their length. Interparietal is small, wedge shaped, widest anteriorly, with a minute parietal foramen; no occipital; Although there is a small tympanicum, it is sometimes difficult to distinguish from temporal plates; ear opening vertical and relatively elliptical, its diameter longer than orbit relatively 2.5 times; relatively medium sized temporal scales (larger ventrally and smaller dorsally). Two supratemporals, the anterior long and the posterior smaller and granular-shaped; no postorbital; 7-7 supraciliaries on each side, the anterior-most is the largest, separated from supraoculars by a complete rows of 15-15 granules (granules rarely two rows); 7-7 supralabials on right and left side, respectively, 4-4 anterior to subocular, respectively; subocular wider dorsally, twice as long as its width; 7 infralabials; five pairs of submaxillary shields, the first three pairs in contact; the last two pairs broadly separated; submaxillary shields bordered by 19 granules; 23 gular scales in a straight median line between the union of the submaxillaries and the central scale of the collar; collar consist of 7 plates with large scales, the last 3 rows of gularia are as collars; 52 dorsal scales at midbody, dorsal scales smooth and unkeeled), granular from nape to caudals, lateral scales relatively smaller than dorsum; ventral and dorsal caudals smooth, 17 large dorsal scales across dorsum between hindlimbs; enlarged ventrals in 10 strait longitudinal series (at the level of the widest transversal row) and 28 transverse rows; anal plate present, the ratio of width (3.74 mm) to length (2.06 mm) is 1.8; four enlarged circumanal plates in a longitudinal row between anterior cloacal margin and the gap between the two series of femoral pores, one preanal developed with one strongly enlarged plates; 23-23 femoral pores, in contact medially; four rows of scale series on the digits, one smooth scale dorsally, two pectinated scales laterally, and one three carinated scale ventrally; toes with three carinated on the subdigital lamellae; 21-21 pectinated lamellae beneath 4th toe.

The base coloration of the dorsum is light brown. There is a clear whitish or grayish stripe in the middle of the dorsum

extending from the parietals to the coccyx. Wide dark brown stripes extending laterally from the midbody on both sides of the dorsum. Small white ocelli are scattered on the ends or inner part of the wide brown stripes. The upper head coloration is light brown; the outer margins of the parietals is dark brown. Temporal region is light brown with less maculation. The eye area is light brown to white in background color, with three vertical brown stripes. White ocelli appear faintly on the limbs. Brown and white spots also run along the dorsal side of the tail. The ventral coloration is generally white, sometimes dark grey coloration on the marginals and on the underside of the head. The underside of the tail is white coloration.



Fig 1: Male specimen of *Acanthodactylus ilgazi* in its natural habitat

Nomenclatural History

To the best of our knowledge, three *Acanthodactylus* species were reported from the Anatolian Peninsula up to this study. These species are *A. boskianus*, *A. schreiberi*, *A. harranensis*. While *A. boskianus* and *A. schreiberi* are also nested in very distant clades from *A. ilgazi*, the subspecies of *A. schreiberi*, *A.s. ataturi*, was reported from Anatolia (Yalçinkaya and Göçmen, 2012) [3], and the subspecies of *A. boskianus*, *A.b. euphraticus* that was only reported in the checklist of Turkish herpetofauna (Kurnaz, 2020) [4]. Lastly, even *A. harranensis* was described as an endemic lizard species to the Anatolian Peninsula (Baran *et al.*, 2005) [5], the recent study showed that the distribution range of this species extends to the Northern Syria (Mulder, 2021) [6]. However, neither these species nor the closest ones in the phylogenetic tree (*A. orientalis*, *A. tristrami*, *A. robustus*) do not overlap with the new described lizard species. Therefore, we have proposed a new name for the fringe-toed lizard species.

Distribution and Habitat

The species is currently known only from the type locality of Yazihan, Malatya province, Turkey. This locality is approximately 250 km north from the known localities of *Acanthodactylus* species ranging in Turkey. *Acanthodactylus ilgazi* sp. nov. lives in a narrow area at the foots of the small hills of the Yazihan valley. The habitat consists of a sandy open ground area with little vegetation and scattered medium sized stones. Generally, three plant species are dominating the area, *Tamarix* sp., *Alhagi* sp., and *Xanthium strumarium*. The new species was mostly observed at the bottom of the *Tamarix* plants. The specimens were observed between 10:00-15:00, and no

specimens were encountered before or after this time. The air temperature during this time fluctuated between 30-33 °C. *Acanthodactylus ilgazi* sp. nov. lives in syntopy with the following reptile species: *Trapelus ruderatus* (Olivier, 1804), *Lacerta media* (Lantz & Cyren, 1920), *Ophisops elegans* (Menetries, 1832) and *Eumeces schneideri* (Daudin, 1802).

Etymology

As it was proposed in Kurnaz and Şahin (2021) [1], the new species was named as *Acanthodactylus ilgazi* as honoring herpetology professor Çetin Ilgaz from Dokuz Eylül University (Turkey), who has many contributions to the Anatolian Biogeography.

ZooBank Registration

We hereby state that the present paper has been registered to the Official Register of Zoological Nomenclature (ZooBank) under LSID: urn:lsid:zoobank.org:pub:4F8D82AC-7482-451C-A69C-D14DA4235068. The new species name *Acanthodactylus ilgazi* has been registered under LSID: urn:lsid:zoobank.org:act:49214ED2-F149-4022-A585-A9F21F461FD9.

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