

# Systematics of the Genus *Trachylepis* Fitzinger, 1843 (Sauria: Scincidae) with special reference to the Middle East: A review

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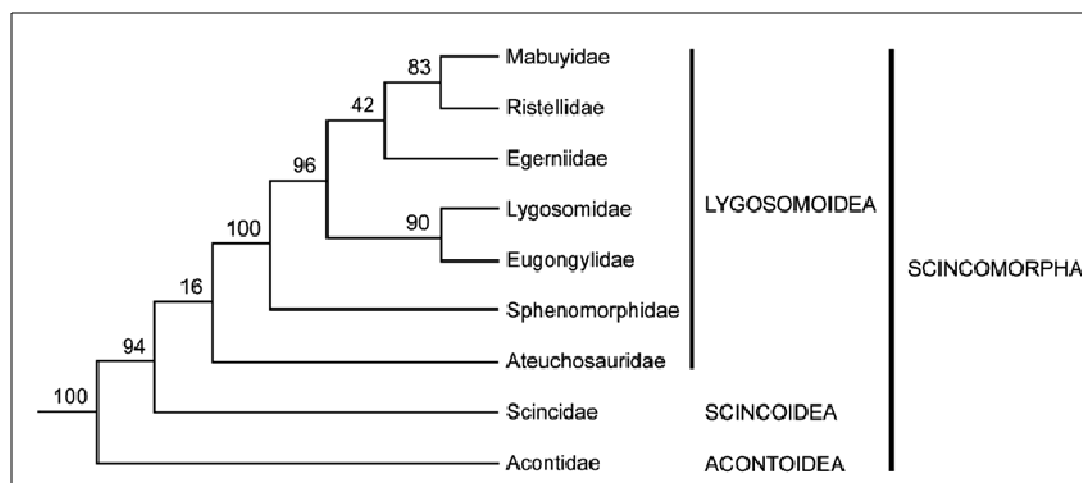
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There are several papers related to the split of the *Mabuya* group (*sensu lato*) into four different subfamilies (Chioniniinae, Mabuyinae, Dasiinae, and Trachylepidinae). The genus has undergone drastic taxonomic changes. In the history of this genus various names such as, *Lacerta*, *Euprepis*, *Mabuya* and *Trachylepis* have been applied. The Iranian species of *Mabuya* and totally the Middle East species of this old genus come under Afro-Malagasy clade. Also *septemtaeniata* and *transcaucasica* are more related to *Euprepis* branch in Afro-Malagasy clade. Further, *transcaucasica* should be treated as a subspecies of *Euprepis* and with *septemtaeniata* as a good species. The Turkish species of *Mabuya* not only belong to any of the four aforementioned genera, but also diversified from *Mabuya* and the rest of *Trachylepis* species. There is no record of *T.aurata* from Iran, but Turkish populations belong to *T.aurata*. The populations from central and northern Iran belong to *T.aurata transcaucasica* and southern populations belonging to *Trachylepis septemtaeniata*. According to Morphological and molecular data, the Turkish *T.vittata*, *T.aurata*, *T.septemtaeniata* are separate species and *T.vittata* is branched off first. Based on morphological characters the Iranian *T.vittata* is a distinct species. The aim of this study is to provide a detailed account on current taxonomic and distributional status of the genus *Trachylepis* with special reference to the Middle East and Iranian Plateau species.

**Key words:** *Systematics, Scincidae, Trachylepis, Iran.*

## INTRODUCTION

The Suborder Scinciformata Vidal and Hedges, 2005 encompass about 1579 species, approximately 25% of lizards in the world (Uetz and Hošek, 2014). This has led skinks to be one of the main components of biological diversity in vertebrates, especially reptiles. Much of our current understanding of the phylogenetic and taxonomic relationships of skinks is originated from morphological studies of Greer (1970). Greer in his study divided the family Scincidae into four subfamilies: Acontinae, Feylininae, Lygosominae, and Scincinae (Greer, 1970). Skinks were formerly considered as a single family Scincidae (*sensu lato*), Opper 1811. Later the family was broken into nine families, including, Acontidae (26 species), Egerniidae (58 species), Eugongylidae (418 species), Lygosomidae (52 species), Mabuyidae (190 species), Sphenomorphidae (546 species), Scincidae (273 species), Fam. nov. (14 species) and Ateuchosauridae Fam. nov. (2 species) (Hedges and Conn 2012; Hedges, 2014). Breaking the Scincidae like Gekkonidae (*Sensu lato*) by Gamble et al., (2008) and Iguanidae (*Sensu lato*) by Townsend et al. (2011) has been useful in taxonomic status of small taxa for conservation.



**FIGURE 1.** Phylogenetic tree of skink families and superfamilies that are well supported by morphological and molecular data (Hedges, 2014).

Although the monophyly of Scincidae is accepted as a large family by Pyron et al., (2013) and other researches (Whiting 2003, 2004; Giovannotti et al., 2009; Brandley et al., 2011), other authors opposed to breaking up Scincidae. Hedges (2014) agree with dividing the Scincidae without affecting the monophyly of the family. Also this author used the superfamily level for the taxonomy of the family Scincidae (*sensu lato*). The superfamily Acontioidea includes the Acontidae (Gray 1839), the superfamily Scincoidea includes the family Scincidae (Oppel 1811) and the superfamily Lygosomoidea includes Mabuyidae and six other families (Fig. 1, after Hedges, 2014). The genus *Trachylepis* Fitzinger, 1843 which is the subject of this review, belongs to the superfamily Lygosomoidea and family Mabuyidae. The classification scheme of this genus is as follows:

**Order Squamata Oppel, 1811**  
**Suborder Scinciformata Vidal & Hedges, 2005**  
**Infraorder Scincomorpha Camp, 1923**  
**Superfamily Lygosomoidea Mittleman, 1952**  
**Family Mabuyidae Mittleman, 1952**  
**Subfamily Trachilepinae (Hedges & Conn, 2012)**

**Genus *Trachylepis* Fitzinger, 1843**

*Mabuya* Fitzinger, 1826:23, 52 (Type species: *Mabouya dominicensis* Fitzinger, 1826= *Lacertus Mabouya* Lacepede The type species of this genus was *Lacertus Mabouya* Lacepede by virtual tautonymy; agreed to place the trivial name *Mabouya* Lacepede, as published in the binomial combination *Lacertus Mabouya*, in the official List of Specific Trivial Names in Zoology Opinion 92. Bull, Zool, Nomencl. London, 4:356) (Leviton et al., 1992:69).

The background of the studies carried on the genus *Trachylepis* in the Middle East is as follows;

Khalaf (1959) noted that *M.aurata* consists of two subspecies in Iraq *M.a.aurata* and *M.a.septemtaeniata* Leviton et al. (1992) believed that *M.aurata* encompass two subspecies in Iraq, *M.a.aurata* in the northern regions, and *M.a.septemtaeniata* at the lower elevations of the Tigris-Euphrates Valley.

Based on morphological characters, Baran and Atatur (1998) reported, two *Mabuya* species in Turkey; *M. aurata* with 2-3 scales at anterior edge of the ear opening, nuchal scales smooth. This species is distributed in western and southern regions of Middle Anatolia; *M.vittata* with keeled nuchal scales

and more slender body distributed in middle, southern and southeastern regions of the Anatolia. Disi et al. (2000) reported *M. vittata* from western and central Jordan. According to Marine et al. (2011) *Trachylepis* consists of one species and subspecies in Armenia, *Trachylepis septemtaeniata* (Reuss, 1834), with subspecies *T.s. transcaucasica* (Chernov 1926). Anderson (1999), mentioned two species *M. vittata* and *M. aurata*, the latter with two subspecies *M.a. transcaucasica* and *M.a. septemtaeniata* from Iran. Faizi and Rastegar Pouyani (2010) reported two species *T.vittata*, *T.septemtaeniata* and subspecies *T.a. transcaucasica* from Iran.

### Phylogenetic and systematic position of the genus *Trachylepis* Fitzinger, 1843

Seventy-eight species are currently recognized in *Trachylepis* (Mausfeld et al., 2002; Rastegar-Pouyani et al., 2006; Hedges 2014), but only a few species are found in the Middle East (Sindaco et al., 2012; Fattahi et al., 2014).

The phylogenetic tree of Pyron et al. (2013) is in full agreement with the species and generic content of Mabuyidae family, formerly the "*Mabuya* Group," with a bootstrap support value of 97%. However, these authors claimed that there was poor support of Mabuyidae because they incorrectly assumed that *Eutropis* and *Eumecia* were not part of the family.

The molecular data of Pyron et al. (2013) had already allied *Eutropis* with the *Mabuya* group (Mausfeld and Schmitz 2003; Skinner et al., 2011), hence erecting the family Mabuyidae. This family includes four subfamilies that have been supported by morphology and molecular phylogenetic studies (Hedges and Conn 2012). These subfamilies are Mabuyinae in the New World, Chioniniinae and Trachylepidinae (*Trachylepis*) in Africa and Madagascar, and Dasiinae (*Eutropis*) in Southeast Asia, China, India, and Sri Lanka (Hedges, 2014). The tree of Pyron et al., (2013) showed with the monophyly of Mabuyinae and Chioniniinae but it was not the case for Dasiinae and Trachylepidinae. The paraphyly of *Trachylepis* in Pyron et al. (2013) is not significant (bootstrap < 50%), although the clade in question (*T. aurata* and *T. vittata*) has been difficult to place in the Trachylepidinae (Carranza and Arnold, 2003; Hedges 2014).

Mausfeld et al. (2002) partitioned the genus *Mabuya* into four genera and restricted the application of the name *Mabuya* to the South American clade of these skinks. Moravec et al. (2006) tentatively associate the skinks known formerly as *Mabuya* with the generic name *Trachylepis*, which was resurrected by Bauer (2003) for the Afro-Malagasy evolutionary lineage.

Sindaco et al. (2012) based on molecular data noted that genus *Trachylepis* is polyphyletic, with the clade formed by *T. vittata*, *T. septemtaeniata* and *T. aurata* branching independently from all the remaining representatives of *Trachylepis*.

Although, the monophyly of the genus *Trachylepis* has never been properly tested and the taxonomic status of the mabuyas from Middle East remains unclear, they probably belong to *Trachylepis*. Based on molecular data the samples from Turkey, were considered as belonging to the genus *Trachylepis* (Güçlü et al., 2014). According to Mausfeld and Schmitz (2003), The Iranian species of *Mabuya* and totally Middle East species of this old genus come under Afro-Malagasy clade, so, now *Mabuya* (*sensu stricto*) is limited to South American branch. Mausfeld and Schmitz (2003) suggested the more satisfactory solution to the systematics of this group by showing that *septemtaeniata* and *transcaucasica* are more related to *Euprepis* branch in Afro-Malagasy clade. Further, they suggested that *transcaucasica* should be treated as a subspecies of *Euprepis* and with *septemtaeniata* as a distinct species. According to Jesus et al. (2005), the Turkish species of *Mabuya* do not belong to any of the four aforementioned genera (Durmuş et al., 2011).

Güçlü et al. (2014) studies showed that the Turkish species (Turkish clade) currently recognized as *Trachylepis* are diversified from *Mabuya* and the rest *Trachylepis* species with high bootstrap value (98%/ 1.00 in ML and BI, respectively). Based on genetic distance, the Turkish species are closer to the genus *Mabuya* spp. than the rest of *Trachylepis* spp. Finally, the diversification

of the Turkish clade from rest of *Mabuya* is very old and occurred in middle Miocene (15.87 Mya). (Güçlü et al., 2014)

The genus *Trachylepis* is distributed in Nepal, northern India, Pakistan, eastern Transcaucasia (Armenia and Azerbaijan), south of Turkmenistan and Uzbekistan, Middle East, as well as the whole Africa ( except for Sahara) and Madagascar with adjacent Islands, beside one species ,*Trachylepis atlantica*, from the Island Fernandu-di-Noronya (Ananjeva et al., 2006).

### **Morphological characteristics**

According to Hedges (2014), the superfamily Lygosomoidea (as for Lygosominae, Trachilepinae s.l.) bear a single frontal bone, palatine separated or in partial contact with ectopterygoid, medial apposition of the palatine bones in the secondary palate, and angular contact between the ventrolateral ridge of the frontal or its ventral process and the prefrontal. These three superfamilies (Lygosomoidea, Scincoidea, Acontioidea) are also well-distinguished in molecular phylogenies with high bootstrap support (e.g., Skinner et al., 2011; Pyron et al., 2013).

In the Mabuyidae (*Trachylepis* and three other genera) the premaxillary teeth are mostly 9; Meckel's groove is completely closed by the overlapping and fusion of the dentary; parietals meet behind interparietal; the parietals are bordered along their posterior edges by upper secondary temporals and transversely enlarged nuchals; the outer preanal scales overlap the inner preanals; scales on dorsal surface of fourth toe in single or multiple rows; the iris is paler than the pupil; the hemipenes consists of a short columnar base and bulbous cap (Hedges, 2014).

The Afro-Malagasy and Cape Verdian group of *Mabuya* morphologically shows an intermediate position between the Asian and the South American groups. Assuming an Asian origin of the genus “*Mabuya*” (Horton, 1973; Greer, 1977) (Quoted from Faizi and Rastegar-Pouyani, 2006).

### **The Middle East species of *Trachylepis*:**

There are four *Trachylepis* species in the Middle East region.

Morphological characteristics of the genus *Trachylepis* (the formerly *Mabuya*) in the Middle East and Iran are as follows:

Medium-sized to large lizards with cylindrical bodies, strong, well developed limbs, the digits 5-5, and medium- sized tails. Cycloid scales underlaid by bony plates (osteoderms). Dorsals smooth. Dorsals and ventrals similar to each other; no distinct boundary between gulars and ventrals. Palatine bones in contact in the median region; palatal notch separating the pterygoids, extending forwards to between the centers of the eyes. No pterygoid teeth. Dorsal head scales mostly flat and subimbricate, with a pair of supranasals, and prefrontals and frontoparietals paired or fused. Most posterior supraocular contacted by the frontal is the second. Secondary temporals are in contact. Nostril pierced in a single nasal. Eyelids movable; lower eyelid with an undivided, semitransparent disc, bordered below directly by one (or more) supralabial(s). Pupil round. Ear opening relatively small, with tympanum recessed in moderately deep auditory meatus. Teeth relatively small, pleurodont; tongue wide, lanceolate, covered with irregularly- shaped papillae, its tip feebly nicked. Femoral pores absent. 28-31 presacral vertebrae (Leviton et al., 1992; Anderson,1999; Faizi and Rastegar-Pouyani, 2006).

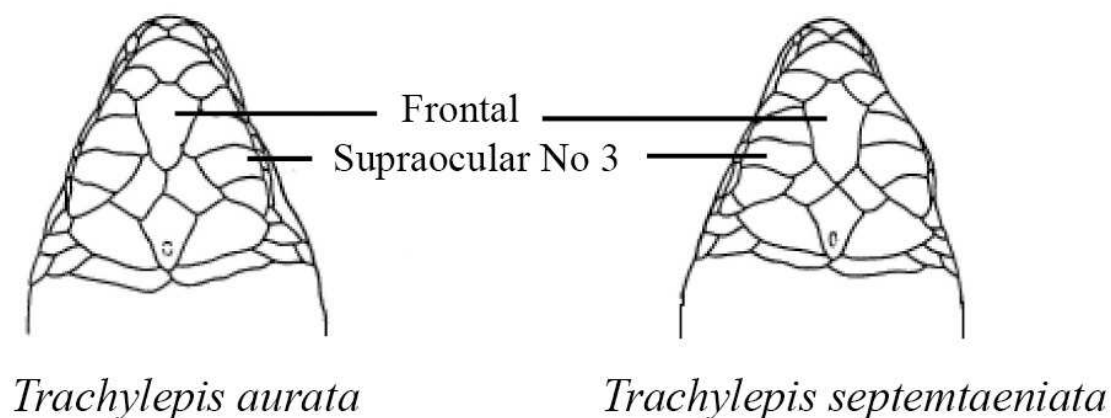
### **Species account**

#### ***Trachylepis aurtata* (Linnaeus, 1758)**

Golden grass skink

*Lacerta aurata* Linnaeus 1758:209 (Type locality. Jersea Anglorum, Cyprus;

*Euprepis affinis* De Filippi, 1865:534 (nec *Tiliqua affinis* Gray, 1838:289 [= *Mabuya affinis*, Boulenger, 1889:166]; Type locality; Kazvin [Qazvin], Iran; Syntypes: Genoa and Turin Museums).



**FIGURE 2.** Pileus pholidosis of *Trachylepis aurata* (Linnaeus, 1758) and *T. septemtaeniata* (Reuss, 1834). The third supraocular is separated from the frontal in *aurata* and in contact with the frontal shield in *septemtaeniata* (see Moravec et al., 2006)(Durmuş et al., 2011).



**FIGURE 3.** *Trachylepis aurata transcaucasica* (Chernov, 1926) (photo by Omid Mozafari).

*Euprepis affinis* De Filippi, 1863;25 (not *Tiliqua affinis* Gray, 1838)

*Mabuya septemtaeniata* Boettger 1887a: 177-178(in part); 1899; 379,-Zarudny, 1903; 22-23,-Niklosky, 1915:487-489(in part).-Lantz, 1918:15.-Morich 1929:32.-F.werner, 1936;201 (in part).

*Mabuya aurata*: Anderson, 1900; 14.-Rostombekov, 1938; 15-16.-S.Anderson 1968; 333 (in part); 1974; 127, 129 (in part).-Welch, 1983:27 (in part).-Frynta et al 1997; 11.

*Mabuya aurata septemtaeniata*: Mertens, 1924a; 377(in part, not Reuss, 1834).-Shmidt, 1939:66(in part).-Terentjev and chernov, 1949:166-167(in part). -S.C.Anderson, 1963-464.- Bannikov, et al., 1977;145.-Schleich, 1977;127,129(in part). -Clarke, 1991; 38.

*Mabuya aurata trnscaucasica* Chernov, 1926; 64 (Type locality: Migri and Ordubat, Armenia; Syntypes: ZIK)

*Mabuya aurata affinis*: Wettstein, 1951: 440 (*nec* Gray, 1838).-Mertens, 1957; 126-127. -Tuck, 1971a:60. -Schleich, 1977; 127,129(in part). Akhmedov, 1983; 84-85. -Akhmedov and Szczerbak, 1987; 20-24. *Mabuya aurata*— Anderson, 1999

*Trachylepis aurata transcaucasica* (Chernov 1926), Rastegar-Poyani et al., 2008

*Trachylepis aurata*— Bauer 2003; Mausfeld and Schmitz, 2003; Güçlü et al., 2014; Hedges, 2014.

The skink *Lacerta aurata* was described by Linnaeus (1758) on the basis of five earlier descriptions (Aldrovandi 1637; Seba 1734; Linnaeus 1749; Gronovius 1754 and Linnaeus 1754). In all, four extant museum syntypes of *Lacerta aurata* Linnaeus, 1758 housed in the collections of the Swedish Museum of Natural History, Stockholm and the Museum of Evolution, Uppsala University, Uppsala are available. *Trachylepis aurata*, the Golden Grass Skink, was first described from “Jersea Anglorum, Cypro” [British island of Jersey and Cyprus] (Linnaeus, 1758) and lie outside the known ranges of today’s *T. aurata* and *T. septemtaeniata*. Only one specimen is *T. aurata*. Three of the syntypes are other species that have been described. The only species of *Trachylepis* living in Cyprus is *T. vittata* (Olivier, 1804). Later, the type locality of *T. aurata* was emended to Asia Minor (Moravec et al., 2006).

Anderson, (1900) revised three of these syntypes and placed *L. aurata* into the genus *Mabuia* [= *Mabuya*]. Until recent time the name *Mabuya aurata* (Linnaeus, 1758) was commonly applied for one supposedly polytypic species distributed widely in the Middle East (Moravec et al., 2006).

**Diagnosis:** Lower eyelid with undivided, more or less transparent disc; 32-38 scales around body, dorsals feebly tricarinate to smooth; prefrontals not in contact; 16-22 lamellae under 4th toe; parietals not in contact; no light vertebral stripe (Anderson, 1999; Rastegar-Pouyani et al., 2007).

A single subspecies is recognized from Iran (Anderson 1999; Leviton et al 1992; Rastegar-Pouyani et al. 2008; Faizi et al., 2010).

### ***Trachylepis auarta transcaucasica* (Chernov, 1926)**

**Diagnosis:** 65-72 gular and ventral scales, third supraocular separated from frontal (Fig. 2), A dark, wide band with white spots on the flank (Fattahi et al., 2014), (Fig. 3).

**Remarks:** Analysis of the populations of *Trachylepis aurata* (the formerly *Mabuya aurata*) by Akhmedov and Szczerbak (1987), showed three population groups based on dorsal color pattern and scale counts: *Mabuya aurata aurata* in western Asia Minor. *Mabuya a. seinemtaeniata* in southern Iran, Baluchistan (Pakistan), and the lowland countries of Southwest Asia and *M.a. affinis* (De Filippi, 1863) in the Transcaucasian (Armenia and Azerbaijan) republics, northern and central Iran, Turkmenistan and Afghanistan (Anderson, 1999). They pointed out that the population from the Kopet Dagh seems to differ from neighboring populations (assigned to *affinis*), but they did not raise it to subspecific rank. They placed *Euprepis fellowsii* Gray, 1845 in the synonymy of the typical subspecies, without examining specimen from Cyprus: the stated type locality for *Mabuya aurata*. Anderson examined the type series of *Euprepis fellowsii* from Xanthus (BMNH 1946.8.17.90-96; Akhmedov and Szczerbak 1987). They fitted the diagnosis of *M. aurata* given above, except the presence of a light vertebral line, distinctive dorsal pattern, broken up the longitudinal stripes into more or less rectangular dark spots. Those of the paravertebral stripes larger than or subequal to the interspaces, the quadrangular spots of the lateral lines interrupted by narrow light interspaces. *Mabuya transcaucasica* Chernov, 1926 appears to be an available name that applies to the populations designated by Akhmedov and Szczerbak as *affinis*. *Mabuya vittata* of the countries of the eastern Mediterranean to western Iran and *M. dissimilis* (*Eutropis dissimilis*) of Pakistan, Afghanistan and northern India appear to be the closest living relative of *M. aurata* (Anderson, 1999). According to tree Güçlü et al. (2014) the closest living relative of *T. aurata* are *T. septemtaeniata* and *T. vittata*.

**Distribution:** Armenia and Nakhichevan (S Azerbaijan), close to the Iranian border, southern Turkmenistan, northern and central Iran, possibly northwestern Afghanistan (Anderson, 1999). Greece (Aegean Islands, Samos, Rhodes) Turkey, in much of Anatolia (except the north) (Fattahi et

al., 2014), Pakistan ?, Syria [Moravec, 1998], Iraq, northeast Saudi Arabia, Bahrain, northern Oman, coastal Ethiopia, Eritrea, probably in east Sudan, southern Turkmenistan and eastern Uzbekistan (Marine et al., 2011).

***Trachylepis septemtaeniata* (Reuss, 1834)**

Southern Grass Skink

*Euprepis septemtaeniatus* Reuss 1834: 47 (Type locality: Massawa, Eritrea).

*Euprepes septemtaeniatus* - Dumeril and Bibron 1839: 680

*Euprepes septemtaeniata*: Blanford. 1876; 388-390.- Boettger 1880: 188,-Niklosky, 1897;333.

*Euprepes septemtaeniatus*: Bedriaga, 1879: 27.

*Mabuia* [sic] *septemtaeniata* - Boulenger 1887a: 177-178(in part); 1899;379.- Niklosky; 1907a; 285, 1915; 487-489,- F.Werner, 1936;201,(in part).

*Mabuya aurata*: Anderson, 1900; 14.-S.Anderson 1968;333(in part); 1974; 38, 44(in part).-Schleich, 1977;127,129(in part).-Welch,1983:27 (in part).-Welch et al., 1990;85.

*Mabuia septemtaeniata* - Werner 1895

*Euprepes massauensis* - Hemprich and Ehrenberg in Tornier 1899.

*Mabuia septemtaeniata* [sic] - Werner 1917.

*Mabuya aurata septemtaeniata* - Schmidt 1939;66.-Terentjev and Chernov, 1949;166-167.- S,C,Anderson, 1963; 463-464.-Haas and Y. Werner, 1969; 360.-Schleich, 1997;127, 129(in part). – Akhmedov, 1983;84-85. Akhmedov and Szzerbak, 1987; 20- 24.-Leviton et al, 1992: 70-71. Engelmann et al. 1993.

*Euprepis septemtaeniatus* - Mausfeld et al. 2002.

*Trachylepis aurata septemtaeniata* - Bauer 2004.

*Trachylepis septemtaeniatus* - Bauer 2003.

*Trachylepis septemtaeniatus* - Moravec et al. 2006.

*Trachylepis aurata septemtaeniata* - Rastegar--Pouyani et al, 2006.

*Mabuya septemtaeniata septemtaeniata* - Sindaco and Jeremcenko, 2008.

*Trachylepis septemtaeniata* -Mausfeld and Schmitz, 2003. Rastegar Pouyani et al. 2008. Sindaco et al. 2012. Güçlü et al. 2014, Hedges, 2014.

**Diagnosis:** 60-62 gular and ventral scales, third supraocular connect to frontal shield (Fig. 2), without complete dark wide band with white spots on the flank (Fig 4).

**Remarks:** The type locality for *Trachylepis* (the formerly *Mabuya*) *septemtaeniata* Boulenger is Massawa, Eritrea, while it seems unlikely on biogeographic reasons that Iranian specimens represent the same taxon. Arnold (1986d: 428) suggested that this skink may have been accidentally both in Eritrea and Muscat (Anderson, 1999).

**Distribution:** Southern Iran, lowland Iraq, northeastern Saudi Arabia (Al Hasa south to Hofuf), Bahrain, northern Oman (Muscat), Eritrea. Zones of possible intergradation with *Trachylepis aurata transcaucasica* in central Iran have not been identified (Anderson, 1999).

***Trachylepis vittata* (Olivier, 1804)**

Bridled skink

*Scincus vittatus*- Olivier 1804: 103 (Type locality: Sands of Rosetta [Rashid], Egypt; [N.B. Boulenger, 1887a: 176 cites Olivier, 1804:2:58.ther are 2 eds. Of Oliver, 4to and 8 vo, which may account for the differences]).

*Euprepes olivieri*- Dumeril and Bibobron 1839: 674. Gravenhorst 1851: 327.

*Hermites vittatus* - Gray 1845.

*Euprepes* (*Euprepis*) *libanoticus*- Peters 1864: 51 (fide Boulenger 1887).



**FIGURE 4.** *Trachylepis septemtaeniata*, collected from Firouz Abad (Fars province) (photo by Faizi, 2006).



**FIGURE 5.** *Trachylepis vittata* from western Iran (Sarpol-e zahab western Kermanshah) (photo by R. Fattahi).

*Euprepes vittatus* - Peters 1864, Peters 1867: 20, Peterris 1874: 372, Peterris 1878: 204, Boettger 1880: 187, Peters 1882: 70, Böttger, 1885.

*Mabuia vittata* -Boulenger 1920b: 553, Procter, 1921;240.

*Euprepes Tomardi* - Hemprich and Ehrenberg in Tornier 1899.

*Mabuia vittata* - Wettstein, 1928b;783.- Khalaf,1959:44; 1960:14.-Haas and Y. Werner,1965:360.

*Trachylepis vittata* - Bauer 2003, Mausfeld et al 2002. Rastegar-Pouyani et al., 2008. Güçlü et al., 2014. Hedges, 2014.

**Diagnosis:** Lower eyelid with undivided, more or less transparent disc; dorsal scales strongly tricarinate; prefrontals usually not in contact; parietals usually in contact behind interparietal; limbs not, or but slightly overlapping when adpressed; a distinct light vertebral stripe, usually dark-margined, usually present (Fig. 5).





**FIGURE 6.** *Trachylepis brevicollis* Ayn Hamran, Oman photo by © Hanne and Eriksen. <http://www.birdsoman.com/Reptiles/54-Lizards/SudanMabuya/SudanMabuya.htm>

**Remarks:** The Schmidtlers' (1972) specimen came from not Far East from the Iraq border, collected on April 26, 1968. The California Academy of Sciences received a specimen from Lar, near Mt. Damavand in the Elburz Mountains, through the courtesy of Mahmoud Latifi of the Institut d'Etat des Serums et Vaccins Razi. This specimen lacks a distinct light vertebral line, but the light dorsolateral stripes are distinct. In cases where the identification of Iranian *Trachylepis* are in doubt, the strong keels on the nuchals of *T. vittata* should distinguish this species from *T. aurata*, in which the nuchals always seem to be smooth (Anderson, 1999).

Three obvious characters that diagnose *T. vittata* from other two species (*T. aurata*, *T. septemtaeniata*) are: nuchal scales keeled, parietals usually in contact behind interparietal and a vertebral light band about one scale wide (Fattahi et al., 2014).

**Distribution:** Turkey, northeast Algeria, Tunisia, northern Egypt, Cyprus, southwest Syria, Israel, Lebanon, Libya, west and central Jordan, Iraq, western Iran (Zagros Mountains and westwards)(Anderson, 1999).

### ***Trachylepis brevicollis* (Wiegmann, 1837)**

#### **Short-necked Skink, Sudan *Mabuya***

*Euprepes brevicollis*- Wiegmann, 1837:133 (Type locality: Abyssinia= Eritrea). Maausfeld et al., 2002

*Mabuya brevicollis*- Arnold, 1986a:429. Al-Sadoon, 1988:66. Al-Sadoon et al 1991:6. Loveridge 1936: 67, Drewes 1972, Greer et al., 2000. Cimatti 2006. Sindaco and Jeremčenko 2008. Largen and Spawls 2010.

*Trachylepis brevicollis*- Bauer, 2003; Hedges, 2014.

**Diagnosis:** Large, to about 140 mm snout-vent length; scales on neck, back and flanks each with double keel; 5 upper labials from snout to subocular. 1st supraocular in contact with frontal shield; young usually boldly blotched; adults more or less uniform, males often having dark, light-spotted heads (Fig. 6) (Arnold, 1986a:429; Leviton et al., 1992).

**Distribution:** Northeastern Africa (Arnold, 1986a:429.) (Sudan, Ethiopia, Eritrea, Somalia, Kenya, Uganda, Tanzania), Yemen, Saudi Arabia (Taif to Asir in the southwest; Buredah and Riyadh area), Oman (Dhofar ) (Leviton et al., 1992).

## DISCUSSION

*Trachylepis aurata* differs from *T. vittata* in having smooth nuchals; parietals not in contact, separated by interparietal; postnuchals smooth or weakly keeled; no light vertebral stripe (Başoğlu and Baran 1977; Leviton et al. 1992; Anderson 1999). Formerly, three subspecies of *M. aurata* were recognized on the basis of color-pattern, contact between third supraocular and frontal and numbers of DS and GS: (i) *M. a. aurata* (Linnaeus, 1758) – two longitudinal rows of large more or less rectangular dark spots on dorsum, third supraocular separated from frontal, 34-38 DS, 56-71 GS; (ii) *M. a. septemtaeniata* (Russ, 1834) – four more or less complete longitudinal rows of small dark spots on dorsum, third supraocular in contact with frontal, 32-38 DS, 60-62 GS; (iii) *M. a. transcaucasica* Černov, 1926 (formerly *M. a. affinis*[De Filippi, 1863]) characterized by the *septemtaeniata* pattern and higher number of gular and ventral scales (associated often with the individuals from Armenia, Azerbaijan [Nakhičevan], central and northern Iran and Turkmenistan)

Moravec et al. (2006) found *septemtaeniata* to occur in sympatry with *aurata* in southern Turkey (surroundings of Birecik, Sanlıurfa), which supported the specific status of both of these taxa. The third supraocular was separated from the frontal in 54.7% of 53 studied specimens of *T. aurata* originating from various localities in southeast Anatolia (Durmuş et al., 2011).

The re-examination of the type material of *Lacerta aurata* Linnaeus, 1758 confirmed that the name *Lacerta aurata* can be fixed as a valid name. Thus, the name *Trachylepis aurata* (Linnaeus, 1758) can be correctly applied to populations having third supraocular shield separated from the frontal shield and dorsal pattern consisting of two longitudinal rows of large more or less rectangular dark spots.

According to Moravec et al. (2006) there is no *T. aurata* in Eritrea, Oman, United Arab Emirates, Qatar, Bahrain, Saudi Arabia, Syria, Iraq, Armenia, Azerbaijan, Iran and Turkmenistan (but Turkish populations belong to *T. aurata*). The populations coming from Armenia, Azerbaijan, central and northern Iran and Turkmenistan differ from the remaining ones by higher number of gular and ventral scales (e.g. Achmedov and Ščerbak 1987; Anderson, 1999). They are traditionally recognized as a distinct subspecies currently known under the name *T. a. transcaucasica* (Černov, 1926) (Anderson, 1999; Rastegar-Pouyani et al., 2006).

*Trachylepis septemtaeniata* (Reuss, 1834) remains the valid name for the populations, which are characterized by third supraocular shield being in contact with the frontal shield and by pattern of four longitudinal rows of small dark spots on the dorsum (the spots can fuse anteriorly and disappear posteriorly) (Moravec et al., 2006). Studies of 21 specimens from Sanlıurfa (including the surroundings of Birecik where *T. septemtaeniata* and *T. aurata* share the same biotope) showed that the third supraocular separated from the frontal only in five specimens (23.8%) (Durmuş et al., 2011). Within the Turkish clade three major lineages that correspond to the three morphological species were recognized. Topologically, *T. vittata* is branched off first and *T. aurata* is the sister taxon of *T. septemtaeniata*. Phylogeny results of the *Trachylepis* species from Turkey suggested that these species represent a distinct radiation and they are probably belonging to a different genus (Güçlü et al., 2014).

Skull studies of the *Trachylepis aurata transcaucasica* by Faizi and Rastegar-Pouyani (2006) showed that discriminant analysis based on 36 characters confirms that the Kurdistan population tends to differ from the other three (West Azerbaijan, Kermanshah, Lorestan) populations. These differences were clearer between Kurdistan and Lorestan (Faizi and Rastegar-Pouyani, 2006). Phylogenetic relationships among the Iranian species or subspecies of *Trachylepis aurata*, *T. septemtaeniata*, and *T. vittata*, from Iran is doubtful and need a more comprehensive study (which is at hand by the senior author and co-workers).

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