

Systematics of the genera *Eumeces* Wiegmann, 1834 and *Eurylepis* Blyth 1854 (Sauria: Scincidae) in Iran: A review

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There are several papers related to the split of the genus *Eumeces* sensu lato into four distinct genera (*Eumeces* sensu stricto Wiegmann, 1834; *Plestiodon* Duméril & Bibron, 1839; *Mesoscincus* Griffith, Ngo & Murphy, 2000 and *Eurylepis* Blyth, 1854). From these, three important ones stand out. The genus has undergone extensive taxonomic changes. There was an initial morphological split which identified the correct four groups but failed to get the correct nomenclatures. These errors were later corrected. In a chronological order, *Novoeumeces* suggested as a new name for the *schneiderii* group and subsequently re-changed to the genus *Eumeces* sensu stricto. North American-clade is now considered as *Plestiodon*. The name *Eumeces* (sensu stricto) was retained for the group close to the type species (*Eumeces pavimentatus*) which is part of the African-Central Asian clade. There are now only five species of *Eumeces* left. The others (old *Eumeces*) are now found in *Eurylepis* (2 species), *Mesoscincus* (3 species) and *Plestiodon* (47 species). A detailed story of these changes plus a brief comparison of current four genera based on mentioned morphological characters in the literatures are discussed in this paper.

Key words: Systematics, Scincidae, *Eumeces*, *Eurylepis*, *Novoeumeces*, Iran.

INTRODUCTION

The Suborder Scincomorpha encompasses about 1579 species, approximately 25% of lizards in the world (Uetz, 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 among skinks are derived from morphological studies of Greer (1970). In his study, Greer realized four subfamilies within the family Scincidae, including Acontinae, Feylininae, Lygosominae, and Scincinae. Greer (1970) stated that the first three subfamilies are independently derived from Scincinae which is considered as the most primitive subfamily. Monophyly of Acontinae, Feylininae, and Lygosominae is well-established by the presence of large numbers of morphological synapomorphies but their phylogenetic position within the Scincidae or into Scincinae is still not clear (Greer, 1970, 1986; Brandley et al. 2005). Although skinks are traditionally classified as a single family Scincidae (s.l) Oppel 1811, but it has recently been divided into seven families (Hedges & Conn, 2012). These families include: Acontidae (26 sp.), Egerniidae (58 sp.), Eugongylidae (418 sp.), Lygosomidae (52 sp.), Maburoidae (190 sp.), Sphenomorphidae (546 sp.) and Scincidae (273 sp.). Subsequently, in 2014, two new families were added to the former seven families, including Ristellidae Fam. nov. (14 sp.) and Ateuchosauridae Fam. nov. (2 sp.), so the

number of families of skinks changed to nine (Hedges, 2014). Dividing and breaking of large taxa for systematic studies is suitable and enables us to have smaller taxa for better management in the taxonomic, systematic and conservation studies. Other examples of this division are found in the Gekkonidae (s.l) by Gamble et al. (2008) and Iguanidae (s.l.) by Townsend et al. (2011).

Regarding the skinks as Scincidae (s.l) in a single family, Pyron et al. (2013) argued that since the monophyly of the family is clear and accepted in their studies and other researchers (Whiting 2003, 2004; Giovannotti et al. 2009; Brandley et al., 2011), there is no need to rise its subclades as distinct families (or any other lower taxonomic ranks). But Hedges (2014) argues that breaking the Scincidae into seven families, does not affect the monophyly of the group. Hedges (2014) argued that breaking larger monophyletic groups into smaller ones (for example, Scincidae and many other traditional families) will not cause any problems. Hedges (2014) also used the superfamily level for the taxonomy of the family Scincidae (s.l). Consequently, the superfamily Acontioidea includes Acontidae (Gray 1839), the superfamily Scincoidea includes family Scincidae (Oppel 1811) and the remaining families belong to the superfamily Lygosomoidea as the largest superfamily of these lizards (Fig. 1, after Hedges 2014).

The genera *Eumeces* Wiegmann, 1834 (sensu stricto) and *Eurylepis* Blyth, 1854 belong to the superfamily Scincoidea and family Scincidae. The classification scheme of these two genera is as follows:

Squamata Oppel, 1811

Suborder Scinciformata Vidal & Hedges, 2005

Infraorder Scincomorpha Camp, 1923

Superfamily Scincoidea Oppel, 1811

Family Scincidae Oppel, 1811

Genus *Eumeces* Wiegmann, 1834

Genus *Eurylepis* Blyth, 1854

The genera *Scincus* and *Scincopus* are strongly supported as being nested within *Eumeces* s.s (Perera et al. 2012) in which, *E.algeriensis* is closer to *Scincopus* and *E.schneiderii* is closer to *Scincus*. Perera et al., 2012, showed that even *E.algeriensis* is closer to *Scincopus* than any other *E.schneiderii* group species. Most studies based on karyological analyses (Matthey, 1931; Gorman, 1973; Kupriyanova, 1986; Caputo et al., 1993, 1994) and morphological/molecular studies (Arnold & Leviton 1977; Carranze et al. 2008) showed the paraphyly of *E.schneiderii* group species and argued that *Scincus* may be derived from an *E. schneiderii*-like stock. The *Scincus-Eumeces* clade is considered basal to other members of the family (Giovannotti et al. 2009).

Phylogenetic and systematic position of the genus *Eumeces*

The genus name *Eumeces* come from eumeces or eumeces, the Greek word meaning along, trim and tall. The first study and comprehensive review of the genus *Eumeces* Wiegmann, 1834 was by Taylor (1935). Using pholidosis characters and common color pattern, and based on attributes and relationships of preanal scales. He defined about 50 species and 14 subspecies for *Eumeces* (s.l) in 15 groups, and located these 15 species groups in three main and larger groups (Tab. 1). These three main groups include group I (*schneiderii*-, *schwartzzei*- and *taeniolatus* groups), group II includes monotypic group of *E. longirostris* and the third one encompassing all the remaining group of species as presented in table 1.

Several common names have been proposed for different subgroups within the genus *Eumeces*, but only two major efforts in this direction have been made to split the genus. One of these before Taylor's review (1936) was made by Dunn (1933), in which the two species from Central America

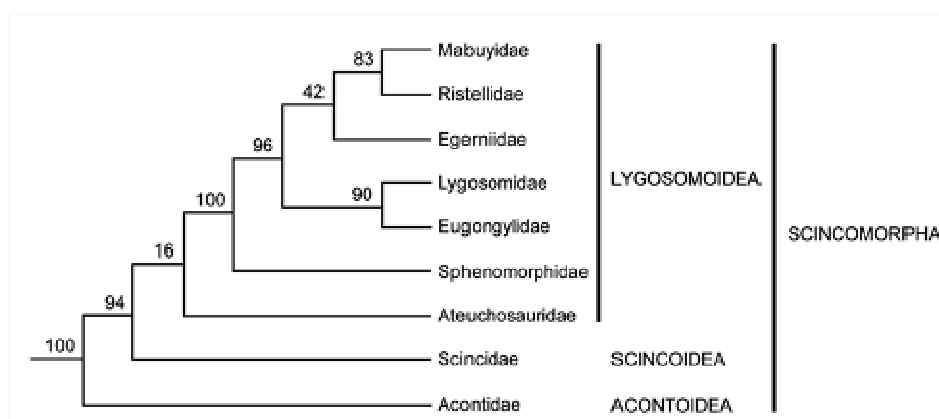


FIGURE 1. Phylogenetic tree of skink families and superfamilies that are well supported by morphological and molecular data (Hedges, 2014)

TABLE 1- Groups defined within the genus *Eumeces* (Taylor, 1935)

| | | | |
|-----|---|---|-------------------------------------|
| I | A | a | 1. “ <i>Schwartzzei</i> ” Group |
| | | b | 2. “ <i>Taeniolatus</i> ” Group |
| | B | c | 3. “ <i>Schneiderii</i> ” Group |
| II | C | d | 4. “ <i>Longirostris</i> ” Group |
| III | D | e | 5. “ <i>Lynxe</i> ” Group |
| | | f | 6. “ <i>Sumichrasti</i> ” Group |
| | | g | 7. “ <i>Fasciatus</i> ” Group |
| | | h | 8. “ <i>Brevilineatus</i> ” Group |
| | | i | 9. “ <i>Obsoletus</i> ” Group |
| | | j | 10. “ <i>Multivirgatus</i> ” Group |
| | | k | 11. “ <i>Anthracinus</i> ” Group |
| | E | j | 12. “ <i>Skiltonianus</i> ” Group |
| | | | 13. “ <i>Quadrilineatus</i> ” Group |
| | | | 14. “ <i>Brevirostris</i> ” Group |
| | F | k | 15. “ <i>Egregius</i> ” Group |

(*E. managuae*, *E. schwartzzei*) and a species from South-West Asia (*Eurylepis taeniolatus*, also *E. scutatus* which is now synonymous of *E. taeniolatus*) were placed in a separate genus *Eurylepis* Blyth, 1854. This view was immediately rejected by Taylor (1935), and he detected the genus *Eumeces* as a completely natural and monophyletic group.

One of the recent efforts for dividing the genus *Eumeces* based on morphological analysis, have been made by Griffith et al. (2000). In this study, based on a series of morphological characteristics of the lizards which were mainly based on ecology of the lizards, a series of major taxonomic and radical changes were proposed for the genus. The genus *Eumeces* distinguished as a paraphyletic group and divided into four separate genera: *Mesoscincus* (“*E. schwartzzei*” group), *Eurylepis* (“*E. taeniolatus*” group), *Novoeumeces* (“*E. schneiderii*” group which includes *E. pavimentatus* as the type species of *Eumeces* sensu lato) (Griffith et al. (2000)). The fourth genus includes *Eumeces* (sensu

stricto) that encompasses all the other remaining species, and mainly distributed in East Asia and North America. Placement of the genus *Eumeces* for the species of North America has emphasized in Griffith works and *Lacerta fasciata* Linnaeus 1758 chosen as type species of the genus *Eumeces*. In addition, based on cranial traits, Griffith and his colleagues, 2000 recognized *Pariocela* species group as members of the genus *Eumeces* as the most basic group of all skinks throughout the world. And a new subfamily Eumecinae was proposed for this group of species.

Schmitz et al. (2004) corrected some of these errors and defined *Eumeces pavimentatus* Geoffroy De St. Hilaire 1827 as the type species of the genus and then based on nomenclature rules of (ICZN) replaced the name *Novoeumeces* with *Eumeces* due to occurring the type species of the genus under *Eumeces*, so referred it to *schneiderii* species group and placed *Novoeumeces* as synonymy. Griffith et al. (2000) also proposed a new generic name, *Pariocela* Fitzinger, 1843, for all North American skinks of *Eumeces* (s. l.). But later the name *Pariocela* replaced with the older available generic name *Plestiodon* Duméril and Bibron, 1839 (Brandley et al. 2005; Smith, 2005).

Several studies (Deweese & Wright 1970; Capriglione, 1987; Guo & Dong 1988; Kato et al. 1998) have shown that all members of the united states *Plestiodon* species have $2n = 26$. While all the African species of the genus *Eumeces* (s.s) have $2n = 32$ (Gorman, 1973; Kupriyanova 1973; DeSmet 1981; Kupriyanova 1986; Erementschenko et al. 1992; Caputo et al. 1993, 1994; Hassan, 1996). But *Eurylepis taeniolatus* groups having $2n = 28$ are different from both groups (Ivanov & Bogdanov, 1975; Kupriyanova, 1986; Erementschenko et al. 1992). Therefore, the genus *Eumeces* (s. s.) is a group of lizards that can be just named for Africa-Central Asia clade which includes the type species of the genus, and is also only five species as follows:

***Eumeces algeriensis* Peters, 1864**

***E. blythianus* (Anderson, 1871)**

***E. cholistanensis* Masroor, 2009**

***E. indothermalensis* Khan & Khan, 1997**

***E. schneiderii* (Daudin, 1802)**

Other species of the genus *Eumeces* (sensu lato) are defined and located in different groups. These genera include: *Eurylepis* (two species), *Mesoscincus* (three species), and *Plestiodon* (47 species). The third genus (*Plestiodon*) is a clade in North America, and all members of this clade formerly known and considered under the genus *Eumeces*. In a phylogenetic analysis by Schmitz et al. (2004), two of these species (*Eumeces algeriensis* Peters, 1864 and *Eumeces schneiderii* (Daudin, 1802)) lumped phylogenetically in a single clade. Since *Eumeces cholistanensis*, *E.indothermalensis* and *E.blythianus* occur in the same region from where the *Eumeces* type species is, so these are put into *Eumeces* where other genera are located. But molecular data on the last three species is required for confirmation which has not been done so far.

***Eumeces schneiderii* (Daudin 1802)**

Scincus schneiderii Daudin 1802: 291 (no type locality given). — *Eumeces schneiderii*, Boulenger, Cat. Liz. Brit. Mus. Iii, 1887, p.383, and Fauna Brit. Ind. 1890, p.219, and J. Linn. Soc. Xxvii, 1899, p. 379; Boettger, Zool. Jahrb. Iii, 1888, p.918; Anderson, Zool. Egypte, 1898, p. 196. *Scincus pavimentatus* Geoffroy de St. Hilaire 1827: 138 (fide SMITH 1935), Deser. Egypte, 1827, p. 138, pl.iv, fig.3 (type loc. Egypte). — *Eumeces pavimentatus*, Balnford, Zool. E. Persia, 1876, p. 387. *Plestiodon aldrovandi* Duméril & Bibron 1839: 701_Duméril, Bibron & Duméril 1854: 305_Fischer 1888: 115 *Eumeces schneiderii* _Boulenger 1890: 219_Taylor 1935_Smith 1935: 341_Engelmann et al 1993_Schleich, Kästle & Kabisch 1996: 351_Anderson, 1999 *Novoeumeces schneiderii* _Griffith, Ngo & Murphy, 2000 *Eumeces schneiderii* _Bonetti 2002: 157_Schmitz et al. 2004_Brandley et al. 2005; Smith, 2005_Mattew et al., 2012.

Eumeces schneiderii is named in honor of Johann Gottlob Schneider (1750-1822), German zoologist. The name, first proposed by Wiegmann in *Herpetologia Mexicana* (1834, p.36). In this study, three species *E.pavimentatus*, *E.rufescens*, and *E.punctatus* placed in a group under the name of the genus. Over a year later, Wiegmann in an article that he had reviewed his earlier works (Wiegmann 1835), he put *E.pavimentatus* as the type species of the genus and stated that both *E.rufescens*, and *E.punctatus* belong to the genus *Euprepis* sensu stricto and have been placed mistakenly in this genus. So, *E.pavimentatus* was the only correct species in the genus until the time.

Currently five subspecies is known for *Eumeces schneiderii* (Daudin 1802) in the whole range of its distribution including: *E.s.baraani* (Kumlutas et al., 2007) in Turkey (Anatolia); *E.s.pavimentatus* (Geoffroy St.-Hilaire 1827) in Syria, Lebanon, Jordan; *E.s.princeps* (Eichwald 1839) in Armenia, Azerbaijan, Caucasus, Iran; *Eumeces schneiderii zarudnyi* (Nikolsky 1900) in SE Iranian Plateau in Kerman, Sistan and Baluchistan Provinces; Helmand Basin and southern desert regions of Afghanistan, Baluchistan and Mekran Coast of Pakistan. Type locality: Bazman, Iran (restricted by Taylor 1935); *Eumeces schneiderii schneiderii* (Daudin 1802) in Cyprus, E Algeria, Tunisia, Libya, Egypt, Sinai (Sindaco & Jeremcenko 2008; Hedges 2014, Murat et al. 2014, Uetz 2014). A brief description of the two subspecies occurring in Iran is as follow:

***Eumeces schneiderii princeps* (Eichwald, 1839)**

Schneider's skink, gold skink, Red-marked skink

Scincus schneiderii Daudin, 1802, 4:291-292 (Type locality: not stated: probably Egypt or Sinaii [Taylor, 1935: 123], or Cyprus [fide Mertens, 1946:55]; Holotype: originally in MNHN, probably lost).

Euprepis princeps Eichwald, 1839:303 (Type locality: Perspolis, Iran; Holotype: FMNH 21008).

Eumeces schneiderii: Boulenger, 1877a: 383-384. _ Nikolsky, 1897:333; 1900:399.

Boulenger, 1899:379-380. _ Zarudny, 1903:22. _ Taylor, 1935:138-141. _ Nikolsky, 1970a:285.

Eumeces schneiderii princeps: Mertens, 1920:179. _ Eiselt, 1940:218, figs. 3b, 3c, 3 d. Mertens, 1946a: 58-59. _ Terentjev and Chernov, 1949: 168-169. _ S. Anderson, 1974:38-44. _ Leviton et al., 1992:68. _ Schmidt, 1939:68-69 _S. Anderson, 1963:476; 1974:38, 44.

Novoeumeces schneiderii princeps _ Griffith, Ngo & Murphy 2000

Eumeces schneiderii princeps _ Roitberg et al. 2000. _ Schmitz et al. 2004 _Brandley et al. 2005; Smith, 2005 _ Mattew et al., 2012 _Perera et al., 2012:69-80

Eumeces schneiderii variegatus Schmidt, 1939:68-69 (Type locality: Perspolis, Iran; Holotype: FMNH 21008). _S. Anderson, 1963:476; 1974:38, 44. Banikov et al., 1977:18 _Schleich, 1977:127, 129. _Welch, 1983:24.

The synonyms history is same as the species presented above. Anderson (1999) placed *E.s.variegatus* in synonymy of *E.s.princeps* because of their similar descriptions.

Diagnosis: nasal completely divided; an indistinct, narrow, lateral cream line from the posterior labials to the ear and along the sides to the groin; presuboculars elongate and very narrow; supranasals moderately large; no postnasal; seven supraciliaries; four large scales on lower eyelid; eight anal plates (Fig. 2). *Eumeces s. princeps* is distinguished from *E.s.schneiderii* by having a completely divided nasal.

***Eumeces schneiderii zarudnyi* (Nikolsky 1900)**

Eumeces pavementatus: Blanford, 1876:354 (not *Scincus pavementatus* Geoffroy St.-Hilaire, 1872). — Bedriaga, 1879:27

Eumeces zarudnyi — Nikolsky, 1900:399-401 (Type locality: Bazman, Iran [restricted by Taylor 1935: 142] Lectotype: ZIL 9339 [designated by Taylor, 1935:142]).—Zarudny, 1903:22.—Taylor 1935: 142-143. Fig. 10.—Werner, 1936:201; 1938:270-271. — Khan & Khan 1997— Anderson 1999.

Novoeumeces zarudnyi — Griffith, Ngo & Murphy 2000.



FIGURE 2. *Eumeces schneiderii princeps* from Markazi Province (Photo by: Fariborz Heidari).

Eumeces schneiderii zarudnyi —Mertens, 1946:58. Anderson, 1974:38-44, — Darvesky, 1981:360.— Welch et al., 1990:77 Schmitz et al. —2004—Perera et al., 2012:69-80.

The synonyms history is same as the species presented above. Detailed description of both subspecies is presented in Taylor (1935) and Anderson (1999). Photos of the subspecies in life from natural habitat is presented in fig. 3.

Diagnosis: Dorsal scales in 26 longitudinal rows; postnasal absent; four supraoculars; ear opening large; the anterior edge with five-six acute lobules; scales of the two middle vertebral rows twice as wide as long; base of tail red above; a white lateral stripe passes from eye through ear to femur; base of tail is red in life (Fig. 3).

Remarks: In the Taylor (1935) work, based on the criteria set for most of the morphological and meristic characters, the “*princeps*”, “*zarudnyi*” and the nominate “*schneiderii*” are differentiate clearly from each other on specific level, and he regarded these as three independent species. Though Taylor’s work is so old and need phylogenetic confirmation, but again, Masroor (2009) argued “*princeps*” and “*zarudnyi*” having an expanded contact zone in Iran as full species (pers. comm.). Phylogenetic studies done by Perera et al. (2012) based on 863 bp mtDNA fragment (12S rRNA and 16S rRNA) has revealed three well supported lineages as distinct and defined subspecies of *E. schneiderii* and validated “*schneiderii*”, “*princeps*” and “*pavimentatus*” at subspecific level. An updated and comprehensive molecular and phylogenetic analysis on *E. schneiderii* subspecies in Iran, Iraq and Armenia is ongoing by the first author of the paper and it will clearly confirm or contradict these conclusions on subspecific status of “*princeps*” and “*zarudnyi*”. There is a need to carry out extensive sampling and phylogenetic studies in the Middle East to understand genetic differences and exact distribution patterns of different known and unknown subspecies of *Eumeces schneiderii*.



FIGURE 3. *Eumeces schneiderii zarudnyi*, from Qeshm Island, Hormozgan Province, southern Iran (Photo by: Fariborz Heidari).

***Eurylepis taeniolatus* Blyth, 1854 (Fig. 4)**

Ribbon-Sided Skink, Alpine Punjab Skink, Yellow-bellied Mole Skink

Eurylepis taeniolatus Blyth, 1854:739-740 (Type locality: Alpine Punjab [= Salt Range, Punjab], India; Holotype: ZSI 2382 [fide Das., et al., 1998]).

Plestiodon scutatus Theobald, 1866: 25-26 (type description: no record of habitat; two specimens)

Eumeces scutatus: Lantz, 1918:15. _Morich, 1929:32. _Boulenger 1887: 382 (fide Smith 1935)

Eumeces taeniolatus: Stoliczka, 1872:75-76. Taylor, 1935:111-119. _ Terentjev and Chernov, 1949:169-170. S. Anderson, 1963:476; 1968:333; 1974:38-44. _ Leviton et al., 1992:69.

Eumeces taeniolatus parthianicus Szczerbak, 1990:33-40. Fig. 1b, fig. 2b. (Type locality: Northern slope of central Lopet Dag, Chuli, 25km west of Ashkhabad, Turkmenistan; Holotype: ZIK Re 18 no. 17660 adult male) — Anderson, 1999:272-274.

Eurylepis taeniolata parthianicus Szczerbak, 1990 — Griffith, Ngo & Murphy 2000— Schmitz et al. 2004— Rastegar-Pouyani et al. 2008.

Two specimens of this species collected for the first time from Salt Punjab region of India by William Theobald, who at the time was a member of the Geological Society of India. In 1854, Blyth, Bengal zoological museum librarian, described these specimens as *Eurylepis taeniolatus* and put them as the type specimens of the new genus. But the description presented for the first time by Blyth was very incomplete for the genus and new species and more accurate descriptions better done by later researchers (Taylor 1935).

In 1866, Theobald during the preparation of a catalog with reptiles of the Bengal Asiatic Society Museum described a new species as *Plestiodon scutatus* based on two adult specimens, but provided no information on locality and collector of specimens. It was later determined that the specimens in which the new species (*Plestiodon scutatus*) was described based on, were *Eurylepis taeniolatus* type specimens (Taylor 1935). Anderson (1871), while debating on the genus *Eurylepis*, provided a comprehensive description of the species *Eurylepis taeniolatus* and recognized the type specimens of



FIGURE 4. *Eurylepis taeniolatus* around Bezangan Lake, Razavi Khorasan (photo by: Mr. Khani)

both species (*scutatus* and *taeniolatus*) as belonging to the same species, and put both as *taeniolatus* Blyth 1854. And *Scutatus* Theobald's became synonymous with *taeniolatus* Blyth (Taylor 1935).

Eurylepis Blyth, 1854 was offered for a variety of Indian skinks. This species was named *taeniolatus* and mainly known by having large dorsal plates or scales. *Eurylepis* contains two species. *Eurylepis poonaensis* (Sharma 1970) which is distributed in Maharashtra, India. And *Eurylepis taeniolatus* Blyth, 1854 in Central and West Asia, which has three sub-species as follows:

The subspecies "*arabica* (Szczerbak 1990)" in Saudi Arabia (type locality: north-west of Saudi Arabia), the subspecies "*parthianica* (Szczerbak 1990)" in the border between Iran and Turkmenistan in the region of Khorasan (Sarakhs) and northern Afghanistan (type locality: northern slopes of the Kopet Dagh mountains, Chuli, 25 km West of Tashkent, Turkmenistan) and the subspecies "*taeniolata* Blyth 1854" in Pakistan and India (type locality: Punjab, Pakistan).

The name "*poonaensis*" originally regarded as *Eumeces poonaensis* Sharma 1970. Then Griffith et al. (2000), changed the name to *Eurylepis*. A name which was then accepted by other workers (Schmitz et al. 2004; Murat et al. 2012; Hedges 2014).

Khan and Khan (1997) believe that *Eurylepis poonaensis* can be synonymous with "*taeniolatus*" and genus *Eurylepis* still can be remain a monotypic genus. Although Taylor (1935: 110) argued that *E. taeniolatus* can be more than one species and proposed further studies to clarify the systematic position of the genus.

Distribution: The distribution of *E. taeniolatus* has largely been cut off with disjunctions. Northwest and West Saudi Arabia; South Yemen; North East, Iran; Iraq; Jordan; Afghanistan; Pakistan; India and southern Turkmenistan.

Comparisons of four current genera of *Eumeces* s.s., *Mesoscincus*, *Plestiodon* and *Eurylepis* (based on Taylor, 1935; Anderson, 1999)

As mentioned above, all these genera were originally classified as a single genus *Eumeces* (s.l) until recently. There is some distinguishing and prominent characters defined for each genus based on which each one classified under a separate species group. *Eurylepis* (the formerly *Taeniolatus* group), is characterized by four or five pairs of nuchals; presence of a large postnasal; two (rarely one) postmentals; frontal in contact with the interparietal, which is not enclosed by parietals; three supraoculars touch parietal; last labial separated from ear by about four pairs of postlabials; 21 scale rows at midbody. This group has no close relatives, but it probably has more specialized characters in common with the "*Schneiderii*" group than with any of others. Fusion of median scale rows which is incomplete to some extent in "*schwartzzei*" group, possibly evolved independently in the two groups (Taylor 1935). *Mesoscincus* (the formerly "*schwartzzei*" group), has three presuboculars, separated from postsuboculars; upper eyelid reduced; the supraciliary and palpebral scales in contact; lower eyelid with three rows of scales; the third supraocular is widely separated from the frontal; ear lobules prominent; a single postmental; a single postnasal; two supraoculars touching the mental; toes and fingers with four complete series of scales throughout their length. *Plestiodon* (previously encompassed about 10 species groups including "*fasciatus*", "*egregious*" group, "*longirostris*" groups..., (Tab. 1) is distributed from America territories to Japan in Eastern Asia. They are characterized by having 28-30 scale rows; postnasal is usually absent; supraciliaries vary from six to nine.

All taxa included in the genus *Eumeces* (s.s) (formerly *Schneiderii* group) are characterized by absence of postnasals; one or two postmental shields; nasal divided; four or five pairs of nuchals; very large species in the group. In *E. s. zarudnyi* dorsal scales of the body smooth, arranged in 26 longitudinal rows; lateral scales smaller; all the specimens from Iran have 26 scales rows.

CONCLUDING REMARKS

There is usual and often published use of "*schneideri*" instead of the "*schneiderii*" which is incorrect based on ICZN nomenclatural rules, articles 31.1.1 and 23.1. Although some authors indicates that the Terra Typica of *Eumeces schneiderii* is as Cyprus, this situation is really complex. Daudin (1802) did not mention a terra typica for his "*Scincus schneiderii*". Thus, Taylor (1935) had designated Egypt (Sina peninsula with high possibility) as the Terra Typica of the species. However Mertens (1946) declared Cyprus as the terra typica for *E. schneiderii* and regarded the nominate ssp *E. s. schneiderii* to be endemic to Cyprus. When take into consideration of the original description of Daudin (1802) it can be seen easily that the described animal has two light longitudinal stripes and whitish dots on dorsum. When the Cypriot specimens taken into consideration (Gocmen et al., 2002 & 2008), curiously Doudin's species is not from Cyprus. Also the *E.s. barani* described by Kumlutas et al. (2007) has been accepted as a synonym of *E. s. princeps* by Yalcinkaya (2013, PhD Thesis), since similar white dotted animals (which are absolutely accepted as *E. s. princeps*) found around Kilis and

Gaziantep provinces of Turkey and also along with the Euphrates river (showing Mediterranean Ecozone).

Since holotype of *E. schneiderii* lost (cp. Taylor 1935:133: "type formerly in the Paris Museum") the revision of the genus needs a "neotype" description and also a range wide molecular reevaluation of the intraspecific variation.

Too close relationships of *Scincus* and *Scincopus spp* to *E. schneiderii* species group is very noticeable. This can represent the paraphyly of *E. schneiderii* species group as presented by Pyron et al. (2013), Figure 6E, extracted from suqamate tree relationships, in phylogenetic relationships among *Eumeces*, *Scincus* and *Scincopus*. The results of molecular studies by mitochondrial genes (12S + Cytb), showed that *E. algeriensis* has been divided from *Scincopus fasciatus* about 12.8mya (Carranza et al. 2008). Based on the same study, common ancestors of *E. schneiderii* and *E. algeriensis* along with species of *Scincus* and *Scincopus* been divided around 13.7mya. Very wide distribution range within the *E. schneiderii* (Punjab Pakistan to the West and North Africa) led to forming about 5 to 6 subspecies within this species. Placing three species *Eumeces blythianus*, *Eumeces cholistanensis* and *Eumeces indothalensis* in *Eumeces schneiderii* species group is only because of occurring at the same geographic range and same distribution pattern with this group of species. And no coherent molecular studies encompassing all 5 species has taken place so far. Since *Eurylepis taeniolatus* is in the same geographic region with the mentioned species group, there is also possibility and probability of the above three species belonging to the monotypic *taeniolatus* species group instead of *Eumeces schneiderii* species group. One way to examine these relationships is phylogenetic studies and the other one is karyotype studies that both aspects are ongoing by the first author in a PhD thesis.

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