Osteology of *Darevskia defilippi* (Camerano, 1877) raises doubts: Is it really a close relative of *Darevskia raddei* (Boettger, 1892)?

Darevskia defilippi is a poorly studied species (Ščerbak 2003). It was described as *Podarcis defilippi* by Camerano (1877), on the basis of specimens regarded as *Lacerta muralis* by De Filippi (1865). In the following years it was considered a variety of the Common Wall Lizard (*L. muralis* var. *defilippi*) by authors such as Boettger (1886), Bedriaga (1886 - *L. muralis* var. *persica*, a synonym) and Boulenger (1904, 1913, 1920). Contemporary to this latter, Mehely (1909) included it in *Lacerta saxicola* Eversmann, 1834, as *L. saxicola* var. *defilippi*, an opinion also adopted by Lantz & Cyrén (1936), and maintained during a good part of the 20th century, even in Darevsky's (1967) seminal work about the Caucasian lizards, where species such as *L. rudis* (Bedriaga, 1886), *L. caucasica* (Méhely, 1909), and the four known parthenogenetic taxa were split from the collective taxon *L. saxicola*. With the progressive disaggregation of *Lacerta saxicola*, *defilippi* was regarded as a subspecies of *Lacerta raddei* (Boettger, 1892) by Bannikov et al. (1977). The first to consider *Lacerta defilippi* as a full species again, apart from Welch (1983) in a mere checklist, were Darevsky et al. (1984). This and the other species corresponding to the *Lacerta saxicola* group were later included in the genus *Darevskia* (Arribas 1997, 1999; Arnold et al. 2007). Méhely (1909) supposedly provided osteological data about *Lacerta saxicola* var. *defilippi*, but in fact all the localities from which bones were studied in this paper (Tativ, Shusha and Njuwadi) refer to record localities of *Darevskia raddei*, not *D. defilippi*.

In the present note, the author submits the first osteological data of *Darevskia defilippi* and compares it with information on other studied species of *Darevskia* (most comparative data in Arribas 1998). The studied material comprised three males of *D. defilippi* (Razi University collection numbers LL40.4, LL40.5, LL40.7) donated by Nasrullah Rastegar-Pouyani (Department of Biology, Faculty of Science, Razi University, Kermanshah, Iran) collected from Lar Valley (Tehran province, Iran), about 3000 m a.s.l. in June 2002. Small samples are sufficient to reveal qualitative traits representative of the majority of the population, even if any of the vouchers displayed a deviant character state.

The previously ethanol fixed and preserved specimens were cleared by means of 1% KOH in deionized water. Bones were stained with alizarin red and thereafter differentiated and freed from excess pigment with Mall solution (80% of the previous clearing solution plus 20% of pure Glycerol) for three months, and preserved permanently in glycerol following procedures by Taylor (1967) and Durfort (1978). Osteological terminology is as in Arribas (1998). The following osteological characteristics of *D. defilippi* are presented:

Skull: Seven (in two specimens) or six (in one) teeth (average 6.66) on the azygous premaxillary. Processus nasalis slender. Number of teeth on maxillary (counts per side and individual, sorted by size): 13, 15, 15, 16, 16, 17 (average 15.33). Number of teeth on dentary: 19, 20, 20, 20, 20, 20 (average 19.83). Maxillojugal suture smooth, not stepped. Postfrontal and postorbitary bones separated, with anterodistal process of the postfrontal and anteromedial process of the postorbitary present. Postfrontal and postorbitary subequal (in one specimen: postorbitary a bit longer than postfrontal; in two specimens: the reverse situation). Squamosal bone overlaps with postorbitary one third the length of the latter. Supraocular lamellae partially reduced and strongly fenestrated.

Vertebral column: Sexual dimorphism in the number of presacral vertebrae is universal in Lacertini where they add up to 27 in male and 28-29 in female *Darevskia*. Since the present *D. defilippi* sample includes males only, sexual dimorphism was not addressed. For these male specimens, the usual number of 27 presacral vertebrae includes 6 posterior presacral vertebrae with short dorsal ribs. The third (cervical) vertebra is not associated with ossified ribs; sternal costal formula: (3+2). A-Type of preautotomic caudal vertebrae is present (Arnold et al. 2007).

Pectoral girdle: Medial loop of clavicle interrupted posteriorly ("clavicles open"); sternal fontanel oval (sometimes slightly distorted); interclavicle with the lateral branches slightly directed forward.

In the past, *D. defilippi* was confused with *D. raddei* (i. e. MEHELY 1909), and in the first approaches to the phylogeny of the group by DAREVSKY (1967; fig 84) it was considered next to this species (concretely to *L. saxicola nairensis* DAREVSKY, 1967, now *Darevskia raddei nairensis*). To date, the Iranian lizard *D. defilippi* is classified a close relative of *D. raddei*.

However, despite extensive genetic studies of the genus *Darevskia* by several authors (both electrophoresis and mitochondrial DNA; see e. g., FU et al. 1997 and MURPHY et al. 2000), *D. defilippi* was not included in any of these analyses and by this, its position yet remains uncertain.

Darevskia raddei is considered a basal form within the so-called "*caucasica* group" (MURPHY et al. 2000), but although being monospecific (the internal relationships are complex and still uncertain), it was preferentially treated as a group of its own in the past (ARRIBAS 1997, 1999). Its studied members [*D. raddei raddei*, *D. r. nairensis* and *D. r. vanensis* (EISELT, SCHMIDTLER & DAREWSKY, 1993)] shared a derived osteological character, the increased modal number of vertebrae in both males and females. This increase in number relative to other *Darevskia* seems also to be present in *D. clarkorum* (DAREVSKY & VEDMEDERJA, 1977), another member of the "*caucasica* group" (ARRIBAS 1998).

The osteological characteristics of *D. defilippi* are largely in agreement with most other *Darevskia* species; it shares with them the increased number of presacral vertebrae, characteristic of this genus (27 in males and 28 or more in females; usually one or two more than in other Lacertini genera). By this, its allocation in *Darevskia* seems justified despite the lack of genetic studies and the extreme morphological similarity among lizard genera.

However, *D. defilippi* lacks the "second increase" in the modal number of vertebrae, the one that characterizes the "*raddei* group" within *Darevskia*. *Darevskia defilippi* might be basal to these *D. raddei* taxa and lack their autapomorphy (i. e., second increase in number of presacral vertebrae), but we cannot be sure about its relationship and the true relations within the genus.

The number of premaxillary teeth (seven in *D. defilippi*) seems to exclude its close relationship with *D. chlorogaster* (BOULENGER, 1908) (nine teeth), which also is Iranian. However, just like the *D. defilippi* specimens studied, *D. chlorogaster* has slightly forward directed lateral interclavicular branches, a character state of variable degree in other species (ARRIBAS 1997, 1998, 1999). Thus, the closer relationship between *defilippi* and *chlorogaster* cannot be fully discarded. None of these two species has been included in the extensive genetic studies of the genus. From the relationships traced in ARNOLD et. al (2007), *D. chlorogaster* may pertain to the "*caucasica* group". Another species, *Darevskia*(?) *steineri* (EISELT, 1995), also from Iran, is only known from its original description.

Geographically close, but allopatric, *D. raddei* have an increased number of vertebrae, as said above, and a green belly, both characteristics being well different from *D. defilippi* with its vivid brick-red venter. *Darevskia valentini* (BOETTGER, 1892) of the "*rudis* group" has a greenish belly (not red), a single and enlarged scale in the semicircle of preanal scales (usually two, not enlarged in *D. defilippi*) and more or less keeled scales in the thighs (small and unkeeled in *D. defilippi*), and thus, is also an improper candidate for parentship.

In fact, only one *Darevskia* shares with *D. defilippi* the brick-red colored belly: *Darevskia parvula* (LANTZ & CYRÉN, 1913). Thus, its relationship to *D. defilippi* would merit to be studied in depth. *Darevskia parvula* of the "*rudis* group" lives in the other (western) side of the Caucasian Isthmus, and if related to *D. defilippi*, would illustrate a perfect areal disjunction between Colchic and Hyrcanian (Talysh) refuges. Osteologically, both share a lot of primitive characters, but these are widespread, and do not say anything about their true relationship.

Another species, *D. portschinskii* (KESSLER, 1878), also of the *rudis* group", can have brigth-yellow or yellowish-orange bellies (DAREVSKY 1967), far from the brick-red of the abovementioned species. *Darevskia portschinskii* occupies a geo-

graphically intermediate area in the Caucasian Isthmus between the range areas of *D. defilippi* and *D. parvula*. From the above, it appears promising to study in detail the relationship of *D. defilippi* with lizards of the "*rudis* group", *D. parvula* in particular, rather than the "*caucasica* group" to which the *D. raddei* complex belongs.

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