

Coluber (sensu lato) schmidtleri n. sp. from the southern Zagros Mountains in Iran (Squamata: Colubridae)

Coluber (sensu lato) schmidtleri n. sp. aus dem südlichen Zagros Gebirge im Iran
(Squamata: Colubridae)

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KURZFASSUNG

Coluber (sensu lato) schmidtleri n. sp. wird aus dem Zagros Gebirge der Provinzen Boyerahmad, Fars und Khuzestan (Iran) beschrieben. Die neue Art ist mit *C. (s. l.) collaris* (MÜLLER, 1878) und *C. (s. l.) najadum* (EICHWALD, 1831) verwandt. Diese Artengruppe zeichnet sich durch einfache Apikalgrübchen aus und bildet wahrscheinlich die Schwestergruppe von saharo-sindischen Zornnattern der Gattung *Platyceps* BLYTH, 1860. Die verwandtschaftlichen Beziehungen paläarktischer Gattungen und Artengruppen von Zornnattern werden kurz diskutiert.

ABSTRACT

Coluber (sensu lato) schmidtleri n. sp. is described from the southern Zagros range in Boyerahmad, Fars and Khuzestan provinces, Iran. The new species is related to *C. (s. l.) collaris* (MÜLLER, 1878) and *C. (s. l.) najadum* (EICHWALD, 1831). This species group is defined by single apical pits and is probably the sister group of Saharo-Sindian racers of the genus *Platyceps* BLYTH, 1860. The phylogenetic relationships of Palaearctic racer genera and species groups are briefly discussed.

KEY WORDS

Reptilia: Squamata: Colubrinae: *Coluber (s. l.) schmidtleri* n. sp., morphology, distribution, Zagros Mountains, Iran, Palaearctic racers, relationships, *Coluber (s. l.) Platyceps*

INTRODUCTION

During the last two decades the senior author has been given the opportunity to examine a large number of Iranian racer and whip snake species from various collections. Some specimens classified as *Coluber (sensu lato) najadum* (EICHWALD, 1831), *Platyceps rhodorachis* (JAN, 1863) and *P. ventromaculatus* (GRAY, 1834) have for a long time been in need of a precise identification. Four individuals hitherto referred to these species as well as a juvenile specimen not specifically determined

by SCHMIDTLER & SCHMIDTLER (1972) clearly differ from Eichwald's Whip Snake as well as Jan's and Gray's Racer. They are described as a new species hereafter.

Against better judgement, we prefer to refer this new species and a few other Palaearctic taxa to the unduly stressed name *Coluber* auct. for reasons explained elsewhere (SCHÄTTI et al. 2001). We account for this unsatisfactory situation with the epithet 'sensu lato' (see generic allocation).

MATERIAL

The examined specimens are deposited in the herpetological departments of The Natural History Museum, London (BMNH), Field Museum of Natural History, Chicago (FMNH), Zoologisches Forschungsinstitut und Museum Alexander

Koenig, Bonn (ZFMK), and the Zoological Institute of the Russian Academy, St. Petersburg (ZISP).

The data for a juvenile paratype in the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt/Main (SMF 66810)

were ascertained by J. F. SCHMIDTLER (Munich). This new species is named after him in honour of his remarkable contributions

to the knowledge of the herpetofauna of the Anatolia-Iranian region and the generosity in making his notes available.

THE NEW TAXON

Coluber (sensu lato) schmidtleri n. sp.

Zamenis dahlii "(Fitz.)". - NIKOLSKIY 1907: 293 ("Dech-i-Diz in Arabistano" [Dehdez, Khuzestan], ZISP 10292); NIKOLSKIY 1916: 61 (same specimen).

Zamenis ventrimaculatus var. *semifasciatus* "BLYTH?". - WERNER 1917: 210 ("zwischen Kazerun-Schiraz-Persepolis", ZFMK 31601).

Coluber n. najadum (EICHWALD) [partim]. - MERTENS 1940: 248 ("Dech-i-Diz", ZISP 10292).

Coluber sp.- SCHMIDTLER & SCHMIDTLER 1972: 62 ("Mehkuh", SMF 66810).

Coluber najadum [partim]. - BARAN 1976: 36 ("Iran", FMNH ["FMC"] 170927).

Coluber "spez. indet.". - SCHLEICH 1977: 129, map II (based on SCHMIDTLER & SCHMIDTLER 1972).

H o l o t y p e : FMNH 170927 (ad. ♂), "Fars, 5 mi. N. E. Yasoodi" (Yasuj, Boyerahmad-va-Kogiluye), 30°40'N 51°36'E, D. Womochel, Street expedition to Iran, 14 October 1968.

P a r a t y p e s : BMNH 1905.10.14.47 (♀), "Backtyari Mts, 120 mls. S. Ispahan", c. 2000 m (7000 feet), R. B. Woosnam (pres. Col. Bailward); SMF 66810 (juv. ♂), Mehkuyeh (Fars), 29°00'N 52°29'E, c. 1500 m, J. J. & J. F. Schmidtlér, 10 April 1968; ZFMK 31601 (♂), "Fars, Umgebung von Shiras" [catalogue entry], F. C. Andreas, 1878 (no. 162); ZISP 10292 (♂), Dehdez [Deh Diz] (Khuzestan), 31°42'N 50°19'E, N. A. Zarudnij, 6 April 1904.

D i a g n o s i s : Apical pits mostly single; 15 or 17 longitudinal rows of dorsals on the neck and at midbody, 13 rows prior to the anal scale, with a single lateral or a lateral and a paravertebral reduction on each side of the body.

Description of holotype: Adult ♂. Rostral only slightly visible from above; internasal about the same length as prefrontals. Frontal considerably wider anteriorly, about the same length as median suture of parietals, posterior tip of frontal

reaching somewhat farther than posterior border of supraoculars. The latter much broader posteriorly. Parietals longer than frontal, narrow and truncated behind. Nostril touching internasal. Loreal longer than deep. Eight supralabials, fourth and fifth bordering eye, fifth and seventh largest. A single subocular (small) and preocular, the latter in contact with frontal; two postoculars, upper larger. Two anterior and three posterior temporals (fig. 1, table 1). Nine or ten sublabials, anterior five in contact with first pair of inframaxillaries, sixth largest. Posterior inframaxillaries narrower and somewhat shorter than anterior pair, caudally separated by two scales.

Habitus slender (fig. 2). 205 ventrals, anal plate divided, 118 subcaudals. Apical pits on forebody (as far as detectable) paired, single toward midbody and posteriorly. Dorsal scales in 17 longitudinal rows at the level of the 15th ventral scale and at midbody; reductions at 65% of the total number of ventrals (table 1) comprising third and fourth row above the 131st (left) and 135th ventral, and rows six and seven at the level of the 133rd ventral. Snout-vent length c. 460 mm, tail length 195 mm.

Snout light brownish olive, posterior part of pileus rather uniformly darkened and without distinct pattern. Preocular, subocular, posterior supralabials and postoculars light, possibly white or yellowish in life. Temporal region with a brownish black edged spot. A dark and slightly crescent stripe from the outer posterior border of the parietals to the angle of the mouth, and with a narrow light brown area running transversely over the neck immediately behind the parietals. At least three complete transverse bands on the nape; first not reaching beyond a longitudinal line running through the mouth, with a light edged posterior border and a distinct cranial extension on the right side; second and third band narrower, with light anterior and posterior borders, laterally reach-

Table 1: Type series of *Coluber (s. l.) schmidtleri* n. sp. including information on sex, ventral and subcaudal counts, number of supralabials and temporal scales, longitudinal dorsal scale rows at the 15th ventral, at midbody and prior to the anal scute, and reduction levels (l - lateral, p - paravertebral) in percent of the total number of ventrals (average of right and left side).

Tab. 1: Typenserie von *Coluber (s. l.) schmidtleri* n. sp. mit Angaben zum Geschlecht und zur Anzahl der Ventralia und Subcaudalia, Supralabialia, Temporalia und Dorsalia-Längsreihen auf der Höhe des 15. Ventrale, in der Körpermitte und vor dem Analschild sowie zum Reduktionsniveau (l - lateral, p - paravertebral) als Prozentsatz der Gesamtzahl der Ventralia (gemittelt für rechte und linke Seite).

Specimen Exemplar	Sex	Vent- ralia	Sub- caudalia	Supra- labialia	Tempo- ralia	Dor- salia	Reductions (%) Reduktionen (%)	Remarks Bemerkungen
FMNH 170927	♂	205	118	8	2+3	17-17-13	65 (l, p)	Holotype Holotypus
BMNH 1905.10.14.47	♀	212	124	8	2+2/3	17-17-13	50 (l), 56 (p)	
SMF 66810	juv. ♂	201	116	8/7	2+3	15-15-13	61 (l)	
ZFMK 31601	♂	199	113	8	2+2	17 *	unknown unbekannt	* at midbody * in Körpermitte
ZISP 10292	♂	198	118	8	2+3	17-17-13*	52 (l), 57 (p)	*see text *vgl. Text

ing to the first row of dorsal scales. Anterior upper part of body darkened in general aspect, likely due to the effect of the preservative agent. Probably with additional narrow transverse bands or fine bars on each side running toward the midline of the forebody. Posterior part of trunk and tail rather uniformly greyish brown and without pattern (fig. 2). Chin and underside of body light coloured, without pattern; anterior parts including chin possibly yellowish in life.

Right maxillary with 13+2 teeth separated by a distinct diastema, anterior-most teeth smaller, posterior series homogeneous in size; the two posteriormost teeth enlarged, last one laterally offset. Hemipenis reaching to 8th subcaudal, *M. retractor penis magnus* inserting at the border between subcaudals 36 and 37.

Variation: BMNH 1905.10.14.47 with an enlarged elongated scale along the posterior outer edge of the parietals. Normally eight supralabials, fourth and fifth in contact with the eye; SMF 66810 with only seven supralabials on left side by fusion of the last two scales. Two (upper small in ZFMK 31601) or three posterior temporals (table 1). Nine to eleven sublabials. Posterior chin shields entirely separated on the midline by one (anteriorly) to three rows of smaller scales in BMNH 1905.10.14.47.

Ventrals 198-212 (♂ 198-205, ♀ 212), subcaudals 113-124 (113-118 and 124, respectively). Apical pits single (not discernible in ZFMK 31601 and ZISP 10292).

Dorsal scales on neck and at midbody in 15 or 17 longitudinal rows, 13 prior to anal scale. SMF 66810 reduces at the level of ventral 122 (61% of the total number of ventrals) by fusion of third and fourth row; three specimens have one lateral and a paravertebral reduction between 50-65% of the total number of ventrals (table 1) including, respectively, rows 3 to 5 and 6 to 8 on each side of the body. ZISP 10292 has 13-11-13 dorsals on posterior part of the body with paravertebral scale row fusions at 93 and 96%. Maximum total length of BMNH 1905.10.14.47 c. 842 mm (c. 580 + 262 mm). Maxillary with 13+2 teeth, extent of diastema variable in ZISP 10292 (narrow) and BMNH 1905.10.14.47 (wide).

BMNH 1905.10.14.47 has a dark oblique subocular streak on fifth and sixth supralabial, dark markings on the temporal area including the posterior supralabials, and narrow, light-edged transverse bars on a greyish brown ground colour partly forming complete bands reaching to approx. ventral 54 (fig. 3); remainder of dorsum and tail plain brown. The juvenile specimen (SMF 66810) has a comparatively light (brownish) snout, a dark streak in the loreal area, a dark spot on the anterior temporal region, a marked crescent posteriorly (as in the holotype) and distinctive light edged transverse bands and bars on the forebody. ZFMK 31601 was described as greyish green on the anterior part of the trunk, light brown posteriorly

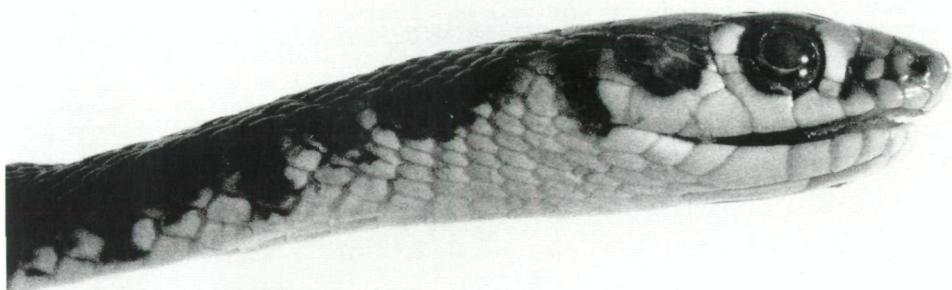


Fig. 1: Lateral view of head and neck of *Coluber* (s. l.) *schmidtleri* n. sp. (FMNH 170927, holotype, ♂).
Photograph CLAUDE RATTON.

Abb. 1: Lateralansicht des Kopfes und Halses von *Coluber* (s. l.) *schmidtleri* n. sp. (FMNH 170927, Holotypus, ♂).
Photo CLAUDE RATTON.

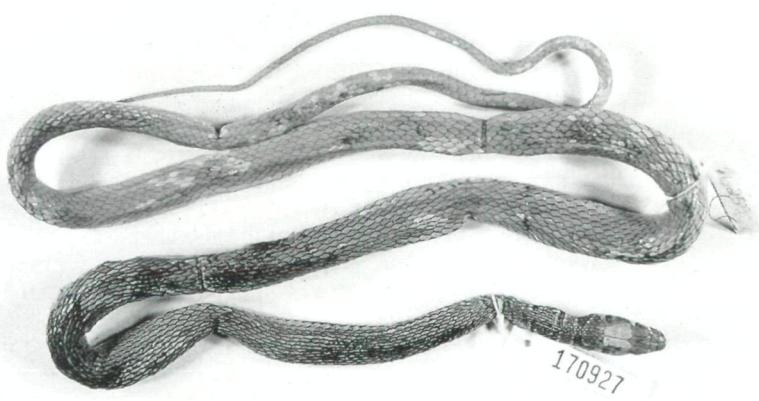


Fig. 2: Dorsal view of *Coluber* (s. l.) *schmidtleri* n. sp. (FMNH 170927, holotype, ♂). Photograph CLAUDE RATTON.
Abb. 2: Dorsalansicht von *Coluber* (s. l.) *schmidtleri* n. sp. (FMNH 170927, Holotypus, ♂). Photo CLAUDE RATTON.



Fig. 3: Dorsal view of *Coluber (s. l.) schmidtleri* n. sp. (BMNH 1905.10.14.47, paratype, ♀).
Photograph PIERRE BRAUCHLI.

Abb. 3: Dorsalsicht von *Coluber (s. l.) schmidtleri* n. sp. (BMNH 1905.10.14.47, Paratypus, ♀).
Photo PIERRE BRAUCHLI.

("vorn hell graugrün, nach hinten in hellbraun übergehend") and a uniformly yellowish underside; there are about twenty ("die letzten 5 schon kaum bemerkbar") narrow and yellow edged dark transverse bars ("Querbinden") on the forebody (WERNER 1917). ZISP 10292 is virtually without pattern and had once an olive dorsal coloration (NIKOLSKIJ 1907; MERTENS 1940).

Distribution and ecological notes

So far, *C. (s. l.) schmidtleri* has only been recorded from the southern Zagros Mountains between Dehdez in extreme eastern Khuzestan and the vicinity of Firuzabad in Fars (fig. 4). The collecting sites are probably situated between c. 1,500 m (Dehdez, Mehkuyeh) to over 2,000 m (BMNH 1905.10.14.47) above sea level.

Except for the juvenile paratype, there is hardly any information on the circumstances of collecting and ecological data concerning the type series of *C. (s. l.)*

schmidtleri. SMF 66810 was caught under a stone near a creek during rainy weather. The habitat is stony with outcrops of larger rocks, mostly low vegetation and scattered almond trees (*Amygdalus communis*, fig. 5). Amphibian and reptile species found in the same general area are, for instance, *Bufo surdus annulatus* SCHMIDTLER & SCHMIDTLER, 1969, *Bufo viridis* LAURENTI, 1768, *Hyla savignyi* AUDOUIN, 1827 (southernmost collecting site in Iran), *Trapelus lessonae* (DE FILIPPI, 1865) (as *Agama ruderata*), *Tropiocolotes h. heleneae* NIKOLSKIJ, 1907, *Ophisops elegans* MÉNÉTRIÉS, 1832 ssp., *Mabuya aurata* (LINNAEUS, 1758), *Ophiomorus persicus* (STEINDACHNER, 1867), *Typhlops vermicularis* MERREM, 1820, *Psammophis schokari* (FORSKAL, 1775) and *Echis cf. carinatus* (SCHNEIDER, 1801) (SCHMIDTLER & SCHMIDTLER 1972; see also SCHMIDTLER & SCHMIDTLER 1969).

It appears that *C. (s. l.) schmidtleri* inhabits open and comparatively dry regions of the southern Zagros range. There

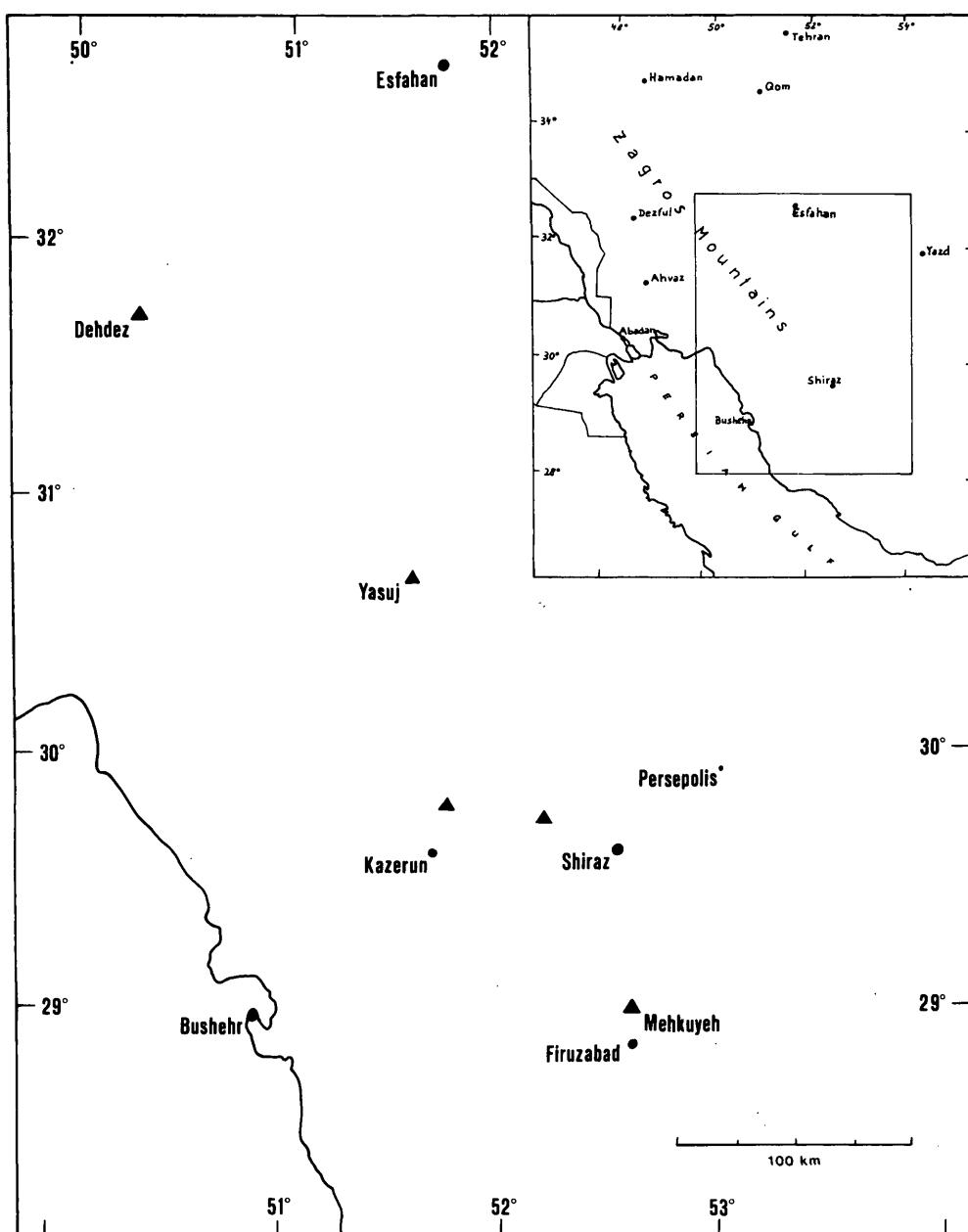


Fig. 4: Collecting sites (▲) of *Coluber* (s. l.) *schmidtleri* n. sp.
Abb. 4: Fundorte (▲) von *Coluber* (s. l.) *schmidtleri* n. sp.



Fig. 5: Habitat of *Coluber* (s. l.) *schmidtleri* n. sp. in the vicinity of Mehkuyeh (Fars, Iran).
Photograph J. J. & J. F. SCHMIDTLER.

Abb. 5: Lebensraum von *Coluber* (s. l.) *schmidtleri* n. sp. in der Umgebung von Mehkuyeh (Fars, Iran).
Photo J. J. & J. F. SCHMIDTLER.

are no records from the semihumid oak association, a cold-resistant forest found in places roughly above 1,200 m altitude along the outer southwestern slopes of these mountains (BOBEK 1968; ANDERSON 1999). Moreover, there is no evidence of an occurrence of *C. (s. l.) schmidtleri* in the northwestern section of the Zagros massif.

Among reptiles, similar distribution patterns may be found in the Banded Dwarf Gecko *Tropiocolotes h. helena* and the Persian Snake Skink *Ophiomorphus persi-*

cus. At least in certain areas, (e. g., the vicinity of Kazerun in Fars), *Coluber* (s. l.) *schmidtleri* may be sympatric with *C. (s. l.) andreasus* (WERNER, 1917) from Fars and Lorestan (SCHÄTTI in press).

It cannot be excluded that *Coluber* (s. l.) *schmidtleri* occurs together with a wide-ranging and closely related species, viz. *C. (s. l.) najadum*. The latter is reported from Yasuj in Boyerahmad province (FRYNTA et al. 1997, see below).

COMPARISON, RELATIONSHIPS, AND GENERIC ALLOCATION

WERNER (1917) noted a confusing combination of morphological features in the specimen obtained by Prof. ANDREAS (ZFMK 31601), and he was tempted to describe it as a new species ("difficile est, speciem novam non facere"). This individual was referred to *Platyceps ventromaculatus* (as *Zamenis v. semifasciatus*) but WERNER (1917) emphasised that its dorsal col-

our pattern bears a strong resemblance to *C. (s. l.) najadum* ("wie bei der sehr ähnlichen Z. *dahlii*").

Probably due to similarities in dorsal pattern and the presence of single apical pits, NIKOLSKIJ (1907, 1916), MERTENS (1940) and BARAN (1976) referred the holotype and a paratype of *C. (s. l.) schmidtleri* (FMNH 170927, ZISP 10292) to *najadum*.

From the latter, the new species can easily be distinguished by fewer scale row counts at midbody, i. e., 15 or 17 compared with 19 in *najadum*.

Coluber (s. l.) *najadum* is known from the Balkans to Iran. LATIFI (1991) reported it from the provinces of Fars ("Schiraz, Takhteh Jamshid, Aghlid") and Kerman ("Kerman, Baft"). These are the presumed southernmost records of Eichwald's Whip Snake. FRYNTA et al. (1997) recorded this species at Qamishlu (32°02'N 51°29'E, 2,000-2,200 m) in Esfahan province and from the vicinity of Yasuj (1,800-2,300 m, Boyerahmad-va-Kogiluye). Unfortunately, no morphological data are given for the two specimens. We do not know any *najadum* from Fars deposited in an institutional collection (e.g., the National Museum at Prague, J. MORAVEC in litt.) and consider the southern limit of distribution of this species as not precisely known for the time being. Certainly, it cannot be ruled out that mentions of *najadum* from Boyerahmad and Fars provinces are based on the new species.

Coluber (s. l.) *schmidtleri*, *C.* (s. l.) *najadum*, and the eastern Mediterranean *C.* (s. l.) *collaris* (MÜLLER, 1878) are most closely related (SCHÄTTI et al. 2001). This is probably the sister group of the Saharo-Sindian genus *Platyceps* BLYTH, 1860 (type species: *Coluber ventromaculatus*) (see SCHÄTTI 1987, 1993; SCHÄTTI et al. 2001). Differences between *Platyceps* spp. and the three species in question exist, for instance, in the number of apical pits (single versus paired, see below).

The systematics of some Iranian racers (e. g., the *Platyceps rhodorachis* complex) are unsatisfactory and the relation-

ships of other species as, for instance, *C.* (s. l.) *andeanus* unclear (SCHÄTTI in press). *Coluber* (s. l.) *ravergieri* MÉNÉTRIÉS, 1832 and its sister species *C.* (s. l.) *nummifer* (REUSS, 1834) are considered to belong to a radiation group including *Hemorrhois* F. BOIE, 1826 spp., viz. *H. algirus* (JAN, 1863) and *H. hippocrepis* (LINNAEUS, 1758) [type species] from Northwest Africa and the Iberian Peninsula (SCHÄTTI 1987).

In an unpublished short communication, NAGY et al. (2000) recently found no difference in the nucleotide sequence of cytochrome b of *C.* (s. l.) *ravergieri* and the eastern Mediterranean racer *Hierophis caspius* (GMELIN, 1789) (both as *Coluber* spp.). This finding is in contradiction with morphological evidence (e.g., basisphenoid, hemipenis) and electrophoretic data (SCHÄTTI 1987; HELFENBERGER unpubl.). Molecular analyses (mtDNA, SCHÄTTI & UTIGER in prep.) support the phylogenetic relationships among Palaearctic racer genera and species groups as briefly outlined in this paper and based on morphological characters. In particular, preliminary results appear to confirm that *C.* (s. l.) *najadum*, *P. rhodorachis*, and *Hemorrhois* spp. belong to a monophyletic radiation group.

At this moment, we prefer to await further morphological and molecular studies and refrain from referring *C.* (s. l.) *schmidtleri* and related species to *Platyceps* or to describe a new genus for the *C.* (s. l.) *najadum* group. Rather, we consider it best to continue to temporarily assign Palaearctic racer species with unclear relationships to *Coluber* sensu lato as an interim nomen operandum.

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