

The Nomenclatural Status of Australian *Ramphotyphlops* (Serpentes: Typhlopidae)

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Abstract

A new genus, *Austrotyphlops*, is proposed for the typhlopoid clade from Australia and southern New Guinea currently known as *Ramphotyphlops*. The names *Libertadictus* and *Sivadictus* of Wells and Wellington (1984-1985) are discussed and dismissed as unavailable *nomina dubia* because their diagnoses are inaccurate and composite. The species of the genera *Ramphotyphlops* and *Austrotyphlops* are enumerated.

Introduction

Although the genus *Ramphotyphlops* Fitzinger (1843) is listed as comprising nearly 60 species (Wallach, 1998; McDiarmid et al., 1999), the exact content is unknown. As currently conceived, the genus is limited to the Australasian region with the sole exception of *R. braminus* (Daudin, 1803), the parthenogenetic 'flower pot' snake, which has colonized much of the world with human assistance. Robb (1966b) resurrected the generic name *Ramphotyphlops*, based upon her anatomical work (Robb, 1960, 1966a), for those species of typhlopids possessing a solid awn-like protrusible hemipenis that retracts into the tail in a helical manner in addition to the presence of cloacal pouches (= retrocloacal sacs of Guibé, 1948) in the posterior body cavity. McDowell (1974), believing he had discovered an earlier available name for this assemblage of snakes, introduced the name *Typhlina* Wagler (1830) in place of *Ramphotyphlops*. The name was employed by Hahn (1980) and others until it was realized that *Typhlina* Wagler is preoccupied by *Typhlina* Ehrenberg, 1828 in Hemprich (1828-1845), whereupon the name reverted back to Fitzinger's *Ramphotyphlops*. Wallach (1995) separated the *R. subocularis* species group from *Ramphotyphlops* and placed the four recognized species in *Acutotyphlops*. Both genera share these male reproductive specializations that are unique within the Scolecophidia and hence are sister taxa.

In addition to *Acutotyphlops* and all Australian *Ramphotyphlops*, other species that are known to have the coiled hemipenis and retrocloacal sacs from Southeast Asia and the East Indies include *R. acuticaudus*, *R. albiceps*, *R. angusticeps*, *R. becki*, *R. cumingii*, *R. depressus*, *R. erycinus*, *R. flaviventer*, *R. lineatus*, *R. multilineatus*, *R. olivaceus*, *R. polygrammicus*, and *R. willeyi* (Wallach, 1998: Table

10). The number of coils in the retracted hemipenis varies from 0.5-15, although coils are lacking in the Philippine *R. cumingii* and the Australian *R. guentheri* and *R. nema* (Wallach, 1998). Retrocloacal sacs range in length from 0.4-7.0% SVL.

Since these two characters are only present in male specimens, some researchers refuse to recognize the validity of *Ramphotyphlops* (Lazell, 1988, 2002). As of yet no other characters are known to separate female *Ramphotyphlops* from *Typhlops* and species known only from females in the Indo-Australian region therefore cannot be positively allocated to either genus. Unfortunately, a number of species from this region have not yet been examined or are only known from females (i.e., *Cyclotyphlops deharvengi*, *R. braminus*, *R. exocoeti*, *R. leucoproctus*, *R. mansuetus*, *R. marxi*, *R. similis*, *R. suluensis*, *R. supranasalis*, *Typhlops ater*, *T. bipartitus*, *T. bisubocularis*, *T. conradi*, *T. depressiceps*) or from types that have been lost or destroyed (i.e., *Typhlops hypsobothrius*, *T. lorenzi*).

Two lineages of *Ramphotyphlops* were detected in a phylogenetic analysis (Wallach, 1998: Fig. 4): a basal clade of Australian-southern New Guinean species and a derived clade of East Indian (Indonesia-Philippines-northern New Guinea-Pacific Islands) species. Since the Australian typhlopids appear to be a monophyletic group and all examined species possess *Ramphotyphlops*-like reproductive structures, it can be assumed that all Australian species share these same reproductive structures. However, the type species of *Ramphotyphlops* is *Typhlops multilineatus* Schlegel (1839), an Indonesian taxon. Thus the name *Ramphotyphlops* is tied to the Indonesian clade of species, necessitating a new generic name for the Australian clade.

Only two generic names are potentially available for typhlopids inhabiting Australia: *Libertadictus* Wells and Wellington (1984) with the type species *Onychocephalus bituberculatus* Peters (1863), and *Sivadictus* Wells and Wellington (1985a) with the type species *Anilius nigrescens* Gray (1845). *Libertadictus* has priority over *Sivadictus*. However, the wholesale splitting of genera and resurrection of all synonyms and subspecies to full species status for the entire Australian and New Zealand herpetofaunas (Wells and Wellington, 1984, 1985a-b) unleashed a torrent of outcries and appeals for the suppression of the three works by the ICZN (Gans, 1985; Grigg and Shine, 1985; King and Miller, 1985; Monteith, 1985; Tyler, 1985; Thulborn, 1986; Australian Society of Herpetologists, 1987; Shea, 1987; Heatwole et al., 1988; Hutchinson, 1988; Ingram and Covacevich, 1988; King, 1988; Stone, 1988; Tyler, 1988; Adler, 1989) although some researchers opposed rejection (Birrel et al., 1988; Dubois et al., 1988; Greer, 1988; Holthius, 1988; Meyer-Rochow, 1988; Anonymous, 1989; Bouchet et al., 1990). What is unsettling is that Wells and Wellington (1985a)

stated that they intended to publish a similar reclassification of the reptiles and amphibians of the world in the future, and they even cite "A Synopsis of the Amphibia and Reptilia of New Guinea and Adjacent Islands" in their bibliography as being "in press" but with a 1985 publication date. This paper has thankfully never appeared. Wells and Wellington (1984) made 282 taxonomic changes, Wells and Wellington (1985a) made 447 changes, and Wells and Wellington (1985b) made 10 changes for a grand total of 739 taxonomic changes. These included 107 new genera, 470 new species, and 104 lectotype designations (Aust. Soc. Herp., 1987), supported by 502 fabricated references by the authors from the 'Australian Herpetologist' in 1983-1984 (Wells and Wellington, 1985a). The ICZN (1991) decided that even though Wells and Wellington displayed contempt for the Code and its provisions and that the case for suppression was strong, the issues involved were of a taxonomic nature rather than nomenclatural one and best left for individual taxonomists to deal with, any request for suppression being concerned with names rather than works.

Libertadictus was established as a monotypic genus by Wells and Wellington (1984) for the species *Ramphotyphlops bituberculatus*. The genus was diagnosed by the following combination of characters: midbody scale rows 20, snout trilobed in dorsal view, snout angular in lateral view, maximum snout-vent length 170 mm, nasals semidivided, superior nasal suture not visible dorsally, rostral shield-shaped, and length/width ratio 40-90. All of these characters fit the type species except for length, which is 450 mm. Wells and Wellington (1985) then expanded *Libertadictus* to include another 13 species (Table 1). Examination of Table 1 reveals that midbody scale rows in the group vary from 16-24, which is the maximum range in all Australian typhlopids. In comparing the dorsal snout shape, a distinctly trilobed contour is only present in *R. bituberculatus* but another nine species have a weakly trilobed appearance and four species have a rounded contour. In lateral profile all species are angular except *R. ammodytes* and *R. diversus*. All included species have snout-vent lengths greatly exceeding 170 mm; total length (which is nearly equal to snout-vent length) ranges from 300-700 mm. A completely divided nasal is present in five species and the superior nasal suture is visible dorsally in three species. Thus, none of the characters proposed by Wells and Wellington (1984) for their genus *Libertadictus* define the expanded group of Wells and Wellington (1985). In fact, the only species for which the characters apply (excepting snout-vent length) are *R. bituberculatus*, *R. pinguis*, and *R. waitii*. It is clear that the genus *Libertadictus* is insufficiently diagnosed and should therefore be considered a *nomen dubium*.

The genus *Sivadictus* Wells and Wellington (1985) was established for 20 species (six of which were resurrected from synonymy) in addition to the type species of *R. nigrescens*. It was diagnosed by the following characters: lacking obvious

Table. 1. Synopsis of taxonomic characters of *Libertadictus*. MSR = mid-body scale rows, TDS = trilobed snout (dorsal view), ALS = angled snout (lateral view), SVL = maximum snout-vent length (mm), ND = nasals divided, SNS = superior nasal suture visible dorsally, L/W = total length/midbody diameter ratio

Species	MSR	TDS	ALS	SVL	ND	SNS	L/W
<i>bituberculatus</i>							
(type species)	20	++	+	450	0	0	40-90
<i>ammodytes</i>	20	0	0	352	0	+	?
<i>batillus</i>	24	0	+	320	+	+	53
<i>centralis</i>	20	0	+	320	0	0	60-69
<i>diversus</i>	20	0	0	352	+	0	40-70
<i>endoterus</i>	22	+	+	376	0	0	40-60
<i>grypus</i>	18	+	+	415	+	0	60-120
<i>hamatus</i>	22	+	+	418	0	0	29-60
<i>leptosomus</i>	16	+	+	375	+	0	70-88
<i>margaretae</i>	18	+	+	306	0	0	?
<i>pinguis</i>	20	+	+	485	0	0	20-30
<i>proximus</i>	20	+	+	700	0	+	20-40
<i>unguirostris</i>	24	+	+	610	+	0	38-70
<i>waitii</i>	20	+	+	614	0	0	57-80

cephalic glands, snout rounded in dorsal and lateral views, and dorsal rostral broadly oval. Reference to Table 2 shows that cephalic glands are conspicuous in seven species (including the type species), obscure in eight species, and unknown in six species. All species except two have rounded dorsal snouts and three species have angular lateral snouts. Eight species lack broadly oval rostrals. Again, the definition of *Sivadictus* does not define the group of included taxa. Only two species fall within the definition of Wells and Wellington (*R. micromma* and *R. wiedii*) and neither are the type species!

Although at least one Wells and Wellington name has been adopted by the scientific community (*Antaresia fide* Kluge, 1993), neither of the typhlopod names

has been considered valid by any Australian worker (Storr et al., 1986, 2002; Griffiths, 1987, 1997; Cogger, 1988, 1992, 2000; Wilson and Knowles, 1988; Gow, 1989; Hoser, 1989; Shine and Webb, 1990; Swan, 1990, 1995, 1998; Weigel, 1990; Covacevich and Couper, 1991; Coventry and Robertson, 1991; Shine, 1991; Ehmann, 1992;

Table 2. Synopsis of taxonomic characters of *Sivadictus* (taxa revived by Wells and Wellington but not currently recognized in quotation marks). CG = cephalic glands (C = conspicuous, O = obscure, A = absent), RDS = rounded dorsal snout profile, RLS = rounded lateral snout profile, BOR = broadly oval rostral (dorsal view)

Species	CG	RDS	RLS	BOR
<i>nigrescens</i> (type species)	C	+	+	+
<i>affinis</i>	O	+	0	+
<i>australis</i>	C	0	0	+
" <i>bicolor</i> "	?	+	+	+
<i>broomi</i>	C	+	+	+
" <i>curtus</i> "	?	+	+	0
<i>guentheri</i>	C	+	+	+
<i>howi</i>	O	+	+	0
" <i>kenti</i> "	?	+	0	+
<i>kimberleyensis</i>	O	+	+	0
<i>ligatus</i>	O	+	+	0
<i>micromma</i>	O	+	+	+
<i>minimus</i>	C	+	+	+
" <i>nigricauda</i> "	?	+	+	+
" <i>preissi</i> "	?	+	+	+
" <i>reginae</i> "	?	0	+	0
<i>tovelli</i>	C	+	+	0
<i>troglydytes</i>	O	+	+	0
<i>wiedii</i>	C	+	+	+
<i>yampiensis</i>	O	+	+	0
<i>yirrikalae</i>	O	+	+	+

Ehmann and Bamford, 1993; Webb and Shine, 1993; Bush et al., 1995; Greer, 1997; Shea, 1999; Alpin and Smith, 2001; Cronin, 2001; Wilson and Swan, 2003; Swan et al., 2004), any taxonomic list (Dowling, "1988," Ferrarezzi, 1994; Frank and Ramus, 1995; Mattison, 1999; McDiarmid et al., 1999), or any herpetology text (Zug, 1993; Pough et al., 1998, 2001, 2004; Zug et al., 2001). The only work in which *Libertadictus* has appeared subsequent to its publication is Williams and Wallach (1989), where it was considered a synonym of *Ramphotyphlops*.

Taxonomy

I take this opportunity to propose a new name for the clade of Australian-New Guinea typhlopids currently known as *Ramphotyphlops*.

***Austrotyphlops* nov. gen.**

Type species.—*Anilios nigrescens* Gray, 1845.

Diagnosis.—All members of the Australian-New Guinean clade of blindsnakes having retrocloacal sacs and solid eversible awned hemipenes that retract into the tail in a helical pattern.

Content.—*Austrotyphlops affinis* (Boulenger, 1889), *A. ammodytes* (Montague, 1914), *A. aspina* (Couper, Covacevich and Wilson, 1998), *A. australis* (Gray, 1845), *A. batillus* (Waite, 1894), *A. bituberculatus* (Peters, 1863), *A. broomi* (Boulenger, 1898), *A. centralis* (Storr, 1984), *A. chamodracaena* (Ingram and Covacevich, 1993), *A. diversus* (Waite, 1894), *A. endoterus* (Waite, 1918), *A. ganei* (Alpin, 1998), *A. grypus* (Waite, 1918), *A. guentheri* (Peters, 1865), *A. hamatus* (Storr, 1981), *A. howi* (Storr, 1983), *A. kimberleyensis* (Storr, 1981), *A. leptosomus* (Robb, 1972), *A. ligatus* (Peters, 1879), *A. longissimus* (Alpin, 1998), *A. margaretae* (Storr, 1981), *A. micrommus* (Storr, 1981), *A. minimus* (Kinghorn, 1929), *A. nema* (Shea and Horner, 1997), *A. nigrescens* (Gray, 1845), *A. nigroterminatus* (Parker, 1931), *A. pilbarensis* (Alpin and Donnellan, 1993), *A. pinguis* (Waite, 1897), *A. proximus* (Waite, 1893), *A. robertsi* (Couper, Covacevich and Wilson, 1998), *A. silvia* (Ingram and Covacevich, 1993), *A. splendidus* (Alpin, 1998), *A. toveli* (Loveridge, 1945), *A. troglodytes* (Storr, 1981), *A. unguirostris* (Peters, 1867), *A. waitii* (Boulenger, 1895), *A. wiedii* (Peters, 1867), *A. yampiensis* (Storr, 1981), *A. yirrikalae* (Kinghorn, 1942). Representatives of all species except *A. ammodytes*, *A. aspina*, *A. batillus*, *A. ganei*, *A. howi*, *A. kimberleyensis*, *A. longissimus*, *A. margaretae*, *A. micrommus*, *A. robertsi*, *A. splendidus*, *A. troglodytes*, *A. yampiensis*, and *A. yirrikala* were examined by Wallach (1998). These species are either known solely from the types, or were published too late for inclusion in Wallach's analysis.

The following species currently classified as *Ramphotyphlops*, but occurring on nearby Christmas Island, northern New Guinea, the Solomon Islands, and New Caledonia, could possibly be members of *Austrotyphlops*: *R. angusticeps* (Peters, 1877), *R. becki* (Tanner, 1948), *R. erycinus* (Werner, 1901), *R. exocoeti* (Boulenger, 1887), *R. leucoproctus* (Boulenger, 1889), *R. mansuetus* (Barbour, 1921), *R. polygrammicus* (Schlegel, 1839), and *R. willeyi* (Boulenger, 1900). Representatives of all species except *R. leucoproctus* were examined by Wallach (1998) and they clustered with the Southeast Asia-East Indies clade.

Etymology.—A generic name of masculine gender derived from the Latin *austral*, meaning southern in reference to the continent of Australia, and the Greek *typhlops*, meaning blind, thus southern blind snakes. Although it is considered by some to be improper to combine Greek and Latin terms when composing a name, the alternative to *Austrotyphlops* would be *Nototyphlops*, employing the Greek term for south (*noto-*). However, since the majority of the included species are endemic to Australia, it is felt that taxonomy and nomenclature are better served using the composite *Austrotyphlops*.

Range.—Australia and southern New Guinea.

Conclusions

Based upon the only available phylogenetic hypothesis of scolecophidian relationships (Wallach, 1998), *Ramphotyphlops* is paraphyletic and consists of two distinct clades: an Australian-southern New Guinea clade and a Southeast Asian-Indonesian clade. Following the principle of phylogenetic definitions of taxon names (De Queiroz and Gauthier, 1990), only monophyletic groups are named. As the type species of *Ramphotyphlops* (*R. multilineatus*) belongs to the Southeast Asian-East Indies clade, the Australian clade can no longer be considered as *Ramphotyphlops* and a replacement name is needed. The only two available names applicable to the Australian typhlopids are *Libertadictus* Wells and Wellington (1984) and *Sivadictus* Wells and Wellington (1985a). Both of these names are shown to be composite and insufficiently diagnosed, thereby dismissed as *nomina dubia*. A new name, *Austrotyphlops*, is proposed for the monophyletic clade of typhlopids inhabiting Australia and New Guinea.

Removal of the Australian members of *Ramphotyphlops* (*sensu lato*) from the genus leaves the following unquestionable members in *Ramphotyphlops* (*sensu stricto*): *R. acuticaudus* (Peters, 1877), *R. albiceps* (Boulenger, 1898), *R. cumingii* (Gary, 1845), *R. depressus* (Peters, 1880), *R. flaviventer* (Peters, 1864), *R. lineatus* (Schlegel, 1839), *R. multilineatus* (Schlegel, 1839), *R. olivaceus* (Gray, 1845),

and *R. ozakiae* Wallach and Piyawan, 1999. Since both *Typhlops* and *Ramphotyphlops* (*sensu lato*) occur in Malaysia, the Philippines, Indonesia, and New Guinea, certain species presently assigned to *Ramphotyphlops* because of distribution or taxonomic characters for which the male reproductive structures (hemipenis and retrocloacal sacs) are unknown may in fact be members of *Typhlops*. These include *R. braminus* (Daudin, 1803), *R. exocoeti* (Boulenger, 1887), *R. leucoproctus* (Boulenger, 1889), *R. lorenzi* (Werner, 1909), *R. mansuetus* (Barbour, 1921), *R. marxi* (Wallach, 1993), *R. similis* (Brongersma, 1934), and *R. supranasalis* (Brongersma, 1934).

To complicate matters even further, in light of the ability of typhlopids to easily disperse over sea in soil and wood (uprooted trees or ship timbers) and since the male reproductive structures of the following typhloid species have yet to be examined or else the species are only known from females or the type specimens have been lost, they may also be members of either *Ramphotyphlops* or *Austrotyphlops*: *Cyclotyphlops deharvengi* Bosch and Ineich, 1994, *Typhlops bipartitus* Sauvage, 1879, *T. coecatus* Jan, 1863, *T. domerguei* Roux-Estève, 1980, *T. hypsobothrius* Werner, 1917, *T. khoratensis* Taylor, 1962, *T. leucomelas* Boulenger, 1890, *T. lankaensis* Taylor, 1947, *T. malcolmi* Taylor, 1947, *T. schmutzi* Auffenberg, 1980, *T. tenebrarum* Taylor, 1947, *T. veddae* Taylor, 1947, *T. violaceus* Taylor, 1947, and *T. zenkeri* Sternfeld, 1908. Until the male reproductive structures are known and a phylogenetic analysis is performed upon all typhloid species from Southern and Southeastern Asia, the Philippines, Indonesia, Papua New Guinea, Australia, and all Indian Ocean and Pacific Ocean islands, including both molecular and morphological characters, the exact content of each genus will be speculative.

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