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# Taxonomy of the Genus Pseudonaja (Reptilia: Elapidae) in Australia.

by

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The clear morphological differences that exist within the genus as previously considered strongly indicate that it is a polyphyletic assemblage. Accordingly, I have taken the step of formally proposing the fragmentation of Pseudonaja. In this work I have decided to restrict the genus Pseudonaja to the Pseudonaja nuchalis complex. Additionally, I herein formally resurrect from synonymy the generic name Euprepiosoma Fitzinger, 1860 for the textilis group of species, erect a new generic name (Placidaserpens gen. nov.) for the snakes previously regarded as Pseudonaja guttata, erect a new generic name (Notopseudonaja gen. nov.) for the group of species previously regarded as the Pseudonaja modesta complex, and erect a new generic name (Dugitophis gen. nov.) for snakes previously regarded as the Pseudonaja affinis complex.

# Genus Pseudonaja Gunther, 1858 The Pseudonaja nuchalis Complex

It is usually reported that Pseudonaja nuchalis occurs across most of northern, central and western Australia, ranging from Cape York Peninsula, in the north-east, through western, southern and south-eastern Queensland, far western New South Wales, north-western Victoria, and most of South Australia, Northern Territory and Western Australia. However, this distribution pattern is now known to actually represents several different species all regarded by most authorities for convenience as the single highly variable species, 'Pseudonaja nuchalis'. As usually defined, this actually is a highly variable and therefore confusing group of species to identify and it is not all surprising that there has been difficulty in breaking up the group. Another not insignificant reason behind this reticence to look at 'Pseudonaja nuchalis' more closely, is that all are highly venomous, very fast and numerous fatalities have resulted from their bites. Until recent years, virtually any description of this 'species' would state or infer that the colour and pattern is subject to considerable ontogenetic, geographic and even seasonal variation, and to an extent this is still true for the Pseudonaja nuchalis complex. Snakes presently regarded as 'Western Brown Snakes' in most texts have a basic body colour that can range across most shades of brown, right through to black, but creamish, yellow, orange and reddish variations are known. Some specimens with the orange or brown base colour are often totally unpatterned, or just barely marked with a few black scales on the neck (often arranged in a 'W' or 'V' pattern), while others can have the head and/or neck greyish, brownish or even jet black, with an unpatterned or patterned body. Patterning can vary from merely scattered black dorsal scales, to neat reticulations of darkedged scales, to even broad dark rings, bands or blotches. Regardless of the dorsal colour and

patterning, the ventral surface is usually light yellowish to pale orange or creamish with irregular rows of orange spots or small blotches in most areas.

The colour of the buchal cavity is purplish-black. Juveniles usually have a generalised pattern of blackish head and neck patches and a body pattern of faint reticulations, but some juveniles have similar patterns to their respective adult 'variations'. As can be seen from this range of colour and pattern combinations, the 'Western Brown Snake' has been widely recorded over Australia since its original description. Morphologically, the scalation patterns appear conservative across the different taxa, so it may not be possible to identify the different taxa alone on the basis of a scale-count. However, recent investigators have now come to the conclusion that the 'Western Brown Snake' is in fact not one highly variable species, but several different species. To field naturalists this has not been all that much of a surprise for the differences in behaviour, habitat and morphology between the various populations more than hinted that a number of different species were in fact being lumped into the name Pseudonaja nuchalis. This snake has now been subjected to a range of morphological, genetic and biochemical investigations by some of the world's leading scientists (see references), and it is now finally gaining wider acceptance that several different species have been unknowingly included under the name 'Pseudonaja nuchalis' in the past. Some of these 'variations' are included in this work as different species partly as a consequence of their distinctive chromosomal arrangements following the work of Mengden (1985). Various estimates are that 'Pseudonaja nuchalis' may actually represent anywhere from 4 to in excess of 10 different species. In this work Pseudonaja nuchalis has been split into 8 different species - and all are supported by chromosomal evidence. Some (but by no means all) of the numerous 'variations' of this species often called 'Western Brown Snakes' are as follows: Firstly, the snake that has been traditionally regarded as the 'Western Brown Snake' Pseudonaja nuchalis is in fact based on a specimen from near Arnhem Land. It is in actuality the most highly restricted of all the group and really would be more appropriately called the 'Northern Brown Snake' instead. Its colour pattern is one of striking wide dark bands on a yellowish-orange to orange-brown base colour.

The variation previously known as the 'southern morph' of Pseudonaja nuchalis, should now be called Pseudonaja aspidorhyncha. In this species the body colour may be any shade of uniform brown, and in most cases the body is unpatterned. Usually the head is slightly darker brown than the body, and there can be a few scattered black scales on the nape. In occasional specimens the head can be very dark brown and the body may have scattered but faint darker brown scales; in some individuals the head can be completely black.

In another 'morph' (now called Pseudonaja kellyi), the head and neck region are jet black (or sometimes very dark brown). The base colour of the body is yellowish-orange to orangebrown, with many of the dorsal scales marked with dark brown or black to form a transverse ziz-zag or even a 'herring-bone' pattern over the body. Juveniles have a similar colour and pattern to the adults, with the exception that the snout is paler followed by a darker interocular area and a dark brownish nape.

Another 'morph' (now called Pseudonaja imperitor), has the base colour of the body uniform tan-brown, and the ventral surface creamish. The snout is pale creamish-brown, followed by an interocular band of dark brown over the head. The nuchal area can have a few scattered black scales, or occasionally these can form a narrow band over the neck. Juveniles have a similar colour and pattern to the adults, with the exception that the darker interocular area and nape markings are more pronounced. There is quite pronounced seasonal colour change with this form - during the summer the entire body colour becomes much lighter brown, while during the (slightly) cooler winter (or dry season) it changes to a darker brown overall. Another 'morph'(now called Pseudonaja mengdeni) has a base body colour varying from tan-brown through to pale yellow or orange.

There is a strong 'herring bone' pattern on the posterior two-thirds of the body caused through the arrangement of darker reddish-brown scales. The head and neck is usually pale brown (snout is paler) with a slightly darker interocular area.

The neck is greyish-brown to darker brown, with a dark narrow row of black or very dark brown scales often forming a sharp boundary (sometimes in a 'V' shape) immediately anterior to the nape patch. Juveniles have a similar colour and pattern to the adults, with the exception that the darker interocular area and nape markings are more pronounced.

Another very distinctive 'morph' (now called Pseudonaja carinata) has the head brown, with the nape paler containing a few darker scales. The base body colour is pale creamish-brown, with the posterior of the body heavily banded with up to 13 (mostly 11) broad blotches or saddle-like bands of black. The dark blotches are slightly narrower than the paler interspaces anteriorly, but are as wide as or slightly wider than the pale areas posteriorly. Within the pale interspaces there are three or four narrow (1 scale wide) dark brown bands. Juveniles have a similar colour and pattern to the adults, with the exception that the head is darker and the broad dark body bands either completely encircle the body or break around the medial area of the ventrals. The WA population of this 'morph' appears to have a greater number of bands also and this could indicate that it may be taxonomically distinct in itself.

In still another 'morph' (now called Pseudonaja acutirostris) the base body colour is brownish to pale orange, with the body being strongly banded in black. Sometimes the anterior of the body is unpatterned, with exception of a couple of black scales on the neck or occasionally a blackish patch on the nape. More often however, the body has a series of (up to 14) very broad black bands, each of which is usually narrower than the paler interspaces. Within the paler areas there are a few thin faint bands of reddish-brown.

Another 'morph' (now called Pseudonaja gowi) has an overall plain brown body colour and reduced patterning. However, with this type there is the addition of a broad black band near the neck-nuchal area, and this is occasionally accompanied by a thin secondary collar of black at the anterior end of the neck band. Additionally, there can be a loose vertebral series of black scales on the posterior of the body. The ventral area is creamish with pale orange blotching.

There are many other variations that are apparently rarely encountered, some of which may represent other undescribed species, hybrids, or merely just colour variations of some of the above. This is a group of snakes that still requires urgent study.

# Mitchell's Brown Snake Pseudonaja acutirostris (Mitchell, 1951)

Previously known as the 'southern, orange with black bands morph', of Pseudonaja nuchalis, genetic studies by Mengden et al have proven its distinctiveness from that species, necessitating the re-instatement of the original name given it by Mitchell in 1955 - thus it should now be called Pseudonaja acutirostris.

*Diagnosis:* This is a medium to large species with a relatively slender body, and a small narrow head that is not distinct from the neck. The eye is large with a round pupil and a pale iris. As presently understood, this species has a distinctive chromosomal morphology (of the 2n=34 karyotype). Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at mid-body, ventrals 180-230, anal divided, and subcaudals 50-70 divided. The base body colour is brownish to pale orange, with the body being strongly banded in black.

Sometimes the anterior of the body is unpatterned, with exception of a couple of black scales on the neck or occasionally a blackish patch on the nape. More often however, the body has a series of (up to 14) very broad black bands, each of which is usually narrower than the paler interspaces. Within the paler areas there are a few thin faint bands of reddish-brown. It attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m.

Notes: This species has a scattered distribution over arid and semi-arid eastern and central Australia, ranging from western New South Wales, north-western Victoria, eastern and northern South Australia, and the southern part of the Northern Territory, and probably adjacent parts of Western Australia. Its principle habitat is open woodland and shrubs with scattered grass cover on open plains with stoney soils and in places low rocky hills. As in the case with all members of the Pseudonaja nuchalis complex, it is an oviparous species, producing up to 20 eggs in a clutch. The main diet comprises lizards but small mammals may also be taken. This snake is highly venomous and although there are no records of fatalities, urgent medical attention should be sought in the event of a bite, because this is most certainly a potentially dangerous species. Protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Additionally, it is protected under the Victorian Wildlife Act (1975) [but not listed as threatened in Schedule 2 of the Victorian Flora and Fauna Guarantee Act (1988)], the SA National Parks and Wildlife Act (1972), the Territory Parks and Wildlife Conservation Act (1998), and the WA Wildlife Conservation Act 1950 (as amended). Generally this species is regarded as being common over much of its range, but in Victoria its survival status may be classified as of 'Lower Risk -Near Threatened' because of its limited occurrence in that State. Further, it is possible that its present distribution pattern elsewhere suggests that its range has fragmented, so it may be considered as potentially vulnerable in some areas.

#### McCoy's Brown Snake Pseudonaja aspidorhyncha (McCoy, 1879)

Previously known as the 'southern morph' of Pseudonaja nuchalis, recent genetic studies have proven its distinctiveness from that species, necessitating the re-instatement of the original name given it by Frederick McCoy in 1879 - thus it should now be called Pseudonaja aspidorhyncha.

Diagnosis: This is a large and relatively slender snake with a small narrow head not distinct from the neck, the eye is large with a round pupil and a pale reddish iris. As presently understood, this species has a distinctive chromosomal morphology (of the 2n=34 karyotype), and could actually represent at a minimum a polytypic species in itself. Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at mid-body, ventrals 180-230, anal divided, and subcaudals 50-70 divided. The body colour may be any shade of uniform brown, and in most cases the body is unpatterned. The head is slightly darker brown than the body, and there can be a few scattered black scales on the nape. In occasional specimens the head can be very dark brown and the body may have scattered but faint darker brown scales; in some individuals the head can be completely black. Ventrally the base colour is creamish with scattered orange spots. Attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m.

*Notes:* This species is distributed over a wide area of arid and semi-arid Australia, ranging from western and southern Queensland, western New South Wales, northern South Australia, and central and southern Western Australia. Its principle habitat is open woodland and semiarid shrubland on red soil plains. An oviparous species, it produces around 20 eggs in a clutch. The main diet comprises lizards but small mammals may also be consumed. This snake is highly venomous and although there is no direct evidence for fatalities resulting from its bite, urgent medical attention should be sought in the event of a bite, because this is most certainly a potentially dangerous species. It is fully protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the SA National Parks and Wildlife Act (1972), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). The conservation status of this species is at present unknown, but it may be considered as potentially vulnerable due to its limited distribution and specialised habitat requirements. Regarded as mostly a very common species over its range, however, some populations may have very restricted distributions.

#### Longman's Brown Snake Pseudonaja carinata (Longman, 1915)

Previously known as the 'carinata morph' or the 'banded' form, of Pseudonaja nuchalis, recent genetic studies have proven its distinctiveness from that species, necessitating the reinstatement of the original name given it by Heber Longman in 1915 - thus it should now be called Pseudonaja carinata.

Diagnosis: This is another medium to large but relatively slender species, Longman's Brown Snake has a small narrow head not distinct from the neck, the eye is large with a round pupil and a pale iris. As presently understood, this species has a distinctive chromosomal morphology (of the 2n=34 karyotype). Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at mid-body, ventrals 180-230, anal divided, and subcaudals 50-70 divided. The head is brown, the nape is paler with a few darker scales. The base body colour is pale creamish-brown, with the posterior of the body heavily banded with up to 13 (mostly 11) broad blotches or saddle-like bands of black. The dark blotches are slightly narrower than the paler interspaces anteriorly, but are as wide as or slightly wider than the pale areas posteriorly. Within the pale interspaces there are three or four narrow (1 scale wide) dark brown bands. Juveniles have a similar colour and pattern to the adults, with the exception that the head is darker and the broad dark body bands either completely encircle the body or break around the medial area of the ventrals. The WA population appears to have a greater number of bands also, and this may indicate that it is taxonomically distinct in itself. Attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m.

<u>Notes</u>: As presently defined this species is distributed over a wide area of arid and semi-arid Australia, ranging from western and southern Queensland, western New South Wales, possibly north-eastern South Australia, and an apparently isolated population also occurs in the semi-arid south-west Western Australia (although this population has superficial similarities to Pseudonaja acutirostris). Its principle habitat is open grassy plains with scattered low shrubs and open woodland. This is an oviparous species, producing up to 20 eggs in a clutch. Feeds mainly on lizards and small mammals. This snake is highly venomous and although there are no records of fatalities, urgent medical attention should be sought in the event of a bite, because this is most certainly a potentially dangerous species. It is protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the Victorian Wildlife Act (1975)

[but not listed in Schedule 2 of the Victorian Flora and Fauna Guarantee Act (1988)], the SA National Parks and Wildlife Act (1972), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). The conservation status of this species is at present unknown, but it is regarded as mostly a very common species over its range. In some parts of its range however, it may be considered as potentially vulnerable (due to its apparently fragmented distribution and specialised habitat requirements).

#### Gow's Brown Snake Pseudonaja gowi sp. nov.

Previously known as the 'southern with black nuchal band morph' of Pseudonaja nuchalis, recent genetic studies have proven its specific distinctiveness. As presently understood, this species has a distinctive chromosomal morphology (of the 2n=34 karyotype). This is another medium to large but relatively slender species with a small narrow head not distinct from the neck, the eye is large with a round pupil and a reddish iris. Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at mid-body, ventrals 180-230, anal divided, and subcaudals 50-70 divided. Very similar in colour and pattern to Pseudonaja aspidorhyncha, with its overall plain brown body colour and reduced patterning. However, there is the addition of a broad black band near the neck-nuchal area, and this is occasionally accompanied by a thin secondary collar of black at the anterior end of the neck band. Additionally, there can be a loose vertebral series of black scales on the posterior of the body. The ventral area is creamish with pale orange blotching. Attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m. I hereby choose as Type Locality: Lyndhurst, South Australia and designate the holotype as being the largest specimen of this species from the vicinity of Lyndhurst, SA in the South Australian Museum collection.

*Notes:* This species has a scattered distribution over arid and semi-arid eastern and central Australia, ranging from south-western Queensland, north-western and far western New South Wales, to eastern and north-eastern South Australia. It is known from a range of temperate semi-arid shrublands. An oviparous species, producing about 20 eggs in a clutch. Feeds mainly on lizards and small mammals. This snake is highly venomous and has almost certainly been the cause of a number of fatalities in the past, so urgent medical attention should be sought in the event of a bite. It is protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the SA National Parks and Wildlife Act (1972) and the Qld Nature Conservation Act (1992). Although regarded as mostly a very common species over its range, some populations may have very restricted distributions. At present, its conservation status is unknown, but this species may be considered as potentially vulnerable in some parts of its range due to its fragmented distribution and specialised habitat requirements. The name 'gowi' honours Australian herpetologist Graeme Francis Gow.

## Western Brown Snake Pseudonaja imperitor Wells and Wellington, 1985

Previously known as the 'Darwin morph' or 'brown with black head' form, of Pseudonaja nuchalis, recent genetic studies have proven its distinctiveness from that species, necessitating the re-instatement of the original name given it - thus it should now be called Pseudonaja imperitor.

*Diagnosis:* This is another medium to large but relatively slender snake with a small narrow head not distinct from the neck, the eye is large with a round pupil and a pale iris. As presently understood, this species has a distinctive chromosomal morphology (of the 2n=30 karyotype). Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at mid-body, ventrals 180-230, anal divided, and subcaudals 50-70 divided. The base colour of the body is uniform tan-brown, and the ventral surface is creamish. The snout is pale creamish-brown, followed by an interocular band of dark brown over the head. The nuchal area can have a few scattered black scales, or occasionally these can form a narrow band over the neck. Juveniles have a similar colour and pattern to the adults, with the exception that the darker interocular area and nape markings are more pronounced. There is quite pronounced seasonal colour change with this form - during the summer the entire body colour becomes much lighter brown, while during the (slightly) cooler winter (or dry season) it changes to a darker brown overall. Attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m. Its distribution is restricted to scattered areas across a wide area of central and northern Australia. Pseudonaja imperitor occurs in north-western Queensland, and into much of the Northern Territory, in particular the far north of the NT (including Arnhem Land and some offshore islands) and the far north of Western Australia (in the northern Kimberley region). At present, it is unknown whether this species' distribution is continuous, or merely composed of a few isolated populations. This species occurs in a variety of habitats, but usually open savanna woodland areas with a dense ground cover of grasses are favoured; it has also been found in the vicinity of rock outcroppings. It is an oviparous species, producing less than 20 eggs in a clutch. The main diet is lizards but small mammals may also be consumed. This snake is highly venomous and has caused a number of fatalities, so urgent medical attention should be sought in the event of a bite. Protected under the Territory Parks and Wildlife Conservation Act (1998), the WA Wildlife Conservation Act 1950 (as amended) and the Old Nature Conservation Act (1992). This is mostly a very common species over its range, however, some populations may have very restricted distributions. As the conservation status of some apparently restricted populations is unknown, they may be considered as potentially vulnerable. The name 'imperitor' means 'commander in chief', and alludes to the defensive behaviour of this species when disturbed.

# Kelly's Brown Snake Pseudonaja kellyi Wells and Wellington, 1985

Previously known as the 'orange with black head morph' or 'hooded' form, of Pseudonaja nuchalis, recent genetic studies have proven its distinctiveness from that species, necessitating the re-instatement of the original name given it - thus it should now be called Pseudonaja kellyi.

*Diagnosis:* This is a moderately large but relatively slender species with a small narrow head not distinct from the neck, the eye is large with a round pupil and a pale iris. As presently

understood, this species has a distinctive chromosomal morphology (of the 2n=32 karyotype). Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at midbody, ventrals 180-230, anal divided, and subcaudals 50-70 divided. The head and neck region are jet black (or sometimes very dark brown). The base colour of the body is yellowish-orange to orange-brown, with many of the dorsal scales marked with dark brown or black to form a transverse ziz-zag or even a 'herring-bone' pattern over the body. Juveniles have a similar colour and pattern to the adults, with the exception that the snout is paler followed by a darker interocular area and a dark brownish nape. Attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m. Notes: Pseudonaja kellyi is distributed over a wide area of arid and semi-arid Australia, ranging from western and southern Queensland, central-western New South Wales, northern South Australia, the southern half of the Northern Territory, and right across to the far west coast of Western Australia. An apparently isolated population also occurs in the northern Kimberley region as well. It lives in a variety of semi-arid and arid shrubland to open woodland habitats on sand plains and in the vicinity of rocky ranges. This is an oviparous species, and although there are no records of clutch-size its body length indicates that it may producing around 20 eggs in a clutch. The diet comprises lizards and small mammals. This snake is highly venomous and has almost certainly been the cause of a number of fatalities in the past, so urgent medical attention should be sought in the event of a bite. Protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the SA National Parks and Wildlife Act (1972), the Territory Parks and Wildlife Conservation Act (1998), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). The conservation status of Pseudonaja kellyi is at present unknown, but some populations may be considered as potentially vulnerable due to its fragmented distribution and specialised habitat requirements. Although regarded as mostly a very common species over its range, some populations appear to have very restricted distributions. The name kellyi was bestowed in recognition of the highly defensive behaviour of this snake when confronted - 'kellyi' recalls the Australian folk hero Ned Kelly, who was noted for standing his ground against insurmountable odds.

#### Mengden's Brown Snake Pseudonaja mengdeni Wells and Wellington, 1985

Previously known as the 'pale head, grey nape morph' or 'pale-headed' form, of Pseudonaja nuchalis, recent genetic studies have proven its distinctiveness from that species, necessitating the re-instatement of the original name given it - thus it should now be called Pseudonaja mengdeni.

*Diagnosis:* This is another medium to large but relatively slender snake with a small narrow head not distinct from the neck, the eye is large with a round pupil and a pale iris. As presently understood, this species has a distinctive chromosomal morphology (of the 2n=34 karyotype). Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at mid-body, ventrals 180-230, anal divided, and subcaudals 50-70 divided.

The base body colour can vary from tan-brown through to pale yellow or orange. There is a strong 'herring bone' pattern on the posterior two-thirds of the body caused through the arrangement of darker reddish-brown scales. The head and neck is usually pale brown (snout is paler) with a slightly darker interocular area. The neck is greyish-brown to darker brown, with a dark narrow row of black or very dark brown scales often forming a sharp boundary (sometimes in a 'V' shape) immediately anterior to the nape patch. Juveniles have a similar colour and pattern to the adults, with the exception that the darker interocular area and nape markings are more pronounced. It attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m.

Notes: Pseudonaja mengdeni is distributed over a wide area of arid and semi-arid Australia, ranging from central and northern Queensland, north-western New South Wales, most of the Northern Territory, northern and western South Australia, then into adjacent south-eastern Western Australia, and the far west coast of Western Australia from about North-West Cape to Perth. An apparently isolated population also occurs in the vicinity of Broome in northwestern WA as well. The principle habitat is open woodland, but it is also known from semiarid shrubland and grassland on plains country. This is an oviparous species, but nothing is known on its clutch-size, although it could be expected to lay upward of 12 eggs in a clutch. It feeds mainly on lizards and small mammals. This snake is highly venomous and has almost certainly been the cause of a number of fatalities in the past, so urgent medical attention should be sought in the event of a bite. Protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the SA National Parks and Wildlife Act (1972), the Territory Parks and Wildlife Conservation Act (1998), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). Although regarded as mostly a very common species over its range, the conservation status of this species is unknown, and it may be considered as potentially vulnerable in some areas due to its apparently fragmented distribution and specialised habitat requirements. The name 'mengdeni' honours American herpetologist, Gregory Mengden.

# Northern Brown Snake Pseudonaja nuchalis Gunther, 1858

Diagnosis: A large and relatively slender snake, the Northern Brown Snake has a small narrow head not distinct from the neck, large eye size with a round pupil and a pale iris of variable colouration, usually reddish. Based on the original description as well as the available Type Specimen that is consistent with that original description, Pseudonaja nuchalis actually represents one of the rarest of the known 'variations' of the complex. In Pseudonaja nuchalis sensu stricto the head, neck and throat is jet black. The body has a base colour of yellowishorange to orange-brown, and there is a series of about 6 broad black bands that do not encircle the body. Each black band has an irregular edge formed by darker brown and black scales, which tends to make the lighter interspaces grade into the darker bands (in other words, not create a clear line of demarcation between the bands). The snout is usually lighter brown, with a slightly darker brown patch on the head; there may be a cluster of brownish scales on the neck also. Ventrally, creamish, with obscure brown edging, becoming darker posteriorly. Some features of this species' scalation are: nasal entire and in contact with preocular, no suboculars, postoculars 2 (occasionally 3), preocular higher than wide and separated from frontal, supralabials 6, infralabials 6, rostral higher than broad, usually extending back onto the top of the snout, temporals 1+2, canthus rostralis very strong, frontal shield longer than wide, and about as wide as a supraocular, body scales smooth in 17 (rarely 19) rows at midbody, ventrals 180-230, anal divided, and subcaudals 50-70 divided. Attains a maximum size of around 1.5 m in total length, but usually mature specimens are around 1.2 m.

*Notes:* As presently defined, Pseudonaja nuchalis is restricted to the far north of the Northern Territory, centred on Arnhem Land and the adjacent coastal areas. Rather than being the widespread and abundant species it is usually assumed to be, Pseudonaja nuchalis as now defined, is probably endangered because of its very restricted known distribution. The principle habitat occupied by this species is open savanna woodland and grassland in association with sandstone outliers of the Arnhem Land escarpment. It is an oviparous species, producing up to 22 eggs in a clutch. The diet is unknown, but it likely feeds mainly on lizards and small mammals. This snake is highly venomous and its bite has likely resulted in several fatalities to date, so urgent medical attention should be sought in the event of a bite. Protected under the Territory Parks and Wildlife Conservation Act (1998). The conservation status of this species is unknown, but this species may be considered as potentially vulnerable or even endangered due to its limited distribution and specialised habitat requirements. The name 'nuchalis' refers to the neck region (nuchal area) and presumably draws attention to the neck colour and pattern.

#### Placidaserpens gen. nov.

*Type Species:* Demansia guttata Parker, 1926 [New reptiles and a new frog from Queensland. Annals and Magazine of Natural History, (9) 17: 665-670]

*Diagnosis:* As presently defined, a monotypic genus of large snakes in the family Elapidae occurring in Australia and readily identified by the following combination of characters: large robust species with a small head that is barely distinct from the neck; head with moderate canthus rostralis; eyes relatively small with round pupils; iris reddish-yellow, with inner margin thinly bordered with white; nasal and preocular scales in contact; suboculars absent; 1 primary temporal; supralabials 6; infralabials 6; body scales smooth in 19 or 21 rows at midbody; ventrals 190-220; anal divided; subcaudals 45-70 divided. The maximum size attained is around 1.0 m. in total length, but 0.6 m is an average-sized adult. Populations in the western part of its range (NT) have mainly 19 mid-body rows, while those from the east in central Qld have 21 and these may represent different species. Etymology: The name 'Placidaserpens' means 'peaceful snake', in recognition of the relatively inoffensive nature of some specimens. (but be very careful when handling this species, because they will readily attempt to bite if disturbed). Content: Placidaserpens guttatus(Parker, 1926).

#### Speckled Brown Snake Placidaserpens guttatus (Parker, 1926)

*Diagnosis:* A large robust species with a small head that is barely distinct from the neck. The head has a moderate canthus rostralis and the eyes are relatively small with round pupils and a reddish-yellow iris, with a the inner margin thinly bordered with white. The body colour can be almost any shade of brown, but usually tan or orange-brown or yellowish-brown is a common base colouration, with the lower (hidden) edges of each dorsal scale black, and black peppering on the head and neck, with an occasional specimen having a dark brown nuchal blotch. The black-edging of the dorsal scales results in a speckled appearance to the body if the skin is even slightly distended. In another variation, some individuals are strongly marked with up to around 12 black, reddish-brown or dark brown bands or blotches on the body and tail; these markings can vary in width, from being very narrow and barely visible, to being very broad and dominant over the dorsum. Speckling can also occur between the bands as well. Ventrally pale whitish in some, but usually creamish-orange to orange with occasional darker orange spotting or blotching on the ventrals (but this is less distinct posteriorly); the throat and labials are whitish. Juveniles are much lighter than adults and lack any dark colouring to the head and neck. Some significant features of the scalation are: nasal and

preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 19 or 21 rows at mid-body (Populations in the western part of its range (NT) have mainly 19 mid-body rows, while those from the east in central Qld have 21), ventrals 190-220, anal divided, and subcaudals 45-70 divided.

The maximum size attained is around 1.4 m. in total length, although specimens around a metre would be mature; 0.75 m is an average-sized adult.

*Notes:* Known from a wide area of central and western Queensland and the adjacent northeastern Northern Territory and north-eastern South Australia. This species inhabits Astrebla grasslands with scattered low shrubs on black-soil plains; also found in low rocky hills adjacent to grasslands. Very little has been recorded on the ecology of this abundant species. It is known to be an egg-layer, but the clutch-size is unknown. It feeds mainly on frogs and small lizards and has been known to take small mammals in captivity. This is mainly a diurnal species that shelters in deep earth cracks, particularly in the vicinity of watercourses or ephemeral waterholes. When aroused this nervous snake will raise its head and neck up from the ground, then flatten its neck to form a distinctive cobra-like hood. It is however usually hesitant to bite even if provoked, but extreme care should be shown in any case. This is a highly venomous species and its bite has likely resulted in a number of fatalities, so urgent medical attention should be sought in the event of a bite. Although the conservation status of the species is poorly known, it is protected under the SA National Parks and Wildlife Act (1972), the Territory Parks and Wildlife Conservation Act (1998) and the Qld Nature Conservation Act (1992). It is nevertheless very common within its habitat.

#### Notopseudonaja gen. nov.

<u>Type Species</u>: Cacophis modesta Gunther, 1872 [Seventh account of new species of snakes in the collection of the British Museum. Annals and Magazine of Natural History, (4) 9: 13-37]. <u>Diagnosis</u>: As presently defined, a monotypic genus of small snakes in the family Elapidae occurring in Australia, readily identified by the following combination of characters: very small, slender species with a small head that is barely distinct from the neck; weak canthus rostralis when an adult (but not in the juvenile); eyes relatively small with round pupils; iris orange-brown; nasal and preocular scales in contact; suboculars absent; 1 primary temporal; supralabials 6, infralabials 6; body scales smooth in 17 rows at mid-body; ventrals 150-183; anal divided; subcaudals 33-56 divided. Maximum size attained is around 0.6 m. in total length, but 0.45 m is an average-sized adult. Content: Notopseudonaja modesta (Gunther, 1872); Notopseudonaja ramsayi (Macleay, 1885); Notopseudonaja sutherlandi (De Vis, 1884).

#### Western Ringed Snake Notopseudonaja modesta (Gunther, 1872)

*Diagnosis:* A very small, slender species with a small head that is barely distinct from the neck. The head has a weak canthus rostralis when an adult (but not in the juvenile) and the eyes are relatively small with round pupils and an orange-brown iris. The mature body colour may be either light tan, light reddish-brown, yellowish-brown, or greyish (usually) all over, the body mostly being without pattern other than a faint trace of a nuchal band, and a fine speckling of the body caused by some of the dorsals being marked with paler bases and slightly darker centres. Juveniles and immatures however, are brightly coloured (usually reddish or orange-brown) with about 4 to 12 bold narrow black transverse bands. The top of the head has a black patch which extends down the side of the head to include the eyes and part of the supralabials, and there is another black patch on the nape. Ventrally, usually

creamish or white with occasional specimens flecked with orange on the ventrals. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 17 rows at mid-body, ventrals 150-183, anal divided, and subcaudals 33-56 divided. The maximum size attained is around 0.6 m. in total length, but 0.45 m is an average-sized adult. Notes: Found over a large part of arid and semi-arid north-western and central Western Australia and adjacent north-western Northern Territory. Occurs in a wide range of arid and semi-arid habitats from gibber deserts, sand deserts, tropical savanna, open woodland, shrubland, sandplains, and rocky ranges. Usually found in association with sandy soils in densely vegetated shrublands and open woodlands with Triodia grass ground cover. This is an oviparous species, producing up to 11 eggs in a clutch. Feeds mainly on lizards. Although this is mainly a diurnal species it may also be encountered during warm evenings. They may found in the burrows of other animals or beneath or associated with low vegetation, such as Triodia tussocks and deep litter under shrubs. They can also be found active at night during warm weather. When aroused, it will raise its head from the ground and place the neck in an 'S' shape, while hissing loudly. Its small size has lead to the belief that this is virtually an innocuous species. Although this is reportedly only a moderately venomous species and although its bite has not resulted in any fatalities to date, I believe that urgent medical attention should be sought in the event of a bite, particularly from a large specimen. It would be sensible to exert caution when handling this snake until the nature of its venom is better known. Although usually inoffensive, even rather placid despite being moderately disturbed, they will try to bite if given the opportunity. Protected under the Territory Parks and Wildlife Conservation Act (1998) and the WA Wildlife Conservation Act 1950 (as amended). Regarded as common. The name 'modesta' means 'modest', and presumably refers to the plain colouration and patterning of the adult of this species.

#### Southern Ringed Snake Notopseudonaja ramsayi (Macleay, 1885)

Diagnosis: A very small, slender species with a small head that is barely distinct from the neck. The head has a weak canthus rostralis when an adult (but not in the juvenile) and the eyes are relatively small with round pupils and an orange-brown iris. The mature body colour may be either light tan, light reddish-brown, yellowish-brown, or greyish (usually) all over, the body mostly being without pattern other than a faint trace of a nuchal band, and a fine speckling of the body caused by some of the dorsals being marked with paler bases and slightly darker centres. Juveniles and immatures however, are brightly coloured (usually reddish or orange-brown) with about 4 to 12 bold narrow black transverse bands. The top of the head has a black patch which extends down the side of the head to include the eyes and part of the supralabials, and there is another black patch on the nape. Ventrally, usually creamish or white with occasional specimens flecked with orange on the ventrals. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 17 rows at mid-body, ventrals 150-183, anal divided, and subcaudals 33-56 divided. The maximum size attained is only around 0.5 m. in total length, but 0.3 m is an average-sized adult. Notes: As herein defined it is found over much of arid and semi-arid eastern and southern Australia, ranging from far western New South Wales, south-western Queensland, through most of central and northern South Australia, most of the southern part of the Northern Territory and into south-eastern Western Australia. Occurs across a wide range of arid and semi-arid habitats from gibber deserts, sand deserts, sub-tropical woodland, temperate semiarid open woodland, shrubland, sandplains, and rocky ranges. Usually found in association with sandy soils in densely vegetated shrublands and open woodlands with Triodia or

Plectrachne grass ground cover. Oviparous, producing about 6 eggs in a clutch. Feeds mainly on lizards. This is mainly a diurnal species that seeks shelter in lizard burrows beneath or associated with low vegetation. They can also be found active at night during warm weather. When aroused, it will raise its head from the ground and place the neck in an 'S' shape, while hissing loudly. As in the case of N. modesta caution should be exerted in the case of any bite from this species. Its small size has lead to the belief that this is virtually an innocuous species, and its overall inoffensive behaviour makes one think that it is virtually harmless. However, lizards are quickly subdued with its venom and I think that it would be wise to seek urgent medical attention in the event of a bite - particularly from a large specimen. It would be sensible to exert caution when handling this snake until the nature of its venom is better known. Protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the SA National Parks and Wildlife Act (1972), the Territory Parks and Wildlife Conservation Act (1998), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). Regarded as common. The name 'ramsayi' honours 19th century Australian herpetologist Edward Pierson Ramsay.

#### Northern Ringed Snake Notopseudonaja sutherlandi (De Vis, 1884)

**Diagnosis:** This is another very small, slender species with a small head that is barely distinct from the neck. It has been in the past regarded as a synonym of Pseudonaja nuchalis by Cogger et al (1983) but this is now known to be incorrect (see Mengden, 1985 who showed that it was actually part of the modesta group). The head has a weak canthus rostralis when an adult (but not in the juvenile) and the eyes are relatively small with round pupils and an orange-brown iris. The mature body colour may be either light tan, light reddish-brown, yellowish-brown, or greyish (usually) all over, the body mostly being without pattern other than a faint trace of a nuchal band, and a fine speckling of the body caused by some of the dorsals being marked with paler bases and slightly darker centres. Juveniles and immatures however, are brightly coloured (usually reddish or orange-brown) with about 4 to 12 bold narrow black transverse bands. The top of the head has a black patch which extends down the side of the head to include the eyes and part of the supralabials, and there is another black patch on the nape. Ventrally, usually creamish or white with occasional specimens flecked with orange on the ventrals. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 17 rows at mid-body, ventrals 150-183, anal divided, and subcaudals 33-56 divided. The maximum size attained is only around 0.45 m.

<u>Notes:</u> Found over a wide area of semi-arid tropical northern Australia, ranging from eastern central Northern Territory and most of northern Queensland. It occurs across a wide range of semi-arid habitats from tropical savanna, open woodland, and shrubland. Usually found in association with sandy soils in densely vegetated shrublands and open woodlands. This species is oviparous in its reproductive habits, and feeds only on lizards. This is mainly a diurnal species that seeks shelter in earth cracks, or beneath or associated with low vegetation and ground litter. They can also be found active at night during warm weather. When aroused, it will raise its head from the ground and place the neck in an 'S' shape, while hissing loudly. Its small size has lead to the belief that this is virtually an innocuous species, and its overall inoffensive behaviour makes one think that it is virtually harmless. However, I think that it would be wise to seek urgent medical attention in the event of a bite - particularly from a large specimen. It would be sensible to exert caution when handling this snake until the nature of its venom is better known. Although usually inoffensive, even rather placid despite being

moderately disturbed, they will try to bite if given the opportunity. Protected under the Territory Parks and Wildlife Conservation Act (1998) and the Qld Nature Conservation Act (1992). Regarded as common.

#### Dugitophis gen. nov.

<u>Type Species</u>: Pseudonaja affinis Gunther, 1872 [Seventh account of new species of snakes in the collection of the British Museum. Annals and Magazine of Natural History, (4) 9: 13-37]. <u>Diagnosis</u>: A genus of medium to large elongate snakes of the family Elapidae occurring in south-western Australia, and readily identified by the following combination of characters: medium-sized to large and slender species with a small head that is not distinct from the neck; head with strong canthus rostralis; eyes relatively small with round pupils and a blackish iris, with a thin yellow or orange ring around the pupil; nasal and preocular scales in contact; suboculars absent; 1 primary temporal; supralabials 6; infralabials 6; body scales smooth in 19 (rarely 17 or 21) rows at mid-body; ventrals 190-230; anal divided; and, subcaudals 50-70 divided. Content: Dugitophis affinis affinis (Gunther, 1872); Dugitophis affinis exilis (Storr, 1989); Dugitophis affinis tanneri (Worrell, 1961).

# Dugite

# Dugitophis affinis affinis (Gunther, 1872)

**Diagnosis:** This is a medium-sized and slender species with a small head that is not distinct from the neck. The head has a strong canthus rostralis and the eyes are relatively small with round pupils and a blackish iris, with a thin yellow or orange ring around the pupil. The body colour can be any shade of brown, but usually dark olive or greyish-brown is a common base colouration. Some of the dorsal scales are coloured black, and these black scales can be sparsely scattered over the dorsum, or clustered together in patches without any particular pattern being created. The blotched form (known as the "Kabada') can be so heavily marked that it is almost black with only scattered sections of a lighter tan-yellow base colour evident, while in others the dark blotching is more evenly distributed over the body. Ventrally, usually whitish with incomplete edging on the margins of the ventral scales. Juveniles usually have a black patch on the top of the head and another on the neck, with a greenish-brown to light yellowish body colour, and a faint darker herring-bone pattern overlying the base colour, and a white belly with scattered brownish-red spotting. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 19 (rarely 17 or 21) rows at mid-body, ventrals 190-230, anal divided, and subcaudals 50-70 divided. The maximum size attained is around 2.0 m. in total length, but 1.2 m is an average-sized adult.

*Notes:* Known only from the south-western and southern coastal parts of Western Australia, and adjacent south-west of South Australia. This species occurs in a wide variety of vegetation communities, ranging from wet sclerophyll forest, rocky areas, coastal dune shrubheath, semi-arid woodland, usually on sandy soils. It is known to be an egg-laying species, producing up to 30 in a clutch (sometimes two clutches are layed in a season) between November and February. Eggs may hatch between February and May, and juveniles can be around 200 mm at hatching. Feeds mainly on lizards and small mammals, but will also eat other snakes on occasions. This is a diurnal and terrestrial species that shelters in holes in the ground or under logs or rocks. When aroused, it often raises its head from the ground and places the neck in an 'S' shape, while hissing loudly. Sometimes this species is quite inoffensive and can be rather placid even when moderately disturbed. However, on other

occasions it will not hesitate to bite if given the opportunity, so extreme care should be shown. This is a highly venomous species and its bite has resulted in a number of fatalities, so urgent medical attention should be sought in the event of a bite. Protected under the SA National Parks and Wildlife Act (1972) and the WA Wildlife Conservation Act 1950 (as amended). Common wherever it occurs. The name 'affinis' means 'related to', and was bestowed because of its alleged similarity in appearance with Pseudonaja nuchalis.

### Rottnest Island Dugite Dugitophis affinis exilis (Storr, 1989)

*Diagnosis:* This is a smaller and more slender form than the nominate subspecies. It has a small head that is not distinct from the neck, with a medium canthus rostralis. It has small eyes with round pupils and a blackish iris, with a thin yellow or orange ring around the pupil. The colour of the dorsal and ventral areas is black. Juveniles from Rottnest Island are very similar to the juveniles of the nominate form. They usually have a black patch on the top of the head and another on the neck, with a light brownish to yellowish body colour, and a faint darker herring-bone pattern overlying the base colour, and a white belly with scattered brownish-red spotting. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 19 (rarely 17 or 21) rows at mid-body, ventrals 190-230, anal divided, and subcaudals 50-70 divided. The maximum size attained is around 1.0 m. in total length, but 0.6 m is an average-sized adult.

<u>Notes:</u> Restricted to Rottnest Island in south-western Western Australia, where it occupies semi-arid temperate shrublands and heath communities on sandy soils. Its reproductive biology is poorly known, although it is egg-laying, producing up to 20 in a clutch. The diet comprises mainly small lizards but small mammals may also be taken. This is a diurnal and terrestrial species that shelters in holes in the ground or under rocks. When aroused, it will raise its head from the ground and place the neck in an 'S' shape, while hissing loudly. This snake is usually inoffensive, but they will not hesitate to bite if given the opportunity, so extreme care should be shown. It is a highly venomous snake and although there are no records of fatalities, urgent medical attention should be sought in the event of a bite, because this is most certainly a potentially dangerous subspecies. The nominate subspecies has caused a number of fatalities. Protected under the WA Wildlife Conservation Act 1950 (as amended). Status unknown, but this subspecies may be considered as potentially vulnerable due to its limited distribution and specialised habitat requirements.

#### Tanner's Brown Snake Dugitophis affinis tanneri (Worrell, 1961)

*Diagnosis:* This race is also smaller and more slender than the nominate subspecies. It has a small head that is not distinct from the neck, with a medium canthus rostralis. It has small eyes with round pupils and a blackish iris, with a thin yellow or orange ring around the pupil. The body colour is usually dark chestnut-brown without spotting. Ventrally, usually whitish with incomplete edging on the margins of the ventral scales. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 19 (rarely 17 or 21) rows at mid-body, ventrals 190-230, anal divided, and subcaudals 50-70 divided. The maximum size attained is around 2.0 m. in total length, but 1.0 m is an average-sized specimen.

<u>Notes:</u> Restricted to two of the islands of the Recherche Archipelago in south-western Western Australia (Boxer Island and Figure-of-Eight Island), where it occupies semi-arid temperate low woodland and shrub-heath communities with limestone on sandy soils. It is believed to produce up to 20 eggs in a clutch, and feed mainly on small lizards. This is a diurnal and terrestrial subspecies that shelters in holes in the ground or under rocks. When aroused, it will raise its head from the ground and place the neck in an 'S' shape, while hissing loudly. As the nominate subspecies has caused a number of fatalities, and the species overall is highly venomous, urgent medical attention should be sought in the event of a bite from this particular subspecies. Protected under the WA Wildlife Conservation Act 1950 (as amended). Status unknown, but this subspecies may be considered as potentially vulnerable due to its limited distribution and specialised habitat requirements. The name 'tanneri' honours Australian herpetologist Charles Tanner (1911-1996)

# Genus Euprepiosoma Fitzinger, 1860

### Peninsula Brown Snake Euprepiosoma inframacula (Waite, 1925)

*Diagnosis:* This is a large but slender species with a small head that is not distinct from the neck. The head has a strong canthus rostralis and the eyes are relatively small with round pupils and a pale brown iris. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal, supralabials 6, infralabials 6, body scales smooth in 17 rows at mid-body, ventrals 185-235, anal divided, and subcaudals 45-75 divided. The body colour can be any shade of pale or rich brown, even black, but usually dark brown or greyish-brown are common base colourations. Sometimes pale yellowish specimens may be found also. Some of the dorsal scales are coloured black, and these black scales may be densely scattered over the dorsum with the spotting being often concentrated along the vertebral line. Occasionally distinctly banded specimens occur in some areas. The head can be flecked or spotted with black, and usually has a shiny or glossy appearance. Ventrally, pale brown with the centre of the belly more towards dark grey with black spots, or in some specimens a greyish mottling pattern may dominate. The maximum size attained is around 1.5 m. in total length, but an average adult is usually about 1.2m. Notes: Restricted to a small area of coastal southern South Australia, principally Eyre Peninsula, York Peninsula and a few nearby islands, where it inhabits a range of quite different habitats, ranging from areas of temperate semi-arid heath and shrubland on sandy soil or dunes, to dry sclerophyll woodland. Known to also inhabit limestone outcroppings in some areas also. Surprisingly little biological data is available on this very common species. It is known to be an egg-laying species, producing up to 20 in a clutch. Peninsula Brown Snakes feed mainly on small lizards, ground-nesting birds, frogs and small mammals. It is diurnal and very fast-moving, and is often observed basking on roads - consequently, many are killed by traffic. Although a rather inoffensive and shy species, it is still highly venomous. There are few records of bites, and symptoms may be severe, so urgent medical attention should always be sought in the event of a bite, because this is most certainly a potentially dangerous species. Protected under the SA National Parks and Wildlife Act (1972). Very common within its habitat, despite its restricted distribution.

#### Ingram's Brown Snake Euprepiosoma ingrami (Boulenger, 1908)

*Diagnosis:* This is a large and robust species with a small head that is not distinct from the neck. The head has a strong canthus rostralis and the eyes are relatively small with round pupils and a dull orange-brown (almost blackish) iris. Some significant features of the scalation are: nasal and preocular scales in contact, suboculars absent, 1 primary temporal,

supralabials 6, infralabials 7, body scales smooth in 17 rows at mid-body, ventrals 190-230, anal divided, and subcaudals 50-70 divided. The body colour can be a variety of browns, ranging from very dark glossy brown (almost blackish-brown), to a form that is a light olive-brown, or even a golden brown overall. Another variation can be dark brown anteriorly and golden brown posteriorly, while another can be a pale to rich yellowish-brown, with the head and nape being dark brown to black. The dorsal scales are always tipped with dark brown. Ventrally, this species may be either pale yellow, bright yellow or even orange, with bright orange spots near the edges of the ventral scales; the chin and labials are creamish. The buchal cavity colour is blackish. The maximum size attained is around 2.0 m. in total length, but 1.7 m is a large adult.

Notes: Restricted to a small area of north-western Queensland and the adjacent north-eastern Northern Territory, and an apparently isolated population in the Kimberley region of far north-east Western Australia (in the vicinity of Kununurra). Generally, it inhabits semi-arid black-soil plains with Astrebla grass cover and scattered low shrubs. Its favoured habitat is usually subject to seasonal inundation by late summer rains. Oviparous, producing up to 12 eggs in a clutch. Juveniles feed mainly on lizards, and adults on small mammals such as the Long-haired Rat (Rattus villosissimus). A secretive, mainly diurnal snake that may be encountered basking or active in the early morning. As the temperature increases, it will seek shelter in deep earth cracks until cooler afternoon conditions when it may emerge again. Although this species has been seldom observed in the field, it is more often found following heavy rain when the ground is saturated and they are forced to the surface. It may also be occasionally found active at night during hot weather. When aroused this snake will raise its head and neck up from the ground, then flatten its neck to form a distinctive cobra-like hood in a similar manner to a Speckled Brown Snake. It is usually hesitant to bite even if provoked, but extreme care should be shown in any case. This snake is highly venomous and although its bite has not resulted in any fatalities to date, urgent medical attention should be sought in the event of a bite, because this is most certainly a potentially dangerous species. Protected under the Territory Parks and Wildlife Conservation Act (1998), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). Seldom found, but known to be common within its habitat. Named for the English ornithologist Collingwood Ingram.

#### Eastern Brown Snake Euprepiosoma textilis (Dumeril, Bibron and Dumeril, 1854)

**Diagnosis:** Variation in morphology suggests that this species may be composite. This is a very large and robust species with a small head that is not distinct from the neck. The head has a strong canthus rostralis and the eyes are relatively small with round pupils and a dull pale brown (to almost blackish) iris with a broken yellow or orange ring around the pupil. Some significant features of the scalation are: frontal straight-sided and longer than wide (and about as wide as a supraocular), nasal and preocular scales in contact, preocular higher than wide, postoculars 2, suboculars absent, temporals 1+2 (ie only 1 primary temporal), supralabials 6, infralabials 6, body scales smooth in 17 rows at mid-body, ventrals 185-235, anal divided, and subcaudals 45-76 divided. As presently defined, this is a highly variable species with a confusing array of colour and pattern combinations. The base body colour can be any of variety of browns or paler colours, ranging from greyish-brown, olive-brown, reddish-brown, orange or golden brown and very dark (almost blackish-) brown, even black. In very dark specimens the head and nape may be much paler. In some specimens, the dorsal scales are faintly edged with dark grey, but usually the (adult) body is unpatterned. In some populations there can be seasonal variation in tonal colouration, with specimens tending to be lighter during the Summer months and greyish-black during the late Autumn to early Spring

period. Although the body is usually unpatterned in mature specimens, in juveniles and even immatures up to around 1 m. in length, can have a series of narrow transverse darker bands, that are usually most distinct in the juveniles but barely noticeable by the time the snake reaches maturity. In some populations the juveniles lack this narrow banding, and just have a black patch on the top of the head (but the snout is pale) and another black patch on the nape - with the body usually a uniform light olive-brown. Ventrally, this species may be either pale yellow or creamish, with bright orange spots or greyish blotches on the ventral scales. The buchal cavity colour is pinkish. The maximum size attained is around 2.3 m. in total length, but 1.8 m is a large adult.

Notes: As its common name suggests, this species occurs mainly in eastern Australia, ranging from north Queensland, south to most of eastern, central and south western New South Wales, and the Australian Capital Territory, throughout Victoria and into the south-east of South Australia. However, a number of outlying populations are also known from central Australia (southern and central parts of the Northern Territory) and from the southeast Kimberley region of northern Western Australia. It is also known from New Guinea. More often found in woodland habitats on sandy or loamy soils with a grassy and shrub understorey, and often in or adjacent to rocky ranges. Known from a wide range of other habitats, including wet and dry sclerophyll forest, coastal dune heath and shrublands, open grassy floodplains, and agricultural habitats. This is an oviparous species, producing up to 35 eggs in a clutch, which take about 80 days to hatch. Feeds mainly on lizards, ground-nesting birds, and small mammals, but will also eat other snakes. This is mainly a diurnal, highly alert and swiftmoving snake of drier habitats. In warmer weather they can occasionally be found active on the ground at night. They shelter in earth cracks, mammal burrows, beneath logs or stumps, inside hollow logs and beneath rocks, indeed almost any object laying flush with the ground. In agricultural areas they readily occupy hay stacks and other farm produce and equipment, and this could partly explain the distinct distribution pattern of the species. Over the years it is possible that this species has been accidentally transported all over Australia (and into Papua-New Guinea?) in shipments of produce, building materials and even in farm machinery. However some regard the New Guinea population as a distinct species in its own right. This species can be highly defensive in its behaviour if disturbed, rapidly striking and delivering several bites before attempting to escape. When aroused, it often raises its head from the ground, opens its mouth in a chewing action and places the neck in an 'S' shape, prior to delivering a strike. Occasionally, specimens may raise the head and fore-body from the ground and just flatten the neck cobra-like, but this is a much less dangerous posture than the 'S'-shape. People have been often bitten by this snake while trying to kill it, as most underestimate how quick this species can move if the need arises. This snake is highly venomous and its bite has resulted in many fatalities to date, so urgent medical attention should be sought in the event of a bite. Protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). Also protected under the ACT Nature Conservation Act (1980), the Victorian Wildlife Act (1975) [but not listed in Schedule 2 of the Victorian Flora and Fauna Guarantee Act (1988)], the SA National Parks and Wildlife Act (1972), the Territory Parks and Wildlife Conservation Act (1998), the WA Wildlife Conservation Act 1950 (as amended) and the Qld Nature Conservation Act (1992). Regarded as common throughout most of its distribution. The name 'textilis' means 'woven' as in textiles, and probably refers to the regular body scalation of the species.

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