



A characterisation for markings of the smooth snake (*Coronella austriaca*)



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November 2018

Characterisation of smooth snake (*Coronella austriaca*) markings:

It can be useful for conservation purposes to identify individual smooth snakes from their markings. Possible exploitation routes could comprise: The determination of population size, understanding the range of the animals, determining their life span and the determination of age from size and weight biometric measurements.

Photographic identification is the most common form of 'mark recapture' for this species, however if many or large sites are assessed the number of identifications can quickly run into the hundreds, meaning that the determination of an individual specimen can involve hours of mandrolic activity.

This short paper suggests characteristics (a form of typology) for smooth snake markings which could improve the efficiency of specimen determination. A similar methodology has been applied to the characterisation of fingerprints by forensic scientists, in terms of 'arch', 'loop' and 'whorl'.

Almost all smooth snake markings can be described in terms of Spur (4 categories), Fusion (4 categories) and Lead (3 categories). All three characterisations apply to all specimens providing a total of 48 possible categories for markings based on a combination of these characteristics. Some categories will be far more abundant than others, so an even population for descriptive categories is not expected.

Smooth snakes have a dark crown (or 'butterfly') marking over and behind the head, with pairs of dorsal markings running along the back of the snake. For the purposes of identification, images should include the entire head and first six pairs of dorsal markings. Often, these dorsal markings are fused, either across the body (transverse – most common) or along the body (elongate – less common). Equally, there may be no fusing of the dorsal markings.





Occasionally, one or both of the first pair of dorsal markings merge with the crown, these occurrences are termed 'spurs'.

Although dorsal markings are generally even, in some specimens there is an offset with markings either on the left ('sinister') or the right ('dexter') offset towards the crown. This characteristic is termed the 'lead'.





Accurate determination of gender in the field could provide an additional method for discrimination, however if using a wide surveyor base, accuracy cannot be assured after the sighting event and matches may be missed. The same issue is true for life stages (adult, sub-adult and juvenile) which can be a subjective judgement.

The three proposed characteristics are: Spur, Fusion and Lead. These are explained with images below. Where 'dorsal markings' are mentioned, we are referring to the first six pairs of dorsal markings behind the crown. Where spurs are present, the spur is considered to be part of these six pairs.

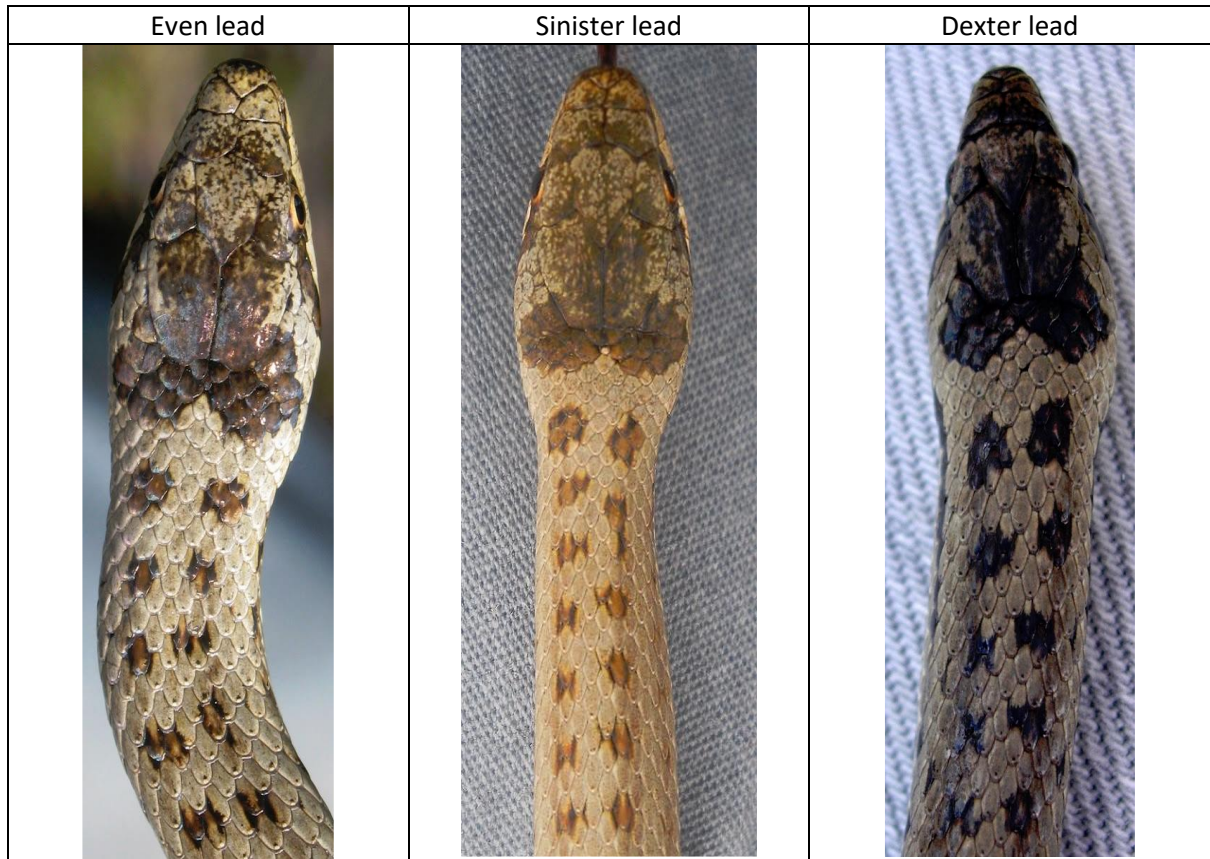
1. **Spur** – dorsal makings which merge with the corona (crown).

Null spur	Dual spur	Sinister spur	Dexter spur
			




2. **Fusion** – where dorsal markings fuse, either along the body or across the body.

Null fusion	Elongate fusion	Transverse fusion	Dual fusion
			

3. Lead – orientation of the first pair of non-fused dorsal markings compared to the crown.



4. Examples

Spur:	Null	Spur:	Null	Spur:	Dual
Fusion:	Transverse	Fusion:	Transverse	Fusion:	Transverse
Lead:	Even	Lead:	Even	Lead:	Dexter
					

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