



Wyre Forest Study Group

Identification of Individual Adders *Vipera berus* by their Head Markings

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Sylvia Sheldon, my grandmother, has been studying adders in the Wyre Forest for the last 30 years. It became clear in the early stages of her work that it was possible to identify individual adders from one year to the next by virtue of their distinctive and unique head markings. The head patterns were initially sketched and recorded in a notebook. However, this was time consuming and not a precise representation of the adders' head markings. There was, therefore, a need to find an accurate and systematic method of identification to prevent double counting adders, which can result in a consequent over-estimation of the population. This method needed to be reliable, as evidence would be needed to show that one adder was different from another. If at all possible it needed to be done in the field with little/no hands-on contact and minimal disturbance to the adders.

It was decided therefore, to produce a photographic record of each adder seen. Although this proved to be a reliable aid to identification and reinforced that no two adders were alike, there were some problems. A clear birds-eye view is preferable to get a true picture of the head pattern, but on some occasions a blade of grass or frond of bracken could obscure the vital details. Also the position of the adder's head or body could influence the shape of the head pattern itself and this meant repeated visits to a hibernaculum or basking spot in order to obtain a clear photograph.

For identification purposes, the head pattern was split into three separate components:

- apex of the zigzag
- inverted V
- eye line

The photographs were used to compare these components between adders on each site to distinguish individuals. If the head markings were totally different then we had different adders. It was also found that on occasions when the individuals in question had similar head markings, we then had to look at other things such as the individual's scales/platelets on top of the head and even the zigzag and side panels. (See Case Study below)

The photographic records were then filed together with all the relevant information on each individual - sex, age, colour, home range and dates when seen.

Fortunately a photograph is not always necessary; when adders slough their skin the pigment is retained within the skin, leaving their head marking and zigzag in the skin and this is clearly visible when placed on a white background. This has proved to be just as good as a photograph for identification purposes.

On our main sites we soon became very accustomed to individual adders, recognising them immediately by sight, and it was therefore convenient to refer to adders by names. In most cases they were named in relation to a specific part of their head marking, for example a male adder where the apex of the zigzag represented a pawn from a chess set was therefore known as Pawn, and indeed was observed for many years. In some cases, individuals were monitored for over 10 years. A mature female first seen in 1983 known as Notches, and estimated to be at least 8 years old, was last seen in 2004 which would make her approximately 29 years old.

By following individuals we have found out valuable information on adder movements, which appears to relate to breeding condition. In non-breeding years females can range over a wide area in pursuit of prey species such as voles. A particular female we found in 2007 moved 0.5 km between two sites. In 1994 another female called Alice moved just over 1 km.

This does pose the question whether the adders' head markings can change and that it renders our method useless. The answer is of course no! We have followed many adders over the length of our studies for many years and can prove that their head markings and zigzags do not differ in size, shape or indeed pattern. Again much like our own fingerprints, we will have the same pattern from birth till death. The same applies to adders. The only exception that may occur might be from an injury resulting in permanent damage to one or more scales, which consequently appear white. As it heals it turns black causing a minor variation in the well-established pattern.

DISCUSSION

Sheldon and Bradley first published this unique method of identification of individual adders by the use of their head markings in 1989. It has now become a common practise to identify adders in this way and indeed other reptiles.

There are other ways to identify adders. Phelps (2007) for many years studied adders and examined them for 'unusual scalation, markings and scarring'. On first capture, 'individual immature and mature adders were permanently and uniquely marked by clipping a series of four ventricle scales' (see Prestt 1971). Females during the later part of gestation were held in captivity to record brood sizes, identification of neonates and physical factors pertaining to the female. The females and their broods were subsequently returned to their place of origin. This form of identification is very disruptive for the adder and could lead to high levels of stress and even the

death of the individual, as some were never seen again after this had taken place (Martin Noble pers.comm.)

In Britain the use of head markings for individual recognition has been used for smooth snakes *Coronella austriaca* Goddard (1984), although details of the work are to be found in his Ph.D thesis only.

Leighton (1901) observed the wide variety of head markings in adders, but did not pursue this as a means of identification.

When studying a population of grass snakes *Natrix natrix* in Sweden, Carlstrom and Edelstam (1946) discovered 'the black and white pattern which is found on the underside of the grass snake has an infinite range of variation', and further states 'photographs of the black pattern can be used for the *Coronella* and *Vipera* species' to identify individual snakes. The most common form of identification for *V. berus* has been by scale cuttings

(mainly on the ventral scales) but this has a limited range of use. More recently Andren and Nilson, University of Gotenbeborg, used a similar method to identify *V. berus* and *C. australis*, though when they came to cut the ventral scale of a juvenile they found that it was too small to mark.

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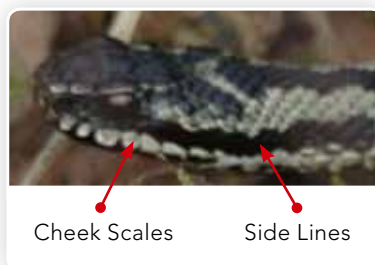
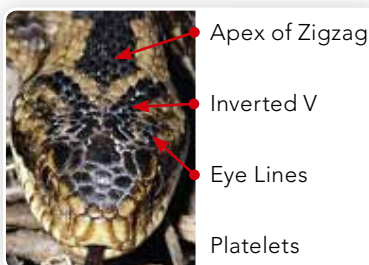
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Case Study



A



B



C



D



E



F

It is convenient to identify individual adders by name, in addition to each being allocated a number. Here we will look at a few case studies, for example:

- Male A, has a black line coming off his apex to the left, thus calling him 'Black Line Left'.
- Male E has a pear shaped apex, consequently called Perry.

Adders can show many different variables, for instance:

- Male F has a very interesting head marking; he has an unusual apex while also having an inverted V, which joins the sidelines

Another way to identify the adders is to look at the platelets on top of the head, for example:

- Comparing Female D with Male A shows the difference in platelet formations. The make up of these platelets is individual to the adder and these can be used as an identification feature.