British Herpetological Society Bulletin, No. 67, 1999

IDENTIFYING INDIVIDUAL ADDERS, *VIPERA BERUS*, WITHIN AN ISOLATED COLONY IN EAST YORKSHIRE

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ABSTRACT

During the past three years the author has regularly visited a small nature reserve in East Yorkshire to see the colony of Adders *Vipera berus* living there. In order to monitor the behaviour and movement of individual Adders during the year, a procedure has been developed which facilitates identification without handling or significantly disturbing the snakes. So that each Adder is correctly recognised, with some degree of certainty, whether from a fleeting glimpse or from photographs, several working aids to identification have been used so far. Work is in progress and record keeping has involved the use of codes using abbreviations and numbers. Other workers have used the distinct head markings of adders to identify individual snakes; this study uses the same technique, together with the arrangement, shape and number of head scales, body colour and dorsal markings.

INTRODUCTION

It is well known that Adders are highly variable in their markings and no two Adders are identical (Smith, 1951; Frazer, 1983; Arnold and Burton, 1978; Sheldon and Bradley, 1989; Evans, 1992). Head markings can be diverse and have been used previously by workers identifying Adders in the field (Sheldon and Bradley, 1992). Head scale number and arrangement can also be highly variable and extremely useful as identification guides (Sheldon, pers. corres. 1998). Body colour and dorsal markings can also be variable.

Although head markings can be the most obvious and 'easy to view' feature between two individuals, they do not always appear grossly different in the field. Body colour and dorsal markings can be useful identification aids 'in the field', but only for a few unique individuals. The shape, arrangement and number of head scales can be significantly different from Adder to Adder, but require the observer to be close to the Adder. It is usually more convenient to examine these features on photographs after a visit. Using scale counts, dorsal marking type and colour code a simple reference system has been developed to improve recording and as a check against previously recorded individuals.

STUDY AREA

The main area consists of 5.7 hectares of open heathland, surrounded by coniferous forestry on three sides and turf-growing land on the fourth. The reserve is managed by the Yorkshire Wildlife Trust. It consists of mixed areas of vegetation with several areas of the Heather, *Calluna vulgaris* and Cross-Leaved Heath, *Erica tetralix*, separated by Tufted Hair-Grass, *Deschampsia caespitosa*. There are also areas of Bracken, *Pteridium aquilinum*, which are kept under control. Silver Birch, *Betula pendula*, and Gorse, *Ulex europaeus*, grow in small stands with Scots Pine, *Pinus sylvestris*, being represented by single maturing specimens. The birch has been greatly reduced within the reserve and the cut branches and twigs have been stacked as habitat piles of various heights. Adders are frequently found together in two small areas, a small raised mound surrounded by heather and an open area containing a low habitat pile of birch branches surrounded by

PLATE 1: Adder F5/SM/140598 from the study group

PLATE 2: Adder F8/SM/270798 from the study group

Tufted Hair-Grass. Individual Adders are found throughout the reserve, either basking in open areas or in the front of vegetation e.g. adjacent to dense groups of birch saplings or gorse. Juvenile Adders are frequently found away from the communal areas sitting on grass tussocks, tree stumps or supported in old heather. Away from the reserve Adders can be found along the transecting forest rides. A particularly good area is along the line of high voltage electrical cables, supported by pylons, which runs parallel to pine forest. In order to maintain access to the pylons the area is kept clear of potentially tall vegetation and Adders are found basking in open areas or on grass tussocks.

METHODS

Within the author's records, each Adder previously found in the field is represented by one or more photographs together with a record card. The record card information consists of two types of coded information, diagrams of head markings (pigmentation and scales) and field notes.

Photographs are used as an obvious first reference and are used in the field. On finding a new individual the head marking and scale pattern are drawn onto blank templates using photographs of that specimen. A standard 8 times magnifying lupe is useful for this exercise. The head marking is drawn out only where the level of contrast against the background is sufficient to allow recognition, at some small distance from the snake e.g. 1 to 2 m. In Figure 1 a typical head marking is shown and for each Adder the apex of the dorsal zig-zag, inverted 'V', eye-lines and continuous area over the parietal, supraocular, frontal, prefrontal and internasal scales are subject to individual variation. Figure 2 shows examples of head marking taken from record cards. In addition, coloured arrows are used to highlight unique features. For example, F5/SM/140598 has a ring of lighter pigmentation surrounding a darker centre on the frontal scale and a small patch of orange pigmentation arranged centrally invading both parietals. Figure 3 shows examples of head scale patterns, again taken from record cards, for the same individuals shown in Figure 2.

Field notes are added to each record when Adders are seen again. Information on when and where they were observed, general condition, evidence of sloughing etc. are transferred from a note pad to the cards after each visit.

The first piece of coded information consists of the letter M, F or U and a number and is intended for filing purposes only. The letter indicates whether the Adder is a male, female or unknown and the number is simply a file number. U for unknown sex is required when the shape of the Adder's tail has not been observed because it has covered it's tail with its body, it has moved off too quickly or the Adder is immature. Next comes the place code, which is where and when first seen. Examples from record cards include F5/SM/140598 – that is a female, number 5, first seen on the small mound in the reserve on 14th May 1998 and F16/PT/080898 – a female, number 16, first seen adjacent to the picnic table along a forest ride on 8th August 1998.

A second piece of coded information allows rapid analysis and is an aid to finally confirming identification or a new listing. It is also listed in a file using a computer word processing facility which allows a match to be quickly obtained to confirm whether the snake is already known. Once again this data is a mixture of abbreviations and numbers that code for several visual features that can be observed on every snake, whether in the field or from photographs later. The first 7 number code refers to the number of head scales, which have proved to be vary variable for the study group. Although there are several snakes, within the study group, that have the same number of scales within each scale group they are still different in size, shape and arrangement on the head.

In Figure 4 (a typical example) the 7 scale groups are shown. In the unusual circumstance where scales number more than 9, the number is underlined. In the case of the typical example, the 7 number code would be 6231332. From Figure 3 the head scale codes would be for F5/SM/140598-4231442 and for F15/OA/080898-62312332. Once again, it is certainly far easier and more accurate to collate this data from a photograph.

The following two letters refer to the main body colour of the Adders e.g. DB – dark brown, LG – light grey etc. and the next variable number of letters refer to the type of dorsal body marking (see Figure 5). Although the scale number should remain constant throughout life, the body colour can change depending on rate of maturity and sloughing. The name for the dorsal body markings are idiosyncratic and suggested by their shape and form. It may be that a particular Adder has an apex zig-zag that then turns into a mirror wave, which brakes up into ovals and then becomes diamonds on the tail, then the code would be ZZMWOD. The order is not relevant as the zig-zag can often break up into 'Ms' and 'Ws' in several places, being indispersed with oval markings a number of times. A large majority of the Adders have a distinct body stripe, where the characteristic zig-zag or parallel wave pattern has been lost. The body stripe may be solid – SS or have a lighter middle band – LS. Dorsal body marking may also be subject to change, as suggested above and for the same reasons. In which case, both pieces of information will be updated as the study continues.

To summarize the above, the Adder in Plate 1 is filed as F5/SM/140598 and F5/231442/LG/ZZOD and Plate 2 is filed as F8/SM/270798 and F8/6231222/LB/LSD.

The records and a camera are taken to the study site on every visit. Visits take place in the morning whilst Adders are warming up, although they can be extended into the early afternoon if cloudy. On carefully approaching a basking Adder a sequence of features are observed in order to try to identify the snake. The colour, shade and type of dorsal body marking are carefully observed. At this stage positive identification can be achieved for particular specimens, either because of certain obvious unique features or because they have been observed before at that place. For example, a small number of specimens in the reserve are particularly pale, one specimen has several bands of different colours running over the body and a regularly observed grey specimen has dorsal markings that are practically all ovals. On approaching closer head markings and scales can be observed and compared with photographic or diagrammatic records. If the Adder has not been identified at this stage, photographs are taken, if possible including full body and head only. Care must obviously be taken not to get too close, such that the snake moves off or possibly become aggressive. If the snake has moved off prematurely, time is allowed for it to return to it's basking spot, when the above procedure can be attempted again.

Using photographs the head scales can be more easily examined and comparisons made with Adders already on file. If the snake is not known a new file card is prepared.

CONCLUSION

Working within a known area where a population of Adders use the same basking spots day after day, certain individual snakes can be identified at some distance, using the unique body colour or dorsal markings. On approaching closer the head marking and scales are the next features that are most significant, again they can be compared with hand-held photographic or diagrammatic records. If the observer can get as close as possible, without making the snake aggressive, photographs can be taken and viewed later. In particular, the shape, arrangement and number of head scales can finally confirm the identity of an individual Adder or produce a new record.

Figure 1: Dorsal view of Adder head
Vipera berus illustrating a typical head marking

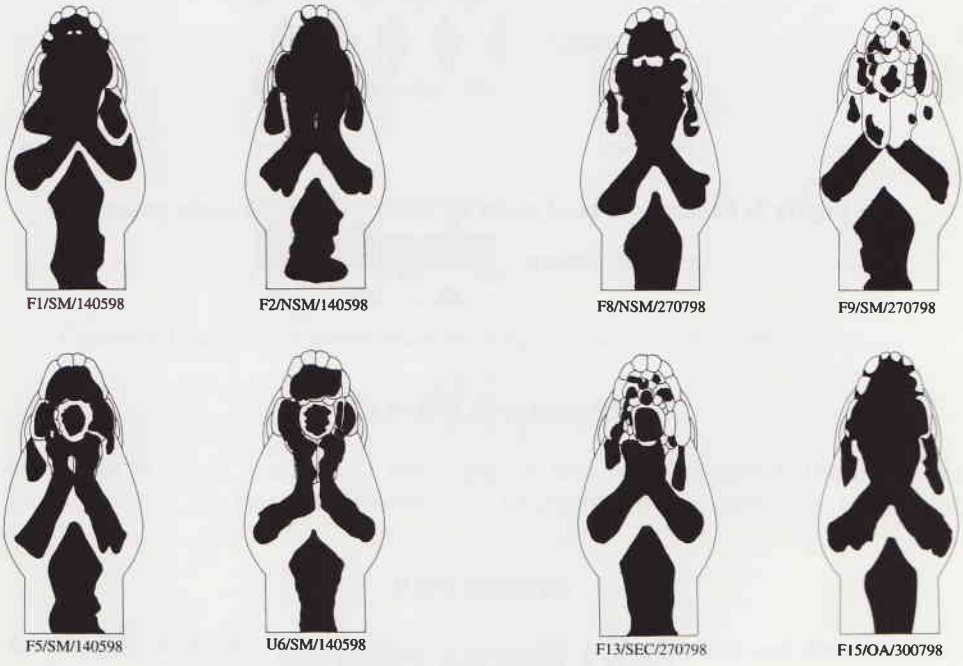

Figure 2: Examples of head markings for Adders with the study group

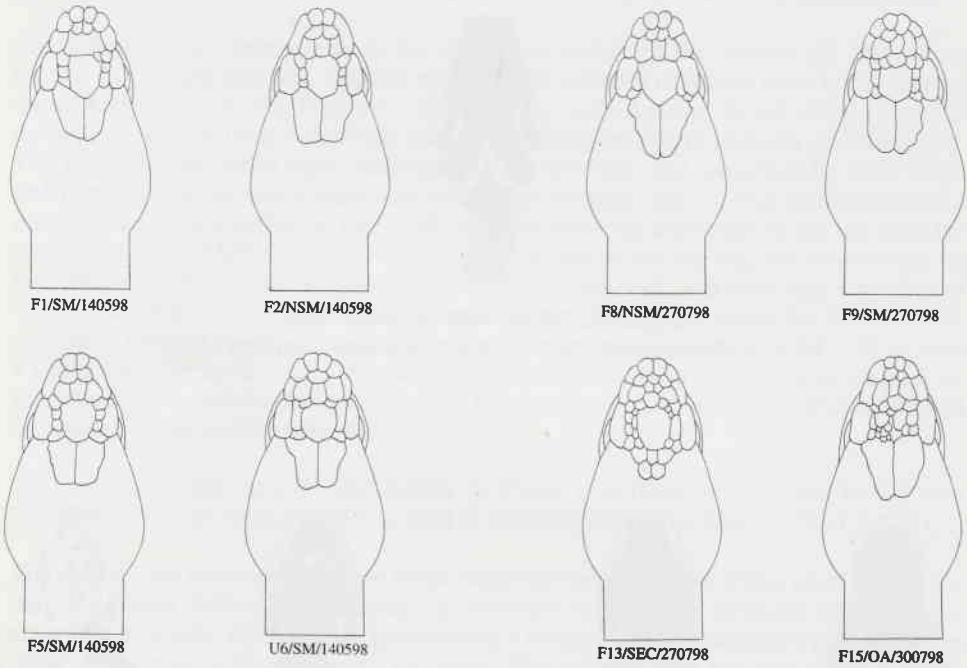

Figure 3: Examples of head scales for Adders within the study group

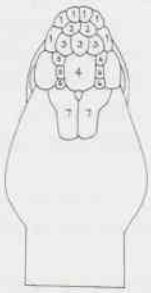

Figure 4: Dorsal view of Adder head *Vipera berus* illustrating scale groups

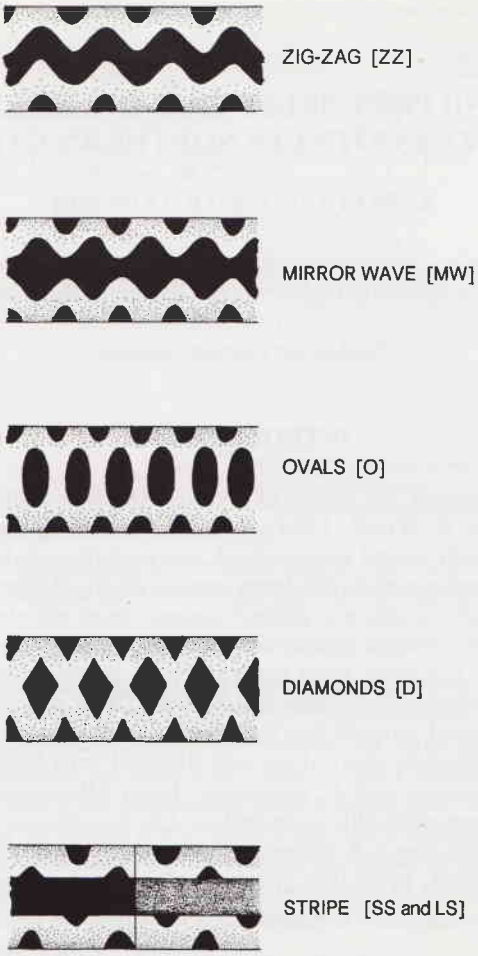

Figure 5: Examples of dorsal body markings for Adders within the study group

ACKNOWLEDGEMENTS

My thanks to Sylvia Sheldon and Jim Foster for their help and advice. Thanks also to Karen Davies of the Yorkshire Wildlife Trust for information and permission to enter the reserve.

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