

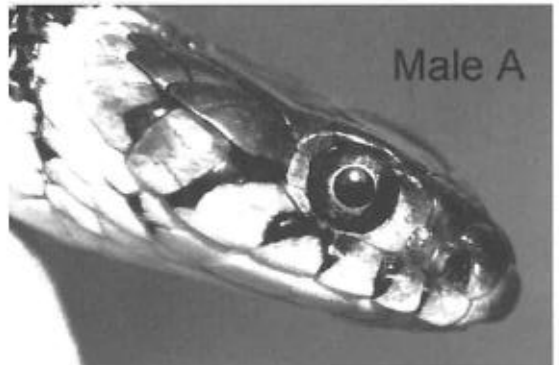
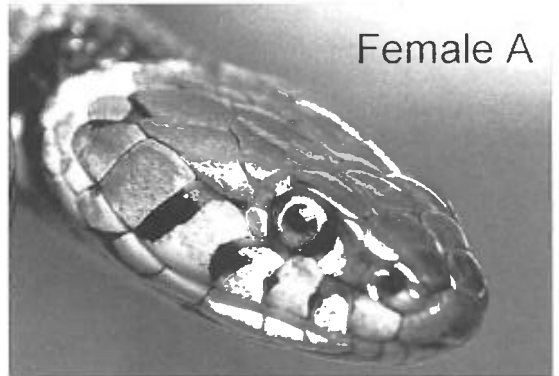
behaviour as is possible while still being within study distance.

By using telephoto zoom lenses, many subject individuals were repeatedly noted and identified over the years and from using this technique a log was able to be built showing preferred routes and movements for the group. Obviously, it required considerably more patience than a repeated 'capture-and-identify' approach, and many 'tail shots' simply didn't add up to much and sometimes proved inconclusive in identifying an escaping member of the group, however, the methodology still allowed close detail to be kept and even led to the positive identification of an adult female that had died due to suspected dog attack as well as incidental notes of a breeding male with confirmed copulation with three different females in three consecutive years.

One unexpected aspect of the study which came to light raised an interesting question that cannot immediately be answered, in that the apparent high incidence of distinct scale patterns as a difference between the sexes was so pronounced as to warrant further investigation. It was noted (see photographic examples shown) that a high incidence of two

### **Further notes on individual facial identification of *Natrix natrix* and sexual dimorphism in the incidence of different postocular scale arrangements**

**W**ITH reference to an earlier submission (Vaughan, 1999), this study continued until the Spring of 2007. During its course, which spanned between 1994 and 2006 (work in 2007 being suspended due to poor results and too few sightings), several aspects of facial identification had proved to be a success, not least, because it was possible to monitor the movements of a study group within a given area without too much interruption to natural behaviour or pattern-altering interference. Using only the facial patterns and collar / neck colour arrangement it was possible to follow a group in as near-natural

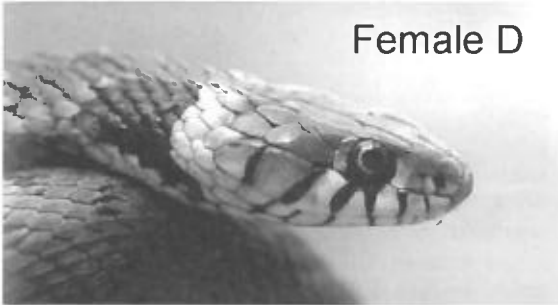




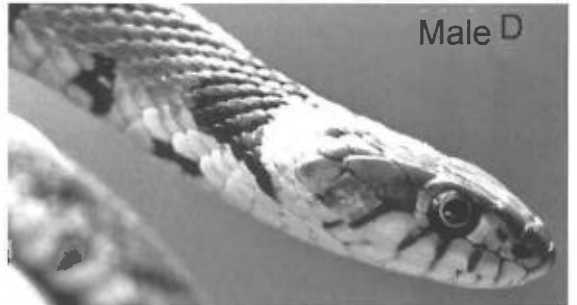
Female B



Male B



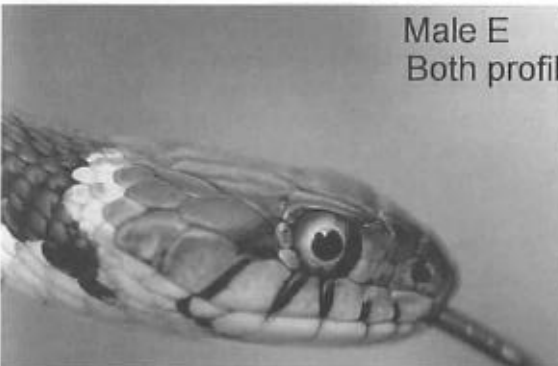
Female D



Male D



Male C  
Both profiles



Male E  
Both profiles



postocular scales occurred in females and three postocular scales occurred in males.

Of the 111 individuals captured over the period, 53 were photographed in such a way as to portray head and facial patterns (the use of inferior

photographic equipment during 1994 to 2000 meant that insufficient facial detailing existed in some shots) and there were 11 confirmed pairs actively involved in the mating process and subsequently recorded by means of a photograph. This did not



Female H

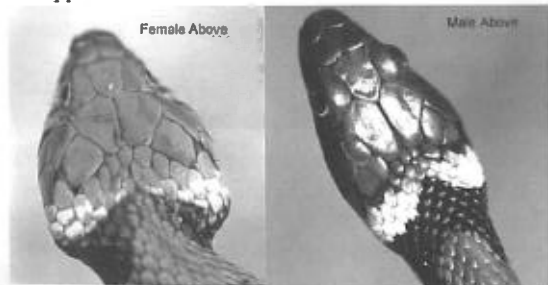
Female H. The only individual positively identified as female (*helvetica*) and with the possibility of three post ocular scales (the lower scale though may be kinked and not separate).

take into account the nine occurrences of “mating balls” observed during the period and which involved many individuals (up to eight) at one gathering and these were not disturbed in any way or counted as a ‘pair’.

By taking account of confirmed ‘partners’ only, this ensured that even where some doubt existed over an individual’s sex (it is known that young adult males and females can have a similar head shape and which only becomes more clearly defined when full adulthood /maturity is reached) (see photographs), the results would not be in doubt, as they had been involved in the actual mating process.

In the 11 confirmed pairs of male and female ‘partners’, only two examples existed where the female appeared to have three post ocular scales rather than two. However, one of those examples, was not thought to be *natrix helvetica*, but, due to the lack of yellow collar and distinct green stripe in evidence, rather suggest a random appearance of *natrix astreptophorus* (its overall influence on future populations cannot be forecast) to have entered the group. The second example had several scale defects apparent on the face and it

Sexual dimorphism in head shape of adult *Natrix natrix*. The male adult head (right) is more slender and has an elongated appearance. It lacks the triangular and thick-set appearance of the female.



Suspected *Natrix n. astreptophorus* also with three postocular scales and confirmed as female.

was therefore difficult to determine if the lower scale was broken or merely ‘kinked’.

No explanation is offered by the author for this apparent anomaly between the scale patterns and between the sexes, for as the study originally set out merely to prove that identification of individuals could be achieved solely through photographic means and at distance, the sexing of the study group was not refined so as to include definitive numbers of males and females at the outset and so the actual and precise incidence of “two’s” and “three’s” cannot be confirmed at numbers higher than the 11 pairs mentioned. It seems reasonable to assume however that such an observation might be more than just coincidence, as twenty individuals from the twenty two confirmed, means that over 90% of females followed the suggested pattern; ie, two post ocular scales and 100% followed the pattern of three post ocular scales for males. If this proves to be the rule generally (countrywide), whether the scale patterns are so formed so as to take account of the difference in head shape between male and female is one suggestion (see photographs) and it is one that would provide the most likely explanation.

#### ACKNOWLEDGEMENTS

Special thanks also to Gemma Fairchild RAUK for continued endeavours in the maintaining of a web site dedicated to our (UK) native herps, and where the voice of the amateur still rates a mention.