

## AMPHIBIAN REMAINS IDENTIFIED FROM THE GUT OF A GRASS SNAKE AND A POLECAT

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### INTRODUCTION

During the preparation of skeletons for comparative osteological collection, the gut contents of a Grass Snake *Natrix natrix* (L.) and a polecat *Mustela putorius* (L.) were separated and examined. The dead Grass Snake was donated by Colin Howes (Doncaster Museum) and was found in the Doncaster area of South Yorkshire in 1994. It measured 826 mm total length, unfortunately its sex was not determined before preparation. The Polecat was found run-over close to the Shropshire border with Powys near Bishops Castle, although it also contained two 22 lead air gun pellets. The enzymic maceration technique used in preparation is described in Bulletin No. 50 (Gleed-Owen, 1994). The vertebrate remains retrieved from the gut of the two animals were examined under low power ( $\times 7$  -  $\times 40$ ) magnification using a binocular microscope. Some bones may have been lost when preparing the polecat as its skeleton was sieved at 500  $\mu$ m before it was realised that the animal contained evidence of its last meal. Modern comparative specimens and scanning electron microscope photographs from the author's collection were used in the identification of the remains. Some of the features used in identification are described by Holman and Stuart (1991) and by Böhme (1977) but this field remains poorly-described in the literature.

### AMPHIBIAN REMAINS RETRIEVED

All of the skeletal material contained in the snake and polecat were of small amphibians. The Grass Snake contained the remains of one Common Toad, *Bufo bufo* (L.) and a newt *Triturus* sp. The Polecat contained a Great Crested Newt, *T. cristatus* (Laurenti) and a Common Toad, *B. bufo*. The specific elements identified are listed below.

### GRASS SNAKE CONTENTS

*Bufo bufo* (L.) Common Toad

**Material:** Five partial or incomplete trunk vertebrae; one sacrum; one urostyle; one partial right humerus; and one right femur; a number of indeterminate appendicular elements and fragments.

**Remarks:** The bones were badly corroded during digestion and were probably in the lower gut rather than the stomach. It is likely that Grass Snakes eventually completely digest all skeletal material. However, specific identification was still possible in this case and the remains are of a very small toad. Comparison was made with the skeleton of a toad which measured 33 mm snout to vent. The remains are around two-thirds of this size and are probably of a newly-metamorphosed toad measuring about 20 mm in snout to vent length.

*Triturus* sp Newt

**Material:** One partial right femur; one left and one right rib.

**Remarks:** Preservation was poor and as these particular elements are not diagnostic, specific identification was not possible. The bones are not of *T. cristatus* and are either *T. vulgaris* or *T. helveticus*. These are probably the remains of one newt.

Along with the skeletal remains, six variously-disarticulated weevils were found, their chitinous exoskeletons remaining in excellent condition. It is unclear whether the weevils were eaten by the grass snake, or by the toad or newt before they themselves were eaten.

## POLECAT CONTENTS

*Triturus cristatus* (Laurenti) Great Crested Newt

**Material:** One incomplete premaxilla; one left pterygoid; one left and one right posterior hyoid cornu; nine trunk vertebrae; three ribs; three caudal vertebrae; one right ulna; one left and one right ilium; one left and two halves of one right femur; one right tibia; one left fibula; a number of metapodials and phalanges.

**Remarks:** These bones were strongly stained but otherwise in fairly good condition and may not have moved further than the stomach. Some long bones were broken and various elements are missing. The size and numbers of the elements suggest they represent one newt of around 120 mm total length (by comparison with other skeletons).

*Rana temporaria* (L.) Common Frog

**Material:** One left and one right fronto-parietal; one left and one right exoccipital; fragments of at least three trunk vertebrae; one urostyle; one omosternum; one right coracoid; one right humerus; one ischium; one left and one right femur; one left and one right tibiofibula; various metapodials and phalanges.

**Remarks:** This material was more seriously corroded and some long bones were broken but could be refitted. The bones are of one juvenile frog with a snout to vent length of about 30-35 mm.

## DISCUSSION

In a previous study of this kind (Gleed-Owen, 1994) a Grass Snake contained a Great Crested Newt and a Common Frog. Frazer (1989) lists the prey of Grass Snakes as newts, fish and frogs, probably taken in the water. Some are known to eat toads, for example in the Isle of Purbeck (opp. cit.) where they constitute the main prey species along with voles and even insects. According to Arnold and Burton (1978), Grass Snakes eat predominantly frogs and toads as well as newts, tadpoles and other small vertebrates. Frazer (1989) suggests that young snakes will take tadpoles and small fish but using the size and age table he provided (opp. cit.: p. 196), this specimen was probably at least eight years old. Smith (1969) suggests that mainly frogs are eaten but also amphibians as well as lizards, birds and mammals. Where necessity dictates, no doubt toads are eaten. However, it is unclear whether Grass Snakes will preferentially avoid toads in other circumstances. Perhaps even if toads are avoided as prey in an area, very young animals would not be rejected. The Common Toad and the three British newts are known from the Doncaster area. This Grass Snake may well have taken its newly-metamorphosed prey close to a water body and probably late this year.

In Britain the polecat is most commonly encountered in Wales where it is known to feed mainly on small mammals and frogs (Macdonald and Barrett, 1993). It would appear

from this example that as well as frogs, newts are also eaten, perhaps even as a primary food source in areas where such species are abundant. Distribution atlas records (Arnold, 1973) are not detailed enough for the Shropshire area to determine whether both prey species are already known from the locality but this example serves as a surrogate method of recording which proves that both species are present in the Bishops Castle area.

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