NOTES ON WORM-EATING IN THE PRAIRIE RINGNECK SNAKE,  
Diadophis punctatus arnyi

INTRODUCTION

The prairie ringneck snake, Diadophis punctatus arnyi, is a small snake which ranges from Iowa and eastern Nebraska south through south-central Texas. It characteristically inhabits rocky hillsides in open woods where it secretes itself under stones, logs and other surface litter. Food includes earthworms, insects, frogs, toads, salamanders, snakes and lizards (Blanchard, 1942). Fitch (1975) found that earthworms were the most common food item of the prairie ringneck snake in Kansas. Many researchers, including Hudson (1942), Anderson (1965) and Henderson (1970), have observed that earthworms are eaten readily in captivity. The peculiar observation that earthworms crawl down the throats of snakes has been reported for Clonophis kirtlandi (Smith, 1965; Tucker, 1977), Thamnophis radix (Tucker, 1977) and Sterneria dekayi texana (Mary Horst, pers. comm.). This paper reports observations made on the ingestion of worms by two captive Diadophis punctatus arnyi.

MATERIALS AND METHODS

The snakes were collected under a log on a rocky creek bank in Tarrant Co., Texas on 13 November 1977. On 24 December the snakes measured 101 and 138 mm in total length. Blanchard (1942) reports 4 hatchlings varied from 98 to 108 mm in total length. The snakes were offered 1-2 worms at approximately weekly intervals. Detailed observations were made on the ingestion of 15 worms during a three month period.

RESULTS AND DISCUSSION

There was no apparent attempt by the snake to initially secure a hold at either the anterior or posterior end of the worm. Rather, the worm was attacked at anypoint along it's length. Henderson (1970) stated that "several times it seemed that the snakes hesitated inorder to strike at a particular end of the worm, but it was not determined which end was sought." The worm usually writhed violently and often wrapped several coils around the snake's head and neck. The snake moved backward; the tail moved rapidly from side to side as if searching for a secure hold. Ingesting an earthworm may require that the snake firmly anchor itself to keep the worm from escaping. The backward motion may also assist in dislodging the worm from the head and neck and in keeping the worm stretched out in front of the snake. After the initial struggle, the worm lost, or released, it's hold on the snake and attempted to crawl off. At this point the snake initiated jaw movements which slowly moved the worm into it's throat. This caused the worm to be doubled over and the short end quickly disappeared into the snake due to contractions of the worm. On four occasions the worm was seized within 1-2 mm of an end and a few jaw movements quickly moved that end into the mouth cavity. On two other occasions a grip on the posterior end of the worm was attained in several minutes due to both jaw movements by the snake and attempts by the worm to crawl forward.

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If the anterior end was initially engulfed, the worm usually disappeared into the snake with 1-6 contractions within 2-15 seconds. If the posterior end was engulfed, the subsequent ingestion process usually took 2-3 minutes, but on one occasion it took nearly ten minutes. The worm attempted to escape by crawling forward and usually only short contractions occurred within the area of the snake's mouth cavity. These contractions were used to advantage by slow jaw movements and the worm was slowly moved posteriorly. On two occasions the worm suddenly contracted to such an extent that it disappeared into the snake within 1-2 seconds.

Two types of jaw movement were evident. Characteristic unilateral feeding movements were used to slowly pull the worm posteriorly. At other times during the swallowing process, the mouth was slowly opened and closed. During these periods, the worm usually moved slowly into the snake by means of short contractions.

According to Tucker (1977), this phenomenon occurs when the snake begins swallowing a worm from the posterior end. This study indicates that it occurs regardless of which end is initially seized or engulfed; indeed, the process appears to be more rapid when the worm is seized at the anterior end.

Due to the posteriorly curved teeth, the worm is unable to move back out of the snake's mouth once a contraction pulls it deeper into the snake. *Diadophis*, like most xenodontine snakes, have enlarged teeth on the posterior end of the maxilla, which in other snakes of this subfamily are usually associated with a mild venom. It is not clear whether *Diadophis* secretes a venom, though Shaw and Campbell (1974) reported that one observer experienced a burning sensation after being bitten. Regardless of the possible association of the enlarged teeth with venom, these teeth may be of great assistance in swallowing earthworms and other food items.

**Literature Cited**

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