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NOTES ON CHARINA BOTTAE IN UTAH:
REPRODUCTION⁽¹⁾

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DISTRIBUTION

The following notes are based upon specimens of the Rubber Boa, collected in Utah, now in the herpetological collection at the Brigham Young University.

A number of specimens have been added to the collection since the publication in 1933, by the senior author, of a "Study of the Variation of the Dorsal Scale Rows in *Charina bottae*."⁽²⁾ This species is not easily collected, being secretive in its habits. It seems to move about during the twilight and early morning hours, then resting in some cool place, probably in the grass or in the leaf mould during the day. All the specimens we have collected have been taken during the hours mentioned above.

Thirty-three specimens have been collected in Utah County: twenty-two at Aspen Grove, Mount Timpanogos; seven in Provo Canyon; two in Payson Canyon; one in Rock Canyon, and one in American Fork Canyon.

At the annual meeting of the Utah Academy of Sciences, Arts, and Letters, held at Salt Lake City, in May, 1939, Mr. Ross Hardy reported the occurrence of the Rubber Snake in Carbon County. On June 15, 1939, the writers, while on a collecting trip to Carbon and Emery Counties, talked with Mr. Stanley Nelson, caretaker of the Peerless Mine, the place where the specimen was collected. Mr. Nelson reported that his son collected the specimen on a hay stack. We examined the area and found the hay had been stacked on a shed which was built on a hill-side on which there was a thick growth

(1) Contribution No. 76.

(2) Tanner, Vasco M., 1933. A Study of the Variation of the Dorsal Scale Rows of *Charina bottae* (Blainville). *Copeia*, July 20, 1933, No. 2, pp. 81-84.

of oaks and other low shrubs. Mr. Nelson also reported having seen another specimen of *Charina bottae* along a small stream, just off the main highway in Price Canyon, about two miles above the Peerless Mine. The range of this snake in Utah is greatly extended, by this record from the High Plateaus and the two records from Payson Canyon, which is only a short distance from the most southern part of the Wasatch Range.

FOOD HABITS

A number of specimens have been kept in the laboratory for periods of one to six months. In a number of cases, captive specimens have eaten small mammals. A nest of *Microtus p. modestus* consisting of four young were eaten; also three young *Peromyscus* sp. The snakes would not take the young rodents outside of the nest, but would enter the nest and there feed upon their prey. Several specimens, when captured, regurgitated their last meal which consisted of young rodents. In June, 1939, Mr. Ronald Dykes of the C. C. C. Camp in Payson Canyon collected a Two-headed Snake. While he was holding the specimen by the tail, with the head downward, three small "mice" were regurgitated. We have made attempts to have *Charina bottae* feed upon other animals such as insects, cold blooded vertebrates and small birds, but have never been successful. According to Cope (1900)⁽³⁾ and Van Denburgh (1922)⁽⁴⁾, this species has been known to eat lizards of the genus *Sceloporus*. Our information concerning the food habits of adult *Charina bottae* to date supports the belief that their food consists mainly of mammals.

REPRODUCTION

An interesting phase of the life history of the Rubber Snake was brought to our attention last summer (1938) when a specimen, number 690, collected at Aspen Grove in August, gave birth to three snakes on September 9. The fact that the young were born alive so late in the season prompted us to examine all the females in the collection. We were rewarded by finding four specimens with eggs in various stages of development. Since the only reference in the literature to reproduction in this species, we have been able to find, is one by Van Denburgh (1922, Vol. 2, p. 642), we are presenting our findings in the

(3) Cope, E. D., 1900. The Crocodilians, Lizards, and Snakes of North America, Ann. Rept. U. S. Nat. Mus. for the year 1898, pp. 153-1294.

(4) Van Denburgh, John, 1922. The Reptiles of Western North America, Vol. 2, pp. 617-1028.

belief that they may be of some interest. Dr. Van Denburgh has but one sentence on the subject as follows: "A female caught in June contained large eggs."

A large specimen, number 842, measuring 556 mm in length, collected at Aspen Grove on July 30, 1926, contained five eggs. The eggs were in a membranous sac 215 mm long, while each egg was surrounded by a thin sac or shell. The anterior egg measured 45 mm in length and 15 mm wide, while the posterior one measured 44 mm by 14 mm wide. The three in between were similar in size. Each egg had reached about the same embryological development. The embryo, in all cases, was developing on the ventral central part of the egg. The two ends and dorsal portions of each egg were composed of a brownish granular food material. The embryos were removed from the anterior and posterior eggs. The anterior one was 96 mm long, with a head diameter of 4 mm, while the posterior one was 99 mm long, with a head diameter of 4 mm and a body width at about the middle of 3.5 mm. The dorsal scales were developed along the sides but they had not formed along the dorsal midline. The specimen in the anterior egg possessed sixteen rows of scales on one side and seventeen on the other, while the posterior one had twelve rows on each side.

Another specimen, number 676, collected in Rock Canyon east of Provo on August 17, 1938, contained only two eggs. The anterior egg, however, was much larger than eggs in other specimens study. It was 77 mm long and 9.5 mm in width. A small embryo was developing in the center of this egg; blood vessels could be seen scattered through the food material which surrounded the embryo. The posterior egg was small and undeveloped suggesting that it was not fertile.

A specimen, number 1387, was collected at Aspen Grove on July 29, 1935, which measured 629 mm. This female contained eight eggs, the greatest number found in any one specimen. None of the eggs showed any embryonic development. The anterior egg measured 23 mm in length and 10.5 mm in width, while the posterior one was 28 mm long and 12 mm wide.

The largest specimen of this species in our collection, number 674, was collected at Aspen Grove on August 4, 1938, and contained three eggs. None of the eggs had undergone any apparent embryological development. The total length of the three eggs before being disturbed was 119 mm. The anterior egg was 39 mm long and 14 mm

in width. The next one was 43 mm long and 17 mm in width, while the last egg was 37 mm long and 18 mm in width.

A fifth specimen, number 690, taken on August 9, at Aspen Grove, was kept alive in a breeding cage for food study purposes. Fresh grass was placed in the cage three times a week, and insects placed in the cage. On September 9, while removing the dry grass, three small snakes and an undeveloped egg were observed in the cage. The young snakes were dead, probably due to the dryness of the soil and grass. The specimens were removed and preserved. The largest specimen of the three measured 170 mm long, with a head width of 6.1 mm and a dorsal scale count of 42 scales.

It is interesting, at this point, to record the capture of a young Rubber Snake at Vivian Park in Provo Canyon on June 27, 1939. It is 175 mm long, with a head width of 6.2 mm and a dorsal scale count of 41. The color is a reddish-brown similar to the young snakes born in captivity to specimen number 690.

From our findings, it appears that *C. bottae* in Utah gives birth to her young in the fall of the year, or in some cases where development commences late in the year as in number 1387, in the early spring. It would seem that this is the case or else the young produced in the fall grow but very little, if any, before winter hibernation. Just what the young snakes feed upon is also unknown. Because of their size, we surmise that their food must be other than mammalian.