REPRODUCTIVE AND ECOLOGICAL OBSERVATIONS ON *TANTILLA RUBRA CUCULLATA* FROM BIG BEND NATIONAL PARK, TEXAS (SERPENTES: COLUBRIDAE)

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FEW specimens of *Tantilla cucullata* and *Tantilla diabola* have been reported since their original description by Minton (1956) and Fouquette and Potter (1961). Degenhardt and Milstead (1959) published on one specimen of *T. cucullata*, and Treadwell and Hibbitts (1968) and Smith and Werler (1969) published on two additional specimens of *T. diabola*. Smith and Werler (1969) recognized the close relationship to *Tantilla rubra* and designated their Chisos Mountains specimen as *T. rubra diabola*. Recently Degenhardt et al. (1975) reported on nine specimens from the Chisos Mountains and designated the Big Bend population as *T. rubra cucullata*, represented by two color morphs (with and without a light collar). They considered the Devil's River population as *T. rubra diabola*, but left unresolved the taxonomic relationship of the Fort Davis–Alpine population. Degenhardt et al. (1975) are followed in my use of *T. rubra cucullata* for reporting on six additional specimens of the large *Tantilla* (both color morphs) from the Chisos Mountains, Big Bend National Park, Brewster County, Texas.

Nothing has been reported on reproduction for the United States *T. rubra* populations. At 2252 h on 16 July 1973 I found a large (snout-vent length [SVL] = 404 mm, tail = 112 mm), recently-killed, gravid Big Bend black-headed snake, *T. rubra cucullata*, (DAE 2775) at the Panther Pass parking lot (elevation—1706.88 m), Big Bend National Park, Texas. It was the collarless morph (run over within the last hour). Dissection revealed two eggs, the largest measuring 27.5 × 10 mm. Although egg development was incomplete, hatching was attempted, but unsuccessfully. Under natural conditions laying would have probably occurred within about 2 weeks. The dicolor morph condition for the Big Bend population of *T. rubra cucullata* may be confirmed perhaps by obtaining both morphs from the same clutch of eggs.

Limited information available suggests that *Tantilla* lays small clutches. Wright and Wright (1957) listed 2–3 eggs/clutch for *T. c. coronata* and *T. g. gracilis*, and 1–4 (usually 2–3) eggs for *T. g. hallowelli* with time of deposition for the latter subspecies from mid-June to mid-July. Although Wright and Wright (1957) gave no clutch data for *T. atriceps* (the only other species of *Tantilla* known to occur in Big Bend National Park), the author has the following data from three *T. atriceps* from the park: one egg (28 × 7 mm) laid in captivity, 28 July 1973, from gravid individual collected 23 July 1973, Basin, Chisos Mountains; one egg (27 × 7 mm) laid in captivity, 4 August 1973, from gravid individual collected 29 July 1973, Rio Grande Village; one egg (23 × 6 mm) laid in captivity, 23 June 1974, from gravid individual collected 20 June 1974, Panther Pass, Chisos Mountains.

On 22 July 1973 at the Panther Pass parking lot I captured at 2155 h a female (SVL = 205 mm, tail = 64 mm) *T. r. cucullata* (DAE 2839; collared morph), and at 2350 h a male (SVL = 367 mm, tail = 123 mm) *T. r. cucullata* (DAE 2838; collarless morph). At 2225 h on 24 July 1973 I found a freshly-killed male (SVL = 234 mm, tail = 74 mm) *T. r. cucullata* (DAE 2840; collarless morph) near the Basin service station (elevation—1645.92 m). On 5 August 1973 at the second curve below Panther Pass on the Basin side I captured at 2153 h a female (SVL = 194 mm, tail = 60 mm) *T. r. cucullata* (DAE

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2841; collarless morph). Associated species captured on these nights in the same area were: *Hyla arenicolor* (1), *Leptotyphlops dulcis dissectus* (5), *Diadophis punctatus regalis* (3), *Lampropeltis mexicana* (*alterna* morph) (1), *Hypsiglena torquata ochrorhyncha* (1), *Trimorphodon biscutatus vilkinsoni* (1), *Tantilla atriceps* (8) and *Crotalus molossus molossus* (2). On 12 September 1972 George Burdick captured alive at 2225 h a male (SVL = 407 mm, tail = 127 mm) *T. r. cucullata* (GB 501; collared morph) at the second curve below Panther Pass on the Basin side. It was warm (24.45° C), moonless and windy (14.5 km/h). All live *T. r. cucullata* specimens were crawling when encountered. Scalation and color patterns for these six *T. r. cucullata* do not differ appreciably from those Big Bend specimens previously described by Degenhardt et al. (1975).

Evidence suggests that in Big Bend, *T. rubra* is a secretive, nocturnal species with narrow ecological tolerances that limit its surface activity. Weather, especially rainfall (i.e., surface moisture), seems most important in influencing surface activity of this snake. During the summer of 1973 no rain fell in the Chisos Mountains until 10 July when 3.58 cm was recorded. It rained every day for the next week including 16 July (0.18 cm) when the first *T. r. cucullata* was found. *Tantilla r. cucullata* was found only when soil surface moisture was abundant. However, it was never found on nights after heavy rains when the soil was muddy; one or two days of drying were necessary before any activity (i.e., captures) was noted. The snake was taken on both wet and dry pavement: on dry pavement several days after the last heavy rain, or wet pavement after only a light rain that day. Overall snake activity was greater on nights of the rainy season (July–August) than the dry season (May–June). Other weather patterns noted were: Sky—overcast, moonless or up to no more than a half moon; temp.—fairly warm, 20–24.45° C; wind—quiet, but some individuals were taken on windy nights. Similar weather patterns were noted by Degenhardt et al. (1975). This snake may rarely come to the surface during years when weather conditions are not satisfactory. Degenhardt collected on the Basin road, Chisos Mountains, for eight summers and never saw *T. rubra*. In the same area within two nights during the summer of 1969, I captured three, but saw no others during the following three summers of intensive collecting until 1973 when I collected five. For a description of the habitat and topography of the Chisos Mountains see Degenhardt et al. (1975).

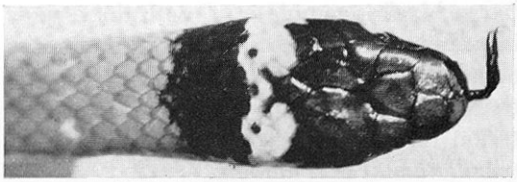

FIG. 1.—Unrecorded (aberrant?) collar pattern of *Tantilla rubra cucullata* (collared morph), 16 August 1974, 490 m north Volcanic Dike Overlook, Big Bend National Park, Texas.

The writer also captured alive on 16 August 1974 at 2325 h an adult male (SVL = 327 mm, tail = 35 mm—tip missing) *T. r. cucullata* (DAE 2942; collared morph) 490 m north Volcanic Dike Overlook (elevation—1172.96 m), Big Bend National Park. When discovered the snake was coiled in the center of the road; weather conditions were hot, windy, and no rain in 7 days. Associated species captured here that night were: *Masticophis flagellum* (1, dead on road), *Hypsiglena torquata* (1), *Crotalus molossus* (2), and *Crotalus atrox* (2). This is the lowest site that *T. r. cucullata* has been reported in the park (473 m lower in elevation than the Chisos Mountains site [Basin–Panther Pass area]), is only the second site recorded for the species in the park, and is a park site that is outside the Chisos Mountains. Additionally, this specimen's collar is of a type previously unrecorded (aberrant?). Instead of the typical dorsal black median

bar, a black incomplete "x" with three spots is present (Fig. 1). This variation in the collared morph of *T. r. cucullata* suggests that collar pattern may not be a valid criterion for subspecies designations of *T. r. cucullata* and *T. r. diabola*.

These specimens were taken on a Collecting Permit issued to the writer by the Superintendent of Big Bend National Park. All specimens (snakes and eggs) were preserved in 10% Formalin and are at Northwest Missouri State University (DAE 2775, 2838, 2839, 2840, 2841, 2942) and Sul Ross State University, Alpine, Texas (GB 501).

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Literature Cited

Degenhardt, W. G., T. L. Brown, and D. A. Easterla. 1975. The taxonomic status of *Tantilla cucullata* and *Tantilla diabola*. Texas J. Sci. 27: (In press).

Degenhardt, W. G., and W. W. Milstead. 1959. Notes on a second specimen of the snake *Tantilla cucullata* Minton. Herpetologica 15:158–159.

Fouquette, M. J., and F. Potter. 1961. A new black-headed snake (*Tantilla*) from Southwestern Texas. Copeia 1961:144–148.

Minton, S. A., Jr. 1956. A new snake of the genus *Tantilla* from West Texas. Fieldiana 34: 449–453.

Smith, H. M., and J. E. Werler. 1969. The status of the northern red black-headed snake, *Tantilla diabola* Fouquette and Potter. J. Herpetol. 3:172–173.

Treadwell, R. W., and T. Hibbitts. 1968. *Tantilla diabola* from Val Verde County, Texas. Texas J. Sci. 20:281–282.

Wright, A. H., and A. A. Wright. 1957. Handbook of snakes of the United States and Canada, Vol. 2. Comstock Publ. Assoc., Ithaca.

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