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THE SUBSPECIES OF *CROTALUS LEPIDUS*[1]

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THE rattlesnake *Crotalus lepidus* is a small species living mostly at high elevations in southwestern United States and Mexico. It was first described by Kennicott in 1861 from two heads collected at Presidio del Norte and Eagle Pass, Texas. In 1887 Garman described an alcoholic skin from Monclova, Coahuila, under the name of *Crotalus palmeri*. Subsequent authors have correctly regarded this as a synonym of *lepidus*.

A study of 208 specimens, all available material known to me, has shown that structural characters in this species are fairly constant, but over the entire geographic range the coloration is extremely variable. In general the pattern consists of a series of more or less conspicuous dark crossbands on a glaucous or gray ground color. Specimens from the few localities which are represented by sufficient material to indicate the extent of variation have certain peculiarities of color tone and pattern elements which appear to be characteristic of the region. This may possibly be accounted for by the fact that many small mountain ranges inhabited by these snakes are definitely isolated by considerable areas of desert or plain which are natural barriers to the spreading of a form adapted to high elevations. Each small colony, therefore, is permitted

[1] Contribution from the Department of Zoology of the University of Michigan.

to maintain its own peculiar characteristics. These small aggregations are not different enough from the population as a whole to justify taxonomic separation. It is possible, however, in fact it seems necessary, to divide the species into two parts, each sufficiently distinct to merit subspecific status, even though no specimens actually intermediate in definitive character are at hand. Most of the material examined is from the northern part of the range[2] where isolation is most complete. From the character of the differences, intergradation is certainly to be expected somewhere on the Mexican Plateau. Two subspecies, therefore, are proposed here: an eastern form inhabiting western Texas (except the El Paso region) and adjacent Mexico, and a western form in New Mexico, southern Arizona, and the Mexican Plateau as far south as Jalisco. To the former Kennicott's name is applicable. For the latter, in recognition of the excellent work of Mr. L. M. Klauber on western rattlesnakes of the genus *Crotalus,* I propose the name

Crotalus lepidus klauberi, new subspecies

Plate I, Figure 1 and Figure 2, No. 4105

DIAGNOSIS.—Distinguished from *Crotalus lepidus lepidus* by the absence of a dark stripe from the orbit to the angle of the mouth; a more vivid coloration, the pattern of dark brown or black crossbands contrasting strongly with the glaucous or greenish gray ground color, and equally distinct throughout the length; the absence of dark blotches between the crossbands or their restriction to small spots on a very few scales; and the light coloration of the belly.

TYPE SPECIMEN.—University of Michigan Museum of Zoology No. 79895, adult male, collected in Carr Canyon, Huachuca Mountains, Cochise County, Arizona, August 10, 1930, by L. H. Cook. Paratypes: L. M. Klauber Collection, Nos. 3078–3082, 3106, 3115, 3119–3123, 3214, all from type locality.

DESCRIPTION OF TYPE SPECIMEN.—Head distinct from neck, snout narrow, and muzzle rounded in profile. Rostral slightly

[2] Out of the total of 208 specimens studied, 153 are from southern Arizona and New Mexico.

wider than high, apex narrow, rounded and somewhat recurved. Internasals 2, canthals 1–1; three moderately large and one small scale on snout back of internasals and between canthals; 15 irregular scales between supraoculars; parietal region covered with smooth scales varying in size, shape, and arrangement. Scutellation of each side of head as follows: prenasal separated from postnasal by nostril and a vertical suture; loreal relatively large, in broad contact above with canthal, completely separating postnasal and preoculars; 3 or 4 small granular scales anterior to maxillary pit above second supralabial; upper preocular divided vertically, the anterior portion prolonged upward to the canthal; orbit separated from supralabials by one scale (lacrimal); temporals in 2 to 5 rows, without keels.

Preoculars 2–2; postoculars 5–5; supralabials 12–12, first in direct contact with anterior nasal; infralabials 11–11, the first on each side meeting in a broad contact behind tip of mental; one pair of chin shields, somewhat longer than wide; about 5 asymmetrical pairs of median gulars; 7 oblique rows of lateral gulars between first ventral and last infralabial.

Dorsal scale rows 25–23–17, all keeled at midbody except lowest two on each side, and keels appearing on these posteriorly; ventrals 160; caudals 25, the last and third from last divided. Anal not divided.

Total length 505 mm.; length of tail 42 mm.; tail length divided by total length .083. Rattles 5 +.

Dorsal ground color greenish gray near midline, shading into bluish gray on the sides; lowest two scale rows and edges of ventrals flecked with pale buff. Entire dorsal surface covered with very fine grayish brown stippling. Top and sides of head uniform gray; muzzle and supraoculars with small, irregular flecks of brown. No dark stripe from eye to angle of mouth. Rostral, mental, and labials stippled with gray, especially along sutures. A middorsal series of 19 blackish brown blotches, the seventh to nineteenth inclusive transversely expanded toward a single series of lateral blotches of the same color with which they form crossbands posteriorly. The fif-

teenth, sixteenth, and seventeenth divided at the midline. Edges of blotches somewhat denticulate and set off sharply from the ground color by very narrow light gray borders. A few irregularly placed scales between the large blotches tipped with brown. Tail crossed by three dark bands, the first similar to those of the body, the last two chestnut brown. Ground color of distal half of tail hazel; base of rattle light chestnut. Ventral surface of body and proximal third of tail cream buff, indistinctly blotched and flecked with gray or grayish brown along sides.

In general coloration the 14 paratypes are essentially similar to the holotype. Some have a smaller amount of green than others; this may be due in part to differences in age. The dorsal blotches vary in this series from 16 to 21; tail bands number 3 in males, 2 in females. In No. 3079 most of the blotches in the main series are divided at the midline and only the last two are connected with those of the lateral series. In Nos. 3115, 3120, 3121, and 3881 the majority of the median blotches do not join with the lateral ones, and complete crossbands are found only on the posterior part of the body. The brown-tipped scales are conspicuous in some, almost absent in others.

RANGE.—The mountains of southeastern Arizona, west-central New Mexico, and El Paso County, Texas, and the Mexican Plateau in Chihuahua, Durango, Zacatecas, and Jalisco.

Crotalus lepidus lepidus (Kennicott)

Plate I, Figure 2, Nos. 4424 and 4200

1861 *Caudisona lepida* Kennicott, *Proc. Acad. Nat. Sci. Phila.:* 206 (type locality Presidio del Norte and Eagle Pass, Texas; type specimens apparently lost).

1887 *Crotalus palmeri* Garman, *Bull. Essex Inst.*, 19: 124 (type locality Monclova, Coahuila, Mexico; type specimen Museum of Comparative Zoology, No. 4578, ♂, alcoholic skin, collected by Dr. Edward Palmer).

DIAGNOSIS.—Distinguished from *C. l. klauberi* by a dark gray or brown stripe from the orbit to the angle of the mouth; a mottled coloration with dark crossbands only slightly dis-

tinct from the gray ground color, and usually becoming noticeably fainter toward the head; irregular intermediate blotches sometimes almost as conspicuous as the crossbands of the main series; and the relatively dark coloration of the belly.

RANGE.—Western Texas (except the El Paso region), Coahuila, and northern San Luis Potosí, Mexico.

The most conspicuous peculiarity of the type specimen of *palmeri* is the fading out of the dark crossbands anteriorly. This occurs to some extent in nearly all specimens of *C. l. lepidus* but is most characteristic of those from the canyons of the Pecos and Devils rivers in Pecos and Valverde counties, Texas. A specimen from Leakey, Real County, Texas (H.K.G. 4200, Pl. I, Fig. 2) is very similar in this respect to Garman's type. A common variation in the same region has dark intermediate blotches coalescing to form indistinct gray bands between those of the main series (H.K.G. 4424, Pl. I, Fig. 2). Bailey[3] states that several were seen "on limestone ledges along the Pecos Canyon at Howard Creek and Sheffield, all of which were whitish in color like the lime rock on which they were found." Occasional specimens from the Chisos and Davis Mountains have a pinkish brown or salmon ground color.

A more detailed treatment of the variations and relationships of these forms, and acknowledgment of sources of material for this study, will appear in a later publication.

[3] "Biological Survey of Texas," *N. Amer. Fauna* No. 25, 1905: 51.

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PLATE I

FIG. 1. *Crotalus lepidus klauberi,* collected 5 miles north of Mimbres P. O., Grant Co., New Mexico, by D. O. Scott. (H.K.G. 4567).

FIG. 2. No. 4105, *C. l. klauberi,* 11 miles north of Pinos Altos, Grant Co., New Mexico.

No. 4424, *Crotalus lepidus lepidus,* Shumla, near mouth of the Pecos River, Valverde Co., Texas. No. 4200, *C. l. lepidus,* Leakey, Real Co., Texas. This specimen is very similar to the type of *C. palmeri* Garman.

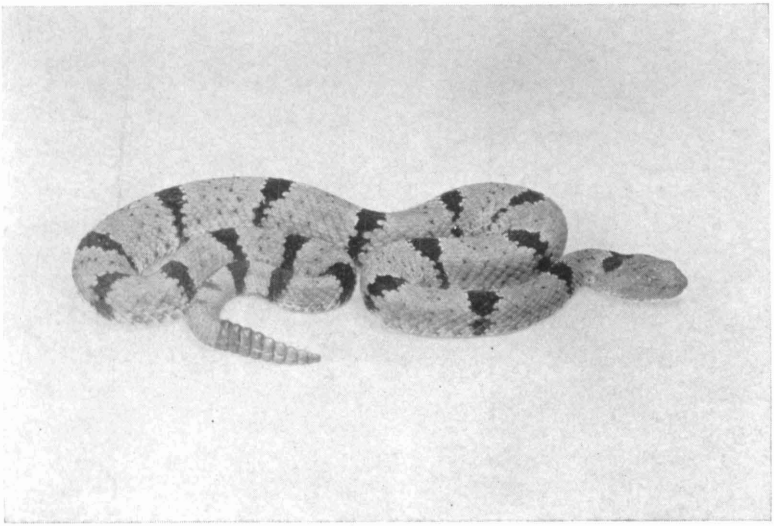

FIG. 1.

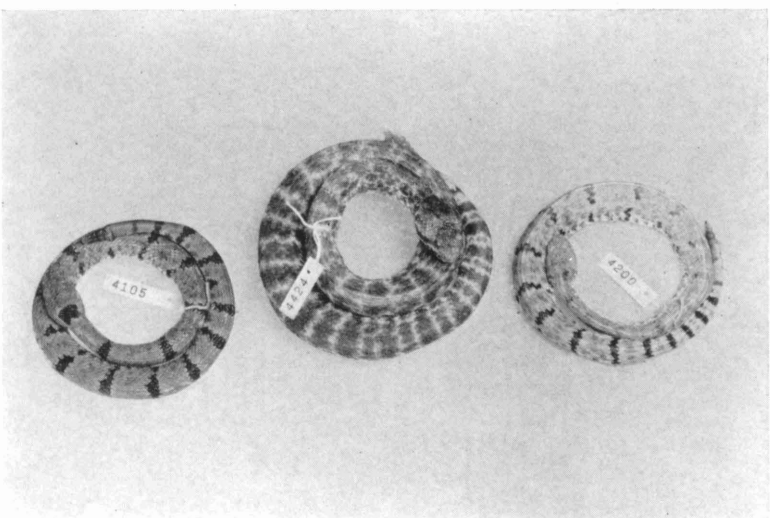

FIG. 2.