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A NEW SUBSPECIES OF THE TURTLE *GEOEMYDA RUBIDA*
(COPE) FROM WESTERN MEXICO

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IN the herpetological collection of the University of Michigan Museum of Zoology there are specimens of the emydid turtle *Geoemyda rubida* (Cope) which represent a form hitherto undescribed. We wish to designate this

Geoemyda rubida perixantha, new subspecies

(Pl. I and Fig. 1)

HOLOTYPE.—UMMZ 80336, an adult female collected 8 kilometers south of Tecoman, Colima, Mexico, on July 13, 1935, by James A. Oliver.

PARATYPES.—UMMZ 80335, data same as for holotype; UMMZ 80337, Paso del Río, Pergillo, Colima; UMMZ 104333, 9 kilometers south of Coahuayana, Michoacán; UMMZ 104334, Point of San Juan de Lima, Michoacán; UMMZ 104335, 2 miles east of La Placita, Michoacán.

DIAGNOSIS.—A form differing from *Geoemyda r. rubida* as follows: marginal scutes uniform light brown and without variegated markings; costal scutes darker than vertebrals and marginals; humeral scute longer relative to the gular; marginal scutes project more outward than downward.

DESCRIPTION.—Head with a well-developed snout; muzzle vertically truncate or slightly angular, with the tip of the snout projecting beyond tip of the upper jaw; dorsal head pattern variable (Fig. 1, UMMZ 80336 and 104334); a more or less well-developed, light, horseshoe-shaped marking with the curved part between the eyes and with the two posteriorly directed prongs consistently present; cutting edge of the upper and lower jaws smooth; upper jaw smooth, sometimes slightly hooked at the symphysis (UMMZ 104334 has the bone of the upper jaw notched at the symphysis; the horny covering is smooth); carapace suboval, wider posteriorly than anteriorly, maximum width occurring

at marginal eight in five specimens and at marginal seven in one; costal scutes darker than the vertebrals and marginals, each costal having a well-defined, light, central spot; marginal scutes above, uniform tan without variegated markings, in some individuals darkened at the edges where concentric growth annuli are grouped and fused; marginals project outward, giving the carapace a somewhat flattened appearance; plastron light yellow, with or without a broad, dark brown, central blotch (UMMZ 104335 has several dark-edged spots in an indistinct light brown area in the center of the plastron); bridge dark brown; humeral suture at mid-line 57 to 92 per cent of the gular.

The results of the evaluation of two quantitative differences between *G. r. rubida* and *G. r. perixantha* are given in Table I. The first of these concerns the outward projection of the marginal scutes. An expression of this projection was obtained in the following way. The straight line width across the costals was taken between the points of their juncture with the seam common to the fifth and sixth marginal scutes; the total carapace width was taken between the points of juncture of marginals five and six. The first width measurement was then subtracted from the second, and the resulting horizontal line distance was used as an expression of marginal flare. The second expression was obtained by dividing the average mid-line length of the right and left humeral scutes by the average mid-line length of the right and left gular scutes. The four means given in Table I are followed by 95 per cent confidence limits for the means obtained by multiplying the Student *t* values for the sample sizes by the standard errors of the means.

The following color notes were taken from life in Michoacán in 1950 by James A. Peters for UMMZ 104333 and UMMZ 104334: carapace tannish brown except for the marginals, which are very much lighter brown, almost tan or fawn; costals, each with an orange red spot; head dark brown, with a yellow stripe over the snout and a posteriorly directed yellow horseshoe between the eyes; all stripes on head yellow with a slight orange suffusion; plastron yellow with a brownish black central area; scales of legs dull orange.

This description and those by Cope (1870:148-49) and Werler and Smith (1952:553) indicate differences in the head coloration of *G. r. rubida* and *G. r. perixantha*, since the stripes in the former subspecies are described as red.

VARIATION.—The head pattern in *Geoemyda rubida* is decidedly variable. The three specimens of *G. r. perixantha* from Colima have similar dorsal head patterns (Fig. 1, UMMZ 80336), whereas the three

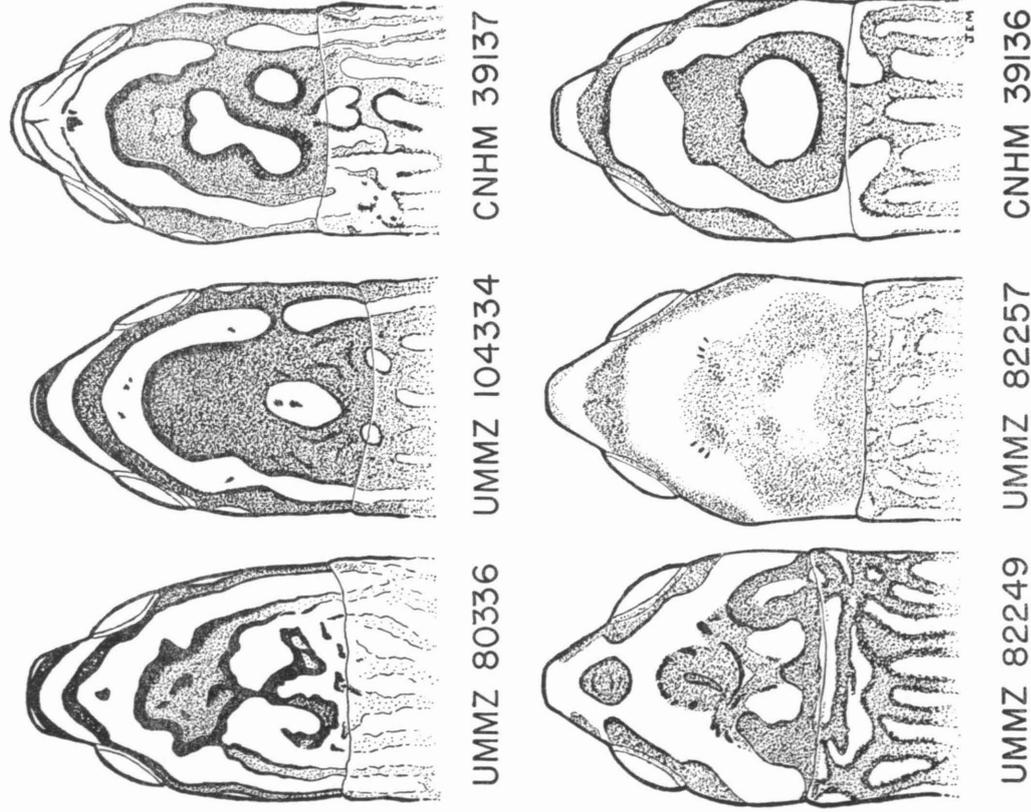


Fig. 1. Variation in the head pattern of *Geoemyda rubida*. *G. r. rubida*: UMMZ 82249, 82257. *G. r. perixantha*: UMMZ 80336, 104334; CNHM 39136, 39137.

from coastal Michoacán differ from the Colima individuals but are similar to one another (Fig. 1, UMMZ 104334). Of two specimens from Apatzingán, Michoacán, CNHM 39137 has a pattern most similar to those of specimens from coastal Michoacán (Fig. 1), but the other, CNHM 39136, approaches a pattern found in specimens of *G. r. rubida* from Tehuantepec, Oaxaca (Fig. 1, UMMZ 82257). Despite the wide

variation in the specimens of *G. rubida* examined, the more or less well-developed, broad, light, horseshoe-shaped dorsal head marking is a consistent character which distinguishes this species from *G. areolata* and *G. pulcherrima*.

The two specimens, CNHM 39136 and 39137, from the proximity of Apatzingán, Michoacán, reported by Schmidt and Shannon (1947: 69), exhibit characters divergent from those of *G. r. perixantha*. Both are darker than any of the other specimens of *Geoemyda rubida* examined. In one the most anterior and posterior vertebral scutes are

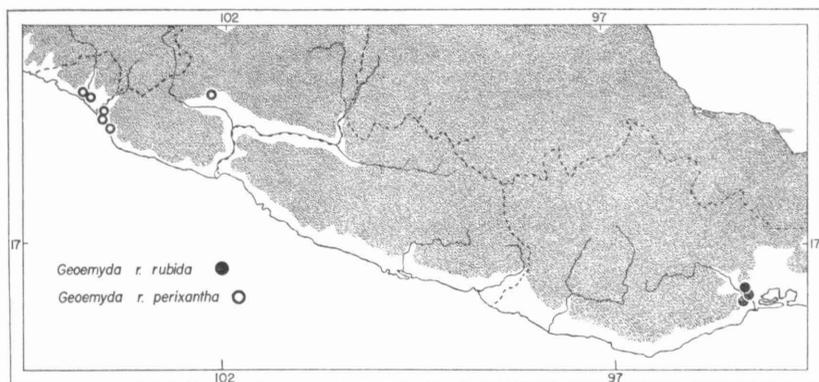
TABLE I
Quantitative Differences Between *Geoemyda r. rubida*
and *Geoemyda r. perixantha*

	$\bar{X} \pm tS_{\bar{X}}$	Range	N
Marginal flare (mm.)			
<u><i>Geoemyda r. rubida</i></u>	13.29 \pm 0.83	8 - 21	35
<u><i>Geoemyda r. perixantha</i></u>	18.66 \pm 2.70	15 - 22	6
Humeral/gular ratio			
<u><i>Geoemyda r. rubida</i></u>	0.49 \pm 0.05	0.25 - 0.85	35
<u><i>Geoemyda r. perixantha</i></u>	0.70 \pm 0.13	0.57 - 0.92	6

as dark as the costal scutes, and the dark coloration of the latter also extends partly onto the marginal scutes. The other is similar except that the first vertebral scute is somewhat lighter. In neither is there variegated patterning on the marginal scutes. The head patterns of the two have been discussed above, and both are illustrated in Figure 1. The marginal flare expression for both is 14 mm., and in this respect they resemble *G. r. rubida*. CNHM 39137 and 39136 have a humeral-over-gular ratio of 0.73 and 0.44, respectively. These specimens may represent localized variation in *G. r. perixantha* in the basin of the Río Balsas (Map 1).

REMARKS.—*Rhinoclemmys mexicana* (Gray, 1870:658-59) is here referred to *G. r. rubida* on the basis of the colored plate of two specimens published by Gray a year after his original description (1871, Pl. 28). Although Gray stated that the shells look very much unlike the typical

specimens of *R. mexicana*, it does not seem possible that the description of this form can apply to *G. r. perixantha*, since the specimen first described was said to be of a nearly uniform dark color above and below (Gray, 1871:296), and since the type locality of San Juan del Río is probably the town of that name in the state of Oaxaca. Siebenrock (1906:101-2) discussed a specimen of *Geoemyda rubida* from Colima and five specimens from the towns of San Mateo del Mar and Huilótepec, both in the state of Oaxaca near Tehuantepec. The turtle from Colima is presumably from the town of Cualata (Siebenrock, 1909:500). He compared these specimens with Gray's figure of *Rhinoclemmys mexicana* and stated that four agree in color but that the specimen from Colima and a young one from San Mateo del Mar differ some-



MAP 1. Locality records of *Geoemyda rubida* in southwestern Mexico. The known range of the species except for a specimen from Nicaragua reported by Cope (1887:21). The unshaded area is approximately that below the 1000-foot contour line.

what. He mentioned none of the diagnostic characters of the carapace for *G. r. perixantha* in his Colima individual; however, he stated that the gular shield is surprisingly short, being only half as long as the humeral. This is extremely, perhaps abnormally, short, even for *G. r. perixantha*.

In regard to the date of publication of Cope's description of *Chelopus rubidus*, which was read before the American Philosophical Society on July 16, 1869, Gertrude D. Hess, assistant librarian of the Society, informed us that there is a bill dated January 17, 1870, for the printing of the Society's *Proceedings*, No. 82. Although not an actual date of publication, this is convincing evidence that Cope's name was

prior to that of Gray, whose paper describing *Rhinoclemmys mexicana* was not read before the Zoological Society of London until June 23, 1870.

The name *perixantha* refers to the tan coloration of the marginals.

HABITS.—*Geoemyda rubida* is a lowland terrestrial form. Hartweg and Oliver (1940:13) reported this turtle as common on rocky hillsides and mountains near Tehuantepec. These are low remnants of erosion, standing above an alluvial plain. The two specimens recorded by Schmidt and Shannon (1947:69) from the vicinity of Apatzingán, Michoacán, were collected near a well-shaded small stream in tangled lowland scrub forest. In Colima Oliver (1937:8) found the turtles in wooded areas near the coast. In coastal Michoacán Peters collected one specimen along a path in thorn scrub and another from the humus of a stream bank.

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SPECIMENS EXAMINED.—*Geoemyda r. perixantha*, 9: the holotype, paratypes, CNHM 39136–37 from the vicinity of La Majada, near Apatzingán, Michoacán, and USNM 55702* from Colima; *Geoemyda r. rubida*, 46: UMMZ 82239–68, USNM 109216, 109096–99, 72341*, 50986*, 46306–07*, 46283–84*, and 45612–15*, all from the vicinity of Tehuantepec, Oaxaca. Abbreviations are as follows: CNHM, Chicago Natural History Museum, UMMZ, University of Michigan Museum of Zoology; USNM, United States National Museum.

* These specimens were obtained too late for inclusion of data from them in the main body of the paper. USNM 55702 from Colima agrees in all diagnostic characters with *G. r. perixantha*. It has a marginal flare of 18 mm. and a humeral-over-gular ratio of 0.78.

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PLATE I

Subspecies of *Geoemyda rubida*. Left, *G. r. perixantha*, UMMZ 80336; right, *G. r. rubida*, UMMZ 82257.

PLATE I

