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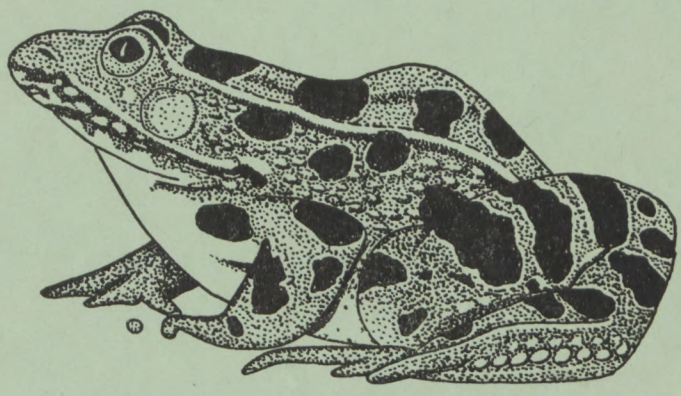
GUIDE TO THE AMPHIBIA OF COLORADO

Hugo G. Rodeck



The Leopard Frog
(Natural Size)

UNIVERSITY OF COLORADO
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No. 1. *Guide to the Snakes of Colorado*
W. Harry Jones-Burdick, 1939

No. 2. *Guide to the Amphibia of Colorado*
Hugo G. Rodeck, 1943

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Hugo G. Rodeck, Director
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GUIDE TO THE AMPHIBIA OF COLORADO

HUGO G. RODECK

While the relative dryness of Colorado's climate makes its fauna of frogs, toads, and salamanders a rather small one, the forms found in the state are of very considerable economic value because of the fact that their food is largely insects, and over the entire state the number of crop pests consumed by amphibians annually is very great. It has been estimated that in one season a single toad may destroy insects which otherwise could damage garden crops to the value of $19.88. In addition many of the details of their life-histories and distribution are unknown, and their study would justify and repay more attention than they customarily receive.

The following guide to the identification of Colorado amphibians is tentative, including only those which are known to occur in the state. It is hoped that it may stimulate interest in these animals and possibly lead to the discovery of additional species within the borders of Colorado.

The writer is much indebted to Dr. Karl P. Schmidt and Clifford H. Pope of the Field Museum of Natural History for a critical review of this paper in manuscript, and to Drs. Gordon Alexander and Robert Pennak of the University of Colorado for valuable suggestions.

Amphibians are cold-blooded animals with a backbone. They are readily distinguished from reptiles and fishes by having no scales. The skin is soft, either smooth or warty. Their eggs are deposited in water and hatch into tadpoles which are legless and which breathe by means of gills. As they mature the gills gradually disappear and legs appear. Finally, in most cases, the adults emerge from the water and breathe air by means of lungs. They return to the water to lay their eggs, hence the name Amphibia, from the Greek *amphi,* meaning double, and *bios,* meaning life.

The tadpoles of most of our amphibians are not well known and a great deal could be added to our knowledge by anyone who would study and record the characters of tadpoles and then rear them through to the adult stage for identification.

Class Amphibia

Tail present throughout life; body elongate; fore and hind legs about the same length (the tailed amphibians, Order *Caudata*) ---------- **Salamanders**

Tail absent in adults; body short, rather broad; hind legs longer than fore legs (the tailless amphibians, Order *Salientia* ---------- **Frogs and Toads**

Colorado Salamanders

Only one species of salamander is known from Colorado, the **Tiger Salamander,** *Ambystoma tigrinum* (Green). Young specimens (larvae) live in water, and are dark brownish or grayish, with a large tuft of branching gills on either side of the throat. The adults found in eastern Colorado are 7 to 8 inches long, very dark, nearly black, with large irregular spots and bars of yel-

Figure 1. Tiger Salamander, adult, about half natural size.

low, sometimes running together (*Ambystoma tigrinum mavortium* Baird, Fig. 1). In the western part of the state most specimens are without markings (*Ambystoma tigrinum nebulosum* Hallowell).

Abundant nearly everywhere in Colorado ponds and lakes up to altitudes of 10,500 feet or higher. This salamander, often called "mud puppy," is sometimes greatly feared, but it is entirely harmless and makes an interesting vivarium pet. It feeds especially on earthworms.

Key for the Identification of Colorado Frogs and Toads

(Always start at beginning of key)

1. Parotoid glands (large swellings on sides behind the head) present, usually conspicuous (Fig. 3). If this statement is true, your animal is a toad or spadefoot toad, and you should go on to key number ---------- 2

   or

   Parotoid glands not present (front cover and Fig. 5); skin smooth. If this statement is true, your animal is a frog or tree frog, and you should go directly to key number---------- 9

2. Pupil of eye vertical; upper jaw with teeth; well-developed 'spade' on heel (Fig. 2); spadefoot toads---------- 3

   Pupil of eye round or horizontal (Fig. 3); jaws without teeth; skin with large warts; 'spade' on heel variously developed; common toads ---------- 4

3. Muzzle rather high and square-cut in front; skin rather rough or with many tubercles or warts; color mottled whitish and black above, whitish beneath ----------Western Spadefoot, p. 4

   Muzzle rounded; skin smooth with few tubercles or warts; color grayish above, witish beneath----------Plains Spadefoot, p. 4

4. Top of head without bony crests (i. e., bone of top of head feels smooth) ---------- 5

Top of head with elevated bony crests or ridges (Fig. 4)---------- 7

5. Underparts spotted; parotoid swellings rounded; webbing between toes deeply indented; animal often large, head and body up to 5 inches long ----------Mountain Toad, p. 5

Underparts not spotted; webs between toes short; animal small, head and body not over 3 inches long---------- 6

6. Warts tipped with red or orange; parotoids rather small. Red-spotted Toad, p. 5

Warts not tipped with red or orange, or very slightly so; parotoids large, elongate, wider behind----------Sonoran Toad, p. 5

7. Median crests parallel, joining lateral crests at right angles; no diagonal crests, (Fig. 4b)----------Woodhouse's Toad, p. 5

Median crests converging in front, not parallel (Fig. 4a, c)------ 8

8. A short diagonal crest from the angle of the median and lateral crests (Fig. 4a) ----------American Toad, p. 6

No diagonal crests at angle of median and lateral crests (Fig. 4c). Western Toad, p. 6

9. Adhesive discs on tips of fingers and toes (Fig. 5); head and body not over 2 inches long (tree frogs)---------- 10

No discs on tips of fingers and toes; head and body 3 inches or more (frogs) ---------- 12

10. Fingers and toes with almost no webs (Fig. 5c); discs small; skin smooth ----------Three-lined Tree Frog, p. 6

Toes (at least) webbed; skin slightly wrinkled or warty---------- 11

11. Toes, but not fingers, webbed; adhesive discs of fingers and toes very small, but visible (Fig. 5a)----------Cricket Frog, p. 7

Fingers as well as toes with webs; adhesive discs of fingers and toes large (Fig. 5b)----------Sand-colored Tree Frog, p. 7

12. Head and body from 3 to 4 inches long; a raised fold of skin along sides of back; pattern of black spots (front cover). Leopard Frog, p. 7

Very large, head and body up to 8 inches; no lateral skin folds; back mottled but not distinctly spotted----------Bullfrog, p. 8

Descriptions of Colorado Frogs and Toads

*Western Spadefoot Toad

Scaphiopus hammondii Baird

Pupil of eye vertical; parotoid glands and ear drum (tympanum) not conspicuous; hind leg equal to or longer than length of head and body; length of head and body less than 2½ inches.

West coast of North America east to New Mexico and Texas. Found west of the Continental Divide in Colorado.

We lack definite records and need information on the occurrence of spadefoot toads in the state. A Great Basin species, **Scaphiopus intermontanus** (Cope), should occur in western Colorado in the valley of the Colorado River. It may be distinguished from the Western Spadefoot only by very careful comparison and dissection. See Tanner, **Great Basin Naturalist**, 1:3-25, 1939.

*Plains Spadefoot Toad

Scaphiopus bombifrons Cope

Similar to the Western Spadefoot above, but muzzle rounded rather than truncate, and the skin smoother, color more grayish (Fig. 2).

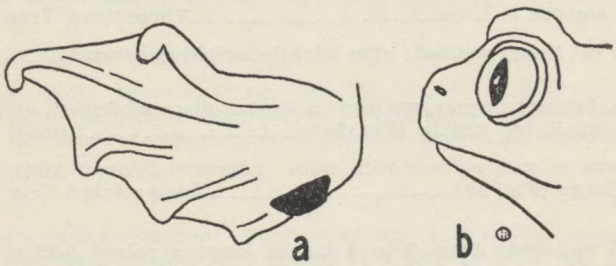

Figure 2. Plains Spadefoot.
a. hind foot showing spade (black).
b. head showing vertical pupil of eye.

A Great Plains form, found east of the Divide in Colorado. Known from Greeley, Denver, and east of Colorado Springs. A specimen is reported to have been found in the entrance of a prairie-dog burrow near Cortez, Montezuma County, in 1925.

* Species marked by asterisk (*) are rare or not well known in Colorado, and require special care in identification. See note on last page of this Guide.

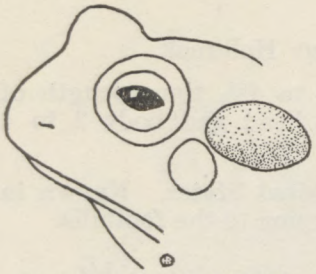

Figure 3. Head of Mountain Toad showing horizontal pupil of eye, parotoid gland (stippled), and ear drum or tympanum.

Mountain Toad

Bufo boreas Baird and Girard

Head short, widest just behind eyes; total length (head and body) about 4 times length of head; total length up to 5 inches (Fig. 3).

Found in mountains of Colorado, thence northwest to Oregon and Washington.

***Red-spotted Toad**

Bufo punctatus Baird and Girard

Much like the Sonoran Toad (below) but covered with small warts which are tipped with bright red or orange; length of head and body not over 3 inches; form rather slender; length of head and body about 3½ times length of head.

Found in southwestern United States and northern Mexico. Known in Colorado only from specimens found in 1914 about 7 miles from Naturita, Montrose County, along Basin Creek, and from near McElmo Creek, Montezuma County, in 1925.

***Sonoran Toad**

Bufo insidior Girard

Head short, length of head and body about 4½ times length of head; parotoids unusually large, triangular, wider behind; length of head and body seldom over 2 inches.

Found from Colorado south into Mexico. Known in Colorado only from near Trinidad, collected in 1883.

Woodhouse's Toad

Bufo woodhousii Girard

Head very short, length of head and body about 5 times length of head; parotoids long and oval; animal large, males to 4 inches (head and body), females to 6 inches long (Fig. 4b).

Found in the Rocky Mountain region. Known from all parts of Colorado at lower altitudes.

American Toad

Bufo americanus americanus Holbrook

Length of head and body about 4 to 4½ times length of head; parotoids large, oval; length of head and body 3 to 4 inches (Fig. 4a).

Found over most of the eastern United States. Known in Colorado only from the eastern plains region to the foothills.

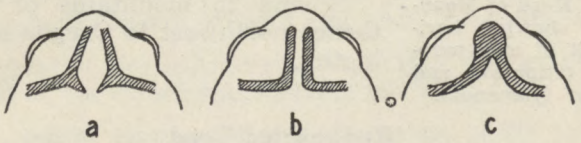

Figure 4. Cranial crests of toads. a. American; b. Woodhouse's; c. Western.

Western Toad

Bufo cognatus Say

Head very short, total length of head and body about 5 times length of head; parotoids large, oval; total length 3 to 6 inches (Fig. 4c).

Found from the Great Plains west to eastern California. Known in Colorado from the eastern plains and San Luis Valley.

Three-lined Tree Frog

Pseudacris nigrita triseriata (Wied)

A small frog, often very abundant about pools and commonly mistaken for the young of larger frogs. Technically a "tree frog" but usually found in grass or low vegetation.

Head and body 1½ inches or less; fourth toe extremely long; color and pattern very variable, usually grayish or greenish, and usually with three more or less complete dark stripes on the back, but the stripes frequently broken up into spots (Fig. 5c).

Widespread in the United States. In Colorado most abundant in the mountains, but known from Boulder, Greeley, Denver, as well as from many mountain localities.

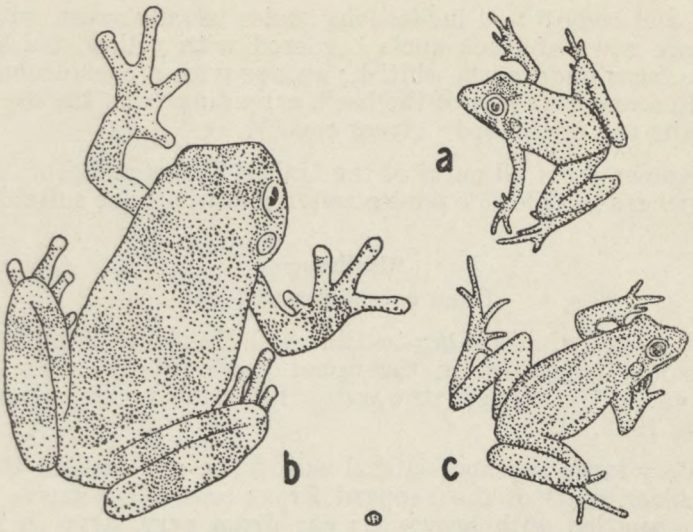

Figure 5. Colorado tree frogs, about natural size. a. Cricket Frog; b. Sand-colored; c. Three-lined.

*Cricket Frog

Acris crepitans Baird

This is another "tree frog" that lives on the ground, always near water. It is about the same size as the preceding species, and similarly variable in color. It is generally brownish with a triangular dark spot on top of the head between the eyes, with a dark line running backward from the eye on either side (Fig. 5a).

Found in the eastern and southern United States, west to Utah and New Mexico. Known in Colorado only from Wray, Yuma County, in 1912 and 1913, and from Briggsdale, Weld County, in 1922.

*Sand-colored Tree Frog

Hyla arenicolor Cope

Larger than the other Colorado tree frogs, but head and body not over 2 inches long; head more rounded in front; color variable and changeable, generally brownish-gray to greenish, with numerous small black spots; hind legs crossed by three slightly darker bars; often a light spot below each eye (Fig. 5b).

Found from Colorado and Utah southward and westward. Known in Colorado only from the Mesa de Maya in Las Animas County, collected in 1886.

Leopard Frog

Rana pipiens Schreber

The common spotted frog of nearly the whole United States.

Head and body 3 to 4 inches long; color usually green with two or more rows of black spots bordered with yellow, black bars across legs; underparts whitish; always with a conspicuous fold of skin along each side of the back, extending from the eye nearly to the end of the body (front cover).

Known from all parts of the United States and from nearly everywhere in Colorado where water conditions are suitable.

*Bullfrog

Rana catesbeiana Shaw

Introduced, according to Ellis and Henderson, into several ponds and reservoirs in the upper South Platte valley about 1914 and 1915. Seen by the writer in spring ponds east of Seibert in 1933.

Very large; without lateral skin folds, and lacking the distinct black spots of the Leopard Frog; color olive green, indistinctly mottled with brownish; ear drum very large in males, about size of eye in females.

Known at present in Colorado only from spring ponds east of Seibert, Kit Carson County.

For further information on frogs and toads see the *Handbook of Frogs and Toads*, by Anna A. and Albert H. Wright; Comstock Publishing Company, or *The Frog Book*, by M. C. Dickerson; Doubleday, Page and Company, at your local library. The amphibians and reptiles of Colorado were treated by Ellis and Henderson in *University of Colorado Studies*, X:39-129, 1913, and XI:253-263, 1915. This is available in most college and university libraries and in most city libraries in Colorado.

Identification Service

The University Museum is anxious to receive specimens for identification, especially when they do not seem to fit satisfactorily into the keys and descriptions in this Guide, or those species whose names are marked in the descriptions by an asterisk (*). The Museum will pay transportation charges on specimens sent to it, and identifications will be supplied to the sender.

Shipping Suggestions

Most amphibians die quickly if the skin is permitted to dry, and consequently they must be furnished with moisture during shipment. The best method is to place a limited number of specimens (of approximately the same size) in a wooden or metal container with damp (not wet) cloths, excelsior, or moss on the bottom. Wooden boxes permit enough air to enter without a special opening. Some provision must be made for air in metal containers, and holes should be punched *from the inside out*. Be sure to suppy information as to the locality where specimens were collected (including name of county).

The box should be marked "Rush" and sent by *Express Collect* to

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