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A NEW SPECIES OF *PSEUDACRIS* FROM THE  
SOUTHEASTERN UNITED STATES

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RECENT studies made by the writers, independently, and in widely separated localities, indicate that the hylid genus *Pseudacris* is represented by four distinct species in the coastal plain region between southern Virginia and northern Georgia. Three are comparatively well known and easily distinguished from one another: *Pseudacris ornata* (Holbrook), *Pseudacris ocularis* (Holbrook), and *Pseudacris nigrita nigrita* (Le Conte). The fourth species, which we believe to be quite distinct although less obvious, has doubtless been confused in the past with *P. n. nigrita* and with *P. n. feriarum*. The latter occurs to the west in the Piedmont region but seems to be replaced by *nigrita* in the coastal area.

In attempting to identify this fourth species due consideration has been given to certain other names of doubtful status that have figured in the herpetological literature of the region. *Chorophilus* (= *Pseudacris*) *occidentalis* (Baird and Girard) has been reported from Georgia by Cope (1889: 337), but his account seems to have been based on specimens of *ornata*, as has recently been suggested by Wright (1932: 205). Examples of *ornata* in material of our own collecting agree in detail with Cope's description of "*occidentalis*," and

according to Wright (*l.c.*: 206) at least one of Cope's specimens from Riceboro is referable to *ornata*. Boulenger (1882: 334) based his *Chorophilus copii* on a single specimen from Georgia. The minute digital disks, irregular black lateral spots, short leg, and other characters attributed to *copii*, are all descriptive of *Pseudacris ornata* and of no other southeastern species known to us.

The long neglected *Hyla ocularis* Daudin was based on a specimen, drawing, and account received by Daudin from Bosc who had observed the species in "*les grands bois de la Caroline*" (Daudin, 1803: 68). This name has never been satisfactorily placed by subsequent authors. The description leaves much to be desired and without an examination of the type it is perhaps unwise to attempt an allocation. In the present connection, however, it is sufficient to point out that the size of the toe disks and extent of webbing preclude any species of *Pseudacris* from consideration excepting the diminutive frog which has long been known as *Pseudacris ocularis* (Holbrook). Furthermore the color characters given in the description, and Bosc's statement (quoted by Daudin, *l.c.*) as to the size of the frog make it seem probable that *Hylodes ocularis* Holbrook and *Hyla ocularis* Daudin are the same.

None of these names seem applicable to the frog under consideration, and after comparison with good series of *Pseudacris n. triseriata* (Wied), *P. brachyphona* (Cope), and *P. n. feriarum* (Baird), we conclude that it is undescribed. It is indeed a pleasure to associate with this species the name of Clement S. Brimley, who has contributed so largely to the herpetology of the southeastern states.

#### *Pseudacris brimleyi*, new species

DIAGNOSIS.—A medium-sized *Pseudacris* with long legs and a triseriate dorsal pattern, closely related to the *nigrita-feriarum-triseriata-brachyphona* series, but differing in having a more delicate, smoother, skin; a sharply defined black lateral stripe combined with a rather weak dorsal pattern; a pronounced tendency towards longitudinal rather than trans-

verse leg markings; a narrow dark line along outer edge of tibia; well defined dark spots on chest in most individuals; and in life, a distinctly yellowish venter.

TYPE SPECIMEN.—A male, University of Michigan, Museum of Zoology, No. 74361, collected by George Ross and B. B. Brandt at a shallow pond near Washington, North Carolina, March 29, 1933.

DESCRIPTION OF TYPE.—A dark mid-dorsal stripe from tip of snout to vent. On each side of this a similar stripe extending from eyelid to posterior end of trunk. A darker, sharply defined line from snout through eye, and along side to groin. Dorsal surfaces of legs with several large dark spots, the long axes of which are longitudinal, and many smaller dark spots. A distinct dark line along outer edge of tibia and on under side of foot. A light line along upper jaw continuing back to shoulder. Edge of jaw dark. An irregular, more or less discontinuous, dark line along posterior side of arm. Undersurface light in color with dark spots on chest. Smaller but similar spots on undersurface of legs.

Texture of dorsal skin much smoother than that of *Pseudacris n. nigrita* but not as smooth as that of *Pseudacris ornata*. Underparts coarsely granulated. Heel of extended hind limb reaching anterior part of eye. Toes with vestiges of webs, most marked between third and fourth, and between fourth and fifth toes. Fingers not webbed. Adhesive disks of fingers and toes slightly dilated. Tympanum distinct, smaller than eye. Vocal sac dark. Muzzle rounded in profile and projecting. Fascicles of vomerine teeth closer together than internal nares, their anterior borders barely reaching forward to an imaginary line joining the posterior sides of the nares. Length (in mm.) 25, femur 11, tibia 12.5, whole foot 19.5, head width 8.5, head length 9.

VARIATIONS.—A female, University of Michigan, Museum of Zoology, No. 74362, taken by B. B. Brandt, February 25, 1933, Washington, North Carolina, is somewhat larger and lacks the gular sac. Throat light, with a few small flecks of dark, most numerous along edge of jaw. Dorsum with rows of black dots

between the stripes. Heel of extended hind limb reaches center of eye. Length (in mm.) 29.5, femur 13.5, tibia 15, whole foot 24.5, head width 10.2, head length 10.

There is much individual variation in the amount of ventral spotting. In thirty-one specimens examined none are entirely immaculate although four lack the large spots on the areolae of the chest which are a striking feature of most individuals. In one, these spots tend to coalesce. The dorsal stripes vary in width and regularity. In none of the specimens of *brimleyi*, however, are the stripes broken up into numerous small spots such as occur frequently in *nigrita*. In seven the black pigment is concentrated at the edges of the stripes forming a distinct black border. Black dots between the stripes occur in nine of the series. The dark tibial line is present in all. In none do the tibial spots approach the form of transverse bars. None show an interorbital triangle or bar such as is frequently seen in related species.

Living specimens show considerable variation in the ground color of the upper parts, but are apparently restricted to yellowish and reddish shades of brown, ranging from a pale buffy brown to a very dark shade near Light Seal Brown.<sup>1</sup> The dorsal stripes and the peculiarly shaped leg spots are usually obscure in the lighter phases, the lateral stripes remain black and sharply defined. The color of the venter also varies but seems always to be yellower than that of *nigrita*. The iridescent surface makes an accurate description of this color difficult. In the paler individuals it approaches Cream-buff, and in more richly colored examples it is near Buff-yellow or Pale Orange-yellow. The light cheek stripe below the vitta is similarly colored. Frequently there is a deeper yellow spot in the groin. The undersurface of the legs is grayish. The scattered dusky pigment of the gular sac is underlain with greenish yellow. There is an obscure dark bar through the eye. The iris shows gold and reddish flecks, the latter restricted to the lower half.

<sup>1</sup> Capitalized names of colors refer to Ridgway, R., *Color Standards and Color Nomenclature*, Washington: 1912, pp. i-iii, 1-43.

Individual variations in proportions and size are not marked. The length of the leg is about the same as in *nigrita* and *feriarum*. The head is narrow like that of *nigrita*, but the snout is not as acutely pointed. In a series of adult males the body length ranges from 24 mm. to 28.5 mm. The females are larger, the extremes being 27 mm. and 32.5 mm.

RANGE.—Dismal Swamp, Virginia (University of Michigan, Museum of Zoology, No. 53300), south in the Coastal Plain to Bryan County, Georgia (University of Michigan, Museum of Zoology, No. 74363). In North Carolina Brandt has taken *brimleyi* in Beaufort, Greene, Pitt, and Wilson counties, and has voice records from Craven and Edgecomb counties. The Museum of Comparative Zoology has a specimen (No. 781) from Newbern, North Carolina.

In voice, *Pseudacris brimleyi* is not to be confused with any of its congeners in the southeast, although Walker, who heard the species in northern Georgia, considered its call very similar to that of *P. brachyphona* of the north. In North Carolina, Brandt interpreted the call as a short, rasping trill, "kr-r-r-a-k," somewhat less than a second in length. Usually a series of these notes, separated by short intervals, is given, the series followed by a pause. The note is suggestive of that of *Hyla squirella* but is more strongly accented at the end, and the intervals between the individual notes are shorter.

At Washington, North Carolina, *brimleyi* was in voice earlier than any other frog of the genus. Mated pairs were taken as early as February 19, and as late as April 17. Although a wary species, it was less frequently found in thick cover than *P. n. nigrita*. The Georgia specimens were secured from pools in the heavily wooded flood plain of the Ogeechee River, west of Savannah. They were not singing persistently, probably on account of the cool weather, and were difficult to locate. *Pseudacris n. nigrita* was also present in this locality but in different situations, occupying roadside ditches and grassy pools in the open uplands.

While it is admittedly hazardous at present to speculate as to relationships within the genus *Pseudacris*, it seems clear that *brimleyi* is closer to *nigrita* than to *ornata* or *ocularis*, the other species of the same region. The prominent lateral stripe and weak dorsal pattern shown by light colored individuals of *brimleyi*, however, are characters shared with some examples of *ocularis*. The phylogenetic value of these characters is entirely problematical, but they tend to connect the more typical species of the genus with *ocularis*, which approximates some species of *Hyla* in its foot structure. The leg markings of *brimleyi* and *ocularis* remain quite different. An approach to the longitudinal spots of *brimleyi* is seen occasionally in *brachyphona*, and the voice also resembles that of *brachyphona*, which is a very different frog in head shape, pattern, and skin texture.

The recognition of four distinct species of *Pseudacris* in one region indicates that any subdivision of the genus into groups or series of vicariating forms should include at least four such divisions. Additional evidence favoring such an arrangement is seen in the instance of *P. n. triseriata* and *P. brachyphona*, which occur together west of the Alleghenies without known intergradation (Walker, 1932: 379).

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LITERATURE CITED

BOULENGER, G. A.

1882 Catalogue of the Batrachia Salientia, s. Ecaudata, in the Collection of the British Museum. London, Printed by Order of the Trustees, xvi + 503, 30 pls.

COPE, E. D.

1889 The Batrachia of North America. Bull. U. S. Nat. Mus. 34: 1-525, Washington, D. C.

DAUDIN, F. M.

1803 Histoire Naturelle Générale et Particulière des Reptiles. Paris, Impr. de F. Dufant, 8: 68-69.

WALKER, C. F.

1932 *Pseudacris brachyphona* (Cope), A Valid Species. Ohio Journ. Sci. 32: 379-384.

WRIGHT, A. H.

1932 Life-Histories of the Frogs of the Okefinokee Swamp, Georgia. New York, The Macmillan Co., xv + 497.

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*Pseudacris brimleyi*, new species. University of Michigan, Museum of  
Zoology No. 73910. Washington, N. C. Adult female, dark  
phase, length 29.2 mm. Drawn by Grace Eager.



*PSEUDACRIS BRIMLEYI*



