

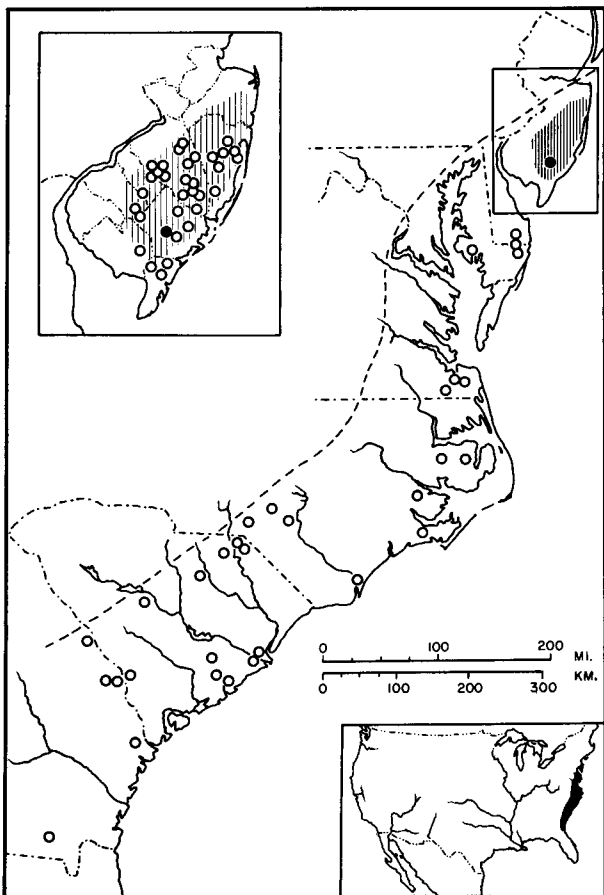
## Catalogue of American Amphibians and Reptiles.

GOSNER, KENNETH L., AND IRVING H. BLACK. 1968. *Rana virgatipes*.

*Rana virgatipes* Cope  
Carpenter frog

*Rana virgatipes* Cope, 1891: 1017. Type-locality, "cut-off of a tributary of the Great Egg Harbor, River in Atlantic county, New Jersey." Revised to "Mare Run, tributary of Great Egg Harbor River above May's Landing, Atlantic County" by Fowler (1907: 122). Cope did not designate a type specimen among five adults and two half-grown individuals mentioned in the original description. Fowler (1905) cites Acad. Nat. Sci. Philadelphia 10,762 as a cotype of *Rana virgatipes* Cope; at present ANSP 10759-64 are labeled as types and presumably are to be considered syntypes (examined by authors). The series was collected by E. D. Cope in October 1891.

- CONTENT. The species is monotypic.
- DEFINITION. Adults are about 50 mm in snout to vent length. The dorsum is brownish with four distinct, light golden-brown stripes, two of these dorsolateral and two lateral. The ventral surfaces are white or pale yellowish, variably mottled with light to dark brown markings that are heaviest on the hind legs.
- DESCRIPTIONS. The dorsal surface of the body and hind limbs is minutely tubercular. Dorsolateral folds are lacking. The webbing on the hind feet leaves two phalanges of the fourth toe free. The tympanum is slightly larger than the eye.



MAP. The solid symbol marks the type-locality; circles indicate other localities. The broken line marks the division between coastal plain and piedmont. The shaded area indicates the extent of the pine barrens in New Jersey.

The dorsal ground color is marked with darker brown markings ranging from small, scattered spots to larger, irregularly coalesced blotches. The ventral markings vary widely in extent and intensity; the striped pattern is constant.

Sexual dimorphism is scant. Males have paired external vocal sacs at the angle of the jaws and slightly larger tympana than females. Full descriptions of the adult are given by Cope (1891), Boulenger (1920), Fowler (1907), and Wright (1932).

The eggs are laid in subspherical or elongate globular masses that range in size from about 25 by 50 mm to 65 by 100 mm and are attached to vegetation at the surface or submerged to a depth of a foot or less. Ovarian egg complements range from 420 to 1240, and individual masses are said to contain from two hundred to six hundred eggs. The vitellus is 1.4 to 1.8 mm in diameter with the animal pole dark chocolate brown or black and the yolk dingy white or cream colored; the single gelatinous envelope measures 3.8 to 6.9 mm. The larvae range in total length from about 9.5 mm at stage 25 to about 95 mm at stage 40 (see Gosner 1960, for staging). The body of the tadpole is brown and the tail musculature is lighter except distally; both are irregularly and indistinctly spotted or mottled with lighter tones and dotted with black. There are two lateral dark stripes or rows of spots on the tail musculature and fins. The lower stripe extends along the midlateral line of the tail musculature a short distance and then curves upward to meet the dorsal margin of the musculature beyond its midpoint. The upper stripe begins at about the point of origin of the dorsal fin and, paralleling the curve of the lower stripe, turns upward into the fin to extend for two thirds or more of the tail length. The margins of the tail fins and especially the dorsal fin are marked with dark blotches. Pattern rudiments may be present in larvae at stage 25 when they are at least 15 mm in total length. The accompanying drawing of the mature larva has been drawn somewhat lighter than normal to emphasize some of the more subtle differences in pigmentation. Livezey and Wright (1947) described the eggs and egg masses and Wright (1929, 1932) described the "mature" larva.

The call consists of a loud, staccato double note which Davis (1907) rendered as "chuck-up"; this double note is repeated 3 to 5 times in rapid succession. The resultant sound, suggestive of hammering, gave rise in New Jersey to the vernacular name of "carpenter." The frequency range is about 180 to 400 cycles per second (Potter 1962). For phonograph records of the call, refer to "Voices of the Night" (Comstock Publishing Company) or to Bogert (1958).

• ILLUSTRATIONS. The eggs were figured by Livezey and Wright (1947), and Wright (1932) published photographs of the egg mass. Wright's photograph of the tadpole (Wright 1929; Wright and Wright 1949), adequately shows the fin markings, and the photographs of the oral discs are excellent. For color illustrations of the adult see Dickerson (1907) and Conant (1958a).

• DISTRIBUTION. This species is found in the Atlantic coastal plain from central New Jersey to extreme southeastern Georgia. Its distribution is spotty, although in areas where it

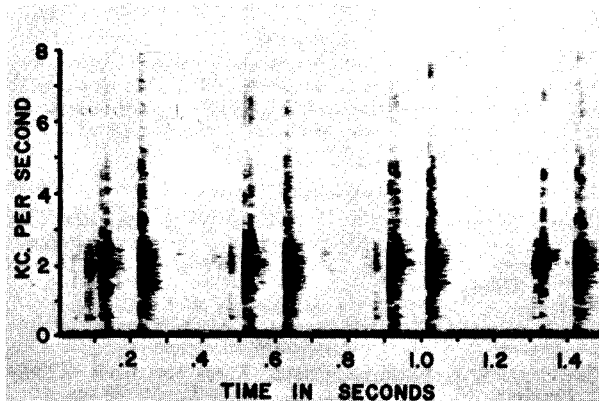


FIG. 1. Audiospectrogram (narrow band, 45 cycles per second) of one call-group of *Rana virgatipes*: Burlington County, New Jersey, 13 May 1955 (Amer. Mus. Nat. Hist. Dept. Herpetology tape library).

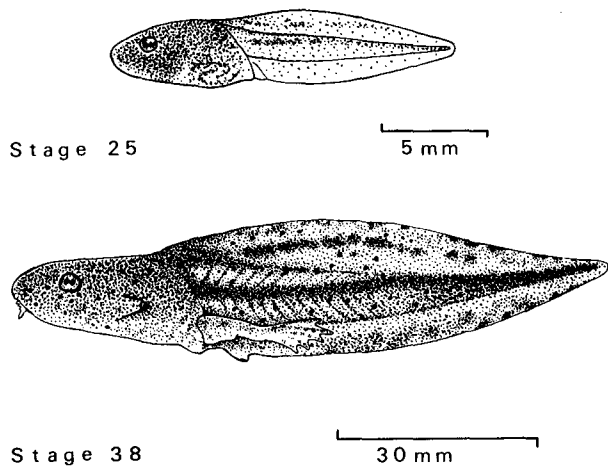


FIG. 2 Larvae of *Rana virgatipes* at two stages of development.

does occur it may be common. In New Jersey *virgatipes* is confined to the pine barrens (Conant, 1962). There and elsewhere adults inhabit sphagnum bog pools, small ponds and the borders of quiet streams, usually where there is floating or emergent vegetation. The adults are persistently aquatic and are found at the water's edge or more frequently are seen resting on partly submerged logs or among vegetation.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Wright (1932) reviewed the literature on distribution, habitat, voice, breeding behavior, development, and "general habits" to the date indicated. Most of the literature citations since that date are to local distribution summaries or new locality records; these include Chamberlain (1939), Conant (1940, 1945, 1947, 1958a, 1958b, and 1962), Freeman (1956), Funderburg (1955), Harper (1935), Meanley (1951), Neill (1952), Palmer and Whitehead (1961), Reed (1957a, 1957b), and Werler and McCallion (1951). Potter (1962) made brief reference to the frequency range of the call. Wright (1932) examined the relationship of *virgatipes* and *Rana grylio* in some detail and more recent references to systematic relationships were made by Tihen (1954), Orton (1952), Neill (1952), and Gosner (1959). Gosner and Black (1957) investigated adaptive responses in early developmental stages relating to the utilization of the highly acid waters of *virgatipes*'s natural environment in New Jersey. Kauffeld (1957) and Wright (1932) mention predation on this species by the water snake, *Natrix sipedon*, and Neill (personal communication) noted "extensive predation by *Natrix fasciata* in Screven and Effingham counties, Georgia."

• ETYMOLOGY. The name alludes to the striped markings on the hind limbs—from the Latin *virga* or *virgatus* an alternate meaning for which is "striped" and *pes*, foot.

COMMENT

*Rana virgatipes* and *Hyla andersoni* present similar problems to the extent that in New Jersey both are restricted to the pine barrens; their disjunct distributions also suggest a special significance in the historical zoogeography of the Atlantic coastal plain.

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