

## Catalogue of American Amphibians and Reptiles.

STEWART, MARGARET M. 1983. *Rana clamitans*.

*Rana clamitans* Latreille  
Green frog

*Rana clamitans* Latreille, in Sonnini and Latreille, 1801:157. Type-locality, "près de Charlestown [South Carolina]." Holotype, Museum National d'Histoire Naturelle, Paris, 1397, male, collected by Bosc (examined by author).

*Rana clamata* Daudin, 1802:54. Assumed to be based on the same material used by Latreille (1801).

*Rana clamator*: LeConte, 1855:424. Emendation of *clamata*.

• CONTENT. Two subspecies are recognized: *Rana c. clamitans* and *R. c. melanota*.

• DEFINITION AND DIAGNOSIS. Size medium to large: males to 86 mm, females to 87 mm in Georgia; to 103 and 105 mm in the north (Martof, 1955, 1956a). Dorsolateral folds distinct, extending at least to sacro-iliac hump. Toes extensively webbed but short of tip in digits III, IV, V. Dorsal color and pattern extremely variable. Color brown, bronze, olive to green, bicolor, or bluish. Dark pigment on dorsum absent or arranged in small to large spots, blotches, or vermiculations. Outer surface of limbs barred or tending toward bars. Venter white or with gray mottling on throat, jaw margin and hind limbs. No light line on upper jaw. Side of face bronze or green. Males have tympanum larger than eye, enlarged forearm and thumb, lateral vocal sacs not visible externally. In the north males have slightly rough skin and a yellow throat. No detectable odor.

The most similar species are *R. catesbeiana*, in which dorsolateral folds are absent and toes are completely webbed, and *R. septentrionalis*, which has indistinct dorsolateral folds, extending only to the shoulder, blotches instead of bars on hind legs, webbing extending to tips of toes, and often a distinctive odor. Labial teeth of tadpoles 2/3 or 1/3 in *clamitans* with the second upper row short or absent; total length 60–100 mm. Labial teeth of *catesbeiana* tadpoles 2/3 or 3/3 with second upper row well developed; total length 75–160 mm. Tail of *clamitans* tadpole blotched with ill-defined but entire spots. Marginal spots on tail of *septentrionalis* tadpole cut by edge of fin.

• DESCRIPTIONS. The most complete descriptions are in Wright (1932), Mecham (1954), Cope (1889), Smith (1961), Stebbins (1951), and Vogt (1981). Eggs: Livezey and Wright (1947). Tadpoles: Wright (1932), Orton (1951, 1952). Sound recordings: Bogert (1958), Anon. (1982).

• ILLUSTRATIONS. Illustrations are available in Smith (1961, black and white), Preston (1982, color) and in several field guides. All life stages including metamorphs, feet, sexes: Dickerson (1906). Hatchlings: Cope (1889). Life stages: Livezey and Wright (1947), Smith (1961), Stebbins (1951), Vogt (1981), Wright (1914, 1929, 1932), Wright and Wright (1949). Yellow morph: Guttman (1972). Chromosomes: Benirschke and Hsu (1971).

• DISTRIBUTION. *Rana clamitans* ranges from the northern shore of the Gulf of St. Lawrence to central Florida, and from the Atlantic Coast to eastern Texas and southeastern Manitoba, but is absent from the central Illinois Prairie (Smith, 1961). It occurs from coastal lowlands to at least 1950 m (Rhoads, 1895). Introduced populations are established in Newfoundland (Bleakney, 1958; Cameron and Tomlinson, 1962), Utah (Behle and Erwin, 1962), Washington (Slater, 1939), and British Columbia (Carl, 1949).

Distributional records are numerous (Stewart and Biuso, 1982). A few of the more recent or comprehensive accounts follow: Southeastern U.S.: Barbour (1956), Harper (1935), Harris (1975), Mount (1975), Raun and Gehlbach (1972). Midwest: Fleming (1976), Minton (1972), Smith (1961), Vogt (1981), Walker (1946). Northeast: McCoy (1982), Wright and Wright (1949). Canada: Cook (1967), Logier and Toner (1961), Bleakney (1958), Schueler (1975), Preston (1982). Range maps: Conant (1975), Mecham (1954).

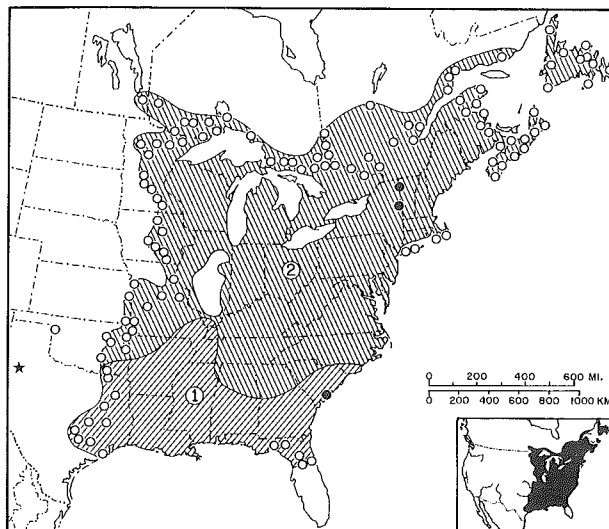
• FOSSIL RECORD. A scapula identified as *R. clamitans* was taken from middle Pleistocene material in the Texas panhandle west of the present range of the species (Womochel, 1977).

• PERTINENT LITERATURE. See Stewart and Biuso (1982) for compilation; only the most germane or recent references are cited here. Nomenclatorial history: Harper (1940). Redescription of type: Stewart (1984). Geographic variation: Mecham (1954), Jenssen (1968). Home range: Martof (1953b), Oldham (1967). Predator-prey: Hamilton (1948), Jenssen (1967), Jenssen and Klimstra (1966), Stewart and Sandison (1972), Formanowicz and Brodie (1977, 1982), Whitaker (1961). Population ecology: Berven et al. (1979), Martof (1956a), Steinwascher (1980). Behavior: Jenssen (1968), Wells (1976b, 1977, 1978). Locomotion: Zug (1972). Hibernation: Bohnsack (1951), Brenner (1969). Migration and orientation: Adler (1980), Oldham (1967), Ralph (1978), Schroeder (1976). Photic reactions: Bridges (1974), Jaeger and Hailman (1976). Audition: Kleerekoper and Sibabin (1959). Vocalization: Bogert (1960), Dickerson (1906), Ramer et al. (1983), Wells (1978). Territoriality: Martof (1953a), Wells (1976b, 1977, 1978). Breeding dates: Wells (1976b), Wright (1932), Jenssen (1968). Fertilization and hybridization: Elinson (1974, 1981), Elinson and Briedis (1981), Moore (1955), Shaver et al. (1970). Eggs and oviposition: Aronson (1943), Wells (1976a). Development and metamorphosis: Etkin (1932), Malinin (1960), Martof (1952, 1956b), Mintz et al. (1945), Moore (1939), Wright (1914, 1932). Larval biology: Gosner and Black (1957), Hassinger (1972), Heyer (1976, 1979), Steinwascher (1979), Steinwascher and Travis (1983), Wilbur and Collins (1973). Growth: Ranev and Ingram (1941), Ryan (1953). Genetics and phylogeny: Frankel and Underhill (1974), Moore (1949), Schmiel and Guttman (1974). Pigments: Pierce (1942), Berns and Narayan (1970). Organ and body weight: Jenssen (1972), Pierce (1942). Digestion: Frye (1964). Thyroid: Steinmetz (1954). Lipids: Mele (1980). Muscle physiology: Stehouwer and Farel (1980). Regeneration: Hsu (1974), Simpson and Skirnyk (1974), Singer (1954). Nerve growth and regeneration: Speidel (1964). Respiration: Vinegar and Hutchinson (1965), Weigmann and Altig (1977). Temperature acclimation: Brattstrom and Lawrence (1962), Willhite and Cupp (1982). Water relations: Boerke (1973), Claussen (1974), Schmid (1965, 1968), Thorson (1956). Tolerance to acid environments: Gosner and Black (1957), Saber and Dunson (1978). Parasites and disease: U.S.D.A. (continuing series), Bollinger et al. (1968). Importance to humans: Surface (1913), Wright (1920).

• ETYMOLOGY. The specific name (Latin, *clamito*, "to cry loudly," or *clamator*, "bawler, shouter") refers to the loud "squeenk" made by individuals as they leap away from disturbance; *melanota* (Greek, *melanos*) refers to the dark-backed morph, the "Black Frog."

## COMMENT

The two subspecies recognized by numerous authors are poorly differentiated (Ferguson, 1961; Jenssen, 1968; Mount, 1975) and



MAP. Solid circles mark type-localities; open circles indicate other localities on periphery of range. The star marks a Pleistocene fossil locality.

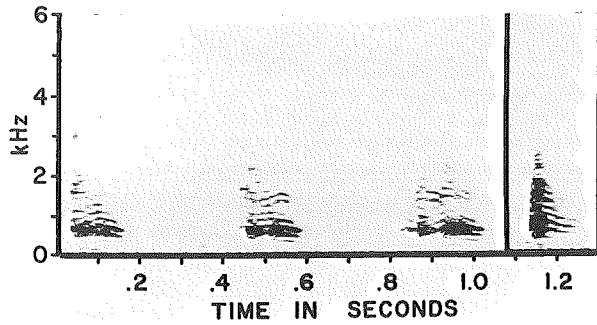


FIGURE. Audiospectrogram of call of *Rana clamitans*: Northvale, Bergen Co., New Jersey, August 1971, air 27.6°C; Amer. Mus. Natur. Hist. Herpetol. Dept. tape reel 160, 46 Hz filter; part of multiple note call on left, single note call on right.

not easily distinguished. Schmidt (1953) did not recognize them. Mecham (1954) statistically confirmed populational differences which Rhoads (1895) and others had noted; the fall line separating the coastal plain from interior uplands approximated a line of demarcation in morphological characters. There appears to be a clinal increase in body size from south to north as in many other anurans (Schmidt, 1938), and from low to high altitudes (Berven et al. 1979). Both color pattern and size appear to converge with that of *R. septentrionalis* in regions of sympatry (Trapido, 1940; Moore, 1952; Schuele, 1975; Vogt, 1981; personal observation). No geographic variation in calls has been reported.

### 1. *Rana clamitans clamitans* Latreille Bronze frog

*Rana clamitans* Latreille, in Sonnini and Latreille, 1801:157. See species synonymy.

*Rana clamitans clamitans*: Mecham, 1954:3. First use of trinomial, although Mecham attributed it to Rhoads (1895).

• DEFINITION. Adults rarely exceed 75 mm, snout-vent length. Monochrome dorsum lacking spotting in adult; more brown than green; face more bronze than green; yellow on throat of males reduced or absent. Dorsal skin never rugose; elevations on sides sparse and pointed.

### 2. *Rana clamitans melanota* Rafinesque Green frog

*Ranaria (Rana L) melanota* Rafinesque, 1820:5. Type-locality, "Lake Champlain [New York and Vermont] and Lake George [New York]." No type specimen designated or known to exist.

*Rana fontinalis* LeConte, 1825:282. Type-locality not stated, designated as "vicinity of New York City" by Schmidt (1953:79). No type specimen designated or known to exist.

*Rana flaviviridis* Harlan, 1826:48. Type-locality, "Inhabit the middle states; abound in the vicinity of Philadelphia [Pennsylvania]." No type specimen designated or known to exist.

*Rana horiconensis* Holbrook, 1838:91. Type-locality, "outlet of Lake George [New York]." No type specimen designated or known to exist.

*Rana nigricans* Agassiz, 1850:379. Type-locality, "various localities along the northern shores of Lake Superior [Ontario]." Syntypes (3), Mus. Comp. Zool., Harvard University 7, collected by L. Agassiz (Barbour and Loveridge, 1929:330) (not examined by author).

*Rana clamitans melanota*: Rhoads, 1895:394. First use of trinomial.

• DEFINITION. Adults often exceed 85 mm, snout-vent length. Brown or green dorsum plain to heavily spotted or mottled; face green; throat of adult males yellow. Dorsum of males rugose; numerous large, flattened elevations on sides.

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