

Catalogue of American Amphibians and Reptiles.

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Taricha torosa.

***Taricha torosa* (Rathke)**
California newt

Triton torosus Rathke in Eschscholtz, 1833:12. Type-locality, "in der Umgebung der Bai St. Francisco auf Californien." Type(s) not known to exist.

Triton ermani Wiegmann in Erman, 1835:24. Type-locality, California. Type(s) not known to exist.

Salamandra [b]echeyi Gray, 1839:99. Type-locality, "Monte-rey," [California]. Type(s) not known to exist.

Notop[h]thalmus torosus: Baird, 1850:284. First use of combination.

Taricha torosa: Gray, 1850:25. First use of combination.

Taricha laevis Baird and Girard, 1853:302. Type-locality, "San Francisco," [San Francisco County, California]. Cotypes, United States National Museum 4014 (5) (*vide* Cochran, 1961a), collected in February, 1850 by John L. LeConte (not examined by authors).

Diem[i]ct[yl]us toros[us]: Cooper, 1868:486. First use of combination.

Triton laevis: Strauch, 1870:51. First use of combination.

Molge torosa: Boulenger, 1882:20. First use of combination.

Cynops torosus: Cope, 1883:23. First use of combination.

Amblystoma rubrum Reid, 1895:60. Type-locality, [vicinity of Pasadena, Los Angeles County, California is the inferred type-locality]. Type unknown.

Triturus torosus: Dunn, 1918:450. First use of combination.

• CONTENT. Two subspecies, *sierrae* and *torosa*, are currently recognized.

• DEFINITION. A species of *Taricha* with rough, granular skin in the terrestrial phase, smoother skin in the aquatic phase; dorsum brown, venter yellow; vent usually without a dark band; iris with at least some light (yellow-gold) pigment; eyes relatively large, protruding beyond profile of head when viewed from above; lower eyelids light-colored (included in light ventral coloration); vomerine teeth in two diverging, longitudinal series, usually forming a Y-pattern; breeds in ponds, lakes, and slow-moving streams; eggs usually attached in clumps of 7–39 to submerged vegetation; larvae normally with dark dorsolateral stripes.

• DESCRIPTIONS. Riemer (1958) provided the most complete description of the external features of metamorphosed *T. torosa*, including an analysis of geographic variation. Other descriptions are in Eschscholtz (1833), Erman (1835), Gray (1839), Baird (1850), Baird and Girard (1853), Girard (1858), Boulenger (1882), Cope (1889), Reid (1895), Ritter (1897), Storer (1925), Slevin (1928), Herre (1934), Wolterstorff (1935), Twitty (1942), Bishop (1943), Pickwell (1947), Stebbins (1951, 1954, 1966), Brattstrom and Warren (1953), Blair (1957), Pimentel (1958), Freytag (1959), Twitty (1966), and Smith (1978). Larvae were described by Storer (1925), Twitty (1935a, 1942, 1966), Pickwell (1947) and Stebbins (1951, 1954, 1966). Eggs were described by Storer (1925), Pickwell (1947) and Salthe (1963). Smith (1927) ostensibly described the detailed anatomy of "*Triturus torosus*," but since her descriptions were based on specimens obtained from Vancouver Island, British Columbia, she actually described the anatomy of *T. granulosa*. References that include descriptions and/or illustrations of particular anatomical features of *T. torosa* are Eschscholtz (1833), Wiedersheim (1877), Cope (1889), Bolka (1928), Herre (1939), Twitty (1942), Hilton (1947a–c, 1948a–d, 1950a–b, 1951a–b, 1952a–b, 1953, 1956, 1960, 1962), von Wahlert (1952, 1953), Larsen (1963), Weaver (1963), Wislang (1965), Regal (1966), Soule (1966), Özeti and Wake (1969) and Naylor (1978a, b).

• ILLUSTRATIONS. Water-color prints are in Girard (1858), Ritter (1897), Twitty (1942) and Stebbins (1966). For other illustrations of adults, including line drawings, black and white photographs and color photographs, see Gray (1839), Breder (1923), Storer (1925), Slevin (1928), Koch (1933), Bishop (1943), Evans (1946), Pickwell (1947), Stebbins (1951, 1954), Klingelhöffer (1956), Riemer (1958), Freytag (1959), Mertens (1960), Cochran (1961b), Mosher et al. (1964), Twitty (1966), Leviton (1970), Wake-

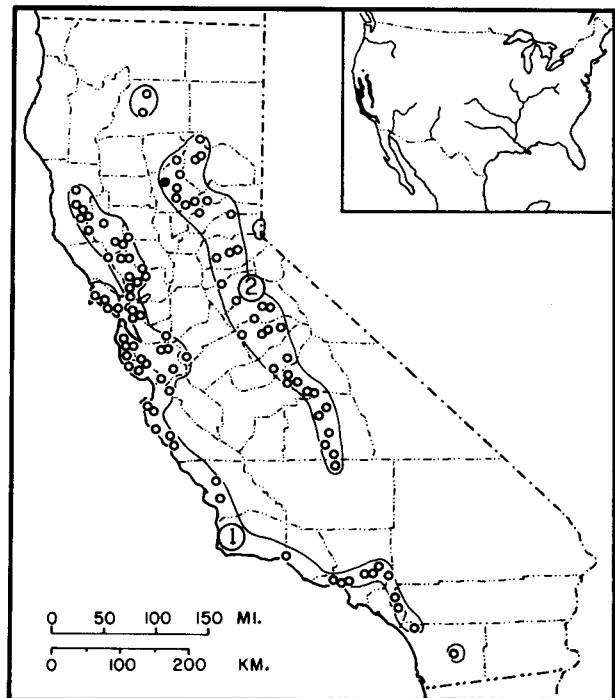
man and Ultsch (1976) and Smith (1978). Eggs and larvae are illustrated by Ritter (1897), Storer (1925), Twitty (1942, 1966), Pickwell (1947) and Stebbins (1966); larvae by Twitty (1935a) and Bishop (1943). Sonograms are shown in Davis and Brattstrom (1975). Defensive postures are illustrated by Riemer (1958) and Leviton (1970).

• DISTRIBUTION. Confined to the State of California and perhaps extreme northwestern Baja California, Mexico. In California the species occurs in the Coast Range from Mendocino County southward to San Diego County and along the western slopes of the Sierra Nevada from Shasta County southward to Kern County. The species has been reported from San Andreas and Keller in Baja California (Slevin, 1928; Smith and Taylor, 1948), but these records were ignored by Riemer (1958) and need verification. The most detailed account of the distribution of this species is in Riemer (1958). Other locality records and comments on distribution and zoogeography are given by Strauch (1870), Yarrow (1883), Fowler and Dunn (1917), Grinnell and Camp (1917), Dunn (1918), Grinnell and Storer (1924), Storer (1925), Slevin (1928, 1934), Klauber (1927, 1928, 1934), Wolterstorff (1935), Twitty (1942), Bishop (1943), Pickwell (1947), Hill (1948), Gorman (1951), Stebbins (1951, 1954, 1966), Livezey (1963), Sloan (1964), Dearolf (1956) and Smith (1978).

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Aspects of the life history and ecology of *T. torosa* were published by Hallowell (1853), Cooper (1868), Ritter (1897), Storer (1925), Slevin (1928), Wolterstorff (1935), Twitty (1942, 1966), Bishop (1943), Pickwell (1947), Hill (1948), Stebbins (1951, 1954, 1966), Miller and Robbins (1954), Brame (1956, 1968), Riemer (1958), Freytag (1959) and Sloan (1964). Accounts of courtship were provided by Schreitmüller (1909), Herre (1932), Koch (1933), Smith (1941a), Klingelhöffer (1956), Davis and Twitty (1964) and Rothenberg (1968). Electrophoretic analyses of proteins include Speaker (1965), Salthe and Kitto (1966), Coates and Twitty (1967), Coates (1967, 1968), Hedgecock and Ayala (1974), Ayala (1975) and Hedgecock (1977).

The ova and developing embryos contain the potent neurotoxin, tetrodotoxin (Twitty, 1935b, 1937; Twitty and Elliot, 1934; Twitty and Johnson, 1934; Horsburgh et al., 1940; van Wagendonk et al., 1942; Davenport and Smith, 1942; Turner and Fuhr-



MAP. Solid spot represents the type-locality of *Taricha torosa sierrae*. Type-locality of *T. t. torosa* not specific enough to plot. Hollow circles mark other locality records.

man, 1947; Brown and Mosher, 1963; Kao and Fuhrman, 1963; Fuhrman et al., 1963; Buchwald et al., 1964; Mosher et al., 1964; Fuhrman, 1967; Brodie et al., 1974). The adult skin also contains this toxin and perhaps others (Wakeley et al., 1966; Brodie et al., 1974). Adults are distasteful to predators (Hubbard, 1903) and assume a rigid antipredator posture called an unken reflex (Stebbins, 1951; Riemer, 1958; Brodie, 1977).

The following aspects have been studied: sex attractants, Twitty (1955); spermatophores, Smith (1941b); orientation and homing, Twitty (1959), Twitty et al. (1967), Ender (1970); locomotion with special reference to the forelimb, Evans (1946); trackways, Peabody (1959); sound production, Maslin (1950), Davis and Brattstrom (1975); stereotropism and geotropism, Main (1931); development of sex organs, McCurdy (1931); egg maturation, Lebrun (1902); hybridization with other species of *Taricha*, Twitty (1955, 1961a–b, 1964, 1966), Brandon (1958); karyotype, Henley and Costello (1947), Seto and Pomerat (1965); heteroploidy, Costello and Henley (1950); metabolism, Wakeman and Ultsch (1976); effects of carbon dioxide, Brattstrom and McFarland (1955); thermal physiology, McFarland (1955), Brattstrom (1963), Feder (1978), Harlow (1978); dehydration-rehydration, Cohen (1952); water balance, Brown and Brown (1980); blood circulation in larvae, Daniel and Currin (1928); albinism, Wells (1964).

• **ETYMOLOGY.** The specific name derives from *torus* (L.) meaning a bulge or swelling, and *osa* (L.) meaning full of, apparently in reference to the thicker and more muscular head and body of *Taricha torosa* as compared to "*Triton cristatus*" by Rathke in Eschscholtz (1833).

The name *sierrae* refers to the range of mountains, Sierra Nevada, where this race occurs.

1. *Taricha torosa torosa* (Rathke) Coast Range newt

Triton torosus Rathke in Eschscholtz, 1833. See species synonymy.

Taricha torosa klauberi Wolterstorff, 1935:179. Type-locality, "Boulder Creek" [San Diego County, California]. Holotype, "Kat. Nr. 108, 22," Magdeburg, a female, collected in 1934 by Laurence M. Klauber, not known to exist.

Triturus klauberi: Bishop, 1943:80.

Triturus torosus klauberi: Stejneger and Barbour, 1943:7. First use of combination.

Triturus torosus torosus: Stejneger and Barbour, 1943:6. First use of trinomial.

Taricha torosa torosa: Schmidt, 1953:25. First use of combination.

• **DEFINITION.** A subspecies of *Taricha torosa* with a yellow venter; dorsal dark color includes upper eyelids and sides of face or below lower limit of eyes.

2. *Taricha torosa sierrae* (Twitty) Sierra newt

Triturus sierrae Twitty, 1942:65. Type-locality, "Cherokee Creek, in the hills above Chico, Butte County, California." Holotype, Stanford University 2425, now California Academy of Sciences, San Francisco (CAS-SU) 2425, a mature male, collected 9 April 1937 by Victor C. Twitty and George S. Myers (not examined by authors).

[*Triturus*] [*torosus*] *sierrae*: Stebbins, 1951:29. First use of trinomial.

Taricha torosa sierrae: Schmidt, 1953:27. First use of combination.

• **DEFINITION.** A subspecies of *Taricha torosa* with an orange-red venter; dorsal dark color usually excludes upper eyelids and nostrils, sides of face with very little dark pigment.

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