

ANDERSON, JAMES D. 1967. *Ambystoma texanum*. Catalogue of American Amphibians and Reptiles, p. 37.

Ambystoma texanum (Matthes)
Small-mouthed salamander

Salamandra texana Matthes, 1855:266. Type locality, "Das erste Exemplar fand ich . . . im Urwalde am Rio Colorado, das zweite ebenfalls . . . im Cumming's Creeck (sic) Bottom Fayette County (Texas)." Collected by Matthes. Type not known to exist.

Ambystoma porphyriticum: Hallowell, 1856:8. Hallowell misidentified a specimen (Academy of Natural Sciences, Philadelphia, 1285) of *texanum* as *Sal. porphyriticum* (= *Gyrinophilus porphyriticus*) and applied the name *A. porphyriticum* to it.

Ambystoma microstomum Cope, 1861:123. New name proposed for *A. porphyriticum* of Hallowell [non *Sal. porphyriticum* Green].

Chondrotus texanus: Cope 1889. Transfer of *texanum* to *Chondrotus*, new genus.

Chondrotus microstomus: Cope 1889. Transfer of *microstomum* to *Chondrotus*, new genus.

Ambystoma texanum: Strecker and Williams 1928. *A. microstomum* placed into synonymy of *texanum*.

Linguaelapsus texanus: Freytag 1960. Transfer of *texanum* to *Linguaelapsus* Cope.

• CONTENT. No subspecies have been recognized although considerable geographic variation exists.

• DEFINITION. A moderately-sized *Ambystoma* (adults up to about 150 mm in total length) characterized by the small head and mouth. The vomerine teeth are in two rows and do not extend laterally beyond the internal nares. The maxillary teeth are in two or three rows. The lingual plicae diverge from a median, longitudinal groove in the tongue. There are 14 or 15 costal grooves and 2-3½ intercostal spaces between the toes of the adpressed limbs. The digits are moderately long. The ground color is black or dark brown overlain by a pattern of greyish lichen-like markings that vary in location and density. The ventrum is black and sometimes conspicuously speckled with markings like those on the dorsum. Dark, unspotted individuals occur and may be more abundant in the northeastern part of the range (Conant, 1958).

The larvae are morphologically of the pond type (Valentine and Dennis, 1964) although frequently found in running water. The color is dark grey to black, and forms a series of dark, transverse bands through the base of the dorsal fin. These bands, about six in number, are most distinct when the larvae hatch but persist, faintly, until metamorphosis. The uneven lateral pigmentation is finely reticulate in small larvae, mottled in large larvae. The lateral dark color extends below the level of limb insertions and outlines a distinct, straight-edged, pale ventral band from the gular region to the vent.

Although great variations undoubtedly exist, total length at metamorphosis is approximately 40 mm.

• DESCRIPTIONS. The eggs and capsules were described by Hay (1892), Smith (1934), and Bishop (1947); egg masses, clusters and single eggs by Hay (1892), Strecker (1909), Smith (1934), Bailey (1943), Bishop (1947), Burger (1950), Bragg (1957), and Brandon (1961, 1966). Cahn (1930) described albino eggs and larvae. Various early authors provided brief notes on the larvae, but the best descriptions were given by Smith (1934), Burt (1938), Orton (1942), Bishop (1947), and Brandon (1961). Many regional guides and keys include brief descriptions, but the best diagnoses are contained in works by Cope (1867, 1889), Hay (1892), Strecker (1909), Smith (1934), Bishop (1947), and Smith (1961). Variations and structure of the vertebral column were described by Stokley and Holle (1953). Tihen (1958) described certain features of the osteology and Monath (1965) described the opercular apparatus. The urogenital system of the male was described by Baker and Taylor (1964). The spermatophore of *A. texanum* has not been described.

Waving of the elevated tail, possibly a defense mechanism, was described by Hay (1892) and more recently by Green (1961).

In many early descriptions the name *microstomum* was applied and in some cases authors attempted to contrast the forms *texanum* and *microstomum*.

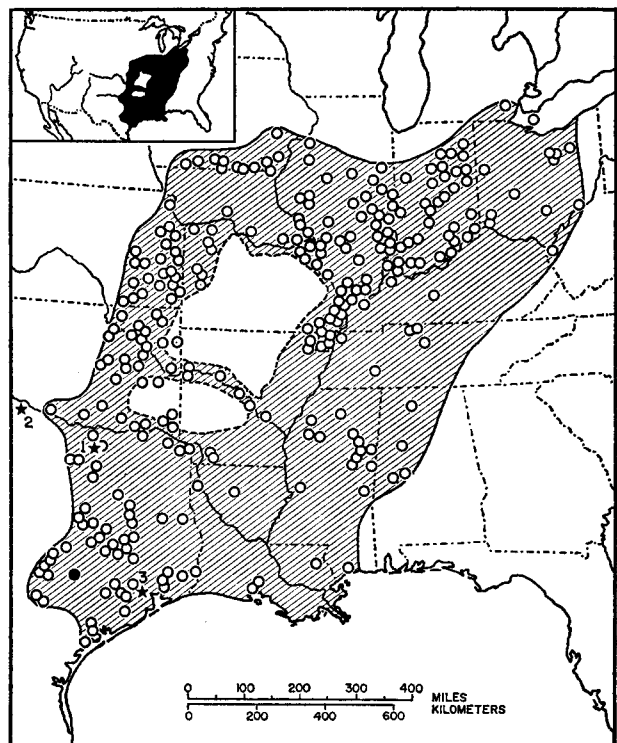
• ILLUSTRATIONS. Eggs from the field and laboratory were figured by Smith (1934). Orton (1942) illustrated a large

larva, and Brandon (1961) figured a 12 mm and a 31 mm larva. Recent, good illustrations of adults are found in works by Smith (1934), Bishop (1947), Conant (1958), and Smith (1961). Conant (1958) illustrated speckled and dark color variants. The hyoid apparatus, head, feet, and mouth were figured by Cope (1889); details of mouth structure by Bishop (1947); male urogenital system by Baker and Taylor (1964); scapula and pelvis by Stokley and Holle (1954); skull by Hoheisel (1931); details of tooth form and structure of the vertebrae by Tihen (1958).

• DISTRIBUTION. This species occurs from eastern Ohio west to southern Iowa and south to the Gulf States. The limits of distribution are imperfectly known at present. It has been recorded north to the Lake Erie Islands of Ohio, Pelee Island of Ontario, Canada (Uzzell, 1962), near Ann Arbor, Michigan (possibly introduced and isolated), the southern two-thirds of Indiana and Illinois and the southern tier of counties in Iowa. At the western extremity of the range it is known from eastern Kansas, the eastern half of Oklahoma and eastern Texas, but extends westward along river valleys. The escarpment of the Edwards Plateau may mark the limit of western distribution in Texas (Brown 1950). The exact limits of the range to the east are unknown, especially in the southeast. Older records from the Carolinas are based on misidentified specimens (Neill 1954) and a specimen recorded from Richmond County, Georgia, was probably introduced into that area (Neill 1957).

Ambystoma texanum is apparently a species with wide ecological tolerances, and is found in many diverse habitats throughout its range. It is known from tall-grass prairie, moist pine woodland, flood plain forest, oak woodland, dense hardwood forest, and also from intensely farmed areas. The breeding sites are also quite variable, including temporary pools and ponds similar to those utilized by many other species of *Ambystoma*, as well as spring-fed pools and streams.

In addition to references cited elsewhere in this account, the following deal with local distribution and habitat: Brandon (1966, Alabama), Chermock (1952, Alabama), Black and Dellinger (1938, Arkansas), Dowling (1956 and 1957, Arkansas), Smith and Minton (1957, Indiana and Illinois), Bailey (1943, Iowa), Clarke (1956, Kansas), Walker (1963, Louisiana), Cook (1957, Mississippi), Hurter (1911, Missouri), Sie-



MAP. The solid circle marks the type-locality. Hollow symbols represent other known localities. Stars mark fossil localities; see under "Fossil Record" for further information.

bert and Brandon (1960, Ohio), Gentry (1955, Tennessee), Green (1956, West Virginia).

• Fossil Record. Holman (1963, 1964, 1965) reported fossil vertebrae of *A. texanum* from the Pleistocene of Texas, in Sangamon interglacial deposits at Clear Creek, Denton County (1, on map), in Wisconsin deposits at Groesbeck Creek, Harde-man County (2), and at Houston, Harris County (3).

COMMENT

Although Fowler and Dunn (1917) listed Acad. Nat. Sci. Philadelphia No. 1285 as the holotype of *A. microstomum*, Cope (1861) actually proposed the name (*microstomum*) for a specimen, Acad. Nat. Sci. Philadelphia No. 1286, collected by Mr. L. Lesquereaux at Columbus, Ohio.

Freytag (1959) placed *texanum* in the genus *Linguaelapsus* Cope. The characters of the genus are those given for the subgenus *Linguaelapsus* by Tihen (1958), and the included species are those in Tihen's subgenus. As yet there is little agreement on the relationships of certain species and species groups in the genus, Tihen's fine contribution notwithstanding. It seems, therefore, best to recognize *Linguaelapsus* (*sensu* Tihen) as a subgenus of *Ambystoma*. Some species presently included in that subgenus possibly are more closely related to species in other subgenera.

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