

Catalogue of American Amphibians and Reptiles.

HIGHTON, RICHARD. 1973. *Plethodon jordani*.

***Plethodon jordani* Blatchley**
Appalachian woodland salamander

Ambystoma jeffersonianum: Rhoads (1895:402-3).

Plethodon jordani Blatchley (1901:762). Type locality between 3000 and 5000 feet on the slope of Mt. Collins or Indian Pass, Sevier County, Tennessee. The two syntypes were originally in the collection of W. S. Blatchley but have been lost (Dunn, 1926:145).

Plethodon shermani Stejneger (1906:559-62). Type locality, east of Wayah Gap, Macon County, North Carolina. Holotype, USNM 36214. In the original description the type locality is said to be between Andrews and Aquone, but this is corrected by Brimley (1912:138).

Plethodon metcalfi Brimley (1912:138-9). Type locality, Sunburst, Haywood County, North Carolina. Holotype, USNM 49682.

Plethodon clemsonae Brimley (1927:73-5). Type locality, Jocasse, Oconee County, South Carolina. Holotype, USNM 73849.

Plethodon glutinosus shermani: Bishop (1941:18-9).

Plethodon shermani rabunensis Pope and Hairston (1948:106-7). Type locality, Rabun Bald, Rabun County, Georgia. Holotype, FMNH 47697.

Plethodon shermani shermani: Pope and Hairston (1948:106-7).

Plethodon shermani melaventris Pope and Hairston (1948:107). Type locality, Highlands, Macon County, North Carolina. Holotype, FMNH 47614.

Plethodon metcalfi metcalfi: Mittleman (1948:418).

Plethodon metcalfi clemsonae: Mittleman (1948:418).

Plethodon shermani clemsonae: Hairston and Pope (1948:274-5).

Plethodon jordani jordani: Hairston (1950:271).

Plethodon jordani metcalfi: Hairston (1950:271).

Plethodon jordani shermani: Hairston (1950:271).

Plethodon jordani clemsonae: Hairston (1950:272).

Plethodon jordani rabunensis: Hairston (1950:272).

Plethodon jordani melaventris: Hairston (1950:272).

Note: *Plethodon jordani tayahalee* Hairston (1950:269-70), formerly included in the synonymy of *P. jordani* (Highton, 1962:329) is now placed in the synonymy of *P. glutinosus* (Green), (Highton, 1970:231). *P. kentucki* (Mittleman, 1951), regarded as a subspecies of *P. jordani* by Schmidt (1953), is regarded as a synonym of *P. glutinosus* (Clay, Case, and Cunningham, 1955).

• CONTENT. No subspecies are recognized because of the discordance in the variation of the geographically variable characters (Highton, 1962, 1970).

• DEFINITION AND DIAGNOSIS. An eastern large *Plethodon* of the *glutinosus* group, with a modal number of 17 trunk vertebrae, and lacking dorsal white iridophore spots and dorsal red pigmentation (except in the young). The ground color is black, except for the belly which is lighter (gray), while the chin is often even lighter than the belly. Certain geographic populations are characterized by possessing additional pigmentation (red on the cheeks, red on the legs, lateral white or yellow spots, brassy dorsal flecks, and red dorsal spots in young individuals). For a summary of the geographic variation in these characters, see Highton (1970).

Costal grooves vary from 15 to 17 (usually 16). Adults have from 9 to 30 vomerine teeth. Sexual maturity is reached at a length between 40 and 50 mm snout to anterior angle of the vent. Mature males have a rounded mental gland. The legs are long with about 1 to 3 costal folds between the toes of the adpressed limbs.

Plethodon jordani is distinguished from most populations of *P. glutinosus* by the absence of dorsal white spots (unspotted *glutinosus* are rare except in southern South Carolina and in Volusia County, Florida, but these *glutinosus* usually have darker chins than *jordani*). It is distinguished from *P. yonahlossee* by the absence of red pigment on the dorsum of adults, the absence of white spots on the dorsal surface of the head, body, and tail, and by its smaller size. It differs from *P. caddoensis* and *P. ouachitae* by the absence of dorsal irido-

phore spots and from *ouachitae* in lacking dorsal red pigmentation, often present in that species. It differs from species of the *wehrlei* group in having fewer trunk vertebrae and less webbing on the toes.

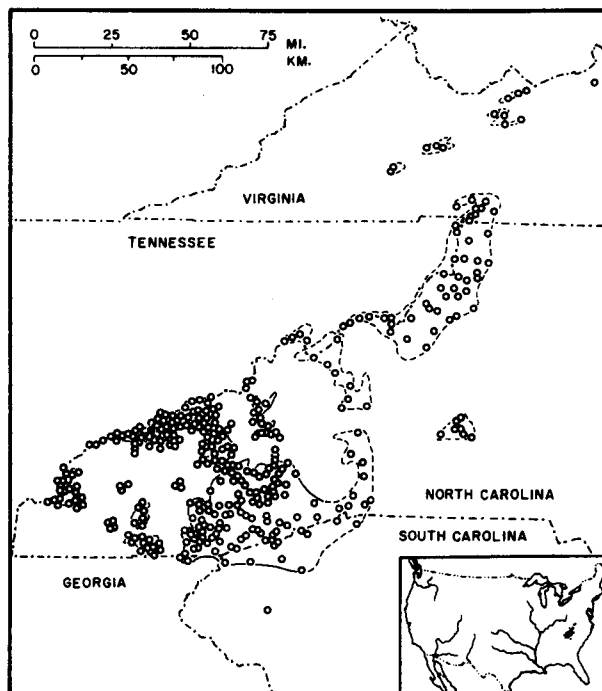
• DESCRIPTIONS. For descriptions, see Bishop (1943), Brimley (1940), Bruce (1967), Conant (1958), Dunn (1926), Hairston (1950), Hairston and Pope (1948), Highton (1962, 1970), Pope and Hairston (1948), Reynolds (1967), and Schwartz (1957).

• ILLUSTRATIONS. Black and white photographs are given in Bishop (1928, 1943), Freytag (1960, 1961, 1967), and Schwartz (1957); color photographs in Cochran (1961), Conant (1958), and Highton (1970).

• DISTRIBUTION. The range of *P. jordani* is subdivided into approximately 21 geographic isolates. Most of these occur at higher elevations in the southern Appalachian Mountains from southwestern Virginia through western North Carolina and eastern Tennessee to northwestern South Carolina and northeastern Georgia (see map). Each isolate is provided with a name in Highton (1972). Erroneous locality records are given by Holt (1924) for Alabama and Joseph (1950) for Ohio. Hoffman (1967) suggests that the Mountain Lake, Giles County, Virginia, record represents an introduction.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Evolutionary relationships and comparisons with other species are given by Dunn (1926), Noble (1927), Pope (1928), Grobman (1944), Pope and Hairston (1948), Mittleman (1948), Deevey (1949), Clay, Case and Cunningham (1955), and Highton (1962, 1970, 1972). Hybridization with *P. glutinosus* (Green) is discussed by Bailey (1937), Bishop (1941), Martof and Humphries (1955), Bruce (1967), Highton (1970) and Highton and Henry (1970). Geographic variation has been considered by Bailey (1937), Pope and Hairston (1948), Hairston (1950), Highton (1962, 1970), and Rubin (1969a). Ecological interactions with related species are discussed in Hairston (1949, 1950, 1951), Pope (1950), and Highton (1962, 1970, 1972). Individual and ontogenetic variation within populations are discussed by Wood (1947a, 1947b), Howell and Hawkins (1954), Schwartz (1957), Reynolds (1959), Gordon (1960), and Bruce (1967). Distribution is analyzed by Hoffman and



MAP. The solid circle marks the type-locality; open circles indicate other localities. Broken lines mark estimated range limits; solid lines mark better defined range limits.

Kleinpeter (1948), Hoffman and Hubricht (1954), Bruce (1966), Hoffman (1967), Folkerts (1971), and in the papers listed above under geographic variation and ecological interactions with other species.

Anatomical studies are by Hilton (1951) on the nasal gland, Reynolds (1961) on the postfemoral gland, Lanza (1959) on the mental gland, Wake (1966) on osteology including a figure of the skull, Worthington and Wake (1972) on regional differentiation of the vertebral column, and Wake and Dresner (1967) on caudal vertebrae and tail autotomy. Kezer (1948) studied male meiosis and karyotype ($N = 14$). Physiological work includes studies on water loss during dehydration (Gordon, 1952; MacMahon, 1965), critical thermal maxima (Hutchison, 1961), haematology (Howell, 1950; Reynolds and Pickard, 1973), vascularization of respiratory surfaces (Czopek, 1961) and variation in blood plasma proteins (Highton and Henry, 1970). Spotila (1972) discusses the role of temperature and water in the ecology. Body temperatures of field collected animals are reported in Bogert (1952). Parasites have been listed by Rankin (1937), and Powders (1967, 1970). Albinism is reported by Hensley (1959). Mimicry of *P. jordani* by various populations of *Desmognathus ochrophaeus* is discussed by Noble (1931), Huheey (1960, 1966), Huheey and Brandon (1961), and Orr (1967).

Food habits are analyzed by Weller (1931), King (1939), Rubin (1969b), and Whitaker and Rubin (1971). Predation is given by Bruce (1972). Variation in abundance is discussed by Gordon, MacMahon, and Wake (1962). Movements and home range size in natural populations are evaluated by Merchant (1972), Madison (1969, 1971), and Madison and Shoop (1970). Homing ability is demonstrated by Madison (1969, 1971, 1972), and Madison and Shoop (1970). Climbing behavior is described by Green (1939) and Madison (1971), feeding behavior by Huheey (1959), burrowing and burrows by Chadwick (1940), aggressive behavior by Hutchison (1959), and nocturnal activity by Gordon (1968). Courtship behavior has been studied by Green and Richmond (1944), Organ (1958), Huheey (1959), MacMahon (1964), and Arnold (1970). Spermatophores are described by Organ (1960), and Organ and Lowenthal (1963). Growth rates are discussed by King (1939), Schwartz (1957), and Highton (1970).

• ETYMOLOGY. The species is named for David Starr Jordan, well-known ichthyologist and President of Stanford University.

COMMENTS

P. jordani is well known for its extensive geographic variation in the southwestern part of its range. In the Great Smoky Mountains, most populations possess bright red cheeks. In the southern part of its range, some populations have red legs, abundant brassy dorsal flecking, lateral yellow or white spotting, and darker chins and bellies. The variation in these characters is quite discordant and the use of subspecies to describe this variation has not seemed useful (Highton, 1962, 1970).

The eggs of this species have not been found in nature, but the writer has induced oviposition in the laboratory by means of mammalian gonadotropic hormone injections. Gravid females collected in the spring respond to hormone injections, but not in the fall. Oviposition in nature probably occurs in late spring in underground passageways that are inaccessible to regular surface collecting methods, and development takes place during the summer. The young usually do not appear at the surface until the following spring.

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