Gyrinophilus gulolineatus Brandon, 1965(a)

BERRY CAVE SALAMANDER

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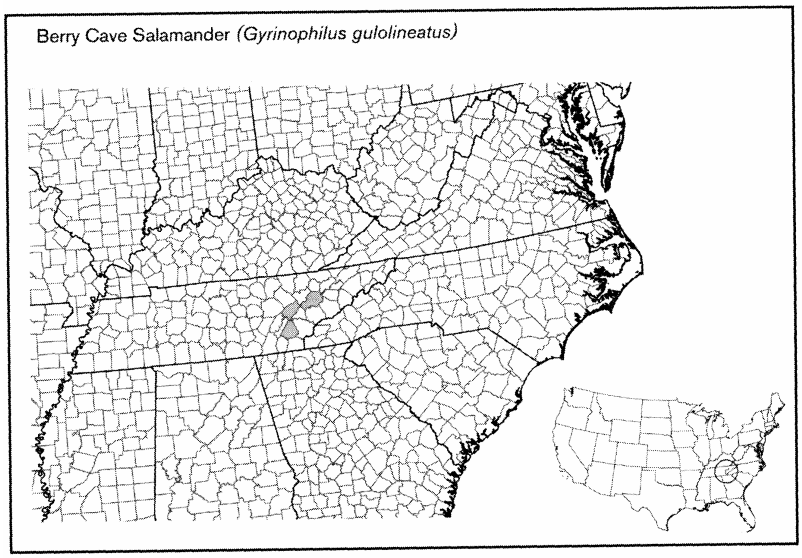
1. Historical versus Current Distribution. Berry Cave salamanders *(Gyrinophilus gulolineatus)* were originally a subspecies of Tennessee cave salamanders *(G. palleucus)*. Collins (1991) suggested their elevation to species status based on allopatry and substantial morphometric differentiation (e.g., unique throat stripe, large size, and fewer trunk vertebrae in *G. gulolineatus* [Brandon, 1965a]) compared to other members of the *G. palleucus* complex.



Berry Cave salamanders are known only from sites in the Ridge and Valley Province in Knox, McMinn, and Roane counties, Tennessee (Brandon, 1965a, 1966c, 1967a; Petranka, 1998). The data necessary to compare current versus historical distributions have not been collected.

2. Historical versus Current Abundance. Berry Cave salamander populations are declining (Caldwell and Copeland, 1992), likely due to above-ground habitat destruction and subsequent effects on water quality; and Caldwell and Copeland (1992) have suggested that Berry Cave salamanders should be given Endangered status.

3. Life History Features.

A. Breeding. No aspect of breeding has been observed. However, reproduction is undoubtedly aquatic, because Berry Cave salamanders are neotenic.

i. Breeding migrations. Unlikely. Given that Berry Cave salamanders are neotenic, breeding habitat is likely to be the same as, or a subset of, adult habitat.

ii. Breeding habitat. Berry Cave salamanders most likely breed in the caverns and passages they occupy.

B. Eggs.

i. Egg deposition sites. Microhabitat characteristics of egg deposition sites are unknown. Extending what is known about egg deposition sites in spring salamanders *(G. porphyriticus)*, clutches will be attached as a single mass to the undersides of large stones.

ii. Clutch size. Unknown. However, a large clutch size (compared to other species of *Gyrinophilus*) is predicted, based on well-established relationships between salamander body size and clutch size (Kaplan and Salthe, 1979).

C. Larvae/Metamorphosis.

i. Length of larval stage. Unknown. Berry Cave salamanders are neotenic and the transition from larvae to reproductive adults has not been documented.

ii. Larval requirements.

a. Food. Unknown, although presumably larvae feed on aquatic, primarily benthic, invertebrates that are small enough to ingest whole (see Brandon, 1967b).

b. Cover. Unknown.

iii. Larval polymorphisms. Unknown.

iv. Features of metamorphosis. Unknown.

v. Post-metamorphic migrations. Unlikely in these neotenic animals.

vi. Neoteny. Berry Cave salamanders are obligate neotenes (Brandon, 1965a, 1966c; Simmons, 1975).

D. Juvenile Habitat. Juveniles live in the same cave systems occupied by adults and are therefore likely to have similar habitat characteristics.

E. Adult Habitat. Berry Cave salamanders either inhabit, or are associated with, caves. Caldwell and Copeland (1992) suggest that inflow (sinkhole) caves versus outflow caves may provide the best

habitat. Inflow caves provide a detritus base that appears to be necessary for Berry Cave salamanders.

F. Home Range Size. Unknown, but possibly extremely small. In mark–recapture studies, animals are found in exactly the same location (e.g., Simmons, 1975).

G. Territories. Unknown.

H. Aestivation/Avoiding Desiccation. Aestivation is unknown and unlikely.

I. Seasonal Migrations. Unknown but unlikely. Unstudied, but if they occur, migrations occur either within their cave system or from caves to the immediate vicinity of cave openings (where animals were first collected; Brandon, 1965a).

J. Torpor (Hibernation). Unknown and unlikely.

K. Interspecific Associations/Exclusions. Berry Cave salamanders are not syntopic with any other amphibian species.

L. Age/Size at Reproductive Maturity. Berry Cave Salamanders are extremely large plethodontids. The holotype is an apparently reproductively mature female measuring 122 mm SVL (preserved; Brandon, 1965a).

M. Longevity. Unknown.

N. Feeding Behavior. Berry Cave salamanders likely feed on isopods, annelids, and aquatic invertebrates, similar to other troglobitic *Gyrinophilus* (see Brandon, 1967b; Simmons, 1975, 1976). Individuals have larger heads than Tennessee cave salamanders. Brandon (1965a) suggests that this is a feeding specialization, noting that among salamanders the most highly modified snouts are found on the most highly specialized cave salamanders, and speculates that because cave-dwelling salamanders tend to feed on bottom-dwelling invertebrates, a broad, spatulate snout may be effective in detecting and capturing food under dark conditions.

O. Predators. Unknown.

P. Anti-Predator Mechanisms. Unknown.

Q. Diseases. Unknown.

R. Parasites. Brandon (1967b) noted intestinal parasites (e.g., nematodes, cestodes, and acanthocephalans) in closely related Tennessee cave salamanders.

4. Conservation.

Berry Cave salamanders are known only from sites in the Ridge and Valley Province in Knox, McMinn, and Roane counties, Tennessee. These populations are declining due to above-ground habitat destruction and subsequent effects on water quality. The Tennessee Wildlife Resources Agency (1994) has listed *G. palleucus* as Threatened; because *G. gulolineatus* was recognized as a subspecies of Tennessee cave salamanders at the time of listing and only occurs in Tennessee, the arguments for listing *G. gulolineatus* are equally valid. Caldwell and Copeland (1992) have suggested that Berry Cave salamanders should be given Endangered status.