

Note

Erythrism in Spring Peeper (*Pseudacris crucifer*) in Maritime Canada

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Abstract

We document three cases of erythrism in Spring Peeper (*Pseudacris crucifer*) in New Brunswick and Nova Scotia. Although the source of erythrism in Maritime *P. crucifer* remains uncertain, the occurrences reported here demonstrate this colour morph to be a widespread, although apparently rare, form in the Canadian Maritimes region.

Key words: Spring Peeper; *Pseudacris crucifer*; amphibian; colour variant; New Brunswick; Nova Scotia

Kolenda *et al.* (2017) noted that the documentation of colour anomalies may contribute to our understanding of the ecological history and phenotypic plasticity of species and recorded a variety of colour aberrations in amphibians. In amphibians, albinism (lack of pigment) and leucism (partial loss of pigment) seem to predominate; axanthism (loss of yellow pigment) may be less common (Dyrkacz 1981; Betschtel 1995; Jablonski *et al.* 2014). Erythrism (abnormal redness) appears to be rare in amphibians, although Moore and Ouellet (2014) reported prevalences of erythrism in Red-backed Salamander (*Plethodon cinereus*) as high as 50%. Chromatophores fortified with pteridines, carotenoids, or flavins generally underlie red-yellow colouration in lower vertebrates (Hubbard *et al.* 2010), including amphibians (Hoffman and Blouin 2000). Recent evidence shows that pheomelanin may also be responsible (Wolnicka-Glubisz *et al.* 2012).

Cases of erythrism in amphibians in Maritime Canada have previously been restricted to Red-backed Salamander. Bleakney and Cook (1957) and Gilhen (1968) have reported erythristic individuals from Nova Scotia, while Cook and Bleakney (1961), Ekstrom (1973), and Jongsma (2012) have all reported this colour form of the species in New Brunswick. There are, apparently, no reports of erythrism in amphibians from Prince Edward Island (Cook 1967; Moore and Ouellet 2014).

Although skin colour in Spring Peeper (*Pseudacris crucifer*) may vary, adults and juveniles are normally light tan through dark brown to grey, usually with a distinctive, dark, x-shaped mark on the back, dark banding or spotting on the legs, and a dark stripe on the side of the head (Dodd 2013). Cook (1967) and Gilhen (1984) reported that Maritime Spring Peepers likewise range in colour through shades of brown or grey, but the x-shaped pattern on the back is usually distorted or fragmented and connected to additional markings (Figure 1).

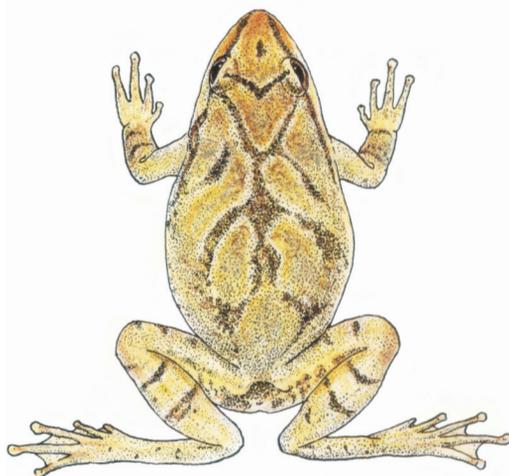


FIGURE 1. Male specimen of Spring Peeper (*Pseudacris crucifer*) from Prince Edward Island showing normal colour morph for Maritime Canada. Note the fragmented x-marking on the back, characteristic of the species in the region. Original line drawing of Canadian Museum of Nature specimen 3956-4 scanned from Cook (1967) and tinted with chalk pastels by A. Karstad.

Here we document cases of erythrism in Spring Peepers from Maritime Canada reported to us at the Nova Scotia and New Brunswick Museums by members of the public.

On 30 September 2008, observer 1 discovered a uniformly orange Spring Peeper inside an empty paint tin at L'Ardoise, Richmond County, Cape Breton, Nova Scotia (45.6151°N, 60.7663°W; Figure 2A). On 16 September 2014, observer 2 reported a (juvenile) uniformly orange Spring Peeper on a screen door 2 km east of the Petitcodiac Bridge, Riverview, New Brunswick (46.0687°N, 64.7801°W; Figure 2B). On 18 September



FIGURE 2. Three erythristic specimens of Spring Peeper (*Pseudacris crucifer*) from Maritime Canada: (A) L'Ardoise, Richmond County, Cape Breton, Nova Scotia; (B) Riverview, Westmorland County, New Brunswick; (C) Duncan's Cove, Halifax County, Nova Scotia. Photos: Nova Scotia Museum files.

2016, observer 3 photographed a uniformly orange Spring Peeper at Duncan's Cove, Halifax County, Nova Scotia (44.4990°N, 63.5258°W; Figure 2C). Each of these erythristic Spring Peepers lacked the x-shaped mark on the dorsum, and banding on the legs and face was reduced.

Kolenda *et al.* (2017) hypothesized that cases of erythrim in Common Eurasian Spadefoot Toad (*Pelobates fuscus*) in Poland are the result of high iron concentrations in water and soil, presumably intensifying the colour of erythrophores. Umbers *et al.* (2016) found that dietary carotenoids influence the saturation and hue of yellow pigments in Australian Southern Corroboree Frog (*Pseudophryne corroboree*). Thurow (1961) attributed genetic, rather than environmental factors, to the presence of erythrim in Red-backed Salamander. Others have suggested that the erythristic form of this species may be a Batesian mimic of the terrestrial eft stage of the predator-toxic Red-spotted Newt (*Notophthalmus viridescens*; Cassell and Jones 2005 and references cited therein).

There appear to be no previous reports of erythrim in *Pseudacris crucifer*, although Telford (1952) briefly mentioned the collection of two "brick red" Little Grass Frogs (*Pseudacris ocularis*) in Florida. Although the source of erythrim in Maritime Spring Peepers remains uncertain, the three occurrences reported here demonstrate this colour morph to be a widespread, although apparently rare, form in the Canadian Maritimes region. We encourage further reporting of erythrim in Spring Peepers and other Canadian amphibians.

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