

Concerning an Albino Foothill Yellow-legged Frog, *Rana boylei* (Amphibia, Anura, Ranidae), from Red Cap Creek Drainage, Humboldt County, California

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Abstract

One recently transformed, fully albino foothill yellow-legged frog, *Rana boylei*, was discovered in September 1994 while conducting habitat and ectotherm inventories within the Red Cap Creek drainage of Humboldt County, in northwestern California. The specimen was captured, examined, photographed, measured and released. Photographic vouchers, along with a description of the specimen, and a discussion of its significance in light of further observations on *R. boylei*, in the drainage of the albino's origin, are presented.

Introduction

Apparently no records of fully albinistic foothill yellow-legged frogs exist (Hensley, 1959; Dyrkacz, 1981; Nussbaum et al., 1983; Bechtel, 1995). Dyrkacz (1981:12) reports but a single specimen of *R. boylei* ever being reported that exhibited partial albinism (Switak, 1967). That specimen, collected as a tadpole from Portola Valley, California, was described as an "albino with pigmented blotches on body" (Dyrkacz, 1981).

On 19 September 1994, while conducting habitat inventories in the Red Cap Creek drainage of extreme northeastern inland Humboldt County, California, we collected a fully transformed (Stage 46 of Gosner, 1960), juvenile foothill yellow-legged frog which exhibited complete albinism with pink eyes (see color photographs at www.chicagoherp.org). Normally colored, fully transformed juveniles and transforming larval frogs of the same species were abundant in the area and had been throughout the previous summer (pers. obs., both authors).

The albino was found in a cobble-dominated, low-gradient riffle habitat unit [Natural Sequence Order #155 (from the confluence with the Klamath River) of the 1994 Red Cap Creek Watershed Analysis Habitat Inventory of Mollier and Norman (1994, 1996) as directed by Cyr (1994, personal communication); see also USFS, 1996].

The sex of the albino specimen was not determined. The specimen was photographed under available room light in conjunction with two low-wattage incandescent bulbs manually placed in a downward stereo position above the specimen at a distance of ca. 20 cm.

Description

A detailed description of the albino specimen in life follows: patellar, elbow, and ankle regions are completely white indicating areas of dense sub-dermal cartilage visible through a pigmentless epidermis; distinct white edge of upper lip contrasts with the overall pinkish-orange appearance of the head and body which is more pink in areas between the lighter, indistinct dorsolateral folds, on the trunk laterally, and at the tips of the toes and across the dorsal surfaces of the legs,

indicating the more highly vascularized nature of these regions sub-dermal to the completely pigmentless epidermis; iris appears white and pupils pink; dorsal surfaces covered with minute, slightly raised, lighter pinkish skin glands (appearing as small warts) which appear less vascularized than the skin between them; ventral surfaces of the abdomen, thorax and head are white showing less sub-dermal vascularization due to the overall thickness of the ventral epidermis; ventral surfaces of the limbs are more pinkish-orange as in the dorsal surfaces indicating a thinner pigmentless epidermis and the effects of subdermal vascularization within the limb musculature.

Discussion

Modern resource managers are continually trying to elucidate ways in which overall watershed health might be quantified, measured, assessed, or estimated. The discovery of a fully-albino specimen within a population, when viewed as a result of standard Mendelian means of origin, portrays an indirect measure, of sorts, of the reproductive success of a population in that, under such means, albino births occur at a rate of about 1 in 20,000 within an hypothetically healthy vertebrate population (Villem and Dethier, 1971). Bechtel (1995: 57; see also p. 69) states that incidence of albinism in vertebrates generally is likely "to be in the order of 1:10,000 to 1:30,000 in the general populations though it is likely it is not necessarily the same for all species."

If we assume that overall health of an environment will maintain, to a degree, or contribute to the overall health or reproductive rate of a given population within it, then this recent discovery of a fully-albino foothill yellow-legged frog in the Red Cap Creek watershed, tends to support an hypothesis that the population of that species there has had continued reproductive success in the area, at least during the 1994 through 1995 observational period. This indirectly suggests that, at least the habitat requirements of the frogs are being met in the drainage under discussion. And thus, perhaps such observations indirectly suggest healthy levels of environmental diversity in the area.

As regarding the hypothesis that *Rana boylei* has exhibited

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reproductive success in the drainage our extended observations throughout 1994 (16 August to 25 October) and 1995 (year-round) confirm this (Mollier, Cyr and Norman, unpublished data). Regarding the transformed stage of the albino frog and its assuredly more conspicuous coloration in comparison with its normally-colored siblings, it is remarkable that the albino had survived the threat of abundant avian, reptilian, and mammalian predators in the Red Cap Creek drainage as long as it did before it was discovered. This fact seems also to subjectively support the hypothesis that the *R. boylei* population in that area is a relatively healthy one and that it exhibits a strong reproductive rate.

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