

MERISTIC CHARACTERS OF THE CUTTHROAT TROUT

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INTRODUCTION

Cutthroat trout, *Salmo clarki* Richardson, of the Northwest United States may be threatened with extinction. They are unable to compete successfully with other trout (Hanzel, 1960) and they produce viable hybrids with the rainbow, *Salmo gairdneri* (Hartman, 1956).

Some of the few truly native cutthroat remaining are found in western Montana. The populations chosen for this study are from widely separated populations in Montana west of the Continental Divide in streams which had never been stocked and in which the cutthroat is the only species of *Salmo*. A comparison is made of these populations and between them and the cutthroat from Montana east of the Continental Divide (*S. c. lewisi*) and from British Columbia (*S. c. clarki*).

The cutthroat trout of the Northwest United States is represented by one species which may be divided into two or more races or subspecies. It is best recognized by the number of scales above, below, and in the lateral line (Schultz, 1941). The species is typified by the presence of a long maxillary extending beyond the orbit, cutthroat marks on the lower jaw, large opercle spots, basibranchial teeth, and a pointed snout.

The two common subspecies, *S. c. lewisi* and *S. c. clarki*, may be differentiated by the spotting below the lateral line (Oadri, 1959; Carl, Clemens, Lindsey, 1959). *Salmo c. lewisi* possesses more numerous spots posteriorly below the lateral line, whereas *S. c. clarki* has more numerous spots anteriorly below the lateral line.

MATERIALS AND METHODS

Cutthroat from Montana west of the Continental Divide were collected from seven different locations. These locations and the number of specimens collected are: Pattee Canyon Creek (6), Marshall Creek (23), Miller Creek (14), Dirty Ike Creek (17), Youngs Creek (38), Landers Fork of the Blackfoot (43), and Tin Cup Creek (28). These streams are in the Columbia River drainage. The latter three streams are separated by considerable distances. The distances, measured with a Dietzgen map device, are: Youngs Creek to Tin Cup Creek, 420 miles; Youngs Creek to Landers Fork of the Blackfoot, 525 miles; and Landers Fork to Tin Cup Creek, 254 miles. The distances are undoubtedly greater as only the large meanders are recorded on the U. S. Forest Service maps used.

snout (0.05). Trout from western Montana are distinct from those of British Columbia in having higher dorsal (0.01), anal (0.01), and caudal fin ray counts (0.01), fewer gill rakers (0.01), and smaller eye (0.05), snout (0.025), and preopercle (0.01).

No distinct morphological characteristics were observed in comparing the seven collections from western Montana.

The results of this study and those of other workers are compared in Table 3.

DISCUSSION

All three geographic populations appear to be closely related. There are only small mean differences in head and peduncle depths, body depth at vent; width of head, mouth, and interorbital; length of snout to anal origin, snout to dorsal origin, and snout to adipose. T-tests and analysis of covariance verify no distinct differences in means of these measurements.

Non-significant small mean differences existing in the three populations are considered similarities. These criteria show the cutthroat of western and eastern Montana to be related in seven characters (length of snout, maxillary, preopercle, and head; number of dorsal fin rays and vertebrae; and width of internasal). The trout of western Montana and British Columbia are related in one character, the number of lateral line scales. Trout of eastern Montana and British Columbia are related in three characters (gill rakers, anal fin rays, and eye diameter).

Statistical analysis indicates a closer relationship of the western Montana cutthroat to *S. c. lewisi* from east of the Continental Divide in Montana than to the coastal cutthroat of British Columbia (*S. C. clarki*), and is considered to be the former subspecies.

Considerable variations in color were noted. A characteristic so variable should not be the primary means of taxonomic separation. All trout in this study possess the dark opercle spots and the typical hyoid slash. These are the best color characteristics for field differentiation of western Montana cutthroat from other local trout species.

SUMMARY

Two hundred and forty-one cutthroat were collected from 11 streams. Seven of these are in Montana west of the Continental Divide; three in Montana east of the Continental Divide; and one in British Columbia.

Twenty-seven counts and measurements were made and their means tested for significant differences by t-test and analysis of covariance in three geographic combinations. Three levels of statistical significance were accepted: 0.05, 0.025, and 0.01.

Distinct mean differences appeared in 14 instances. The cutthroat of western Montana show 12 distinct differences, one almost distinct difference, and only one similarity when compared to those of British Columbia. The trout of eastern and western Montana possess seven distinct differences and seven similarities. Cutthroat of eastern Montana exhibit seven distinct and four almost distinct differences and three similarities in comparison with those of British Columbia.

Analysis of these mean differences and their level of significance indicates a greater relationship of the western Montana cutthroat to *S. c. lewisi* from Montana east of the Continental Divide than to *S. c. clarki* of British Columbia. Therefore the cutthroat of western Montana is considered to be *Salmo clarki lewisi*.

No distinct morphological characteristics were observed among the seven collections of cutthroat from western Montana.

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