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the posterior s less marked b traversed by at of dorsal to i to 38 oblique

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## FISHES OF THE KLAMATH BASIN.

head. Gillrakers short, triangular, somewhat wider than in species of Chasmistes, their free margins plain or moderately frluged, not bearing the dense mass of short, divided processes so conspicuously developed in C. fecundus and to a less degree in other species of Chasmistes.

Scales with concentric lines and radiating ridges very strongly marked. Seventy-eight pores in the lateral line; 14 scales in an oblique series from median line before dorsal downward and backward to lateral line; 9 scales between lateral line and base of ventrals. In 9 specimens not preserved the pores in lateral line were as follows: 76, 78, 78, 79, 79, 79, 79, 80, 81. Thirty-four series of scales before dorsal.

Ventrals inserted about under middle of dorsal. Front of dorsal slightly nearcr shout than base of candal. Last dorsal ray more than half the length of the first, which is equal to distance from shout to preopercle. Pectorals not nearly reaching ventrals, the latter not reaching vent. Anal high, the anterior rays reaching rudimentary candal rays when deflexed. Dorsal with 12 rays, the last one divided to base. In six other specimens counted the dors' rays were 11, 11, 11, 11, 11, 12. Anal constantly with 7 rays (in eight specimens), the last divided to base.

Very dark above, silvery on belly and lower part of sides. Dorsel and caudal dusky, the lower fine dusky on terminal half, light at base.



Leuciseus bicolor (Girard) .- Drawn by Anna L. Brown from a specimen from Upper Klamath Lake.

8. Leuciscus bicolor (Girard).

Tigoma bicolor Girard, Proc. Ac. Nat. Sci. Phila. 1856, 206.

Cheonda cærulea Girard, 1. c., 207. Lost River, Oregon.

Squalius caraleus Cope, Proc. Ac. Nat. Sci. Phila. 1883, 146. Klamath Lake.

Abundant in Upper Klamath Lake and Lost River. A large species with compressed body, a tapering caudal peduncle, a small compressed head tapering to an acute snout. The snout is usually slender wedge-shaped, with straight ontlines; in exceptional cases blunter and heavier. The mandible is usually included, but projects slightly at tip in some of our specimens. The month is gently oblique, the maxillary reaching vertical from front of orbit or slightly beyond it, its length 3½ to 3½

in head. Eye 5 to 5 $\frac{1}{2}$  in head in adults, 1 $\frac{3}{2}$  to 1 $\frac{1}{2}$  in interorbital width. Teeth 2, 4-5, 2 or 2, 5-5, 2, all of them comparatively small, with deeply grooved grinding surface, in adult specimens with the hooks obsolete. The teeth differ strikingly from those in *L. lineatus*, in which they are much larger, with strong hooks and with grinding surface sonvexly rounded, or in older specimens beyeled by use. In *L. interactius* they are hooked and channeled.

Scales marked with strong concentric lines and radiating ridges, as in L. lineatus. In seven specimens examined, the scales range from 65 to 67 in the conres of the lateral line, 14 or 15 in an oblique series running downward and backward from the median line before dorsal to the lateral line, and 30 to 32 before dorsal (enumerating the oblique series which cross the median line).

The dorsal fin is inserted distinctly behind the ventrals and has the upper margin straight when spread, slightly concave when closed. There are usually 9 developed rays, of which the first is unbranched, the last forked to base. In 20 specimens examined, but one had 8 dorsal rays. Anal with 8 rays, the first unbranched, the last forked to base; 2 out of 20 specimens examined have 9 anal rays. The pectorals do not nearly reach the ventrals, the ventrals usually not to vert.

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region. It is nd Tule lakes, a varying from a most highly arics of Upper out apparently orth from 60 to

hich it differs th C. fecundus arly horizontal id, C. fecundus

was well over, some more or r. One young

clined upward f which is the axillary splues vertical from bit (measured *Chasmistes*, the p very narrow; p and sides of