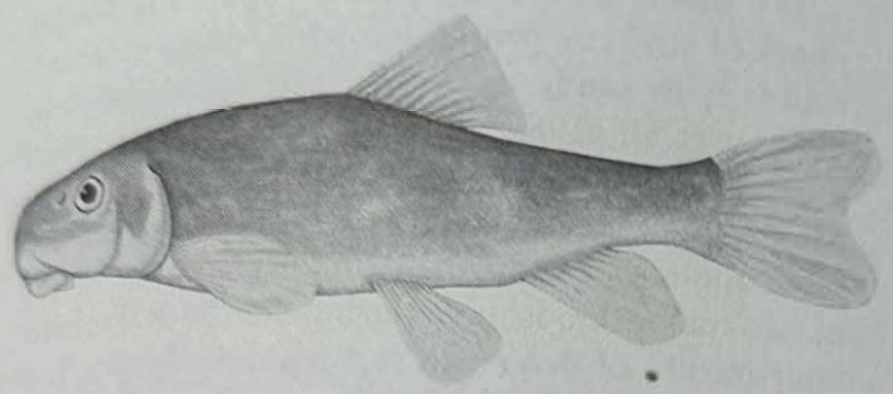
Catostomus (Pantosteus) clarki Baird and Girard · desert sucker



154. *Catostomus clarki*—desert sucker.

Catostomus clarki Baird and Girard 1854: 27; type locality, "Rio Santa Cruz, Gila" (Basin, Arizona); Jordan 1885: 120; Smith 1966: 73; Koehn 1969: 21; Hubbs and Echelle 1972: 150; Minckley 1980e: 373.

Minomus clarkii (Baird and Girard); Girard 1857a: 173; Girard 1859c: 38, redescription of type.

Pantosteus arizonae Gilbert, *In:* Jordan and Evermann 1896–1900; 70; type locality, Salt River, Arizona; Jordan and Evermann 1902: 45.

Pantosteus (Notolepidomyzon) arizonae Gilbert; Fowler 1913: 47.

Pantosteus clarki (Baird and Girard); Hubbs et al. 1943: 40; Koster 1957: 47; Kobetich 1969: 1; LaBounty and Minckley 1972: 143; Minckley 1973: 165; Bestgen 1985: 78; Propst et al. 1986: 2; Bestgen et al. 1987: 352; Propst et al. 1988: 32.

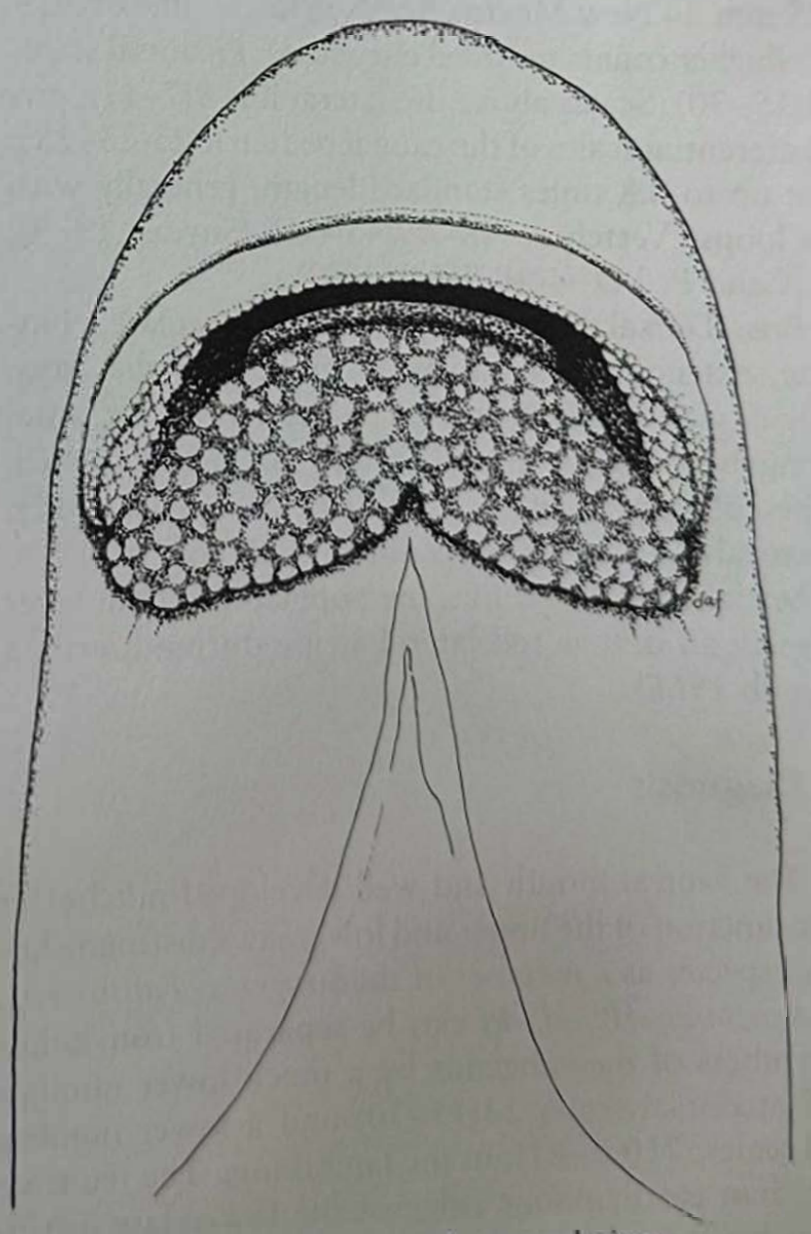
Catostomus (Pantosteus) clarki Baird and Girard; Smith and Koehn 1971: 282; Crabtree and Buth 1987: 843.222

Catostomus insignis × *Pantosteus clarki;* Hubbs et al. 1943: 40.

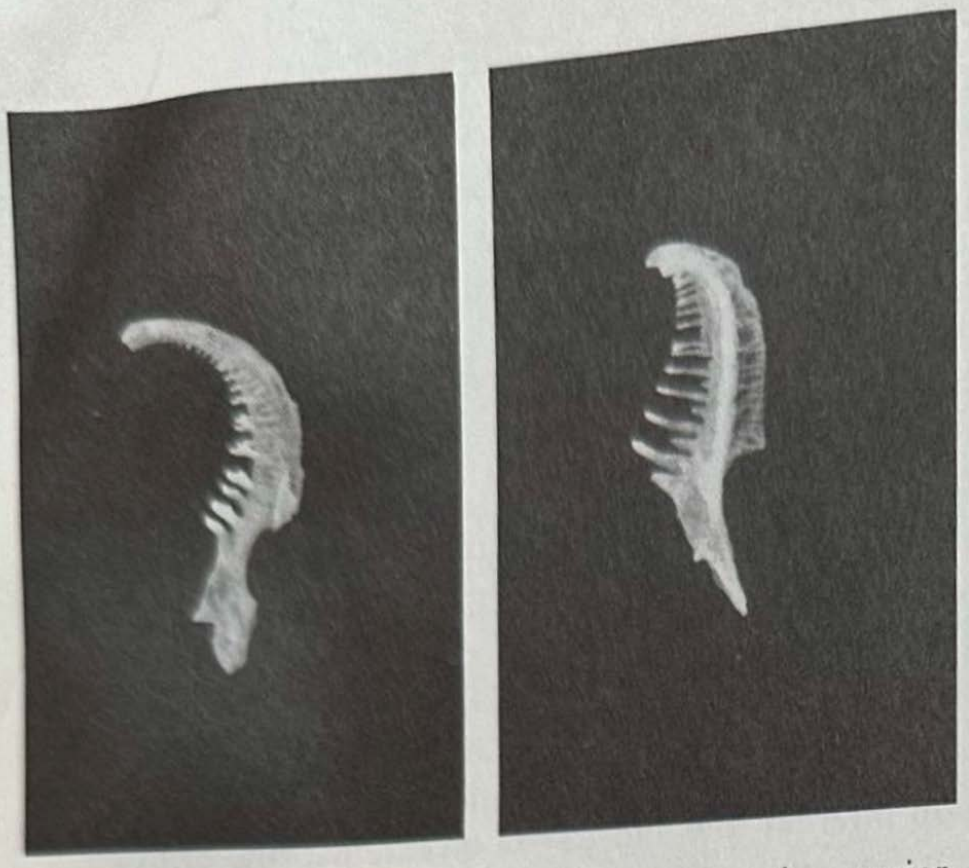
Characteristics

Coloration: Back and upper sides tan to dark green; lower sides and abdomen fading to silvery yellow; peritoneum black.

Head: Terete; snout broadly rounded. Mouth ventral, large; upper lips with small, evenly scattered papillae over the margin and oral surface, anterior surface smooth; median notch on lower lip shallow, separated from the lower jaw ridge by 6–7(4–7) rows of papillae; lateral notches at commissure of upper and lower lips well developed; jaws with cartilaginous scraping edges (Fig. 155). Median cartilaginous ridge of mandible truncate; SL/width of ridge = 15.3(11.5–24.4). SL/HL = 3.9–4.3; SL/HD = 6.3–7.0; SL/Isth W = 6.9–11.8. Gill rakers in double rows; 38–59 on internal row and 28–43 on external row of first arch in specimens larger than 70 mm standard length. Free edges of gill rakers with numerous minute spines. Pharyngeal teeth in single row, generally 31–41 per arch; medial teeth widely spaced, weakly bifurcate, diminishing in size towards the dorsal apex, becoming straplike and ultimately spinous near the tip (Fig. 156). As in other members of the subgenus (in New



155. *Catostomus clarki*—mouth, ventral view.



156. *Catostomus clarki*—pharyngeal arch; left, anterior view; right, posterior view.

Mexico), frontoparietal fontanelle usually closed in adult.

Body: Terete, slightly depressed ventrally. Average standard length 100–380 mm; maximum length about 325 mm. In New Mexico, scales in lateral line 69(61–81) (higher counts recorded elsewhere). Predorsal scales 23(15–30). Scales above the lateral line 9(7–11); circumferential scales of the caudal peduncle 25(23–28). Gut up to 8.8 times standard length, generally with 10 loops. Vertebrae 46–49(45–51) (Snyder 1979). SL/Caud Ped D = 10.7(8.8–13.7).

Fins: Dorsal triangular. Pectorals lanceolate, elongate, extending posteriorly to or beyond the anus. Pelvics with inguinal process reduced or absent. Anal elongate, bluntly pointed. Caudal shallowly notched, lobes bluntly pointed. Rays: Dorsal 10–11(8–12); pectorals 15; pelvics 8–12; anal 7; caudal 18.

Sexual Differences: In some populations, both sexes display an orange red lateral stripe during breeding (Smith 1966).

Diagnosis

The ventral mouth and well developed notches at the junction of the upper and lower jaws distinguishes this species as a member of the subgenus *Pantosteus*. *Catostomus* (*P.*) *clarki* can be separated from other members of the subgenus by a much lower number of predorsal scales 23(15–30) and a lower number of scales, 71(64–81), in the lateral line. The truncate median cartilaginous ridge of the lower jaw distinguishes it from *C.* (*P.*) *plebeius* which has a rounded lower jaw. Marker loci which biochemically differentiate *C.* (*P.*) *clarki* from other New Mexico species of the subgenus *Pantosteus* have been given by Col... tree and Buth (1987).

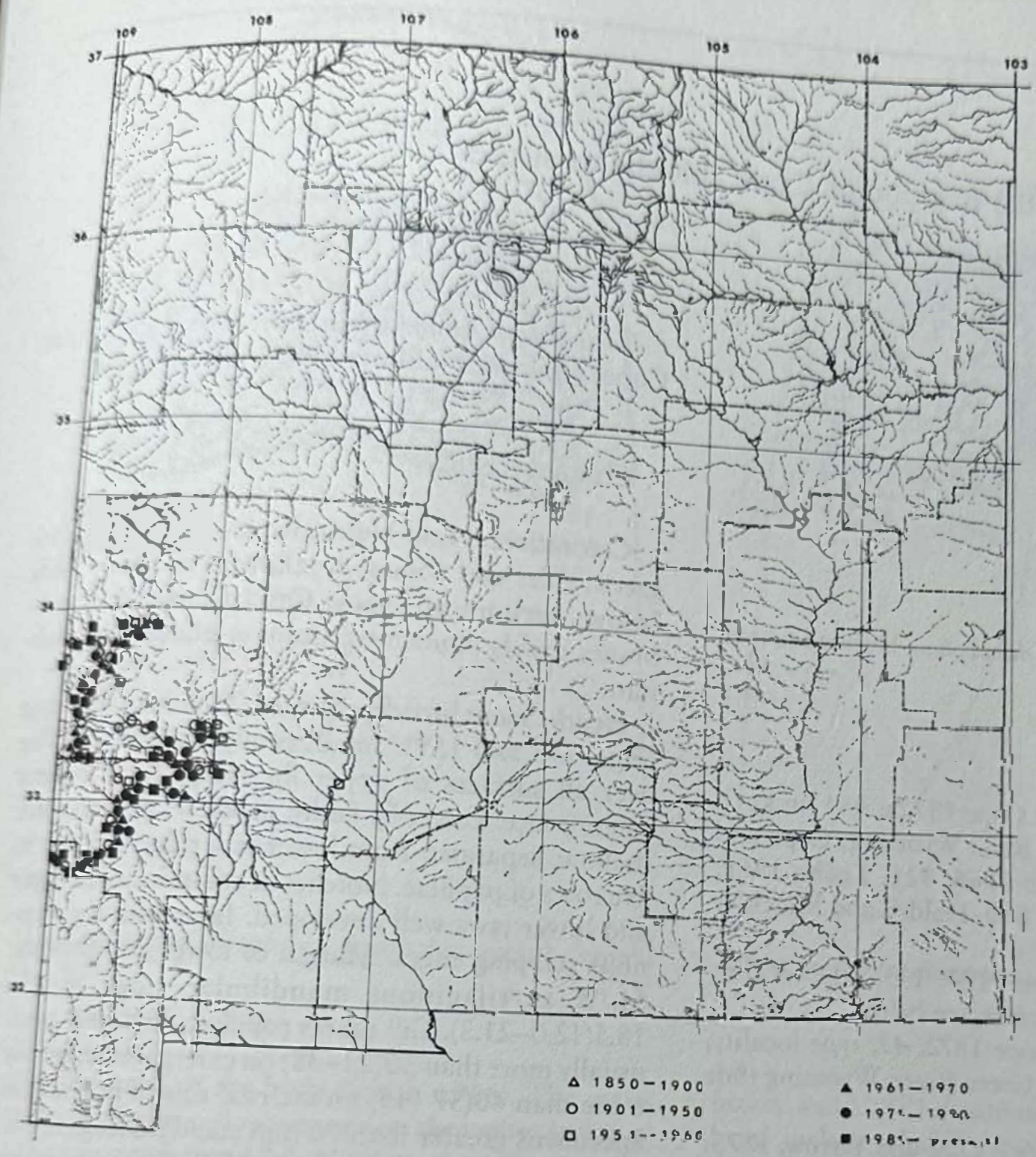
Biology

The desert sucker is found in rapids and flowing pools of streams, primarily over bottoms of gravel, rubble with sandy silt in the interstices. Studies by Bestgen et al. (1987) indicate that *C. clarki* is very sedentary in the Gila and San Francisco rivers of New Mexico and Arizona, exhibiting little seasonal movement and resisting downstream displacement in spite of two major floods there during the 1980s. Preferred temperature of desert suckers from the Virgin River is believed to be 17.5°C with extremes in modal bounds ranging from 10.0–21.0°C based on the distribution of differentially acclimated fish along a thermal gradient (Deacon et al. 1987). However, the desert sucker is highly adaptive to a wide range of temperatures. The critical thermal maximum for the desert sucker from the Virgin River was found to be 32.30 and 37.17 when acclimated at 10 and 25°C respectively (Deacon et al. 1987).

Spawning occurs in riffles in the late winter or early spring. After hatching, juveniles gather in quiet pools near the bank, moving to swifter waters as they mature.

Chironomid larvae are the primary food of juveniles (Kobetich 1969). As an adult, this species is primarily herbivorous, scraping aufwuchs from stones as well as ingesting plant detritus (Smith 1966; Kobetich 1969; Clarkson and Minckley 1988). Large amounts of sand and silt are occasionally found in the gut suggesting that it also feeds in the interstitial sediment of rubble-boulder substrates. Greger and Deacon (1988) reported the gut contents to be a "fine, diatom-rich clay-like material . . . such as occurs on diatom-coated rocks in areas of moderate current." Kobetich (1969) found diatoms to be a minor part of the diet, with filamentous green algae the primary food source; animal components of the aufwuch that are also ingested include Chironomidae, Ephemeroptera, Simuliidae, and Pyralididae (Kobetich 1969), all typical inhabitants of riffles.

The desert sucker spawns in early spring and the larvae are mature by the second year of life at a length of 85–120 mm standard length (Smith 1966). Experimental studies on oxygen deprivation (Lowe et al. 1967) suggest that it has a lower tolerance to reduced oxygen than other native stream fishes. Together, this species and *C. clarki* constitute 95 percent



Catostomus (Pantosteus) clarki—desert sucker.

of the larval drift in the Gila River (Propst et al. 1987). *Catostomus (P). clarki* is known to hybridize with C. (C.) *insignis* in the Gila River system (Hubbs et al. 1943; Smith 1966).

Parasites of this species have been described by Mpoarne (1982) and Mpoame and Rinne (1983).

Distribution

New Mexico: Catostomus (P.) clarki is native in the Gila basin and the San Francisco drainage except in extreme headwater situations. The species is stable in the state.

Other: The desert sucker occurs in suitable habitats of the lower Colorado River downstream from the Grand Canyon, generally including tributary streams of the Gila River drainage upstream of Gila, Arizona, along with the Virgin River basin of Utah, Arizona, and Nevada including the pluvial White River and Meadow Valley Wash.