Species Account – *Catostomus latipinnis*

Fig. 20. ***Catostomus latipinnis*** adult (© Joseph R. Tomelleri).

Adult Description: Usually 30-40 cm, but up to 60 cm TL. Lacking conspicuous predorsal keel. Caudal peduncle slender, typically ≤6% SL. Mouth inferior, moderate in size; lacking prominent cartilaginous ridges along inside of jaws. Lips large, fleshy, profuse with large papillae, without notches at corners; lower lip with a deep median cleft allowing one or no rows of papillae to span the two lobes; lobes extend beyond vertical from nostrils, sometimes to eyes. Dorsal fin large and falcate. Scales small. Fontanelle present. (Also, Table 10.)

Reproduction: Non-guarding, open-substrate lithophil. Spawn from April to August, mostly May to mid-June, 6 to at least 13°C (also early autumn in Grand Canyon, possibly elsewhere). Usually over gravel-cobble bars or riffles, or coarse gravel in <1.2 m of water. Sometimes migrate to spawning grounds. Water-hardened eggs 3.8-3.9 mm diameter, demersal, initially adhesive.

Young: Larvae, predominately mesolarvae, drift day or night depending on conditions. Young typically occupy slow to quiet and shallow waters along shore and in backwaters or pools; often in the marginal areas of swift-flowing streams; not common in sluggish, very warm areas.

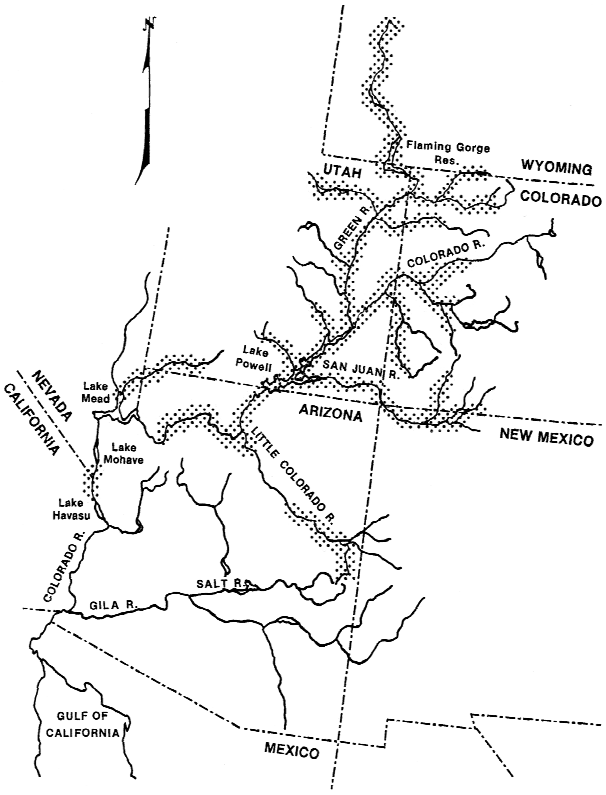

Fig. 21. Recent distribution of ***Catostomus latipinnis*** in the Colorado River Basin.

Table 10. Selected juvenile and adult meristics for *Catostomus latipinnis*. (P = principal rays; R = rudimentary rays; D = dorsal; V = ventral. Scales are lateral series or line when complete. Four added to vertebral count for Weberian complex. Gill rakers for exterior row of first arch, specimens >70 mm SL. Mean or modal values underlined if known and noteworthy; rare values in parentheses.)

Character	Observed*	Literature	Character	Observed*	Literature
Dorsal-fin rays - P	(11)12-13(14)	(10)11-12-13-14(15)	Dorsal-fin rays - R	3-4	–
Anal-fin rays - P	7	7(8)	Anal-fin rays - R	(1)2-3	–
Caudal-fin rays - P	18	–	Caudal-fin rays - RD	10-11-14	–
Pectoral-fin rays	15-16-17	18	Caudal-fin rays - RV	9-10-11	–
Pelvic-fin rays	(9)10(11)	9-10-11	Lateral scales	–	89-98-105-116(-120)
Vertebrae	47-50	–	Gill rakers	–	25-27-31-32(-35)

*From Snyder 1981and Snyder and Muth 1990 and 2004.

Table 11. Size at onset of selected developmental events for *Catostomus latipinnis*. (As apparent under low power magnification. P = principal rays; R = rudimentary rays. Scales are lateral series. Rare values in parentheses. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

Event or structure	Onset or formation mm SL	mm TL	Fin rays or scales	First formed mm SL	mm TL	Last formed mm SL	mm TL
Hatched	(8-)10-11	(8-)10-11	Dorsal - P	15	16	17-18	20-22
Eyes pigmented	(9)10 or *	(9)10 or *	Anal - P	17	18-19	19-20(21)	23-24
Yolk assimilated	(14)15(16)	(15)16-17	Caudal - P	13	13(14)	(14)15(16)	(15)16(17)
Finfold absorbed	23-24(25)	28-29(31)	Caudal - R	(15-)17	(16-)18(19)	23	28-29
Pectoral-fin buds	(9) or *	(9) or *	Pectoral	17	18-19	19-22	22-27
Pelvic-fin buds	(15)16(17)	17-18	Pelvic	17-18	19-20	23	(28)29
* before hatching			Scales	(36)37-39	(44)45-49	39-42	48-51

References: Baird & Girard 1854a, Baxter & Stone 1995, Behnke et al. 1982, Beckman 1952, Bezzerides & Bestgen 2002, Carlson et al. 1979, Douglas & Douglas 2000, Holden 1973, Hubbs & Hubbs 1947, Hubbs & Miller 1953, Hubbs et al. 1943, Jordan & Evermann 1896, Joseph et al. 1977, La Rivers 1962, McAda 1977, Miller 1952, Minckley 1973, Mueller & Wydoski 2004, Prewitt 1977, Sigler & Miller 1963, Snyder 1981, Snyder & Muth 1990 & 2004, Sublette et al. 1990, Tyus et al. 1982, Wheeler 1997, Winn & Miller 1954, Woodling 1985.

Table 12. Size at developmental interval (left) and gut phase (right) transitions for *Catostomus latipinnis*. (See Figure 5 for phases of gut folding. Rare values in parentheses. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

Transition to	mm SL	mm TL	Transition to	mm SL	mm TL
Flexion mesolarva	13	13(14)	2 - 90° bend	(17)18(-20)	(20)21(-24)
Postflexion mesolarva	(14)15(16)	(15)16(17)	3 - Full loop	(19-)21-25(-27)	(23-)26-30(-33)
Metalarva	19-20(21)	23-24	4 - Partial crossover	(22)23-32(-37)	(27)28-39(-46)
Juvenile	23-24(25)	28-29(-31)	5 - Full crossover	(29-)35-42	(36-)40-51

Table 13. Summary of morphometrics and myomere counts by developmental phase for *Catostomus latipinnis*. (See Figure 4 for abbreviations and methods of measurement and counting. Protolarvae with unpigmented eyes excluded. Mean and SD values of 0 actually between 0.0 and 0.5. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

	Protolarvae (N=9)			Flexion mesolarvae (N=10)			Postflexion mesolarvae (N=20)			Metalarvae (N=15)			Juveniles (N=19)		
	$\bar{x}$	±SD	Range	$\bar{x}$	±SD	Range	$\bar{x}$	±SD	Range	$\bar{x}$	±SD	Range	$\bar{x}$	±SD	Range
SL, mm	11	1	10 - 13	14	1	13 - 15	17	2[m]	14 - 20	22	1	20 - 25	32	6	23 - 43
TL, mm	12	1	11 - 13	14	1	14 - 16	19	3[m]	15 - 24	27	2[h]	24 - 31	40	7	29 - 53
Lengths %SL															
AS to AE	2	0	2 - 3	3	1	3 - 4	6	1	3 - 7	7	1	6 - 8	8	1	7 - 10
PE	7	1	6 - 9	9	1	8 - 10	12	1	9 - 14	13	1	12 - 14	14	1	13 - 15
OP1	14	1	12 - 16	18	1	16 - 19	23	2	19 - 27	26	1	24 - 28	25	1	24 - 28
OP2							53	1[a]	50 - 54	55	1	52 - 57	55	1	52 - 57
PY	78	2	75 - 81	69	9	48 - 75	60	8[b]	50 - 72						
OPAF	54	19	32 - 77	26	3	22 - 32	34	5[c]	27 - 44	55	11	34 - 67			
ODF	35	2	33 - 38	38	2	35 - 40	44	3[d]	36 - 48	45	0[i]	45 - 45			
OD							50	1[a]	49 - 51	49	1	47 - 51	48	1	46 - 49
ID							64	1[e]	62 - 67	65	1	62 - 67	65	1	61 - 66
PV	79	1	77 - 81	77	1	75 - 78	78	1	76 - 80	75	2	74 - 78	74	1	72 - 76
OA							78	1[f]	76 - 80	75	1	74 - 78	75	1	72 - 77
IA							84	1[g]	83 - 84	82	1	81 - 84	82	1	80 - 85
AFC							110	2[m]	107 - 112	113	1	111 - 114	114	1[j]	112 - 116
PC	103	1	102 - 105	105	1	104 - 107	113	4[m]	107 - 123	122	2[h]	117 - 125	123	1	121 - 125
Y	61	5	54 - 67	42	17[l]	0 - 54	7	14[m]	0 - 46						
P1	6	2	3 - 9	11	1	9 - 12	12	1	10 - 15	16	1	14 - 18	18	1	16 - 19
P2							4	2	0 - 7	11	2	9 - 13	14	1	11 - 15
D							18	2[a]	15 - 21	22	1	20 - 24	24	1	23 - 26
A							8	1[d]	5 - 9	12	2	9 - 14	14	1	12 - 16
Depths %SL															
at BPE	8	1	7 - 9	10	1	9 - 11	13	1	11 - 16	16	1	15 - 17	16	1	15 - 17
OP1	9	1	8 - 10	11	1	10 - 12	16	2	13 - 18	19	1	16 - 21	19	1	17 - 22
OD	14	1	13 - 15	11	1	9 - 13	14	3[c]	10 - 19	19	2	16 - 22	19	1	17 - 22
BPV	5	1	4 - 6	6	0	5 - 6	8	1	6 - 10	11	1	9 - 12	11	1	10 - 13
AMPM	3	1	2 - 3	3	0	3 - 4	6	1	4 - 7	7	0	6 - 8	7	0	7 - 8
Max. yolk	12	3	9 - 16	5	3[l]	0 - 9	0	1[m]	0 - 3						
Widths %SL															
at BPE	8	1	6 - 9	10	1	9 - 12	13	1	10 - 15	16	1	14 - 17	15	1	15 - 17
OP1	7	1	6 - 9	7	1	6 - 8	11	1	8 - 13	14	1	13 - 16	16	1	14 - 17
OD	10	1	7 - 11	6	1	5 - 8	8	2	6 - 12	12	1	10 - 15	13	2	11 - 17
BPV	3	0	3 - 4	4	1	4 - 6	6	1	4 - 8	7	1	6 - 8	8	1	6 - 9
AMPM	2	0	1 - 2	2	0	1 - 2	3	0	2 - 3	4	0	3 - 4	4	0	3 - 5
Max. yolk	13	3	9 - 18	5	3[l]	0 - 9	1	2[m]	0 - 5						
Myomeres															
to PY	38	1	37 - 39	34	5	22 - 38	28	6[b]	21 - 35						
OPAF	23	11	10 - 37	7	2	5 - 10	9	3[c]	6 - 15	22	8[e]	9 - 32			
OP2							21	1[a]	19 - 23	22	1[e]	21 - 24	22	1[k]	21 - 23
ODF	12	2	10 - 15	13	1	12 - 15	15	1[h]	12 - 17	15	1[i]	14 - 15			
OD							18	1[a]	17 - 21	18	1[e]	16 - 19	18	1[k]	17 - 19
PV	39	1	38 - 40	39	1	38 - 40	39	1	37 - 40	37	1[e]	36 - 38	37	1[k]	36 - 38
Total	48	1	47 - 49	48	1	47 - 49	48	1	47 - 49	47	1[e]	46 - 48	48	1[k]	47 - 48
After PV	9	1	8 - 10	9	1	8 - 11	9	1	8 - 10	10	0[e]	9 - 10	11	1[k]	9 - 12

[a]N = 17. [b]N = 6. [c]N = 19. [d]N = 12. [e]N = 14. [f]N = 15. [g]N = 7. [h]N = 13. [i]N = 2. [j]N = 18. [k]N = 9. [l]N = 11. [m]N = 25.

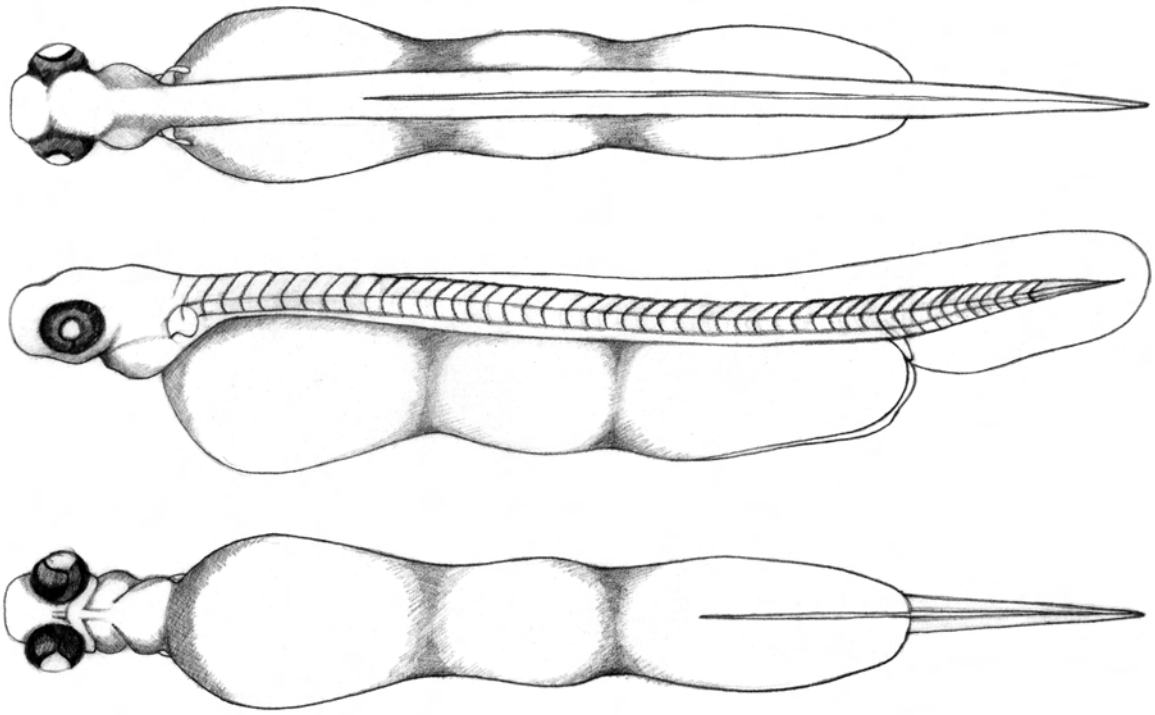

Fig. 22. ***Catostomus latipinnis*** protolarva, recently hatched, 10.3 mm SL, 10.6 mm TL. (Cultured in 1978 with stock from the Yampa River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

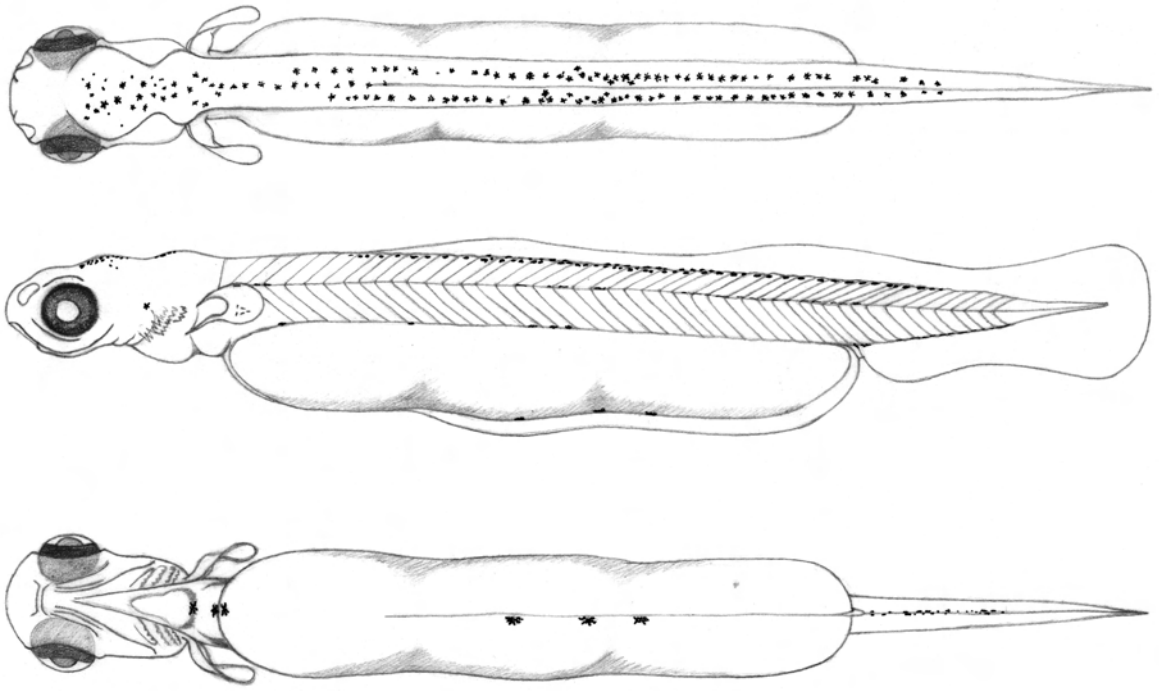

Fig. 23. ***Catostomus latipinnis*** protolarva, 12.4 mm SL, 12.9 mm TL. (Cultured in 1978 with stock from the Yampa River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

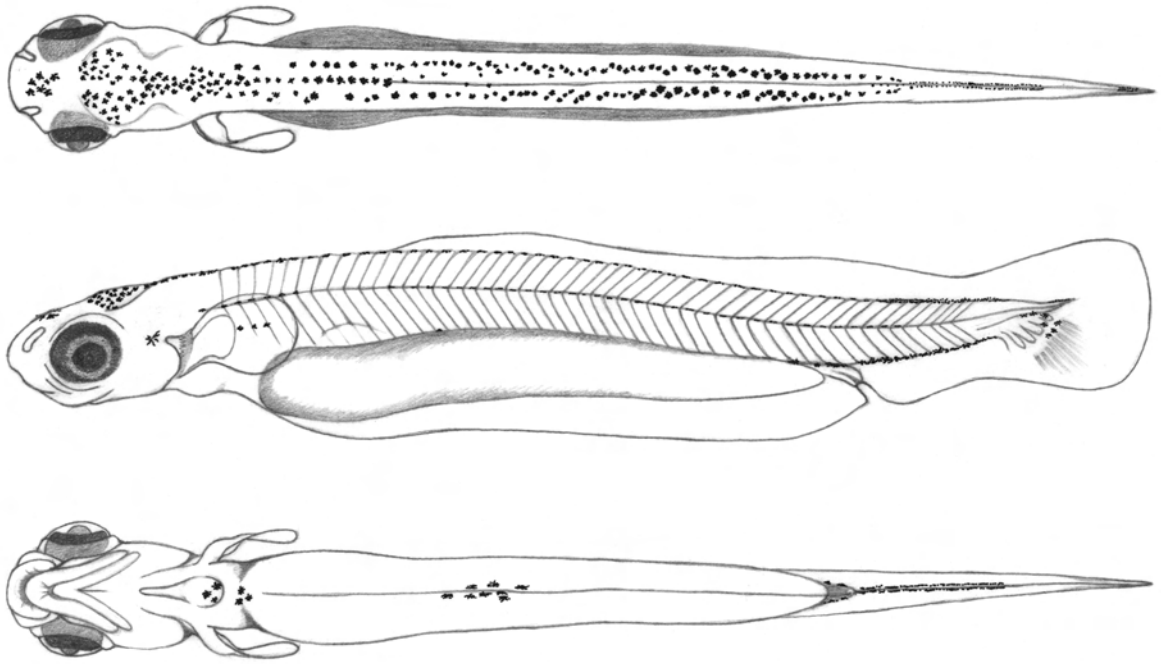

Fig. 24. ***Catostomus latipinnis*** flexion mesolarva, recently transformed, 13.0 mm SL, 14.0 mm TL. (Cultured in 1978 with stock from the Yampa River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

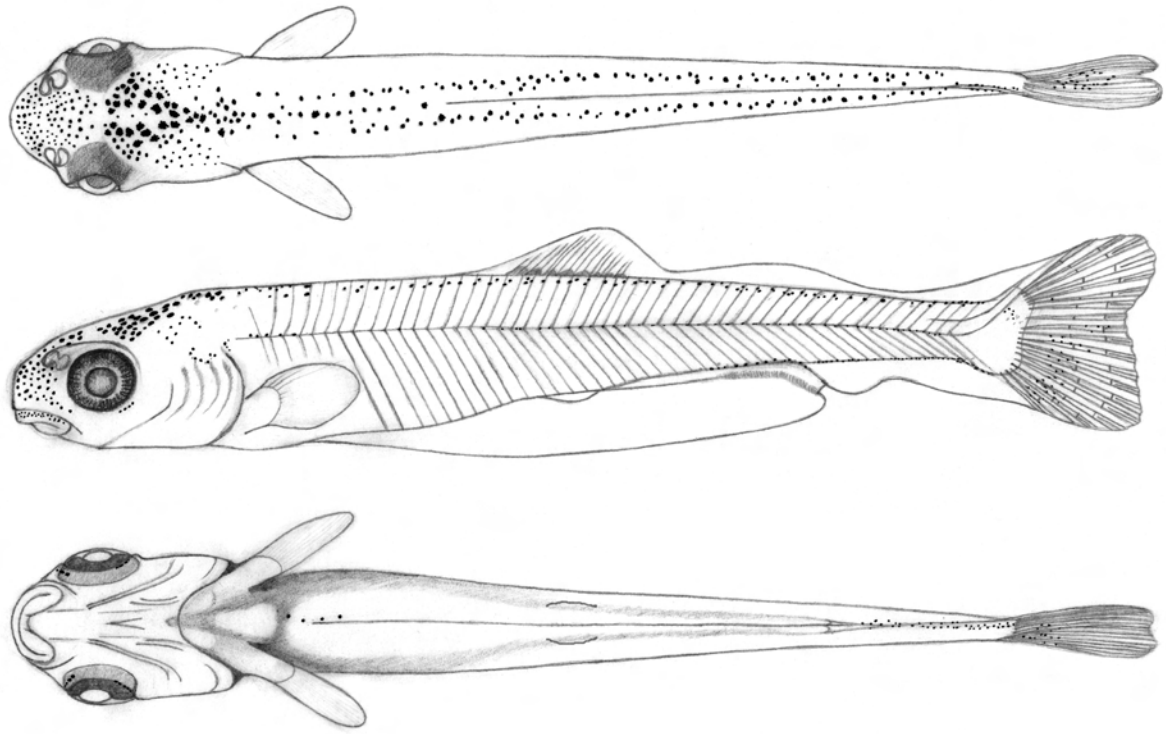

Fig. 25. ***Catostomus latipinnis*** postflexion mesolarva, 16.8 mm SL, 18.9 mm TL. (Collected in 1976 from the White River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

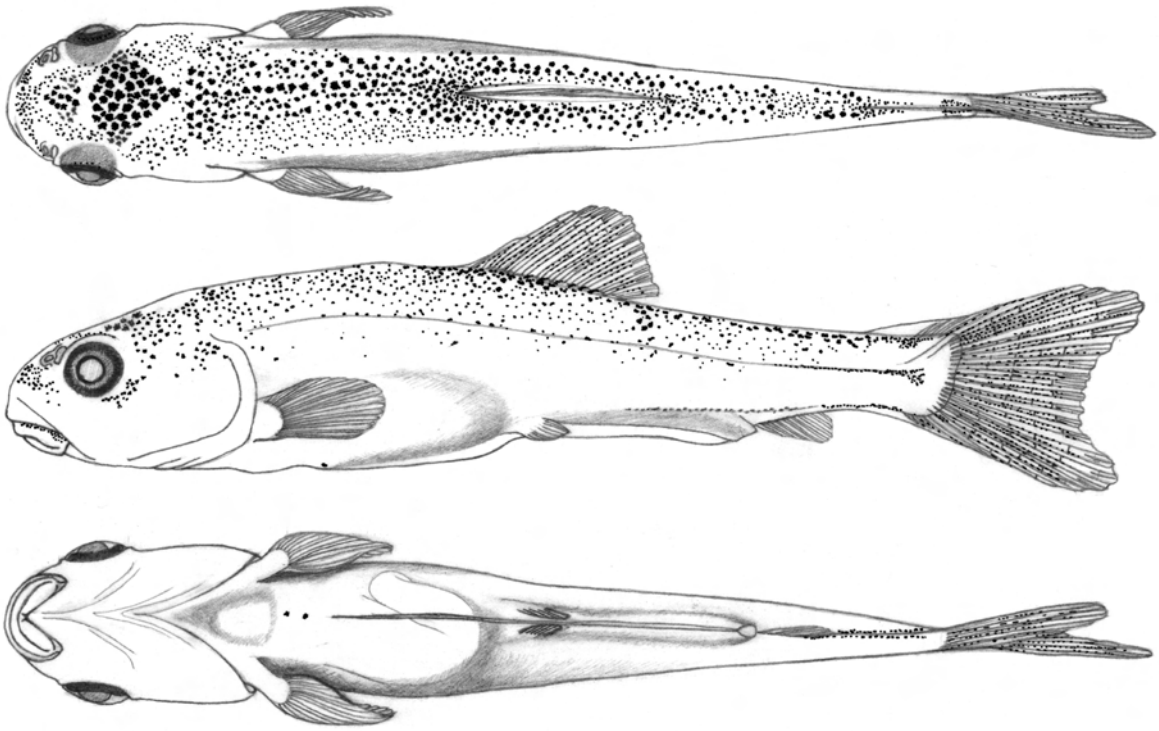

Fig. 26. ***Catostomus latipinnis*** metalarva, recently transformed, 20.5 mm SL, 24.5 mm TL. (Collected in 1976 from the White River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

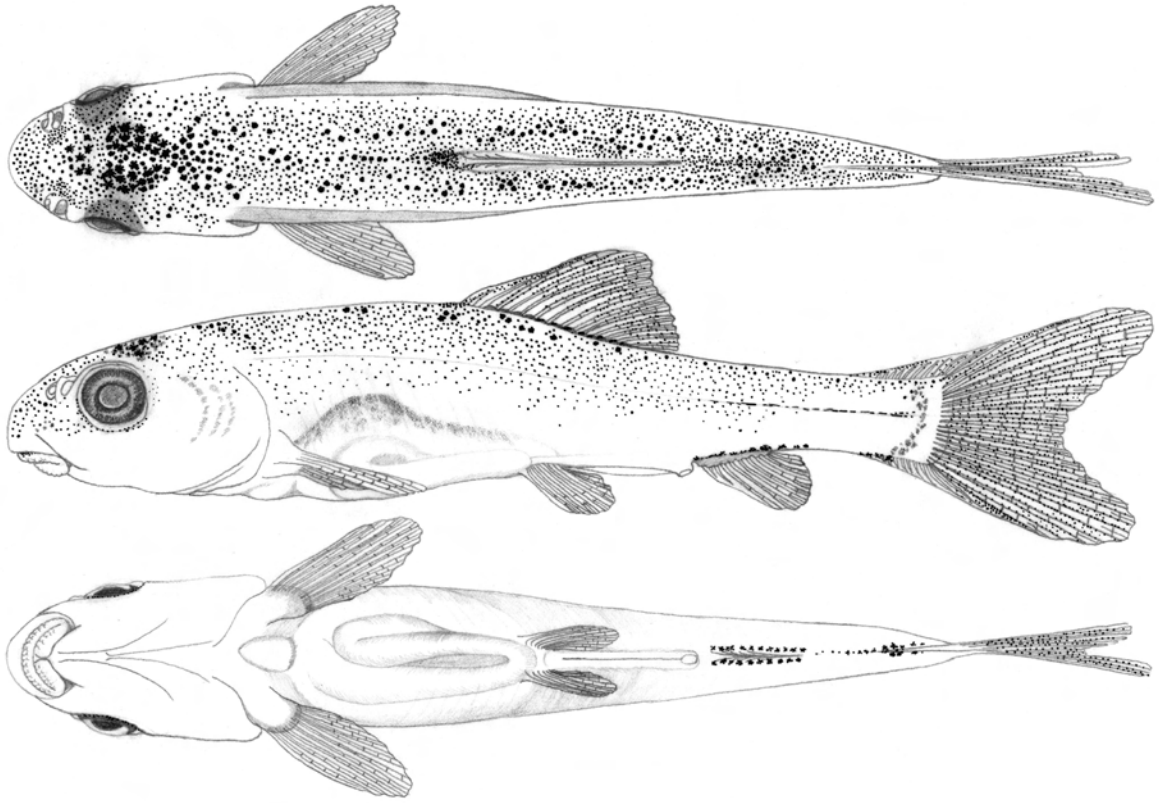

Fig. 27. ***Catostomus latipinnis*** metalarva, 22.7 mm SL, 27.5 mm TL. (Collected in 1976 from the White River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

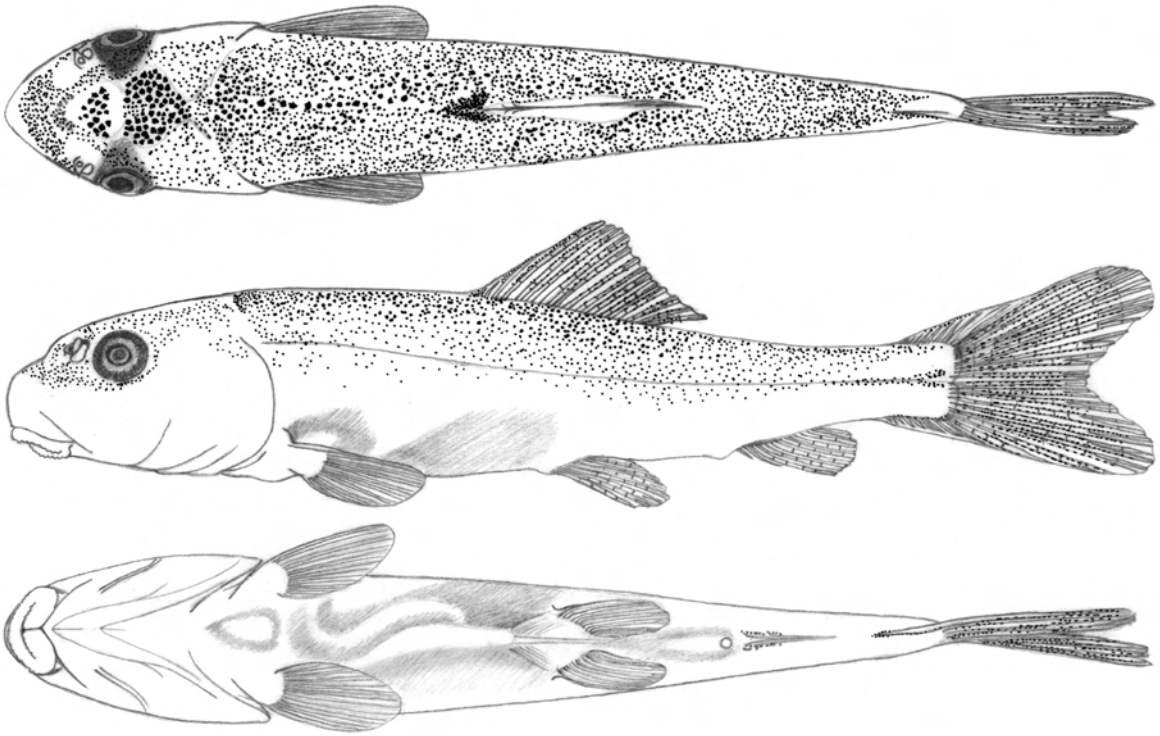

Fig. 28. ***Catostomus latipinnis*** juvenile, recently transformed, 26.6 mm SL, 32.0 mm TL. (Collected in 1976 from the White River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)

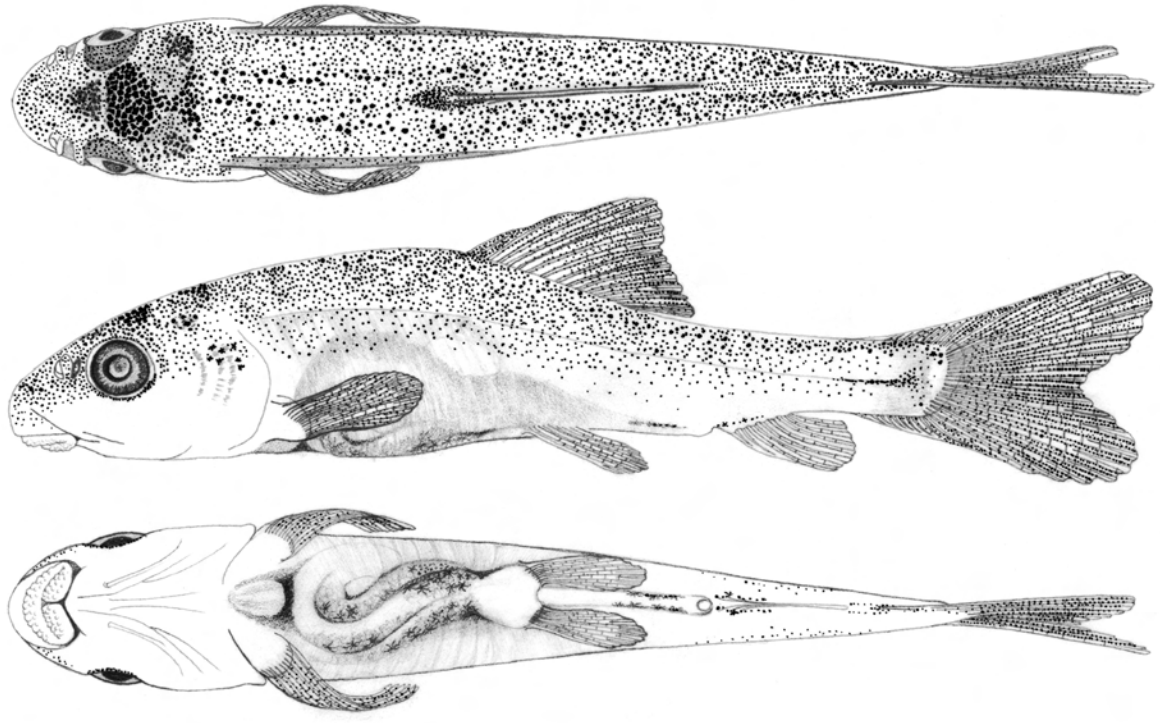

Fig. 29. ***Catostomus latipinnis*** juvenile, 31.6 mm SL, 38.0 mm TL. (Collected in 1976 from the White River, Colorado. From Snyder 1981 and Snyder and Muth 1990 and 2004.)