Species Account – *Pimephales promelas*

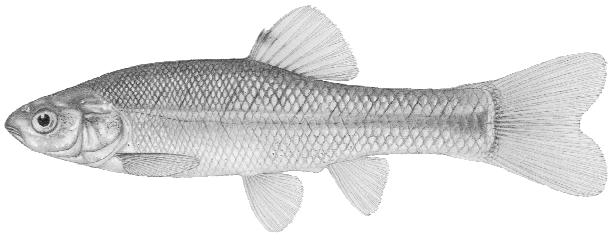

Fig. 116. ***Pimephales promelas*** adult (© Joseph R. Tomelleri).

Adult description: Small, 5-10 cm TL. Heavy-bodied and round to oval in cross section. Mouth terminal, small, somewhat oblique, and without barbels. Head and snout rounded, head about 25 % of SL. Dorsal fin short and rounded; last rudimentary ray is short and thickened. Scales moderately large in lateral series, but smaller and crowded dorsally before dorsal fin. Usually olivaceous above, silvery-grey laterally, and white below, sometimes with a moderately distinct single lateral band. Breeding males often black dorsally and dark brown laterally with light vertical bands behind head and between dorsal and pelvic fins, or with dark saddles over body; have a few heavy tubercles concentrated on snout. (Also, Table 54.)

Reproduction: Guarding nest spawner. Spawn from early March to mid-September, or later when water reaches day-time highs of at least 16-18°C, usually in low-velocity areas such as backwaters or pools. Territorial males mate with several females, one at a time. Females deposit clutches of adhesive eggs on the exposed undersides of solid surfaces (e.g., rocks, vegetation); males guard the eggs which are 1.2-1.6 mm in diameter.

Young: Hatch in 4-6 d at 23-30°C. Larvae occupy near-shore, low-velocity channel margins, backwaters, eddies, and pools and consume early instars of chironomids and other small invertebrates, as well as algae and detritus.

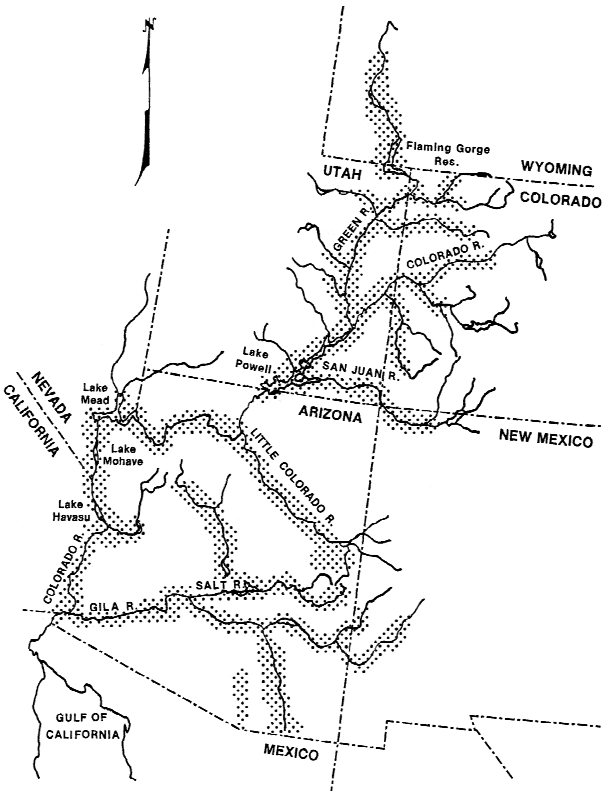

Fig. 117. Recent distribution of ***Pimephales promelas*** in the Colorado River Basin.

Table 54. Selected juvenile and adult meristics for *Pimephales promelas*. (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. Pharyngeal teeth given as left outer row, inner row/right inner row, outer row. Mean or modal values underlined if known and noteworthy; rare values in parentheses.)

Character	Observed*	Literature	Character	Observed*	Literature
Dorsal-fin rays - P	(7)8(9)	(7)8(9)	Dorsal-fin rays - R	2	1
Anal-fin rays - P	7	7	Anal-fin rays - R	–	–
Caudal-fin rays - P	19	19	Caudal-fin rays - RD	–	–
Pectoral-fin rays	14-15-16-17	14-15-16-18	Caudal-fin rays - RV	–	–
Pelvic-fin rays	8-9	8-9	Lateral scales	–	40-44-48-54(-60)
Vertebrae	35-36-37-38	35-37-38	Pharyngeal teeth	–	0,4/4,0

*Original data from Snyder (1981).

Table 55. Size at onset of selected developmental events for *Pimephales promelas*. (As apparent under low power magnification. P = principal rays; R = rudimentary rays. Scales are lateral series. Rare values in parentheses. Mostly from Snyder et al. 1977 and Snyder 1981.)

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	4(5)	4(5)	Dorsal - P	–	–	8-9	9-10
Eyes pigmented	*	*	Anal - P	–	–	8-9	9-10
Yolk assimilated	4-5(6)	5(6)	Caudal - P	6-7	6-7	7-8	(7)8
Finfold absorbed	13-15	16-18	Caudal - R	–	–	~13-15	~16-18
Pectoral-fin buds	*	*	Pectoral	–	–	–	–
Pelvic-fin buds	8-9	9-10	Pelvic	–	–	–	–
* before hatching			Scales	–	–	16-<23	20-<28

References: Andrews and Flickinger 1972, Baxter and Simon 1970, Becker 1983, Beckman 1952, Eddy and Underhill 1974, Gale and Buynak 1982, Heufelder and Fuiman 1982, Hubbs and Lagler 1958, Lentsch et al. 1996, Minckley 1973, Moore 1968, Moyle 1976, Muth and Snyder 1995, Page and Burr 1991, Perry 1979, Perry and Menzel 1979, Pfleiger 1975, Snyder 1981, Snyder et al. 1977, Scott and Crossman 1973, Sublette et al. 1990.

Table 56. Size at developmental interval (left) and gut phase (right) transitions for *Pimephales promelas*. (See Figure 5 for phases of gut folding. Rare values in parentheses. From Snyder et al. 1977 and Snyder 1981.)

Transition to	mm SL	mm TL	Transition to	mm SL	mm TL
Flexion mesolarva	6-7	6-7	2 - 90° bend	8-11	10-13
Postflexion mesolarva	7-8	(7)8	3 - Full loop	11(12)	(13)14
Metalarva	8-9	9-10	4 - Partial crossover	15-19	18-23
Juvenile	13-15	16-18	5 - Full	19-20	(23)24(25)

Table 57. Summary of morphometrics and myomere counts by developmental phase for *Pimephales promelas*. (See Figure 4 for abbreviations and methods of measurement and counting. Protolarvae with unpigmented eyes excluded. Data for mesolarvae not segregated into flexion and postflexion subphases; no data for juveniles. SD value of 0 actually between 0.0 and 0.5. Except as noted, approximated by calculation or adjustment from Snyder et al. 1977.)

	Protolarvae (N=5)			Flexion & Postflexion Mesolarvae (N=5)			Metalarvae (N=5)		
	$\bar{x}$	±SD	Range	$\bar{x}$	±SD	Range	$\bar{x}$	±SD	Range
SL, mm	5		4 - 5	7		6 - 8	10		8 - 13
TL, mm	5		4 - 6	8		6 - 9	12		9 - 16
Lengths %SL									
AS to AE	2		1 - 2	3		3 - 3	5		5 - 5
PE	9		8 - 10	12		12 - 14	14		13 - 16
OP1	19		18 - 21	22		21 - 24	27		24 - 30
OP2							54		51 - 57
PY	–	[a]	- 61						
OPAF	–	[a]	31 - 56	–			–		
ODF	42		39 - 45	46		41 - 50			
OD				–			54		50 - 57
ID							–		
PV	62		61 - 64	69		65 - 72	71		65 - 75
OA							–		
IA							–		
AFC				109		107 - 112	113		111 - 117
PC	105		105 - 106	112		109 - 116	120		116 - 123
Y	–	[a]	0 - 53						
P1	12		5 - 14	12		12 - 14	13		12 - 15
P2							6		2 - 10
D							–		
A							–		
Depths %SL									
at BPE	15	[b]	13 - 16	16	[b]	15 - 17	19	[b]	16 - 22
OP1	15	[c]	13 - 24	15	[c]	13 - 16	19	[c]	16 - 23
OD				–			–		
BPV	–			–			–		
AMPM	–			–			–		
Max. yolk	–	[a]	0 - 22						
Widths %SL									
at BPE									
OP1	11	[c]	7 - 20	10	[c]	10 - 13	16	[c]	12 - 20
OD				–			–		
BPV	–			–			–		
AMPM	–			–			–		
Max. yolk	–	[d]	0 - 20						
Myomeres									
to PY	–								
OPAF	–			–			–		
OP2				–			14		12 - 15
ODF	12		10 - 13	12		10 - 13			
OD				–			15		12 - 16
PV	23		21 - 24	24		22 - 25	23		22 - 25
Total	36		34 - 37	37		35 - 38	35		34 - 36
After PV	13		13 - 15	13		12 - 14	12		11 - 13

[a]Data extracted from drawings of protolarvae in Snyder et al. (1977), N = 1 for AS-PY, N = 2 for others. [b]Maximum head depth, including yolk in smallest protolarvae. [c]Maximum body depth or width, probably near or somewhat behind OP1. [d]Based on maximum body width for protolarvae which would also be maximum width of yolk for specimens with much yolk.

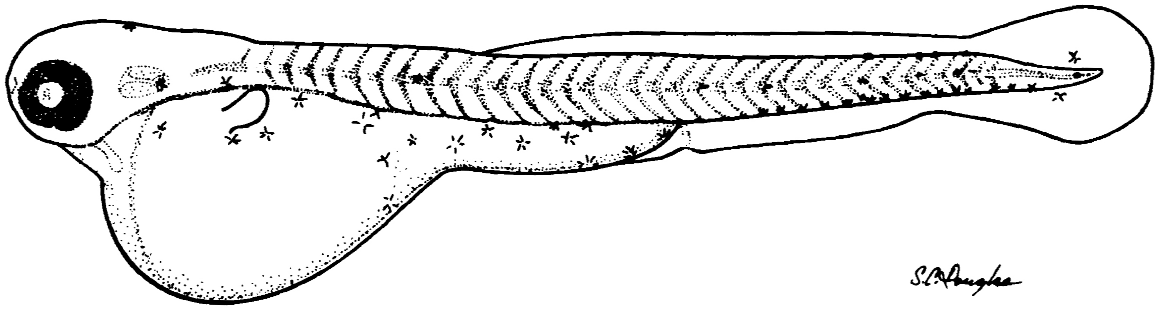

Fig. 118. ***Pimephales promelas*** protolarva, recently hatched, 4.1 mm SL, 4.3 mm TL. (From Snyder et al. 1977.)

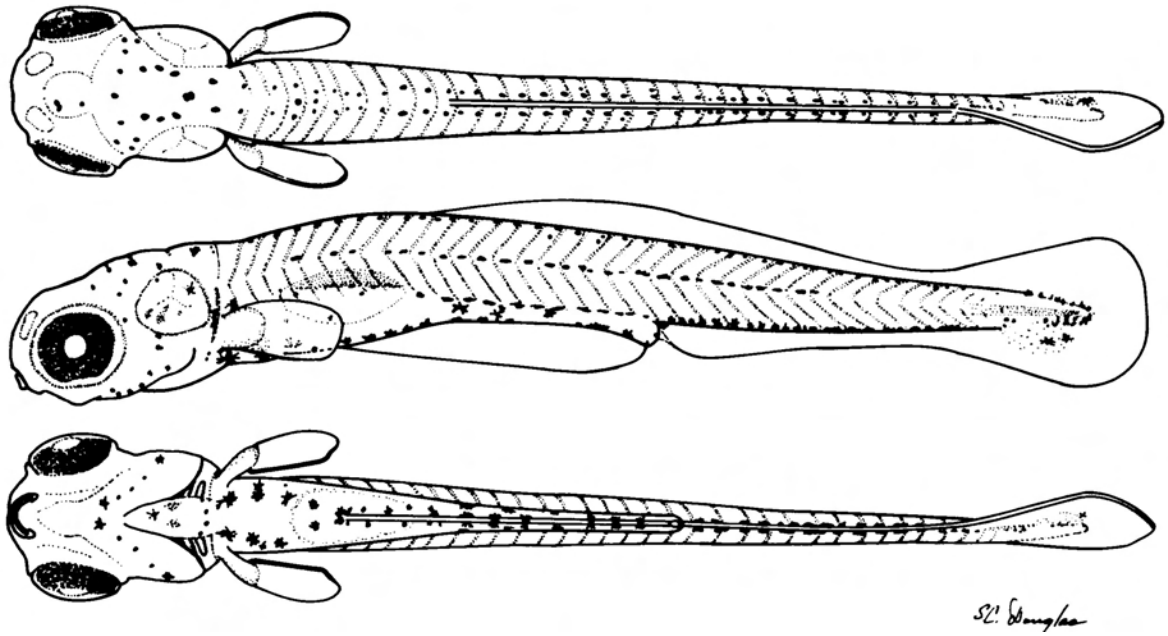

Fig. 119. ***Pimephales promelas*** protolarva, 5.3 mm SL, 5.6 mm TL. (From Snyder et al. 1977.)

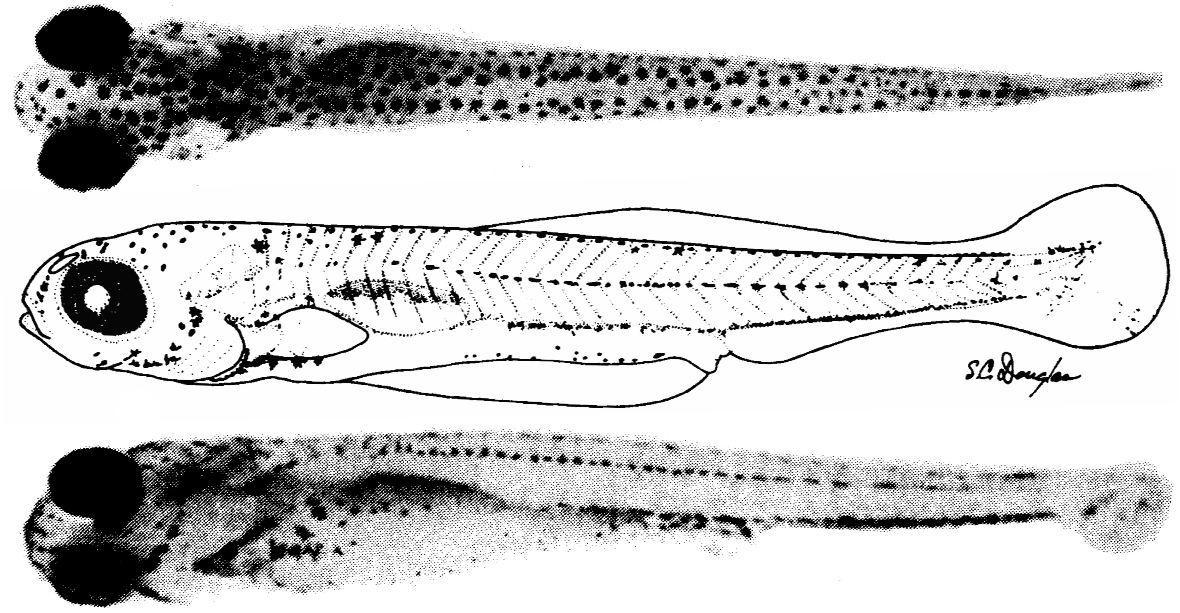

Fig. 120. ***Pimephales promelas*** flexion mesolarva, recently transformed, 7.5, 6.1, and 7.5 mm SL (top to bottom), 8.0, 6.5, and 8.0 mm TL. (From Snyder et al. 1977 and Perry 1979.)

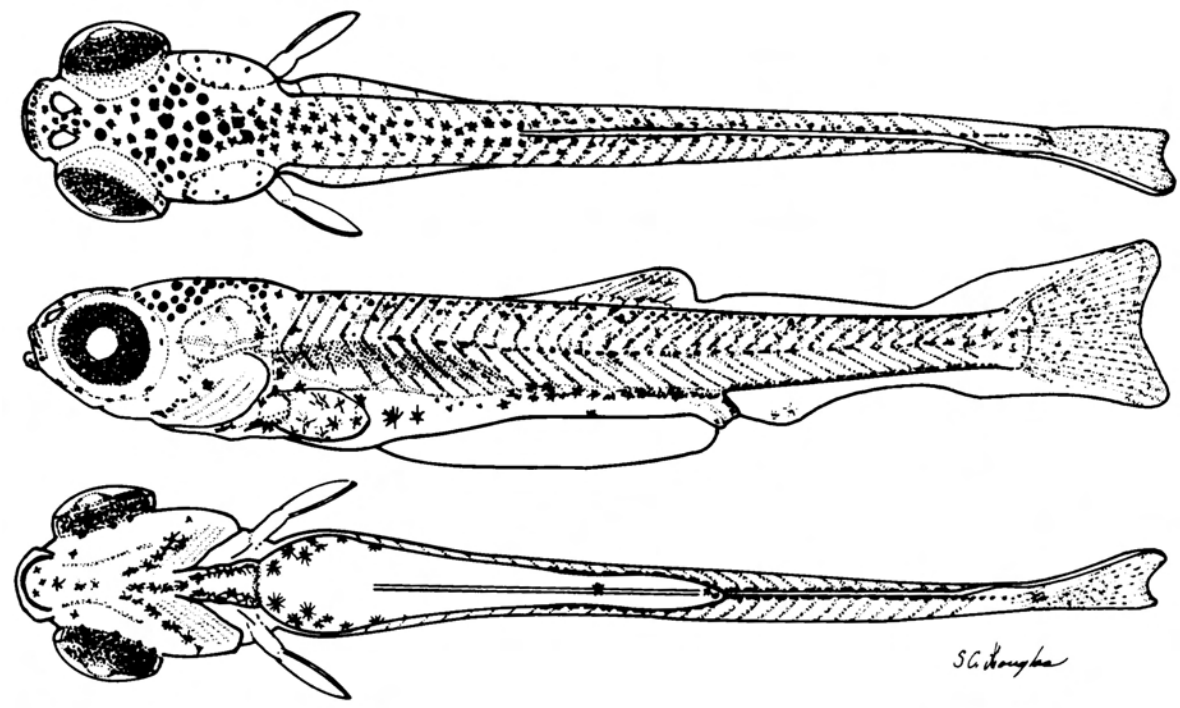

Fig.121. ***Pimephales promelas*** postflexion mesolarva, 7.0 mm SL, 7.9 mm TL. (From Snyder et al. 1977.)

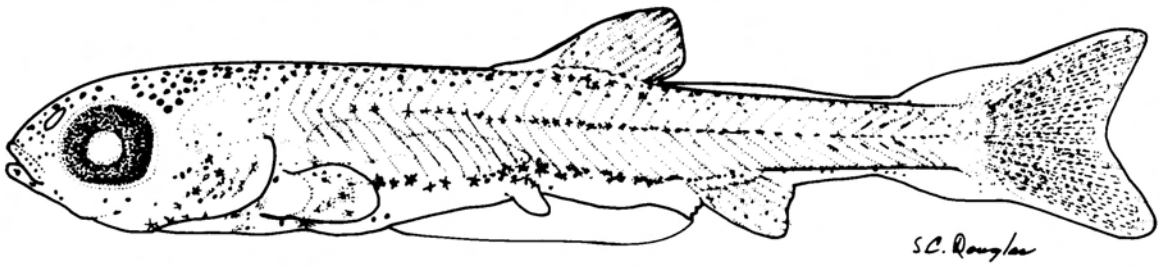

Fig. 122. ***Pimephales promelas*** metalarva, recently transformed, 8.0 mm SL, 9.3 mm TL. (From Snyder et al. 1977.)

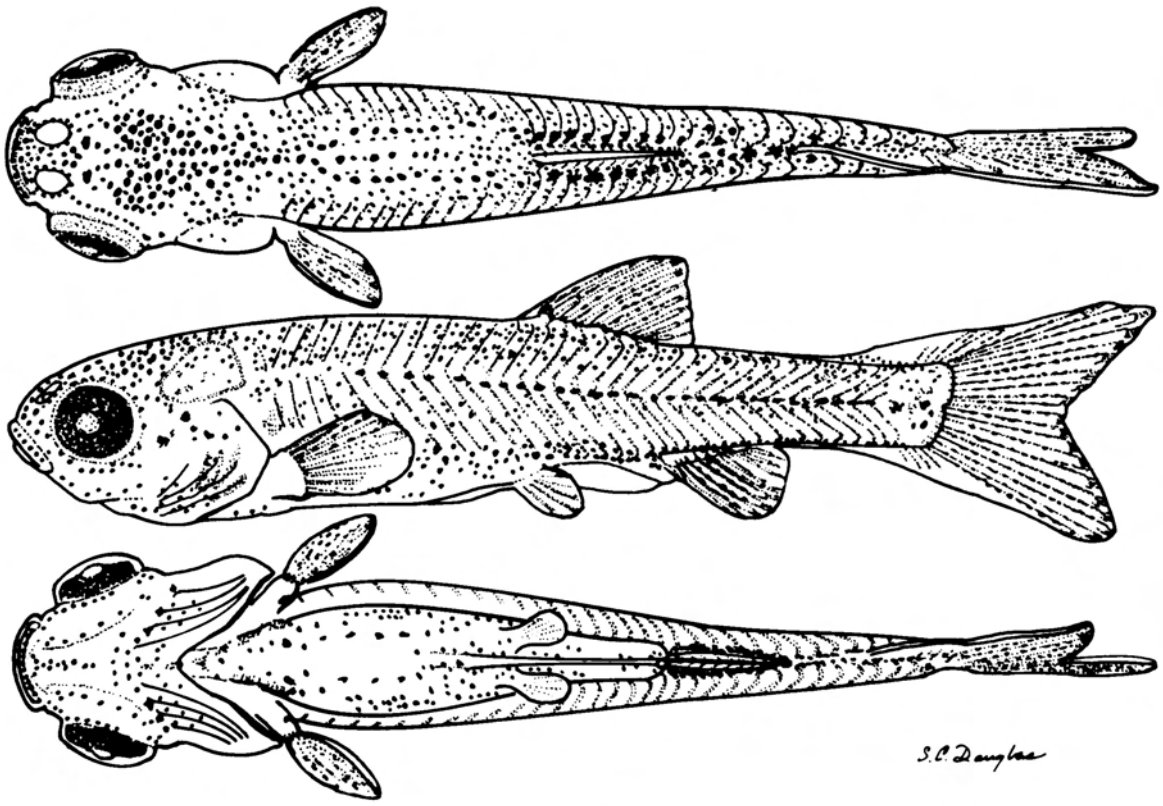

Fig. 123. ***Pimephales promelas*** metalarva, 12.0 mm SL, 14.3 mm TL. (From Snyder et al. 1977.)

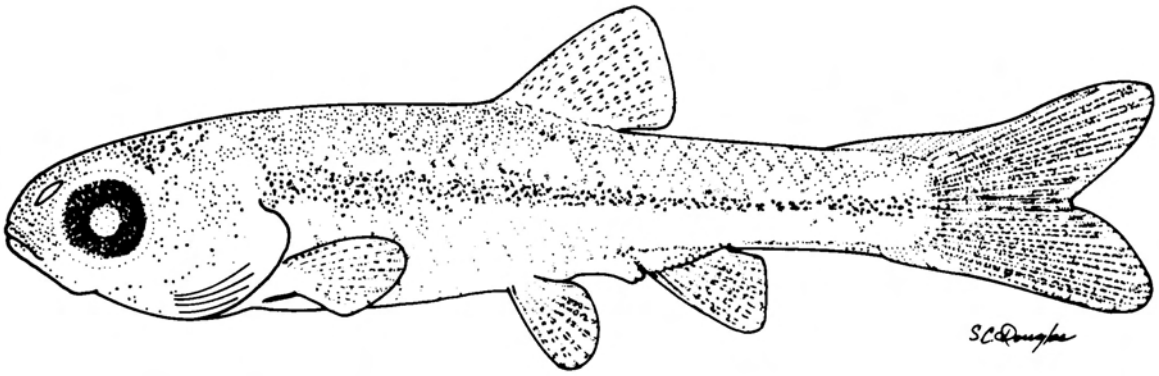

Fig. 124. ***Pimephales promelas*** juvenile, recently transformed, 16.0 mm SL, 19.6 mm TL. (From Snyder et al. 1977.)

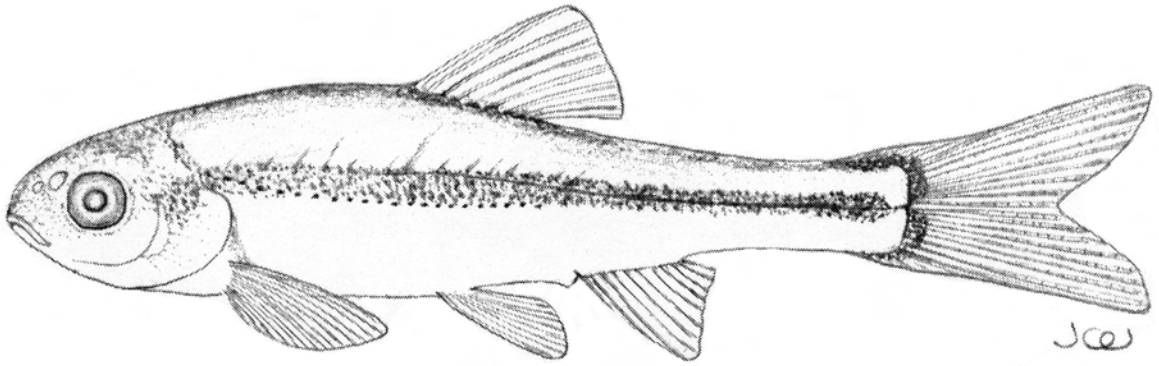

Fig. 125. ***Pimephales promelas*** juvenile, 33.7 mm SL, 42.5 mm TL. (From Wang 1986.)