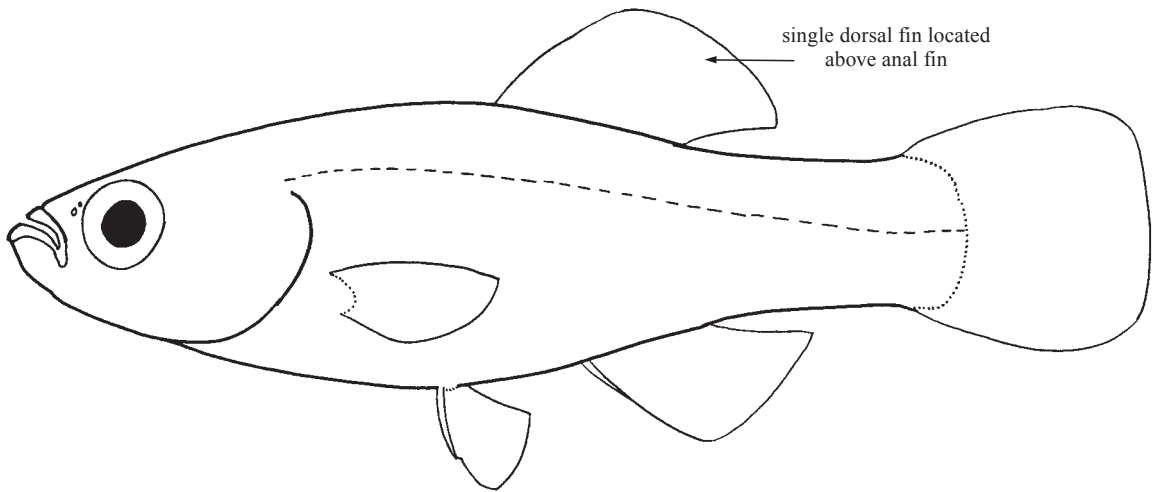


**FUNDULIDAE****Fundulid killifishes**

by E.O. Wiley, Museum of Natural History, Kansas, USA and M.J. Ghedotti, Regis University, Colorado, USA

**Diagnostic characters:** Small fishes (5 to 30 cm). Body elongate to moderately deep. Head flattened, scaled; mouth wide, terminal, oblique, and protrusible. **Fine conical teeth present on edges of jaws. No spines in fins. Single dorsal fin set at approximately midbody above anal fin** and with 7 to 16 soft rays. Origin of dorsal fin slightly anterior to slightly posterior to origin of anal fin. Anal fin with 9 to 15 soft rays. Third anal-fin ray branched in males and females. Caudal fin rounded. Pectoral fins short, rounded, and inserted below the pit organs of lateral line. Pelvic fins abdominal in position and with 6 soft rays. Lateral line reduced to series of separate pit organs along side. Body with large cycloid scales. Sexes usually dimorphic, males having larger anal fins. **Colour:** Variable among and within species, ranging from plain grey (non-breeding *Lucania parva*) to combinations of spots, vertical bars, or stripes. Males frequently differ from females and juveniles in colour pattern, especially when breeding.

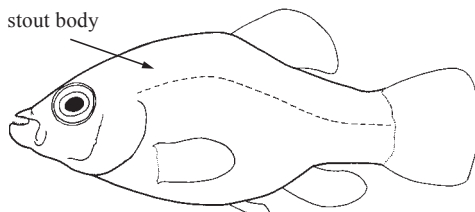
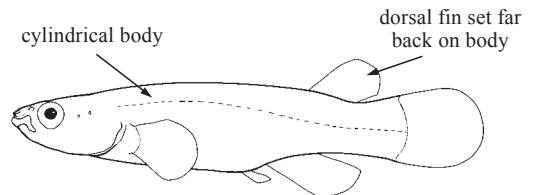


**Habitat, biology, and fisheries:** Highly adaptable to varying conditions of temperature and salinity. All are oviparous. Most species restricted to fresh water, but other species inhabit estuaries and salt marshes, and some are coastal marine and are even found in hypersaline waters. Diet includes aquatic vegetation, insects, other small invertebrates, and small fishes. Most live near surface or just off bottom in shallow waters. None of the fundulids occurring in Area 31 are of commercial importance, but some of the larger ones (*Fundulus grandis*, *Fundulus grandissimus*) might be consumed locally. Fundulid killifishes were classified with cyprinodontid pupfishes until recently.

**Similar families occurring in the area**

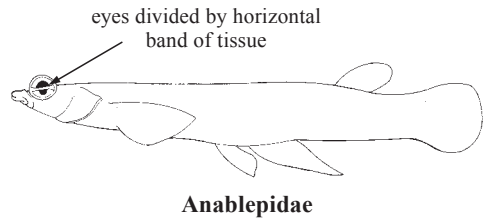
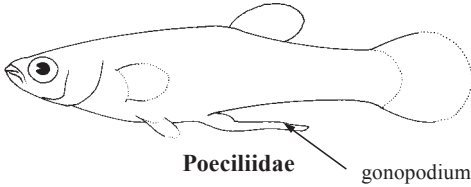
Cyprinodontidae: generally stouter bodied (the killifish *Adinia xenica* excepted); jaw teeth tricuspid.

Rivulidae: generally more cylindrical, supraorbital sensory canal open, without sensory pores, dorsal fin set far back on body, its origin over last 2 or 3 anal-fin rays (saltwater species only).

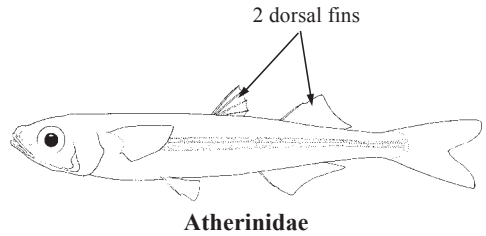
**Cyprinodontidae****Rivulidae**

Poeciliidae: males with long anal fin modified into a non-tubular intromittent organ (gonopodium); third anal fin ray unbranched; viviparous.

Anablepidae: eyes divided by horizontal band of opaque tissue into upper and lower halves; anal fin in males forms tubular intromittent organ (gonopodium); dorsal fin set far back on body, approximately halfway between anal and caudal fins.



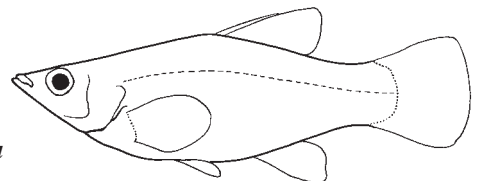
Atherinidae: 2 dorsal fins, the first with 3 to 9 slender spines, the second with 1 anterior spine; anal and pelvic fins also with spines, pectoral fins set high on body, pelvic fins thoracic; no lateral line; most species with lateral silvery stripe; caudal fin forked.



**Key to the species of Fundulidae occurring in the area**

This key is valid only for the species appearing in the checklist of species and not for all fundulid taxa, most of which are fresh water and occur only sporadically in brackish waters. Please note that many of the species are allopatric and that possible identification should be checked against geographic occurrence. The Florida Keys populations of *Fundulus similis* are distinctive and may be another species. *Fundulus grandis* and *F. saguanus* are treated as a single species by many authors.

- 1a. Jaw teeth in a single row; any teeth behind the row not organized into rows; 8 or fewer scale rows between origin of dorsal fin and origin of anal fin . . . . . *Lucania parva*
- 1b. Jaw teeth in more than a single row; 9 or more scale rows between origin of dorsal fin and origin of anal fin. . . . . → 2



**Fig. 1** *Adinia xenica*

- 2a. Body stout and trapezoidal in adults, body depth usually 2 to 3 times in standard length; scales large, fewer than 30 scales along midlateral scale row (Fig. 1). . . . . *Adinia xenica*
- 2b. Body slender, body depth more than 3 times in standard length; scales small, more than 30 scales along midlateral scale row. . . . . → 3
- 3a. Dorsal fin origin distinctly behind origin of anal fin; dorsal-fin soft rays 8 to 11. . . . . → 4
- 3b. Dorsal fin origin over or anterior to anal fin origin; dorsal-fin soft rays 10 to 15 . . . . . → 5

- 4a. Males and females with 15 or more large dark spots on sides of body; males lacking dark ocellus on dorsal fin (Fig. 2) . . . . . *Fundulus jenkensi*
- 4b. Males and females lacking dark spots on body, males with dark ocellus on dorsal fin (Fig. 3) . . . . . *Fundulus luciae*

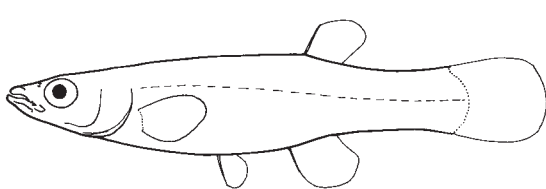


Fig. 2 *Fundulus jenkensi*

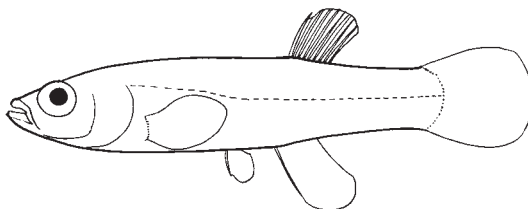


Fig. 3 *Fundulus luciae*

- 5a. Total mandibular pores in both jaws 8 (Fig. 4a) . . . . . → 6
- 5b. Total mandibular pores in both jaws 10 to 12 (Fig. 4b). . . . . → 11
- 6a. Mouth distinctly below a horizontal line drawn through the middle of the eye (Figs 5, 6, 7) . . . . . → 7
- 6b. Mouth level with, or slightly above, a horizontal line drawn through the middle of the eye (Fig. 8) . . . . . → 9

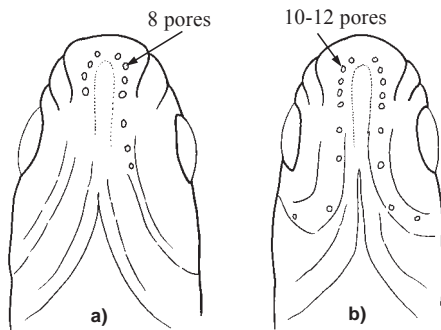


Fig. 4 mandibular pores

- 7a. Females with 2 or 3 dark horizontal stripes on side of body, males with about 12 vertical bars on side of body (Fig. 5) . . . . . *Fundulus majalis*
- 7b. Females lacking horizontal stripes on side of body; males and females with vertical bars on side of body . . . . . → 8

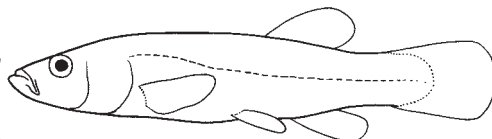


Fig. 5 *Fundulus majalis*

- 8a. Frequently with a dark spot on upper base of caudal peduncle (may be diffuse or missing in some individuals), dorsal-fin rays 10 to 14 (mode 12); anal-fin rays 9 to 12 (mode 10); ratio of head length to mouth width 3.15 to 3.75 (Fig. 6) . . . . . *Fundulus similis*
- 8b. No dark spot on upper base of caudal peduncle; dorsal-fin rays 9 to 11 (mode 10); anal-fin rays 9 or 10 (mode 9); ratio of mouth width to head length 3.8 to 4.5 . . . . . *Fundulus persimilis*
- 9a. Origin of dorsal fin distinctly anterior to origin of anal fin, more pronounced in males; males with dark and silvery vertical bars on side of body, silvery dots between bars (Fig. 7) . . . . . *Fundulus heteroclitus*
- 9b. Origin of dorsal fin more or less over origin of anal fin; males with numerous dark vertical bars on side of the body but lacking silvery dots . . . . . → 10

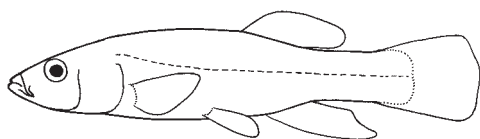


Fig. 6 *Fundulus similis*

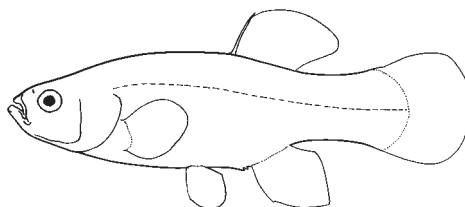


Fig. 7 *Fundulus heteroclitus*

- 10a. Females with large black spots on body, concentrated along lateral sensory pores and sometimes forming horizontal lines; males variably with dorsal fin ocellus (Fig. 8) . . . . . *Fundulus pulverus*
- 10b. Females lacking dark spots but with vertical bars posteriorly; females with dorsal fin ocellus, males lacking ocellus (Fig. 9). . . . . *Fundulus confluentus*

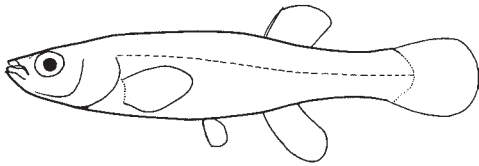


Fig. 8 *Fundulus pulverus*

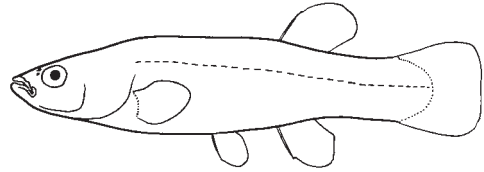


Fig. 9 *Fundulus confluentus*

- 11a. Total mandibular pores 10 in both jaws, (Figs 5, 10) . . . . . *Fundulus grandis complex*
- 11b. Total mandibular pores 12 in both jaws . . . . . *Fundulus grandissimus*

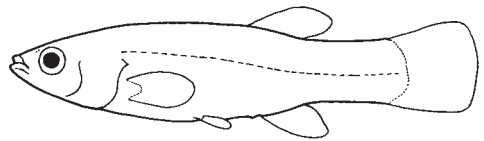


Fig. 10 *Fundulus grandis complex*

**List of species occurring in the area**

Only species occurring in brackish or sea water. The following species show some salt-tolerance, but probably do not occur in estuaries and rarely in salt marshes: *Fundulus chrysotus*, *Fundulus diaphanus*, *Fundulus nottii*, *Fundulus olivaceus*, *Fundulus seminolis*, *Lucania goodei*.

- Adinia xenica* (Jordan and Gilbert, 1882). N Gulf Coast from the tip of Florida to S Texas.
- Fundulus confluentus* Goode and Bean, 1879. From 35 N S along the Atlantic Coast of the USA and W on the N Gulf Coast to the vicinity of Mobile, Alabama.
- Fundulus grandis* Baird and Girard, 1853. St. Johns River, Florida, USA S and W to Laguna de Tamiahua, Veracruz, Mexico. Populations in Florida Keys and lower Florida Peninsula may be *F. saganus*.
- Fundulus grandissimus* Hubbs, 1936. Restricted to the N Yucatán Peninsula around Progreso.
- Fundulus heteroclitus* (Linnaeus, 1766). From 35 N to NE Florida, US.
- Fundulus jenkinsi* (Evermann, 1892). N Gulf Coast from Galveston Bay, Texas E to Escambia Bay, W Florida.
- Fundulus luciae* (Baird, 1855). From 35 N along the Atlantic Coast to Georgia.
- Fundulus majalis* (Walbaum, 1792). 35 N S to the Matanzas River, NE Florida.
- Fundulus persimilis* Miller, 1955. N Yucatán Peninsula in the vicinity of Rio Lagartos.
- Fundulus pulvereus* (Evermann, 1892). From the vicinity of Mobile Bay, Alabama W and S along the Gulf Coast to the vicinity of Corpus Christi, Texas. Reports of occurrence on the Atlantic Coast N of Florida are doubtful.
- Fundulus saganus* Rivas, 1948. Cuba and possibly the Florida Keys and S Florida Peninsula.
- Fundulus similis* (Baird and Girard, 1854). Matanzas River, NE Florida and S and W to just N of Tampico, Mexico. Populations in the Florida Keys and possibly the lower Florida Peninsula are distinctive and may represent another species.
- Lucania parva* (Baird and Girard, 1855). From 35 N, S, and W along the Atlantic and Gulf Coasts to NE Mexico.

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