A Larva of the Poorly Known Serranid Fish *Jeboehlkia gladifer* (Teleostei: Serranidae: Epinephelinae)*

Carole C. Baldwin
Virginia Institute of Marine Science, School of Marine Science
College of William and Mary, Gloucester Point, Virginia 23062

G. David Johnson
Division of Fishes, National Museum of Natural History
Smithsonian Institution, Washington, D.C. 20560

Jeboehlkia gladifer Robins, 1967, was described from a single mature female collected at 165 m (90 fm) in the Caribbean Sea. Several additional specimens have been collected recently in similarly deep waters of the Caribbean and western North Atlantic (R.G. Gilmore, Harbor Branch Found., Ft. Pierce, FL, pers. commun., Fall 1990). Robins (1967) noted a strong resemblance between *J. gladifer* and the epinepheline genus *Liopropoma*, but accorded the former generic status on the basis of absence of pored lateral line scales. Several features of the holotype—its small size (40.8 mm standard length, SL), elongate dorsal fin spine, produced pelvic fin rays, and large eye—appear paedomorphic with respect to other epinephelines (Kendall 1984).

The following description of larval *Jeboehlkia* is based on a single specimen, 10.2 mm SL, collected between 10 and 300 m in Atlantic slope water off New York (MCZ 81740, Fig. 1). The specimen is in poor condition, lacks pigment (but possibly it is naturally unpigmented), and is bent in half at midbody; nonetheless, it is identifiable as *J. gladifer* on the basis of counts and morphology of fin rays. The holotype (USNM 201422) has the following counts: dorsal fin rays VIII,9; anal fin rays III,7; pectoral fin rays 15; pelvic fin rays I,5; principal caudal fin rays 17 and vertebrae 24. The spinous dorsal fin in the larval specimen is incomplete, but the larva clearly has nine dorsal-fin soft rays, a meristic feature unique among Atlantic Epinephelinae to *Jeboehlkia* (see Kendall 1979, Table 1). Corroborating the identification of this specimen as *Jeboehlkia* is the presence of seven anal-fin soft rays, 15 pectoral fin rays, and a thin, flexible, elongate second dorsal fin spine. Although Robins (1967) stated that the holotype has seven dorsal-fin spines and that the first spine is the elongate element, an examination of a radiograph of the holotype indicates that the first spine is only an unexposed nubbin and was overlooked by Robins; consequently, there is a total of eight (not seven) dorsal-fin spines. The tiny first spine is the only element borne in supernumerary association with the first dorsal fin pterygiophore, and the elongate (second) spine in larval *Jeboehlkia* is serially associated with the first dorsal pterygiophore, a hallmark of all known larvae of the Epinephelinae.

The specimen was illustrated (flattened right-side-up beneath a glass microscope slide) with the aid of a camera lucida and then photographically reversed. The pectoral fin was drawn from the left side of the body, and myomeres were reconstructed from a combination of vertebrae (partially visible on the damaged right side of the body) and myomeres (partially visible on the left side of the body). Counts, measurements, and qualifications of morphometric features (e.g., moderately deep, large) follow Leis and Trnski (1989). Standard length is abbreviated as SL; institutional acronyms are as listed in Leviton et al. (1985).

The postflexion larva of *J. gladifer* is laterally compressed, moderately deep (body depth at pectoral fin base 34.5% SL), and has a large head (42.4% SL). The specimen essentially is eviscerated, but the anus is evident just posterior to midbody (56.5% SL). The eye is round, moderately large, and greater in diameter than the length of the snout (diameter of eye 11.0% SL, length of snout 9.4% SL). The mouth is large, the maxilla reaching just beyond middle of the eye.

The distance between the dorsal and ventral body margins of the caudal peduncle is 15.7% SL (between dashed lines on caudal peduncle in Figure 1), but the total depth of the peduncle is greater (18.6% SL between solid lines on caudal peduncle in Figure 1). This disparity is due to the presence of two blade-like sheaths of modified tissue that lie above and below the dorsal and ventral margins of the caudal peduncle, respectively, and extend from the posterior bases of the dorsal and anal fins to the caudal fin. This tissue contains numerous small globules (of fat?). Tissue with a similar appearance covers the procurrent rays of the caudal fin and appears along the lengths of most principal caudal fin rays, on the rays of the soft dorsal and anal fins, and on the head.

* Contribution 1650 of the Virginia Institute of Marine Science.

Manuscript accepted 30 January 1991.
Fishery Bulletin, U.S. 89:535–537 (1991).

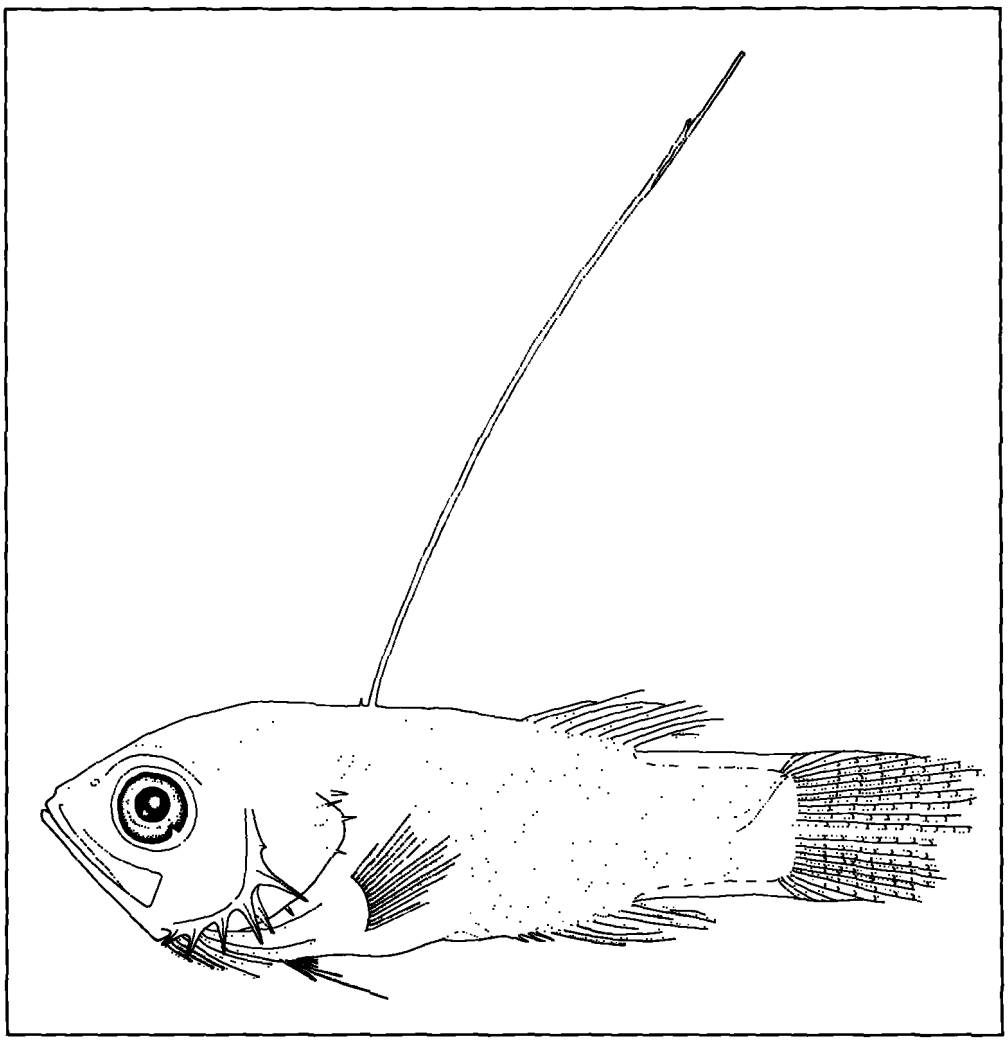

Figure 1
Larva of *Jeboehlkia gladifer*, MCZ 81740, 10.2mm SL, collected in the western North Atlantic Ocean (40°42.0'N, 65°00.3'W).

The longest ray of the pectoral fin measures 15.1% SL, but all rays appear broken, and the original length of the fin is unknown. Pelvic fin rays also appear broken, but the first soft ray on the right side and second on the left side are clearly produced. Robins (1967) noted that the first two pelvic rays are very elongate in the holotype, and both are probably elongate in intact larvae.

The elongate second dorsal-fin spine is thin, flexible, and covered with a sheath of tissue that is torn distally. It measures 105% SL but is broken, and we are unable to determine its original length.

There is a full complement of soft dorsal (9), anal (III,7), pectoral (15), and principal caudal fin rays (9+8). Only the first two dorsal fin spines are visible externally, but four additional tiny spines that have not yet emerged through the skin are apparent in a radiograph of the larva. The procurrent caudal fin rays are difficult to see, but the specimen appears to have three in both the dorsal and ventral caudal lobes, two fewer than the adult complement of 4+4, as determined from a radiograph of the holotype. The pelvic fin bears one spine and five soft rays, the medialmost two of which are closely approximated. All fin spines are smooth.

There are six prominent smooth preopercular spines, the four on the lower limb becoming increasingly antrorse anteriorly. Robins (1967) noted the presence of three strong antrorse spines on the lower limb of the preopercle in the holotype. Our examinations indicate that the three anteriormost antrorse spines in the larval specimen are very similar in morphology and position to those of the holotype and thus provide additional corroborative evidence for the identification of the larval specimen as *J. gladifer*. Antrorse preopercular spines are rare among larval epinephelines (present in some larvae of the epinepheline tribe Epinephelini, Leis 1986), and their presence in larval *J. gladifer*, in combination with other characters, appears diagnostic. The interopercle and supracleithrum each bear one well-developed smooth spine, and a

single small spine is present on the subopercle; spines are lacking on the lateral ridge of the preopercle and supraorbital ridge of the frontal. The frontal bones bear a conspicuous "golf ball-like" pattern of very small pits (not illustrated in Figure 1), not nearly so prominent as the raised network of ridges (rugosity) found in some anthiine and epinephelin serranids. Scales are lacking and presumably have not yet formed.

The relationship of *Jeboehlkia* to other Epinephelinae is unclear. Robins (1967) regarded it as a close relative of *Liopropoma*. Johnson (1983), following Robins, included it in his tribe Liopropomini, but did not examine the holotype. The presence in larval *Jeboehlkia* of a single (vs. two in *Liopropoma*) elongate filamentous dorsal fin spine, robust (vs. weak) spines on the medial preopercular ridge, and absence (vs. presence) of spines on the lateral preopercular ridge suggest affinities with Johnson's (1983) Grammistini (see Baldwin et al. 1991), and some aspects of adult morphology corroborate this. A cladistic analysis of epinepheline genera based on larval and adult morphology, which should elucidate the proper phylogenetic placement of *Jeboehlkia*, is in progress.

Acknowledgments

We thank David Smith (USNM, formerly of MCZ) for loaning us several lots of larval epinephelines (originally Wood's Hole collections) in which the larval specimen of *Jeboehlkia* was discovered. Martin R. Cavalluzzi, John E. Olney, and two anonymous reviewers made helpful comments on the manuscript.

Citations

Baldwin, C.C., G.D. Johnson, and P.L. Colin
1991 Larvae of *Diploprion bifasciatum*, *Belonoperca chabanaudi* and *Grammistes sexlineatus* (Serranidae: Epinephelinae) with a comparison of known larvae of other epinephelines. Bull. Mar. Sci. 48.

Johnson, G.D.
1983 *Niphon spinosus*: A primitive epinepheline serranid, with comments on the monophyly and intrarelationships of the Serranidae. Copeia 1983:777-787.

Kendall, A.W. Jr.
1979 Morphological comparisons of North American sea bass larvae (Pisces: Serranidae).NOAA Tech. Rep. NMFS Circ. 428, 50 p.
1984 Serranidae: Development and relationships. *In* Moser, H.G., et al. (eds.), Ontogeny and systematics of fishes, p. 499-510. Spec. Publ. 1, Am. Soc. Ichthyol. Herpetol., Allen Press, Lawrence KS.

Leis, J.M.
1986 Larval development in four species of Indo-Pacific coral trout *Plectropomus* (Pisces: Serranidae: Epinephelinae) with an analysis of relationships of the genus. Bull. Mar. Sci. 38:525-552.

Leis, J.M., and T. Trnski
1989 The larvae of Indo-Pacific shorefishes. New South Wales Univ. Press, Sydney, and Univ. Hawaii Press, Honolulu, 371 p.

Leviton, A.E., R.H. Gibbs Jr., E. Heal, and C.E. Dawson
1985 Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. Copeia 1985:802-832.

Robins, C.R.
1967 The status of the serranid fish *Liopropoma aberrans*, with the description of a new, apparently related genus. Copeia 1967:591-595.