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Larvae and Juveniles of the Deepsea "Whalefishes" *Barbourisia* and *Rondeletia* (Stephanoberyciformes: Barbourisiidae, Rondeletiidae), with Comments on Family Relationships

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ABSTRACT. Larvae of the deepsea "whalefishes" *Barbourisia rufa* (11: 3.7–14.1 mm nl/sl) and *Rondeletia* spp. (9: 3.5–9.7 mm sl) occur at least in the upper 200 m of the open ocean, with some specimens taken in the upper 20 m. Larvae of both families are highly precocious, with identifiable features in each by 3.7 mm. Larval *Barbourisia* have an elongate fourth pelvic ray with dark pigment basally, notochord flexion occurs between 6.5 and 7.5 mm sl, and by 7.5 mm sl the body is covered with small, non-imbricate scales with a central spine typical of the adult. In *Rondeletia* notochord flexion occurs at about 3.5 mm sl and the elongate pelvic rays 2–4 are the most strongly pigmented part of the larvae. Cycloid scales (here reported in the family for the first time) are developing by 7 mm; these scales later migrate to form a layer directly over the muscles underneath the dermis. By 7 mm sl there is a unique organ, here termed Tominaga's organ, separate from and below the nasal rosette, developing anterior to the eye. Larvae of the two species of *Rondeletia* can be distinguished by the presence or absence of developing spongy bone in the pectoral girdle and sphenotic by at least 9 mm and by the counts of the vertebrae, pelvic-fin rays, and dorsal hypural bones in smaller larvae. The presence of Tominaga's organ in the gibberichthyid *Gibberichthys* suggests that "the whalefishes", Barbourisiidae, Rondeletiidae, and Cetomimidae, as a group are paraphyletic, and that *Rondeletia* and *Gibberichthys* are sister taxa.

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The deepsea "whalefish" families Rondeletiidae and Barbourisiidae have been considered close relatives since the description of the latter family by Parr (1945). Recent authors have considered them part of a separate order Cetomimiformes (Ebeling & Weed, 1973), part of a "stephanoberycoid assemblage" (Rosen, 1973) or part of a suborder of the Beryciformes (Rosen & Patterson, 1969; Keene & Tighe, 1984; Moore, 1993). We follow Johnson & Patterson (1993) and Nelson (1994) in recognizing two orders: Stephanoberyciformes (Melamphaidae, Stephano-