

Labridae: Wrasses

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Labrids are small to large, colourful, carnivorous fishes that are extremely varied in body shape and habitats. They live primarily on reefs, but some species are strongly associated with vegetation or open sand bottoms. Sex reversal is the norm, and most species have two or three sex-related colour or body forms. Labrids are the second-most speciose Australian fish family. In Australian waters, 175 species of labrids in 44 genera are known (Gomon, 1994; Randall et al., 1997; Hoese et al., in press) of which about 80 species in 31 genera are temperate. Most species swim primarily using the pectoral fins (labriform swimming), and specialised dentition is a characteristic of the family. All Australian labrids, so far as is known, spawn small (0.6-1.1 mm diameter) pelagic eggs. Development is direct. The only apparent specialisations to larval life are the preopercular spines of one tropical taxon, the elongate or early-forming dorsal-fin elements of a very few taxa, and the narrow eyes and choroid tissue of some others.

Meristic characters of labrid genera of temperate Australia

| | Dorsal | Anal | Pectoral | Pelvic | Caudal | Vertebrae |
|-------------------------|--------------|------------|----------|--------|---------|--------------------|
| CHEILININI | | | | | | |
| <i>Cheilinus</i> | IX-X,8-11 | III,8-9 | 12 | I,5 | 7+6 | 9+14=23 |
| <i>Cirrhilabrus</i> | XI-XII,8-10 | III,8-10 | 14-16 | I,5 | 13 | 9+16=25 |
| <i>Oxycheilinus</i> | IX,10 | III,8 | 12 | I,5 | 7+6 | 9+14=23 |
| <i>Pteragogus</i> | IX-XI,9-12 | III,8-10 | 12-15 | I,5 | 7+7 | 9+16=25 |
| HYP SIGENYINI | | | | | | |
| <i>Achoerodus</i> | XI, 10-11 | III, 10-11 | 16-18 | I, 5 | 7+7 | 28 |
| <i>Bodianus</i> | XII,9-11 | III,11-13 | 15-18 | I,5 | (7-8)+7 | 11+17=28 |
| <i>Choerodon</i> | XII-XIII,7-8 | III,9-10 | 15-19 | I,5 | 7+7 | (10-11)+(16-17)=27 |
| JULIDINI | | | | | | |
| <i>Anampses</i> | IX,11-13 | III,10-13 | 13-14 | I,5 | 7+7 | 9+16=25 |
| <i>Austrolabrus</i> | IX, 11 | III, 10 | 13 | I, 5 | 7+7 | 9+16=25 |
| <i>Cheilio</i> | IX,12-13 | III,11-12 | 12 | I,5 | 7+7 | 9+16=25 |
| <i>Coris</i> | IX,12 | III,12 | 13-15 | I,5 | (7-8)+7 | (9-10)+(15-16)=25 |
| <i>Dotalabrus</i> | IX, 11 | III, 10 | 12 | I,5 | 14 | |
| <i>Eupetrichthys</i> | IX, 12 | III, 10 | 13 | I, 5 | 7+7 | 9+10=25 |
| <i>Halichoeres</i> | IX-X,11-14 | III,10-13 | 12-15 | I,5 | 7+7 | (9-10)+(15-16)=25 |
| <i>Hemigymnus</i> | IX,11 | III,11 | 14 | I,5 | 13 | 10+15=25 |
| <i>Hologymnosus</i> | IX,12 | III,12 | 13 | I,5 | 14 | 9+16=25 |
| <i>Leptojulius</i> | IX,11-12 | III,10-12 | 12-13 | I,5 | 14 | 9+ 16=25 |
| <i>Macropharyngodon</i> | IX,11-12 | III,11-13 | 12-13 | I,5 | 7+7 | 9+16=25 |
| <i>Notolabrus</i> | IX,11 | III, 10 | 14 | I, 5 | 14 | 9+16=25 |
| <i>Ophthalmolepis</i> | IX, 12-13 | III, 13 | 13 | I, 5 | 14 | 26 |
| <i>Pictilabrus</i> | IX, 11 | III, 10 | 13 | I, 5 | 14 | 9+16=25 |
| <i>Pseudocoris</i> | IX,12 | III,12-13 | 15 | I,5 | - | - |
| <i>Pseudolabrus</i> | IX,10-11 | III,10-11 | 12-14 | I,5 | 8+7 | 9+16=25 |
| <i>Pseudojuloides</i> | IX,11-12 | III,11-12 | 12-13 | I,5 | 14 | (9-10)+(15-16)=25 |
| <i>Stethojulis</i> | IX,10-12 | III,10-12 | 12-15 | I,5 | 7+7 | 10-15=25 |
| <i>Suezichthys</i> | IX,11 | III,10 | 13-14 | I,5 | (7-8)+7 | 9+16=25 |
| <i>Thalassoma</i> | VIII,12-14 | III,10-12 | 14-17 | I,5 | 7+7 | (9-10)+(15-16)=25 |
| LABRICHTHYINI | | | | | | |
| <i>Labroides</i> | IX,10-12 | III,9-11 | 13 | I,5 | 14 | 10+15=25 |
| NOVACULINI | | | | | | |
| <i>Cymolutes</i> | VIII-X,12-15 | III,11-13 | 11-13 | I,5 | 14 | 9+17=26 |
| <i>Novaculichthys</i> | IX,12-14 | III,12-14 | 12-13 | I,5 | 14 | 9+16=25 |
| <i>Xyrichtys</i> | IX,12 | III,12-14 | 12-13 | I,5 | 7+7 | 9+16=25 |

Note: under caudal rays, a format of X+X indicates principal rays, whereas a single number indicates branched rays plus 2.

Main characters of labrid larvae:

- 23-28 myomeres
- Body laterally compressed with a deep caudal peduncle
- Gut is initially straight but coils (usually by flexion), and is slightly rugose
- Dorsal-fin count VIII-XIII, 7-15
- Principal caudal rays 13-15 (7+6, 7+7 or 8+7)
- Small mouth
- Eyes round, squarish, or ovoid
- No head spination
- Very little pigment
- Most species lack scales prior to settlement
- Larger larvae are distinguished by the long-based dorsal fin and counts of all fins

References to labrid larvae

Relatively few developmental series of labrid larvae have been published, Spartá, (1956); Fahay, (1983); Richards and Leis, (1984); Kojima, (1988); Richards, (1990); Watson, (1996); Leis and Rennis, (2000); Leis and Hay (2004), and references therein.

Families with similar larvae

Scaridae - 25 myomeres; usually have a series of melanophores on the ventral edge of the tail; narrow or roundish eyes; slightly rugose gut coils late in development; 7+6 caudal-fin rays; D IX, 10.

Pseudochromidae subfamilies Pseudochrominae and Pseudoplesiopinae - 26-29 myomeres; mouth of moderate size; small preopercular spines; round eyes; variable pigment; gut seldom rugose; generally 9+8 caudal-fin rays; D I-III, 20-79.

Callanthiidae - 24 myomeres; moderate to strong head spination; a coiled, compact gut; round eyes; variable pigment; moderate to large mouth; 9+8 caudal-fin rays; D X-XI, 9-12.

Serranidae subfamily Grammistinae - 24-28 myomeres; moderate to strong head spination; an early-forming dorsal-fin spine; large mouth; round eyes; 9+8 caudal-fin rays; DVI-VIII, 11-25.

Cirrhitidae – 26 myomeres; no head spination; non-rugose gut that coils late, if at all; distinctive, heavy pigmentation; a barbel on the lower jaw is often present; round eyes; 8+7 caudal-fin rays; DX, 11-17; AIII, 6-7.

Odacidae - 31-54 myomeres; moderate mouth; prominent angle of lower jaw; round eyes; long non-rugose gut that coils late, if at all; 11-14 caudal-fin rays; at least 14 spines in the dorsal fin.

Myctophidae – elongate; narrow to round eyes; rugose gut; at least 30 myomeres; lack spines in the fins; 10+9 caudal-fin rays.

Note: families in bold text are dealt with in Neira *et al.*, 1998.

References:

Beltrán-León, B.S. and Herrera, R.R. (2000). Estadios tempranos de peces del Pacifico Colombiano. Instituto Nacional de Pesca y Acuicultura de Columbia, Buenaventura.

Colin, P.L. (1982). Spawning and larval development of the hogfish, *Lachnolaimus maximus* (Pisces: Labridae). US Fishery Bulletin, 80:853-862.

Dulčić, J., Kožul, V., Kraljević, M., Skarmuca, B., Glamuzina, B. and Ré, P. (1999). Embryonic and larval development of the brown wrasse *Labrus merula* (Pisces: Labridae). Journal of the Marine Biological Association of the UK, 79:327-332.

Fahay, M.P. (1983). Guide to the early stages of marine fishes occurring in the western North Atlantic Ocean, Cape Hatteras to the southern Scotian Shelf. Journal Northwest Atlantic Fishery Science, 4: 1-423.

Gomon, M.F., Glover, J.C.M. and Kuitert, R.H. (1994). The fishes of Australia's south coast. State Print, Adelaide, South Australia.

Hoese, D.F., Bray, D.J., Allen, G.R., Allen, C.J., Cross, N.J. and Paxton, J.R. (in press). Pisces: Mugilidae to Molidae. Zoological Catalogue of Australia, Vol. 7 part 2. Australian Biological Resources Survey, Canberra.

Kanashiro, K. (1998). Morphology, and changes of distribution and food habits with growth, of late larvae and juveniles of black-spot tuskfish, *Choerodon schoenleinii* (Labridae), settled on seagrass beds of Okinawa Island, the Ryukyus. Nippon Suisan Gakkaishi, 64:427-434.

- Kimura, S., Nakayama, Y., Kiriya, T. (1998). Comparison of laboratory-reared eggs, embryos and larvae of five labrid fishes. *Environmental Biology of Fishes*, 52:187-201.
- Kojima, J. I. (1988). Labridae. In: Okiyama, M. (ed). *An Atlas of the Early Stage Fishes in Japan*. Tokai University Press, Tokyo, pp. 575-591.
- Kuiter, R.H. (1993). *Coastal fishes of south-eastern Australia*. Crawford House, Bathurst, NSW, Australia.
- Leis, J.M. and Hay, A.C. (2004). Larval development of *Achoerodus viridis* (Pisces: Labridae), the Australian Eastern Blue Groper. *Ichthyological Research*, 51: 46-51.
- Leis, J.M. and Carson-Ewart, B.M. (eds) (2000). *The larvae of Indo-Pacific coastal fishes: an identification guide to marine fish larvae*. Brill, Leiden.
- Leis, J.M. and Rennis, D.S. (2000). Labridae (Wrasses). In: Leis, J.M. and Carson-Ewart, B.M. (eds). *The larvae of Indo-Pacific coastal fishes: an identification guide to marine fish larvae*. Brill, Leiden, pp. 536-544.
- Nelson, J.S. (1994). *Fishes of the World*, 3rd ed. Wiley, New York.
- Randall, J.E., Allen, G.R. and Steene, R.C. (1997). *Fishes of the Great Barrier Reef and Coral Sea*, 2nd ed. Crawford House, Bathurst, NSW, Australia.
- Richards, W.J. (1984). Kinds and abundances of fish larvae in the Caribbean Sea and adjacent regions. NOAA Technical Report NMFS SSRF 776:1-54.
- Richards, W.J. (1990). List of the fishes of the western central Atlantic and the status of early life stage information. NOAA Technical Memorandum NMFS SEFC 267: 1-88.
- Richards, W.J. and Leis, J.M. (1984). Labroidei: development and relationships. In: Moser, H.G., Richards, W.J., Cohen, D.M., Fahay, M.P., Kendall, A.W. and Richardson, S.L. (eds). *Ontogeny and Systematics of Fishes*. Special Publication 1, American Society of Ichthyologists and Herpetologists, Lawrence, Kansas, pp. 542-547.
- Schoedinger, S.E. and Epifanio, C.E. (1997). Growth, development and survival of larval *Tautoga onitis* (Linnaeus) in large laboratory containers. *Journal of Experimental Marine Biology and Ecology*, 210:143-155.
- Spartá, A. (1956). Famiglia Labridae. *Fauna e Flora del Golfo di Napoli*. Monogr. 38: 576-594.
- Victor, B.C. (1987). Growth, dispersal, and identification of planktonic labrid and pomacentrid reef-fish larvae in the eastern Pacific Ocean. *Marine Biology*, 95:145-152.
- Watson, W. (1996). Labridae: wrasses. In: Moser, H.G. (ed). *The early stages of fishes in the California Current Region*. California Cooperative Oceanic Fisheries Investigations Atlas 33, La Jolla, California, pp. 1088-1103.