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Marine and Freshwater Research

Supplementary Material

Aseasonal and short life cycles of the protandrous hermaphrodite blue threadfin (*Eleutheronema tetradactylum*) in a near-equatorial tropical region

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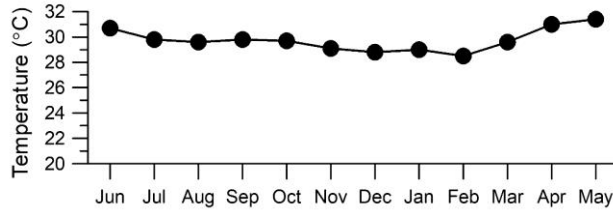


Fig. S1. Mean monthly sea surface temperature of Khanom Beach (9°11'N, 99°52'E), Thailand from June 2015 to May 2016.

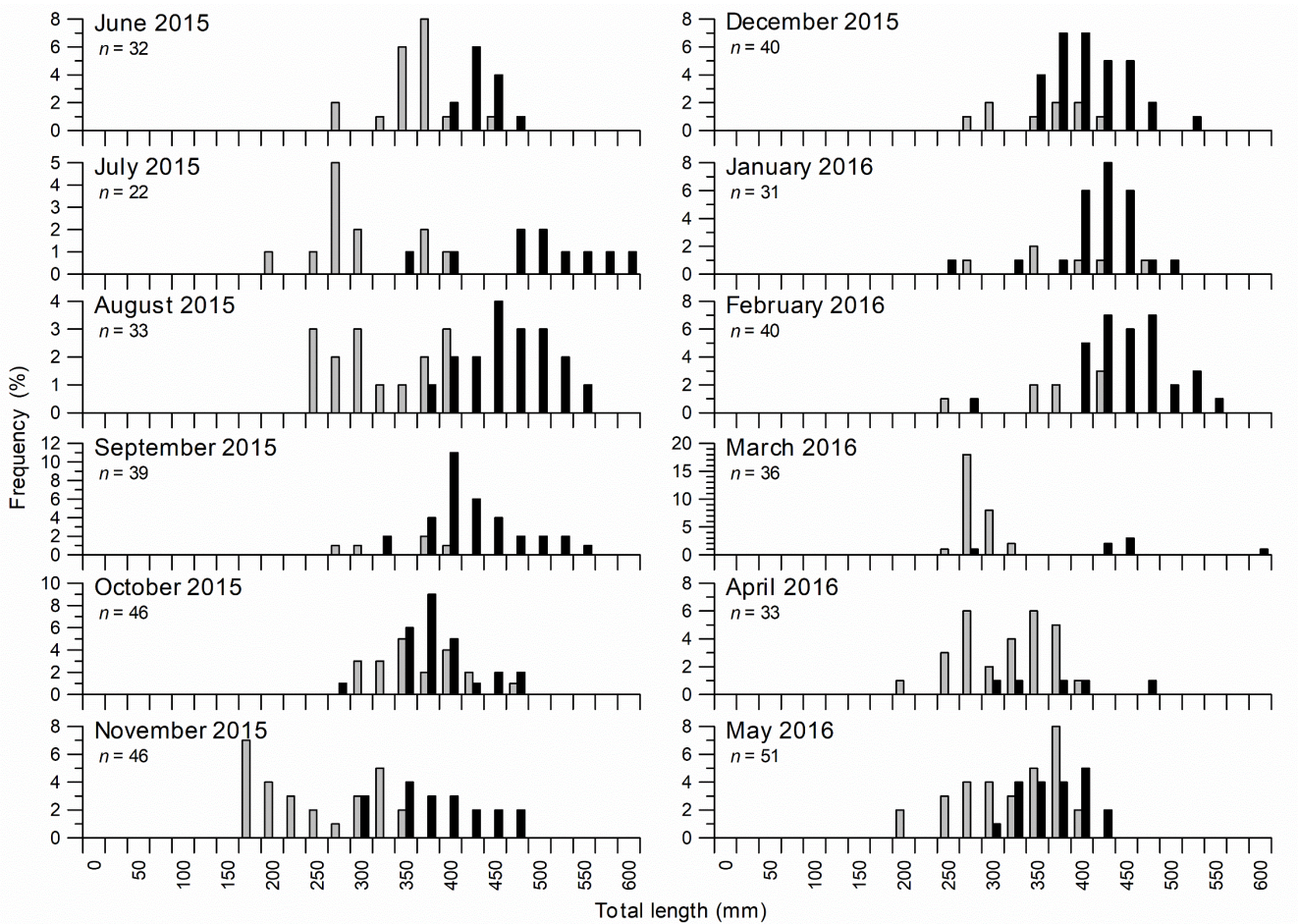


Fig. S2. Monthly change of length-frequency distribution of *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand. Grey columns indicate undifferentiated or male fish. Black columns indicate female fish.

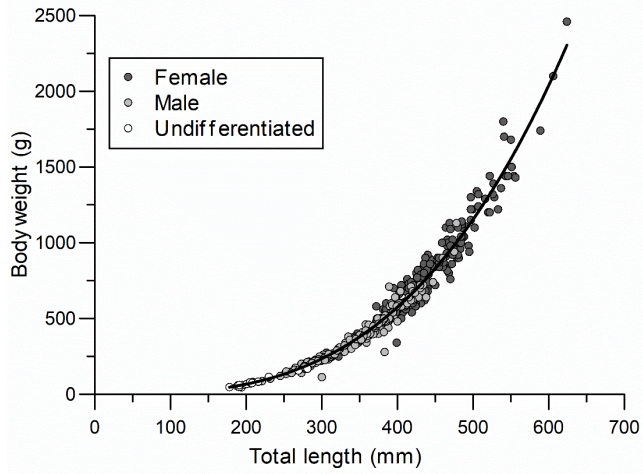


Fig. S3. Length–weight relationship of *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand.

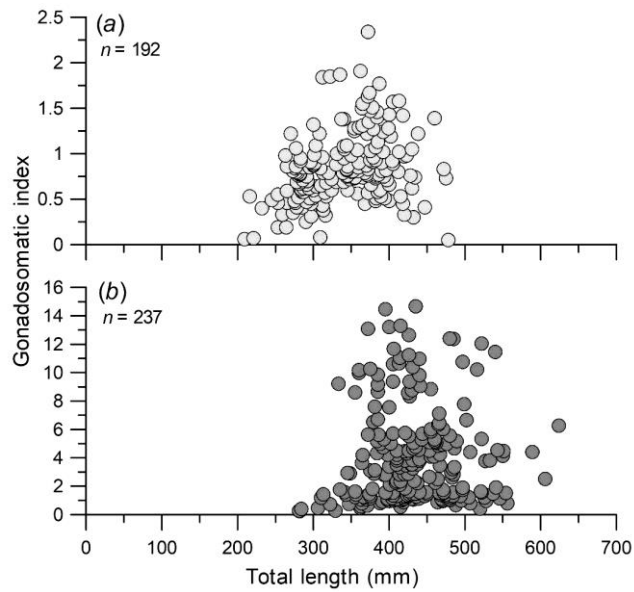


Fig. S4. Relationships between total length and gonadosomatic index (%) for (a) male and (b) female *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand.

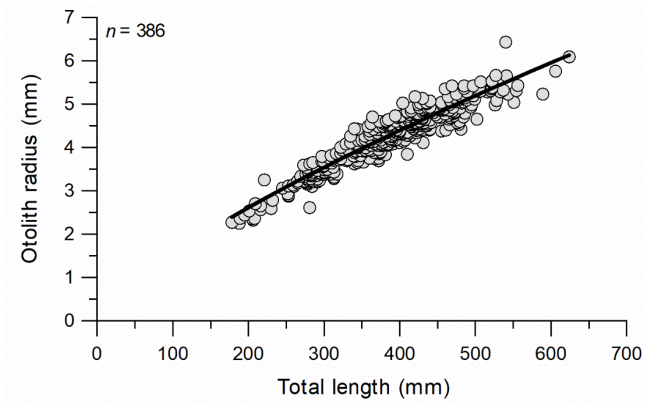


Fig. S5. Relationship between total length and otolith radius with allometric model of *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand.



Fig. S6. Examples of (a, b) 0-zone, (c, d) 1-zone, (e, f) 2-zone, and (g, h) illegible left sagittal otolith of *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand. Total length of each specimen is (a) 245, (b) 455, (c) 273, (d) 554, (e) 400, (f) 556, (g) 270, and (h) 455 mm. Arrowheads indicate outer edge of each translucent zone. Scale bar: 2 mm.

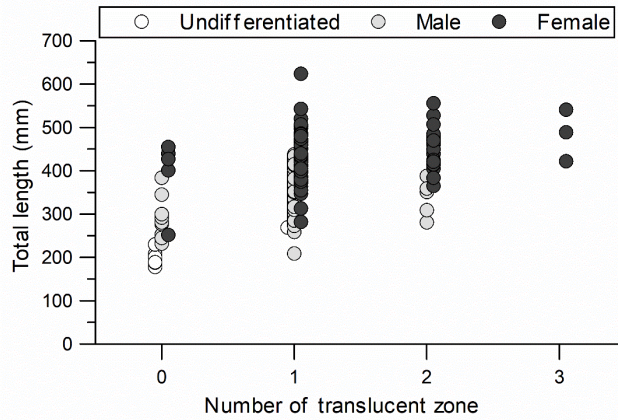


Fig. S7. Relationship between number of translucent zones in otoliths and total length for *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand.

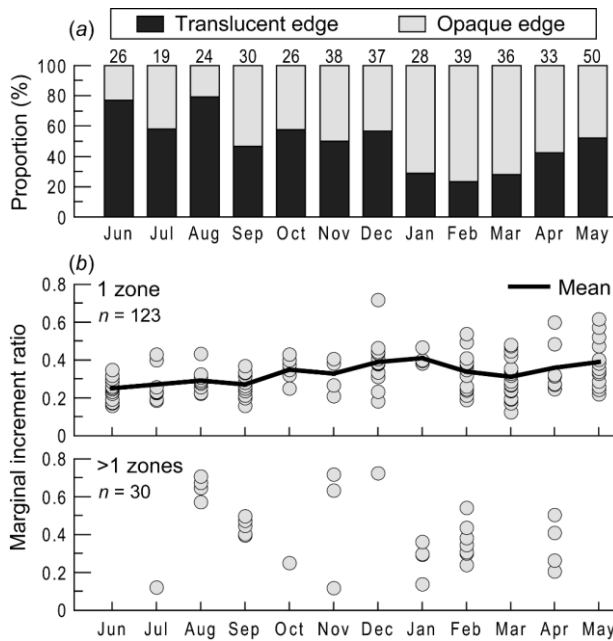


Fig. S8. Monthly trends of (a) percentage occurrence of translucent edge and (b) marginal increment ratio on otoliths of *Eleutheronema tetradactylum* collected from the southern Gulf of Thailand. Numbers above columns indicate sample sizes.

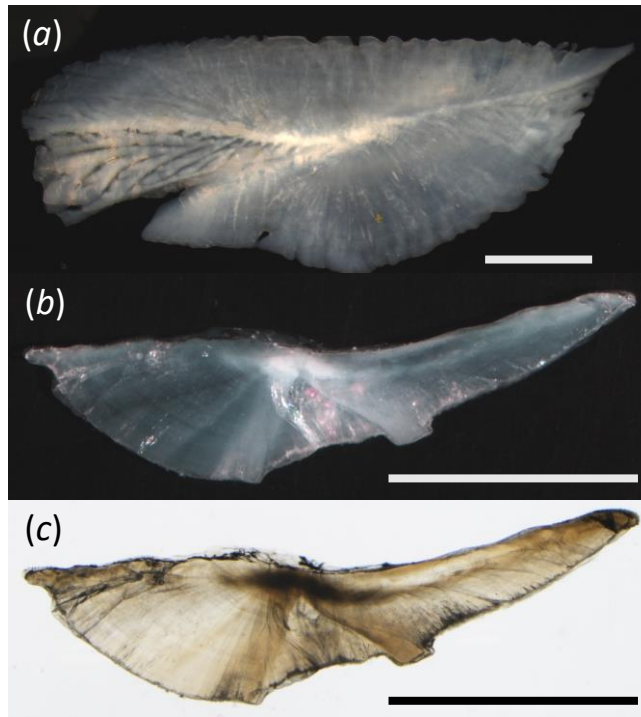


Fig. S9. (a) Whole and (b, c) transverse-sectioned otolith of a female *Eleutheronema tetradactylum* (624-mm total length), captured under reflected light (a, b) and with transmitted light (c). Scale bars: 2 mm.

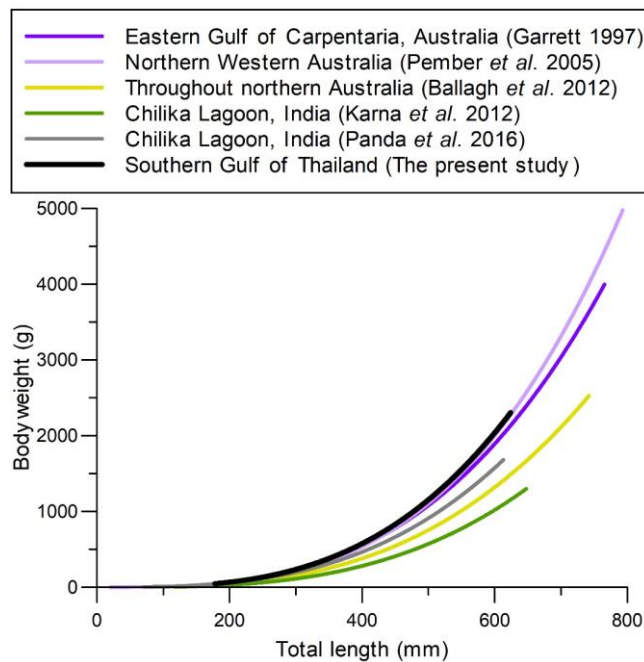


Fig. S10. Comparison of length–weight relationships of *Eleutheronema tetradactylum* among studies.

Table S1. The two-point (M1,M2) and five-point (F1–F5) maturity scale for *Eleutheronema tetradactylum* males and females, respectively, based on Kesteven (1960).

Stage	State	Description
M1	Immature	Gonad small, white colour in appearance
M2	Mature	Gonad larger and soft, colour become creamy in appearance
F1	Virgin	Gonad still very small and attached to the skeleton bone
F2	Developing	Gonad more developed, red colour appearance and bright, length equal 1/2 or 2/3 of the internal cavity
F3	Gravid	Gonad expanded throughout the internal cavity. Spherical in shape
F4	Spawning	Gonad fully developed, the ova inside the gonad lie freely and have a yellow or orange in colour. The gonad follicle wall is quite thin
F5	Spent	This stage is after spawning. There are some remaining ova inside the gonad. Gonad is smaller and has a red colour