FISH SPECIES CAUGHT BY SHRIMP TRAWLERS OFF THE COAST OF SERGIPE, IN NORTH-EASTERN BRAZIL, AND THEIR LENGTH–WEIGHT RELATIONS

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Abstract. The objective of this study was to report all fish species caught by shrimp trawlers based in Pirambu, in the state of Sergipe, Brazil and estimate the length–weight relation (LWR) for the most abundant species in the samples. Four samples were collected monthly from four shrimp trawlers. A total of 8522 fishes were caught (89 species; 38 families). LWRs were estimated for 18 species having the parameter $b$ within the range of 2.5–3.5: Cathorops spixii (Agassiz, 1829); Stellifer brasiliensis (Schultz, 1945); Pellona harroweri (Fowler, 1917); Odontognathus mucronatus Lacepède, 1800; Paralochrus brasiliensis (Steindachner, 1875); Stellifer rastrifer (Jordan, 1889); Isopisthus parvipinnis (Cuvier, 1830); Selene brownii (Cuvier, 1816); Anchoa spinifer (Valenciennes, 1848); Trinectes paulistanus (Miranda Ribeiro, 1915); Symphurus plagusia (Bloch et Schneider, 1801); Chirocentrodon bleekerianus (Poey, 1867); Stellifer stellifer (Bloch, 1790); Citharichthys spilopterus Günther, 1862; Cynoscionaena gracilicirrhus (Metzelaar, 1919); Anchoviella lepidentostole (Fowler, 1911); Peprilus crenulatus Cuvier, 1829; Genyatremus caviornis (Cuvier, 1830). Five new maximum size records were reported in this study for Trinectes paulistanus, Citharichthys spilopterus, Anchoviella lepidentostole, Chirocentrodon bleekerianus, and Stellifer brasiliensis. Fifty-four new maximum weight records were also registered. LWR estimated here are the first for Genyatremus caviornis and Peprilus crenulatus.

Keywords: weight–length relation, shrimp trawlers, bycatch, discard, WLR

INTRODUCTION

Length–weight relations (LWR) are used to estimate the weight corresponding to a given length, which reflects different conditions for various populations throughout their life cycle (Wootton 1998, Freire et al. 2009). LWRs and their parameter $b$ are not considered interesting science for some fisheries scientists (Hilborn and Walters 1992, Froese 2006), even though these relations are important for estimating biomass where weighing fishes is not possible (Maceira and Joyeux 2009) or for species where such relations were not previously known (Froese 2006). Although LWRs have been estimated for many fish species along the Brazilian coast, data are still missing for many species, especially those that are not commercially important, or localities (Freire et al. 2009). This paper aims to identify all fish species caught by shrimp trawlers off the coast of Sergipe and estimate LWRs for the most abundant species.

MATERIAL AND METHODS

Samples were collected from the artisanal shrimp trawl fishery based in the municipality of Pirambu, in the state of Sergipe (Fig. 1). Four samples were obtained monthly from March 2015 to May 2016, with the exception of April and December 2015 and April 2016 due to two closed seasons per year for the shrimp fishery (90 days in total). Each sample, with approximately 6 kg, was separated immediately after the last trawl before heading to the port and was stored on ice and later kept frozen.
**Barreto et al.**

* Bathytoshia centroura. **was the main species considering Trinectes paulistanus Cynoscion leiarchus (Cuvier, 1830); Decken unpublished Larimus breviceps (Quoy et Gaimard, 1824); Notarius grandicassis (Fowler, 1911), 16.1 cm Stellifer brasiliensis, Anonymous (Fowler, 1917); α Diplectrum radiale Cynoscion (Steindachner, 1875) to (Valenciennes, 1840); Schultz, 1945); Desenvolvimento da Pesca, SUDEPE, Aracaju-Sergipe. [In Portuguese.]

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**RESULTS**

A total of 8522 fishes were caught, representing 89 species and 38 families (Table 1). The total weight of all samples was about 151.6 kg and the most representative families were Sciaenidae (35% of the total weight caught), Arriidae (17%), Pristigasteridae (10%), and Haemulidae (7%). The most abundant species in the samples were *Cathorops spixii* (Agassiz, 1829); *Larimus breviceps* Cuvier, 1830; *Stellifer brasiliensis* (Schultz, 1945); and *Pellona harroweri* (Fowler, 1917); representing about 15%, 11%, 8%, and 7% of the total weight, respectively. *Pellona harroweri* was the main species considering number (1077) and was present in all samples, followed by *L. breviceps* (1075), *C. spixii* (1022), and *S. brasiliensis* (961). Eleven of these species are not reported in FishBase for the state of Sergipe: *Aspistor quadriscutis* (Valenciennes, 1840); *Cyclopsetta chittendeni* Bean, 1895; *Cynoscion leiarchus* (Cuvier, 1830); *Cynoscion microlepidotus* (Cuvier, 1830); *Bathytosha centroura* (Mitchell, 1815); *Diplectrum radiale* (Quoy et Gaimard, 1824); *Notarius grandicassis* (Valenciennes, 1840); *Ogocephalus parvus* Longley et Hildebrand, 1940; *Raney brasiliensis* (Kaup, 1856); *Stellifer brasiliensis* (Schultz, 1945); and *Stellifer stellifer* (Bloch, 1790).

Five new maximum size records were established in this study in relation to the information currently available in FishBase (Froese and Pauly 2018): 18.2 cm for *Trinectes paulistanus* (Miranda Ribeiro, 1915), 21.0 cm for *Citharichthys spiloterus* Günther, 1862, 16.4 cm for *Anchovilia lepidentostole* (Fowler, 1911), 16.1 cm for *Chirocentrodon blekerianus* (Poey, 1867), and 17.0 cm for *Stellifer brasiliensis* (Schultz, 1945) (all of them unsexed).

Parameters $a$ and $b$ of the LWR estimated for 18 fish species are summarized in Table 2, along with their standard errors. All regressions were statistically significant ($P < 0.05$). Parameter $a$ ranged from 0.00240 for *Paralochrus brasiliensis* (Steindachner, 1875) to 0.03135 for *Genyatremus cavifrons* (Cuvier, 1830), and parameter $b$ ranged from 2.578 for *C. blekerianus* to 3.424 for *P. brasiliensis*.

**DISCUSSION**

Freire and Araújo (2016) listed commercial fish species for the state of Sergipe. Thirty species are also listed here, indicating they are, in fact, commercially important. Juveniles of important species correspond to a high proportion of the bycatch of shrimp trawlers and species without market value are probably discarded or consumed by fishers (Tischer and Santos 2001, Branco 2005). Thus, a high proportion of the catch may not be accounted for in officially reported catch statistics. It is also worth pointing out that many species reported here were never registered in previous studies carried in the area related to the bycatch of shrimp trawlers in the state of Sergipe (Santos 1996, Decken unpublished*, Anonymous unpublished**).
Table 1

| Order                     | Family                | Species                                           | Total catch [g] | Total length [cm] | Total weight [g] |
|---------------------------|-----------------------|---------------------------------------------------|-----------------|-----------------|-----------------|
|                          |                       |                                                   | n               | Mean ± SD       | Range           | Mean ± SD       |
| Torpediniformes           | Narcinidae            | *Narcine brasiliensis* *(Ofllers, 1831)*          | 9               | 10.6–36.6       | 19.24 ± 9.64    | 11.6–57.6       | 131.58 ± 4.47  |
|                          | Pristiformes          | Rhinobatidae                                      | 12              | 56.9–106.5      | 79.55 ± 10.19   | 106.3–689.6     | 334.40 ± 233.30|
|                          | Myliobatiformes       | Dasyatidae                                        | 1               | 62.4            | —               | 148.9           | —              |
|                          |                       | *Bathytoschia centroa* *(Mitchell, 1815)*         | 1               | 15.6            | —               | 90.0            | —              |
| Anguilliformes            | Gymnuridae            | Gymnothorax ocellatus *Agassiz, 1831*             | 1               | 27.0–46.7       | 39.73 ± 5.33    | 38.5–184.4      | 103.51 ± 38.00 |
|                          | Myliobatidae          | Rhinoptera bonasus *(Mitchell, 1815)*             | 1               | 60.5            | —               | 953.0           | —              |
| Clupeiformes              | Pristigasteridae      | *Pellona harroweri* *(Fowler, 1917)*             | 1077            | 5.0–16.5        | 10.34 ± 1.67    | 0.6–33.0        | 9.54 ± 5.18    |
|                          | Engraulidae           | *Anchoa spinifer* *(Valenciennes, 1848)*         | 140             | 8.1–21.0        | 12.00 ± 2.15    | 3.5–66.3        | 13.27 ± 9.76   |
|                          | *Lycengraulis grossidens* *(Spix et Agassiz, 1829)* | 83               | 5.2–9.2         | 11.66 ± 2.39    | 0.8–19.3        | 8.06 ± 4.29    |
| Clupeidae                 | *Ophisthomena oglinum* *(Lesueur, 1818)*         | 23               | 10.4–14.0       | 12.09 ± 1.62    | 5.6–21.1        | 16.20 ± 5.53   |
| Batrachoidiformes         | Anidae                | *Cathorops spixi* *(Agassiz, 1829)*              | 1022            | 9.1–29.1        | 13.49 ± 2.33    | 3.9–97.5        | 21.48 ± 13.64  |
| Batrachoidiformes         | Batrachoida           | *Bagre marinus* *(Mitchell, 1815)*               | 126             | 8.3–20.7        | 12.17 ± 1.98    | 3.7–52.4        | 12.61 ± 8.07   |
| Perciformes               | Gymnuraidae           | *Notarius grandicassis* *(Valenciennes, 1840)*   | 39              | 7.9–18.7        | 11.7 ± 2.91     | 3.6–58.3        | 17.60 ± 15.82  |
| Polynemidae               | *Aspistor quadriscutis* *(Valenciennes, 1840)*  | 3                | 8.8–16.0        | 12.40 ± 3.60    | 4.2–33.3        | 17.63 ± 14.68  |
| Batrachoidiformes         | *Selene setapinnis* *(Mitchell, 1815)*          | 6                | 15.3–19.3       | 16.95 ± 1.48    | 12.1–36.0       | 20.58 ± 9.26   |
| Batrachoidiformes         | *Oligoplites saliens* *(Bloch, 1793)*           | 3                | 15.2–17.2       | 15.97 ± 1.08    | 21.4–27.5       | 14.07 ± 1.08   |

Table continues on next page.
| Order                  | Family               | Species                      | $n$ | Total catch [g] | Total length [cm] | Total weight [g] |
|-----------------------|----------------------|------------------------------|-----|-----------------|-------------------|-----------------|
|                       |                      |                              |     | Range           | Mean ± SD         | Range           | Mean ± SD       |
| Istiophoriformes      | Sphyraenidae         | *Sphyraena guachancho* Cuvier, 1829 | 2   | 13–14.6         | 13.8 ± 1.13       | 8.4–12.0        | 10.20 ± 2.55   |
|                       | Panichthyidae        | *Citharichthys spinolatus* Günther, 1862 | 61  | 5.5–21.0        | 11.1 ± 3.08       | 1.8–92.7i       | 19.90 ± 15.93  |
|                       |                      | *Cyclopetta chittendenii* Bean, 1895 | 2   | 17.9–19.0       | 13.7 ± 7.42       | 7.2–76.0i       | 41.6 ± 48.65   |
| Achiroidae            | *Trinectes paulistatus* (Miranda Ribeiro, 1915) | 106 | 5.4–18.2        | 10.75 ± 1.72      | 2.7–63.3i        | 24.33 ± 12.10  |
|                       | *Achirus declivis* Chabanaud, 1940 | 22  | 11.4–16.0       | 13.23 ± 1.37      | 18.8–90.2i       | 47.85 ± 18.22  |
|                       | *Achirus lineatus* (Linnaeus, 1758) | 6   | 8.7–11.1        | 9.95 ± 0.89       | 12.1–29.5i       | 20.98 ± 6.67   |
|                       |                      | *Trinectes microphthalum* (Chabanaud, 1928) | 3   | 5.0–5.7         | 5.40 ± 0.46       | 2.3–4.5i        | 3.30 ± 1.11    |
| Cynoglossida          | *Symphurus plumbeus* (Bloch et Schneider, 1801) | 103 | 4.2–18.2        | 12.82 ± 2.91      | 0.5–51.3i        | 17.42 ± 11.83  |
| Syngnathiformes       | Fistularidae         | *Fistularia tuberculata* Linnaeus, 1758 | 1   | 90.3            | —                | 279.0i         | —              |
|                       |                      | *Dactylopterus volitans* (Linnaeus, 1758) | 13  | 6.2–11.0        | 7.26 ± 1.19       | 3.5–14.2        | 5.02 ± 2.84    |
| Scombriformes         | Trichiuridae         | *Trichiurus lepturus* Linnaeus, 1758 | 420 | 11.0–56.2       | 34.22 ± 5.59      | 0.6–95.2        | 18.17 ± 10.74  |
|                       | Stromateidae         | *Parapriacanthus* Cuvier, 1829 | 31  | 3.5–15.0        | 9.71 ± 3.78       | 0.7–66.8i       | 24.25 ± 17.52  |
| Perciformes           | Gerreidae            | *Diapterus rhabdus* (Cuvier, 1829) | 17  | 8.7–17.1        | 13.31 ± 3.02      | 8.1–76.3i       | 41.89 ± 24.11  |
|                       |                      | *Eucinostomus melanopterus* (Bleeker, 1863) | 8   | 8.9–13.5        | 10.20 ± 1.48      | 9.0–26.5i       | 13.18 ± 5.62   |
|                       |                      | *Eucinostomus jonesii* (Günther, 1879) | 4   | 9.9–10.9        | 10.25 ± 0.47      | 11.6–16.9i      | 13.30 ± 24.58  |
|                       |                      | *Eucinostomus argentatus* Baird et Girard, 1855 | 3   | 9.8–12.1        | 10.93 ± 1.15      | 9.8–20.8i       | 15.13 ± 5.35   |
| Mullidae              | *Upeneus parvus* Poey, 1852 | 5   | 12.6–15.1       | 14.08 ± 1.20      | 24.2–75.5i       | 42.92 ± 20.06  |
| Serranidae            | *Ruticulus randallii* Courtenay, 1967 | 7   | 11.3–13.9       | 12.40 ± 0.94      | 16.5–31.8i       | 23.33 ± 6.01   |
|                       |                      | *Diplectrum radiale* (Quoy et Gaimard, 1824) | 1   | 18.8            | —                | 101.4i         | —              |
| Haemulidae            | *Haemulopoma corvinaeformis* (Steindachner, 1868) | 227 | 9.2–17.2        | 12.21 ± 1.32      | 10.4–71.4        | 24.01 ± 9.52   |
|                       |                      | *Conodon nobilis* (Linnaeus, 1758) | 183 | 8.1–20.0        | 11.62 ± 1.93      | 7.3–118.7       | 22.92 ± 15.70  |
|                       |                      | *Genyatremus caviger* (Cuvier, 1830) | 21  | 7.3–12.6       | 9.90 ± 1.62       | 5.6–10.0i       | 7.91 ± 1.36    |
|                       |                      | *Haemulon steindachneri* (Jordan et Gilbert, 1882) | 1   | 18.2          | —                | 93.2           | —              |
|                       |                      | *Haemulon auroradiatum* Cuvier, 1830 | 1   | 18.6          | —                | 85.6i         | —              |
| Lutjanidae            | *Lutjanus synagris* (Linnaeus, 1758) | 2   | 8.9–18.2        | 13.55 ± 6.58      | 11.7–84.7        | 48.20 ± 51.62  |
|                       |                      | *Pristipomoides aquilinares* (Goode et Bean, 1896) | 1   | 10.7          | —                | 17.4           | —              |
| Scorpaeniformes       | Scorpaenidae         | *Scorpaena plumieri* Bloch, 1789 | 7   | 19.0–26.2       | 21.57 ± 2.58      | 158.5–361.5     | 233.21 ± 6.01  |
|                       | Triglidae            | *Prionotus punctatus* (Bloch, 1793) | 83  | 7.7–21.0        | 12.55 ± 2.26      | 5.2–114.1i      | 26.38 ± 17.62  |
| Moroniformes          | Ephippidae           | *Chaetodipterus faber* (Broussonet, 1782) | 23  | 4.3–17.0        | 8.83 ± 3.22       | 4.8–165.8       | 32.90 ± 40.66  |
| Acanthopterygii       | Scorpaenidae         | *Scorpaena plumieri* Bloch, 1789 | 7   | 19.0–26.2       | 21.57 ± 2.58      | 158.5–361.5     | 233.21 ± 6.01  |
|                       | Sciaenidae           | *Larimus breviceps* Cuvier, 1830 | 1075 | 3.7–18.0       | 10.26 ± 2.65      | 0.5–81.2        | 15.72 ± 12.69  |
|                       |                      | *Stellifer brasilensis* (Schultz, 1945) | 961 | 4.4–17.0       | 10.09 ± 2.17      | 0.96–91.0i      | 12.09 ± 9.19   |
|                       |                      | *Paralophus brasiliensis* (Steindachner, 1875) | 423 | 5.0–19.6       | 12.13 ± 2.72      | 0.4–72.2i       | 15.05 ± 12.43  |
|                       |                      | *Stellifer rastrifer* (Jordan, 1889) | 338 | 5.0–17.0       | 12.06 ± 1.62      | 1.3–70.2i       | 22.14 ± 9.48   |
|                       |                      | *Isopisthus parvipes* (Cuvier, 1830) | 309 | 4.8–22.5       | 10.8 ± 3.06       | 0.6–73.9        | 11.38 ± 10.99  |

Table continues on next page.
### Table 1 cont.

| Order                  | Family       | Species                          | n  | Total catch [g] | Total length [cm] | Total weight [g] |
|------------------------|--------------|----------------------------------|----|-----------------|-------------------|-----------------|
|                        |              |                                  |    | Range           | Mean ± SD         | Range           | Mean ± SD       |
|                        |              |                                  |    |                 |                   |                 |                 |
|                        |              | *Stellifer stellifer* (Bloch, 1790) | 79 | 1435            | 6.6–15.5          | 11.16 ± 1.68     | 2.7–53.2       | 16.74 ± 9.39   |
|                        |              | *Nebris microps* Cuvier, 1830     | 56 | 525             | 3.3–23.5          | 8.63 ± 3.16      | 0.2–31.1       | 7.40 ± 7.08    |
|                        |              | *Ctenosciaena gracilicirrhus* (Metzelaar, 1919) | 47 | 1816            | 7.0–17.0          | 13.59 ± 2.06     | 4.0–77.2       | 37.75 ± 15.5   |
|                        |              | *Macronor helenod* (Bloch et Schneider, 1801) | 39 | 1154            | 6.5–23.5          | 15.11 ± 4.35     | 1.3–109.6      | 29.58 ± 27.00  |
|                        |              | *Cynoscion virescens* (Cuvier, 1830) | 34 | 873             | 10.0–21.3         | 16.65 ± 2.37     | 3.7–52.5       | 25.66 ± 11.29  |
|                        |              | *Stellifer sp. B*                 | 19 | 132             | 5.9–10.4          | 8.52 ± 1.36      | 2.3–11.4       | 6.97 ± 2.75    |
|                        |              | *Menticirrhus americanus* (Linnaeus, 1758) | 18 | 591             | 10.5–18.7         | 14.82 ± 2.39     | 8.7–71.8       | 32.54 ± 17.47  |
|                        |              | *Cynoscion acoupa* (Lacepède, 1801) | 17 | 112             | 4.9–17.6          | 8.16 ± 3.07      | 0.8–49.3       | 6.56 ± 11.40   |
|                        |              | *Cynoscion microlepidotus* (Cuvier, 1830) | 14 | 353             | 5.5–18.3          | 12.63 ± 4.40     | 1.9–65.1       | 25.23 ± 22.60  |
|                        |              | *Micropogonias furnieri* (Desmarest, 1823) | 13 | 449             | 13.5–17.4         | 15.23 ± 1.07     | 21.2–55.3      | 34.31 ± 8.28   |
|                        |              | *Cynoscion leiarchus* (Cuvier, 1830) | 6  | 257             | 17.3–18.2         | 17.75 ± 0.64     | 26.3–57.0      | 42.77 ± 9.99   |
|                        |              | *Menticirrhus littoralis* (Holbrook, 1847) | 3  | 80              | 10.9–18.1         | 13.90 ± 3.75     | 10.0–48.9      | 26.60 ± 20.07  |
|                        |              | *Odontoscinc dentex* (Cuvier, 1830) | 1  | 14              | 9.5              | —                 | 13.7±         | —              |
|                        |              | *Lophiiformes* Antennariidae       | 1  | 33              | 8.7              | —                 | 32.9±         | —              |
|                        |              | *Antennarius striatus* (Shaw, 1794) | 1  | 33              | 8.7              | —                 | 32.9±         | —              |
|                        |              | *Ogcocephalidae* Ogcocephalus vespertilio (Linnaeus, 1758) | 3  | 87              | 7.3–16.7          | 11.30 ± 4.85     | 8.0–60.8      | 20.07 ± 27.97  |
|                        |              | *Ogcocephalus pinax* Longley et Hildebrand, 1940 | 2  | 9               | 5.8–7.1          | 6.45 ± 0.92      | 3.3–5.8       | 4.45 ± 1.63    |
|                        |              | *Tetraodontiformes* Ostraciidae     | 2  | 214             | 14.0–20.5         | 17.25 ± 4.60     | 61.4–152.4     | 106.90 ± 64.35 |
|                        |              | *Acantostichon polygonius* Poey, 1876 | 7  | 761             | 12.3–26.6         | 17.78 ± 5.43     | 30.5–306.9    | 108.67 ± 103.83|
|                        |              | *Tetraodontidae* Sphoeroides testudineus (Linnaeus, 1758) | 6  | 15              | 4.1–5.8           | 4.87 ± 0.73      | 1.3–3.9       | 2.57 ± 1.03    |
|                        |              | *Sphoeroides tyleri* Shipp, 1972   | 4  | 1149            | 4.5–39.3          | 12.55 ± 7.02     | 1.4–976.5     | 16.19 ± 33.9   |
|                        |              | *Lagocephalus laevigatus* (Linnaeus, 1766) | 1  | 12              | 6.0              | —                 | 12.21±       | —              |

Order level affiliation according to Nelson et al. (2016); n = number of individuals, SD = standard deviation; 1 Data not available in FishBase (Froese and Pauly 2018); 2 Revised scientific name; 3 Commercially important, cited in Freire and Araújo (2016); 4 According to Carpenter (2002).
Table 2

Length–weight relations (LWRs) for all fish species caught by shrimp trawlers off the coast of Sergipe, Brazil (with $n \geq 20$)

| Species                              | $n$  | TL [cm] Range | $L_{\text{max}}$ | $L_n$ | $a$   | SE log$_e^a$ | $b$ | SE $b$ | $r^2$ |
|--------------------------------------|------|---------------|-------------------|-------|-------|---------------|-----|--------|-------|
| Cathorops spixii                     | 922  | 9.1–29.1      | 30.0              | —     | 0.00501| 0.07250       | 3.181| 0.028  | 0.981 |
| Stellifer brasiliensis               | 883  | 4.4–17.0$^a$ | 14.5              | 7.3   | 0.00563| 0.04333       | 3.257| 0.019  | 0.932 |
| Pellona harroweri                   | 755  | 5.0–16.5      | 18.0              | —     | 0.00952| 0.06468       | 2.969| 0.028  | 0.971 |
| Odontognathus macronotus            | 428  | 8.6–18.4      | 19.2              | —     | 0.00277| 0.07587       | 3.248| 0.030  | 0.964 |
| Paralichthys brasiliensis           | 400  | 5.0–19.6      | 30.0              | 15.7  | 0.00240| 0.08994       | 3.424| 0.036  | 0.923 |
| Stellifer rastrifer                 | 322  | 5.0–17.0      | 32.1              | 9.8   | 0.00756| 0.09541       | 3.182| 0.038  | 0.977 |
| Isopisthus parvipinnis              | 302  | 4.8–22.5      | 25.0              | 15.9  | 0.00630| 0.07832       | 3.078| 0.033  | 0.955 |
| Selene brownii$^1$                  | 149  | 3.6–20.2      | 29.0              | —     | 0.01754| 0.10391       | 2.833| 0.043  | 0.955 |
| Anchoa spinifer                     | 128  | 8.1–21.0      | 24.0              | —     | 0.00386| 0.14540       | 3.222| 0.059  | 0.967 |
| Trinectes paulistanus               | 104  | 5.4–18.2$^a$ | 18.0              | —     | 0.01824| 0.25548       | 3.009| 0.108  | 0.959 |
| Symphurus plagusia                  | 101  | 4.2–18.2      | 25.0              | —     | 0.00389| 0.12819       | 3.225| 0.051  | 0.882 |
| Chirocentrodon bleekeriandus$^2$    | 89   | 7.0–16.1$^a$ | 11.2              | 7.6   | 0.01324| 0.28281       | 2.578| 0.116  | 0.963 |
| Stellifer stellifer                 | 68   | 6.6–15.5      | 21.0              | 7.5   | 0.00552| 0.22621       | 3.287| 0.094  | 0.884 |
| Citharichthys spiopterus            | 59   | 5.5–21.0$^a$ | 20.0              | —     | 0.01522| 0.21824       | 2.799| 0.091  | 0.852 |
| Ctenosciaena gracilicirrhus$^3$     | 45   | 7.0–17.0      | 21.0              | —     | 0.00631| 0.16291       | 3.302| 0.063  | 0.960 |
| Anchoviella lepidostotole           | 28   | 5.5–16.4$^a$ | 13.1              | —     | 0.00474| 0.32489       | 3.181| 0.146  | 0.941 |
| Peprilus crenulatus$^3$             | 27   | 3.5–15.0      | —                 | —     | 0.01836| 0.12115       | 2.979| 0.054  | 0.992 |
| Genyatremus cavironus$^3$           | 21   | 7.3–12.6      | —                 | —     | 0.03135| 0.29881       | 2.751| 0.131  | 0.959 |

$n = $ number of individuals, TL = total length observed, $L_{\text{max}} = $ total length reported in FishBase, $L_n = $ length at first maturity reported in FishBase; $a$ and $b$ = parameters of the LWR, SE = standard error, $r^2 = $ coefficient of determination; only species with more than 20 specimens examined and the maximum observed length representing more than 70% of the maximum size reported in FishBase (Froese and Pauly 2018) or significantly higher than $L_n$ are presented; *no LWR found for Brazil; $^1$LWR not found for NE Brazil; $^2$new species name according to Tavera et al. (2011) and Marceniuk et al. (2016); *$L_{\text{max}}$ obtained in this study higher than currently reported in FishBase, $^b$statistically different from 3.

All results for $b$ from the LWR are within the usual range (2.5–3.5) described by Carlander (1969). Species for which only juveniles were sampled were excluded from this analysis as small individuals change during growth (Lima Filho et al. 2006), resulting in very different $b$ values. These values may also be influenced by differences among seasons (Pauly 2010), localities, and feeding habits (Wootton 1998). This is the first time that an LWR is presented for G. cavironus, and P. crenulatus under their revised scientific names (Tavera et al. 2011, Marceniuk et al. 2016).

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