*The following appendices (1 through 3) accompany the manuscript*

Functional trait consistency of mid-water fish species in two contrasting island systems

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**Appendix 1: Supplementary Tables**

Table S1 – Common length, Bayesian length-weight coefficients, estimated body mass, and trophic level data for all species observed, by family. Body mass of Delphinidae was derived from literature rather than calculated using length-weight coefficients. Where only genus or family was identified, data for species native to study sites were used to inform values.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Family** | **Species** | **Common length (cm)** | **Bayesian length-weight coefficients** | **Body mass****(kg)** | **Trophic level** |
| **α** | **β** |
| Acanthuridae | *Acanthurus monroviae* | 38 | 0.0275 | 2.97 | 2.24 | 2.5 |
| *Acanthurus xanthopterus* | 50 | 0.01413 | 3 | 4.85 | 2.9 |
| Aetobatidae | *Aetobatus narinari* | 180 | 0.00586 | 3.13 | 67.13 | 4.2 |
| Balistidae | *Balistes capriscus* | 44 | 0.02089 | 2.9 | 1.29 | 4.2 |
| *Canthidermis maculata* | 35 | 0.0257 | 2.94 | 2.54 | 3.5 |
| Belonidae  | 58 | 0.00118 | 3.081 | 4.97 | 4.37 |
| Carangidae | *Caranx crysos* | 40 | 0.01738 | 2.95 | 0.93 | 4.1 |
| *Caranx lugubris* | 70 | 0.01698 | 2.95 | 4.71 | 4.5 |
| *Decapterus* sp. | 24 | 0.01189 | 2.978 | 0.43 | 3.68 |
| *Elagatis bipinnulata* | 90 | 0.00977 | 2.85 | 3.63 | 4.3 |
| *Selene dorsalis* | 24 | 0.01479 | 2.89 | 0.14 | 4.1 |
| *Seriola* sp. | 66.67 | 0.01748 | 2.924 | 3.76 | 4.4 |
| *Trachurus* sp. | 23.5 | 0.00961 | 2.95 | 0.11 | 3.5 |
| Juvenile (unidentified) | 1.413 | 0.00957 | 3.039 | 2.74 × 10-5 | n.a. |
| Carcharhinidae | *Carcharhinus falciformis* | 250 | 0.00489 | 3.09 | 125.59 | 4.5 |
| Coryphaenidae | *Coryphaena hippurus* | 100 | 0.01622 | 2.83 | 7.41 | 4.4 |
| Dasyatidae | *Hypanus* sp. | 107.5 | 0.00676 | 3.06 | 11.12 | 3.5 |
| Echeneidae | *Echeneis naucrates* | 66 | 0.00166 | 3.15 | 0.89 | 3.7 |
| Fistulariidae | *Fistularia* sp. | 150 | 0.00069 | 2.965 | 4.7 | 4.05 |
| Istiophoridae | *Istiophorus platypterus* | 270 | 0.00513 | 3.1 | 176.74 | 4.5 |
| Kyphosidae | *Kyphosus ocyurus* | 25 | 0.0182 | 3.01 | 0.29 | 3.5 |
| Lutjanidae | *Lutjanus aratus* | 35 | 0.01288 | 2.96 | 0.48 | 4.1 |
| Monacanthidae | *Aluterus scriptus* | 55 | 0.823 | 1.814 | 1.18 | 2.8 |
| Scombridae    | *Acanthocybium solandri* | 170 | 0.00288 | 3.16 | 32.18 | 4.3 |
| *Euthynnus alletteratus* | 80 | 0.01 | 3.05 | 6.38 | 4.5 |
| *Sarda orientalis* | 55 | 0.00955 | 3.03 | 1.79 | 4.2 |
| *Thunnus albacares* | 150 | 0.01445 | 3.01 | 51.28 | 4.4 |
| Sphyrnidae   | *Sphyrna lewini* | 360 | 0.00355 | 3.11 | 316.47 | 4.1 |
| *Sphyrna tiburo* | 80 | 0.002 | 3.1 | 1.59 | 3.9 |
| *Sphyrna zygaena* | 335 | 0.00417 | 3.03 | 186.65 | 4.9 |
| Delphinidae | 246.43 | n.a. | n.a. | 140 | 4.3 |

Table S2 – Functional trait values for all species observed, by family. Where only genus or family was identified, traits were based on values for species of the group in question native to study sites. The 6 traits used to describe each species were size (0-7 cm, 7.1-15 cm, 30.1-50 cm, 50.1-80 cm, > 80 cm), mobility (sedentary, mobile within a reef, mobile between reefs), period of activity (diurnal, both nocturnal and diurnal, nocturnal), schooling (solitary, pairing, small group [3-20 individuals], medium group [20-50 individuals], large group [> 50 individuals]), position in water column (benthic, benthopelagic, pelagic), and diet (herbivorous-detritivorous, macroalgal herbivorous, invertivorous targeting sessile invertebrates, invertivorous targeting mobile invertebrates, planktivorous, piscivorous [including cephalopods], omnivorous).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Family** | **Species** | **Length (cm)** | **Mobility** | **Activity** | **Schooling** | **Position** | **Diet** |
| Acanthuridae | *Acanthurus monroviae* | 30.1-50 | Within reef | Diurnal | Small group | Benthic | Herbivorous-detritivorous |
| *Acanthurus xanthopterus* | 50.1-80 | Within reef | Diurnal | Small group | Benthopelagic | Herbivorous-detritivorous |
| Aetobatidae | *Aetobatus narinari* | >80 | Between reefs | Both | Solitary | Benthopelagic | Invertivorous (sessile) |
| Balistidae | *Balistes capriscus* | 30.1-50 | Within reef | Diurnal | Small group | Benthopelagic | Invertivorous (sessile) |
| *Canthidermis maculata* | 30.1-50 | Between reefs | Diurnal | Large group | Pelagic | Planktivorous |
| Belonidae |  | 50.1-80 | Between reefs | Both | Small group | Pelagic | Piscivorous |
| Carangidae  | *Caranx crysos* | 30.1-50 | Between reefs | Both | Medium group | Pelagic | Piscivorous |
| *Caranx lugubris* | 50.1-80 | Between reefs | Nocturnal | Solitary | Benthopelagic | Piscivorous |
| *Decapterus* sp. | 15.1-30 | Between reefs | Both | Medium group | Benthopelagic | Planktivorous |
| *Elagatis bipinnulata* | >80 | Between reefs | Diurnal | Large group | Pelagic | Piscivorous |
| *Selene dorsalis* | 15.1-30 | Between reefs | Nocturnal | Medium group | Benthic | Piscivorous |
| *Seriola* sp. | 50.1-80 | Between reefs | Both | Small group | Benthopelagic | Piscivorous |
| *Trachurus* sp. | 30.1-50 | Between reefs | Nocturnal | Large group | Benthopelagic | Invertivorous (mobile) |
| Juvenile (unidentified) | 0-7 | Between reefs | Both | Medium group | Pelagic | Planktivorous |
| Carcharhinidae | *Carcharhinus falciformis* | >80 | Between reefs | Both | Solitary | Pelagic | Piscivorous |
| Coryphaenidae | *Coryphaena hippurus* | >80 | Between reefs | Both | Small group | Pelagic | Piscivorous |
| Dasyatidae | *Hypanus* sp. | >80 | Between reefs | Nocturnal | Solitary | Benthic | Invertivorous (mobile) |
| Echeneidae | *Echeneis naucrates* | 50.1-80 | Between reefs | Both | Solitary | Pelagic | Planktivorous |
| Fistulariidae | *Fistularia* sp. | >80 | Between reefs | Both | Solitary | Benthopelagic | Piscivorous |
| Istiophoridae | *Istiophorus albicans* | >80 | Between reefs | Both | Small group | Pelagic | Piscivorous |
| Kyphosidae | *Kyphosus ocyurus* | 15.1-30 | Between reefs | Diurnal | Medium group | Pelagic | Omnivorous |
| Lutjanidae | *Lutjanus aratus* | 30.1-50 | Between reefs | Nocturnal | Large group | Benthopelagic | Piscivorous |
| Monacanthidae | *Aluterus scriptus* | 50.1-80 | Between reefs | Diurnal | Solitary | Benthopelagic | Omnivorous |
| Scombridae  | *Acanthocybium solandri* | >80 | Between reefs | Both | Solitary | Pelagic | Piscivorous |
| *Euthynnus alletteratus* | 50.1-80 | Between reefs | Both | Large group | Pelagic | Piscivorous |
| *Sarda orientalis* | 30.1-50 | Between reefs | Both | Large group | Pelagic | Piscivorous |
| *Thunnus albacares* | >80 | Between reefs | Both | Large group | Pelagic | Piscivorous |
| Sphyrnidae | *Sphyrna lewini* | >80 | Between reefs | Nocturnal | Solitary | Pelagic | Piscivorous |
| *Sphyrna tiburo* | 50.1-80 | Between reefs | Diurnal | Small group | Pelagic | Invertivorous (mobile) |
| *Sphyrna zygaena* | >80 | Between reefs | Nocturnal | Solitary | Pelagic | Piscivorous |
| Unidentified larval fish | 0-7 | Between reefs | Both | Medium group | Pelagic | Planktivorous |
| Delphinidae | >80 | Between reefs | Both | Large group | Pelagic | Piscivorous |

Table S3 – Results of SIMPER analysis of abundance with 95% cut off, showing average MaxN of species across all samples at each site, average contribution to dissimilarity between sites, standard deviation of average contribution, cumulative contribution to dissimilarity between sites, and *P* level of contribution.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|    | Average MaxN | Average Contribution % | S.D.  | Cumulative Contribution %  | *P* level  |
| **Cape Verde** | **Malpelo** |
| *Decapterus* sp. | 26.11 | 2.63 | 0.20 | 0.18 | 0.21 | ns |
| *Elagatis bipinnulata* | 0.00 | 14.50 | 0.12 | 0.14 | 0.34 | \*  |
| *Thunnus albacares* | 0.00 | 9.00 | 0.10 | 0.12 | 0.45 | \* |
| *Euthynnus alletteratus* | 19.22 | 0.00 | 0.09 | 0.16 | 0.55 | ns |
| *Trachurus* sp. | 36.33 | 0.00 | 0.08 | 0.24 | 0.64 | ns |
| Carangidae juvenile | 6.22 | 0.88 | 0.08 | 0.11 | 0.73 | ns |
| *Lutjanus aratus* | 0.00 | 15.13 | 0.08 | 0.16 | 0.82 | ns |
| *Canthidermis maculata* | 0.00 | 2.75 | 0.02 | 0.05 | 0.84 | ns |
| *Sarda orientalis* | 0.00 | 4.75 | 0.02 | 0.06 | 0.86 | ns |
| *Delphinidae* sp. | 1.00 | 0.75 | 0.02 | 0.04 | 0.88 | ns |
| *Sphyrna lewini* | 0.00 | 0.88 | 0.02 | 0.03 | 0.90 | \*\* |
| *Kyphosus ocyurus* | 0.00 | 2.75 | 0.02 | 0.03 | 0.92 | ns |
| *Belonidae* sp. | 0.00 | 2.38 | 0.01 | 0.03 | 0.93 | ns |
| *Fistularia* sp. | 0.44 | 0.00 | 0.01 | 0.02 | 0.94 | \*  |
| *Acanthocybium solandri* | 0.89 | 0.13 | 0.01 | 0.01 | 0.95 | ns |

*P*-value: ns, non-significant; \*, p < 0.05; \*\*, p < 0.01

**Appendix 2: Supplementary Figures**

Figure S1 – Comparison of quality of multidimensional functional spaces, showing mean squared deviation between Euclidean distance of species in initial space and Gower distance of species in scaled spaces.******

Figure S2 – Distribution of trait levels on the first and second (A) and third and fourth (B) dimensions of the functional space; labels are positioned at the centroids of convex hulls around coordinates of species with each trait value. Circles indicate species observed at Cape Verde, and triangles indicate species from Malpelo.

**Appendix 3: Literature used to compile functional trait values, species lengths, Bayesian length-weight coefficients, and trophic levels**

Ajemian MJ, Powers SP, Murdoch TJT (2012) Estimating the potential impacts of large mesopredators on benthic resources: Integrative assessment of spotted eagle ray foraging ecology in Bermuda. PLOS ONE 7:e40227

Ahlstrom EH (1984) Ontogeny and Systematics of Fishes. American Society of Ichthyologists and Herpetologists Special Publication No 1. American Society of Ichthyologists and Herpetologists, New York

Aprieto VL (1974) Early Development of Five Carangid Fishes of the Gulf of Mexico and the South Atlantic Coast of the United States. Fish Bull 72:415–443

Aronson R (1983) Foraging behavior of the west Atlantic trumpetfish, *Aulostomus maculatus*: use of large, herbivorous reef fishes as camouflage. Bull Mar Sci 33:166–171

Au DWK, Perryman WL (1985) Dolphin Habitats in the Eastern Tropical Pacific. Fish Bull 83:623–643

Bahou L, Kone T, N’Douba V, N’Guessan KJ, Kouamelan EP, Gouli GB (2007) Food composition and feeding habits of little tunny (*Euthynnus alletteratus*) in continental shelf waters of Cote D’Ivoire (West Africa). ICES J Mar Sci 64:1044–1052

Bayhan B, Sever TM (2009) Food and feeding habits of the Atlantic horse mackerel, *Trachurus trachurus*, from the Aegean Sea (Osteichthyes: Carangidae). Zool Middle East 46:47–54

Bertrand A, Barbieri MA, Córdova J, Hernández C, Gómez F, Leiva F (2004) Diel vertical behaviour, predator-prey relationships, and occupation of space by jack mackerel (*Trachurus murphyi*) off Chile. ICES J Mar Sci 61:1105–1112

Branstetter S (1987) Age, growth and reproductive biology of the silky shark, Carcharhinus falciformis, and the scalloped hammerhead, *Sphyrna lewini*, from the northwestern Gulf of Mexico. Environ Biol Fishes 19:161–173

Bridge TCL, Luiz OJ, Coleman RR, Kane CN, Kosaki RK (2016) Ecological and morphological traits predict depth-generalist fishes on coral reefs. Proc R Soc B Biol Sci 283:20152332

Brown H, Benfield MC, Keenan SF, Powers SP (2010) Movement patterns and home ranges of a pelagic carangid fish, *Caranx crysos*, around a petroleum platform complex. Mar Ecol Prog Ser 403:205–218

Carpenter KE, ed (2002) The Living Marine Resources of the Western Central Atlantic. FAO Species Identification Guide for Fishery Purposes. FAO, Rome

Clark E, Nelson DR, Dreyer R, Pkwy KT (2015) Nesting sites and behavior of the deep-water triggerfish *Canthidermis maculata* (Balistidae) in the Solomon Islands and Thailand. Aqua, Int J Ichthyol 21:1-38

Coles DP (2014) Dusk Transition in sub-tropical reef fish communities off of North and South Carolina. MSc dissertation. The Graduate School of the College of Charleston, Charleston, SC

Compagno LJV (1984) FAO Species Cat Vol 4: Sharks of the World. FAO, Rome

Corcoran MJ, Wetherbee BM, Shivji MS, Potenski MD, Chapman DD, Harvey GM (2013) Supplemental Feeding for Ecotourism Reverses Diel Activity and Alters Movement Patterns and Spatial Distribution of the Southern Stingray, *Dasyatis americana*. PLOS ONE 8:e59235

Dharmadi, Fahmi, White W (2009) Biodiversity of Sharks and Rays in South-Eastern Indonesia. Indones Fish Res J 15:17–28

Ditty JG, Shaw RF, Cope JS (2004) Distribution of carangid larvae (Teleostei: Carangidae) and concentrations of zooplankton in the northern Gulf of Mexico, with illustrations of early *Hemicaranx amblyrhynchus* and *Caranx* spp. larvae. Mar Biol 145:1001–1014

Domm SB, Domm AJ (1973) The Sequence of Appearance at Dawn and Disappearance at Dusk of Some Coral Reef Fishes. Pacific Sci 27:128–135

Eldridge PJ, Berry FH, Miller MC. 1976 Diurnal Variations in Catches of Selected Species of Ichthyoneuston by the Boothbay Neuston Net Off Charleston, South Carolina. Fish Bull 76:295–297

Falautano M, Castriota L, Finoia MG, Andaloro F (2007) Feeding ecology of little tunny *Euthynnus alletteratus* in the central Mediterranean Sea. J Mar Biol Assoc UK 87:999–1005

Fertl D, Landry AM (2018) Remoras. In: Würsig B, Thewissen JGM, Kovacs K (eds), Encycl Mar Mamm. Academic Press, Cambridge, p 942–943

Filmalter JD, Dagorn L, Cowley PD, Taquet M (2010) First descriptions of the behaviour of silky sharks (*Carcharhinus falciformis*) around drifting FADs, in the Indian Ocean, using acoustic telemetry. Bull Mar Sci 87:325–337

Fischer W, Bianchi G, Scott WB (1981) Eastern Central Atlantic, Fishing Area 34, 37 (in part). FAO Species Identification Sheets for Fisheries Purposes. FAO, Rome

Frazer TK, Lindberg WJ, Stanton GR (1991) Predation on sand dollars by Gray Triggerfish, *Balistes capriscus*, in the Northeastern Gulf of Mexico. Bull Mar Sci 48:159–164

Fritzsche RA (1976) A review of the cornetfishes, genus *Fistularia* (Fistulariidae), with discussion of the intrageneric relationships and zoogeography. Bull Mar Sci 26:196–204

Froese R, Pauly D (2019) FishBase. www.fishbase.org (accessed 2 Feb 2019)

Gnone G, Moriconi T, Gambini G (2006) Activity and sleep in dolphins. Nature 441:E10–E11

Hazevoet CJ, Monteiro V, López P, Varo-cruz N, Torda G, Berrow S, Gravanita B (2010) Recent data on whales and dolphins (Mammalia: Cetacea) from the Cape Verde Islands, including records of four taxa new to the archipelago. Zool Caboverdiana 1:75–99

Hazevoet CJ, Wenzel FW (2000) Whales and dolphins (Mammalia, Cetacea) of the Cape Verde Islands, with special reference to the Humpack Whale *Megaptera novaengliae* (Borowski, 1781). Contrib Zool 69:197–211

Helfman GS (1978) Patterns of community structure in fishes: summary and overview. Environ Biol Fishes 3:129–148

Helfman GS (1986) Fish Behaviour by Day, Night and Twilight. In: Pitcher TJ (ed) The Behaviour of Teleost Fishes. Springer, Boston

Hendriks IE, Wilson D, Meekan M (2001) Vertical distributions of late stage larval fishes in the nearshore waters of the San Blas Archipelago, Caribbean Panama. Coral Reefs 20:77–84

Herrera Carmona JC, Capella Alzueta JJ, Soler GA, Bessudo S, García C, Flórez González L (2011) Occurrence and encounter rates of marine mammals in the waters around the Malpelo Island and to the continent. Bull Mar Coast Res 40:57–78

Hobson ES (1975) Feeding patterns among tropical reef fishes. Am Sci 63:382–392

Hobson ES (1973) Diel feeding migrations in tropical reef fishes. Helgoländer Wissenschaftliche Meeresuntersuchungen 24:361–370

Hobson ES (1965) Diurnal-Nocturnal Activity of Some Inshore Fishes in the Gulf of California. Copeia 1965:291–302

Hoffmayer ER, Franks JS, Comyns BH, Hendon JR, Waller RS (2005) Larval and Juvenile Fishes Associated with Pelagic Sargassum in the Northcentral Gulf of Mexico. Gulf Caribb Fish Inst 56:260–269

Honebrink RR (1990) Fishing in Hawai’i: A Student Manual. Department of Land and Natural Resources, Division of Aquatic Resources, Honolulu

Honebrink RR (2000) A review of the biology of the family Carangidae, with emphasis on species found in Hawaiian waters. Department of Land and Natural Resources, Division of Aquatic Resources, Honolulu

Horta E Costa B, Gonçalves EJ (2013) First occurrence of the Monrovia doctorfish *Acanthurus monroviae* (Perciformes: Acanthuridae) in European Atlantic waters. Mar Biodivers Rec 6:2005–2008

Houde ED (1989) Comparative growth, mortality, and energetics of marine fish larvae: temperature and implied latitudinal effects. Fish Bull 87:471–495

Humann P, DeLoach N (2004) Reef Fish Identification: Baja to Panama. New World Publications, Jacksonville

Humann P, DeLoach N (2014) Reef Fish Identification: Florida, Caribbean, Bahamas. New World Publications, Jacksonville

Izzo P, Milessi AC, Ortega L, Segura AM (2010) First record of *Aluterus scriptus* (Monacanthidae) in Mar del Plata, Argentina. Mar Biodivers Rec 3:1–3

Jefferson TA, Curry BE, Leatherwood S, Powell JA (1997) Dolphins and porpoises of West Africa: a review of records (Cetacea: Delphinidae, Phocoenidae). Mammalia 61:87–108

Jefferson TA, Leatherwood S, Webber MA (1993) Marine Mammals of the World. FAO Species Identification Guide. FAO, Rome

Johnson AG, Saloman CH (1984) Age, Growth, and Mortality of Gray Triggerfish, *Balistes Capriscus*, from the Northeastern Gulf of Mexico. Fish Bu 82:485–492

Kaji T, Tanaka M, Takahashi Y, Oka M, Ishibashi N (1996) Preliminary observations on development of pacific bluefin tuna *Thunnus thynnus* (Scombridae) larvae reared in the laboratory, with special reference to the digestive system. Mar Freshw Res 47:261–269

Leahy SM, Russ GR, Abesamis RA (2015) Pelagic larval duration and settlement size of a reef fish are spatially consistent, but post-settlement growth varies at the reef scale. Coral Reefs 34:1283–1296

Leak JC (1981) Distribution and Abundance of Carangid Fish Larvae in the Eastern Gulf of Mexico, 1971–1974. Biol Oceanogr 1:1–28

Leis JM, McCormick MI (2002) The Biology, Behavior, and Ecology of the Pelagic, Larval Stage of Coral Reef Fishes. In: Sale, PF (ed) Coral Reef Fishes: Dynamics and Diversity in a Complex Ecosystem, p 171–199. Academic Press, San Diego

Lin PL, Shao KT (1999) A review of the carangid fishes (Family Carangidae) from Taiwan with descriptions of four new records. Zool Stud 38:33–68

Luiz OJ, Floeter SR, Gasparini JL, Ferreira CEL, Wirtz P (2004) The occurrence of *Acanthurus monroviae* (Perciformes: Acanthuridae) in the south-western Atlantic, with comments on other eastern Atlantic reef fishes occurring in Brazil. J Fish Biol 65:1173–1179

Marshell A, Mumby PJ (2012) Revisiting the functional roles of the surgeonfish *Acanthurus nigrofuscus* and *Ctenochaetus striatus*. Coral Reefs 31:1093–1101

McKenney TW, Alexander EC, Voss GL (1958) Early Development and Larval Distribution of the Carangid Fish, *Caranx crysos* (Mitchill). Bull Mar Sci Gulf Caribb 8:167–200

Misund OA, Luyeye N, Coetzee J, Boyer D (1999) Trawl sampling of small pelagic fish off Angola: Effects of avoidance, towing speed, tow duration, and time of day. ICES J Mar Sci 56:275–283

Mohan JA, Sutton TT, Cook AB, Boswell KM, David Wells RJ (2017) Influence of oceanographic conditions on abundance and distribution of post-larval and juvenile carangid fishes in the northern Gulf of Mexico. Fish Oceanogr 26: 526–541

Myrberg AA, Gruber SH (1974) The Behavior of the Bonnethead Shark, *Sphyrna tiburo*. Copeia 1974:358–374

Nunn AD, Tewson LH, Cowx IG (2012) The foraging ecology of larval and juvenile fishes. Rev Fish Biol Fish 22:377–408

Perelman JN, Schmidt KN, Haro I, Tibbetts IR, Zischke MT (2017) Feeding dynamics, consumption rates and daily ration of wahoo *Acanthocybium solandri* in Indo-Pacific waters. J Fish Biol 90:1842–1860

Perrin WF (2018) Pantropical Spotted Dolphin. In: Würsig B, Thewissen JGM, Kovacs K (eds), Encycl Mar Mamm. Academic Press, Cambridge, p 676–678

Perrin WF (2018) Spinner Dolphin. In: Würsig B, Thewissen JGM, Kovacs K (eds), Encycl Mar Mamm. Academic Press, Cambridge, p 925–928

Perrin WF, Dolar MLL, Chan CM, Chivers SJ (2005) Length-weight relationships in the spinner dolphin (*Stenella longirostris*). Mar Mammal Sci 21:765–778

Reiner F, Santos ME dos, Wenzel FW, Whale A (2006) Cetaceans of the Cape Verde Archipelago. Mar Mammal Sci 12:434–443

Safran P (1992) Theoretical analysis of the weight-length relationship in fish juveniles. Mar Biol 112:545–551

Schluessel V, Bennett MB, Collin SP (2010) Diet and reproduction in the white-spotted eagle ray *Aetobatus narinari* from Queensland, Australia and the Penghu Islands, Taiwan. Mar Freshw Res 61:1278

Shivam A (2015) Sucker fish *Echeneis naucrates* Linnaeus 1758 of west coast of India. Indian J Geo-Marine Sci 44:56–62

Sivakami S (1996) On the Food Habits of the Fishes of the Family Carangidae - A Review. J Mar Biol Assoc India 38:118–123

Sley A, Jarboui O, Ghorbel M, Bouain A (2009) Food and feeding habits of *Caranx crysos* from the Gulf of Gabs (Tunisia). J Mar Biol Assoc UK 89:1375–1380

Sobhana KS, Seetha PK, Kishore TG, Divya DD, Dineshkumar S, Najmudeen TM, Nair RJ, Zacharia PU (2013) Unusual landing of the spotted ocean triggerfish *Canthidermis maculata* at Cochin Fisheries Harbour. Mar Fish Inf Serv T&E Ser 215:35

Stobberup KA, Ramos VDM, Coelho ML (2004) Ecopath Model of the Cape Verde coastal ecosystem. In: Palomares MLD, Pauly D (eds) West African Marine Ecosystems: Models and Fisheries Impacts. Fish Cent Res Reports 12:39–56

Swaby SE, Potts GW, Lees J (1996) The First Records of the Blue Runner *Caranx crysos* (Pisces: Carangidae) in British Waters. J Mar Biol Assoc UK 76:543–544

Takeuchi N, Hashimoto H, Gushima K (2002) Short-term foraging patterns of individual cornetfish, *Fistularia commersonii*, based on stomach content analysis. Ichthyol Res 49:76–80

Theisen TC, Baldwin JD (2012) Movements and depth/temperature distribution of the ectothermic Scombrid, *Acanthocybium solandri* (Wahoo), in the western North Atlantic. Mar Biol 159:2249–2258

Tricas TC, Gruber SH, eds (2001) The behavior and sensory biology of elasmobranch fishes: an anthology in memory of Donald Richard Nelson. Springer Netherlands, Dordrecht

Trites AW (2001) Marine Mammal Trophic Levels and Interactions. In: Steele J, Thorpe S, Turekian K (eds) Encyclopedia of Ocean Sciences. Academic Press, Cambridge, p 1628–1633

Vose FE, Nelson WG (1994) Gray Triggerfish (*Balistes capriscus* Gmelin) Feeding from Artificial and Natural Substrate in Shallow Atlantic Waters of Florida. Bull Mar Sci 55:1316–1323

Yankova MH, Raykov VS, Frateva PB (2008) Diet composition of horse mackerel, *Trachurus mediterraneus ponticus* Aleev, 1956 (Osteichthyes: Carangidae) in the Bulgarian Black Sea Waters. Turkish J Fish Aquat Sci 8:321–327

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