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Life-History Traits of the Bluespotted Cornetfish *Fistularia commersonii* Rüppell, 1838 in Rhodes, Greece, with Notes on the Red Cornetfish *Fistularia petimba* Lacepède, 1803

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Abstract: In the Mediterranean, the bluespotted cornetfish *Fistularia commersonii* Rüppell, 1838, presents a minor socioeconomic impact and the assessment of any environmental impact requires more relevant data. The congeneric red cornetfish *Fistularia petimba* Lacepède, 1803, has expanded its distribution range within the basin but only small numbers have been reported to date. A total of 207 individuals of *F. commersonii* were collected between April 2021 and March 2022 from the Levantine coast of Rhodes and 92 more from various locations. Additionally, 13 individuals of *Fistularia petimba* were caught in March 2024 from the Aegean coasts of the island. We aim to assess the current progression of the population of the two cornetfish, the possible further exploitation of *F. commersonii* to boost the local fishing economy, their possible dietary overlaps and to add valuable biological and ecological data. In *F. commersonii*, male to female ratio (1:1.33) significantly departed from 1:1, with length–weight relationships exhibiting positive allometric growth. Six age groups were identified. The highest reproductive intensity was observed during summer. The onset of sexual maturity was estimated at 65.52 cm in total length (1.8 years). Longevity was estimated at 11.1 years with females growing larger than males. The exploitation rate (E = 0.47) indicated that the population is underexploited. The optimum and target fishing mortality were higher in comparison with the present fishing mortality (F = 0.48), indicating a potential for commercial exploitation of the species. For *F. petimba*, the sex ratio was 1:2.25. The species preys on crustaceans, followed by fish and molluscs. The finding of *Vanderhorstia mertensi* (Klausewitz, 1974) in the stomach content of both cornetfishes constitutes the second published record for Hellenic waters and the first for the Dodecanese Islands.

Keywords: cornetfish; dietary overlap; invasive fish; length-weight relationship; maturity; southern Aegean Sea; *Vanderhorstia mertensi*; von Bertalanffy

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1. Introduction

A growing number of non-indigenous species (NIS) is being recorded in the Mediterranean Sea, one of the world's primary hotspots for marine biological invasions [1–3]. According to recent studies, almost 1000 non-indigenous taxa have been identified in the basin [4,5]. The most significant introduction pathway for the Mediterranean is their unaided entrance through the Suez Canal [6,7], a phenomenon known as Lessepsian migration [8]. Any species introduced accidentally or deliberately into a new environment, out of its natural distribution range, and delivers negative impacts to the biodiversity, structure and function of the ecosystem is referred to as invasive alien species (IAS) [9–15]. IAS can also have negative impacts on the economy and human health [13,16–19].

The bluespotted cornetfish *Fistularia commersonii* Rüppell, 1838, is one of the worst invasive fish species to have entered the basin [20] that manifests a combination of characteristics such as fast range expansion, buildup of large populations, high fecundity, long period of reproduction and generalistic feeding behavior [21–24]. During the early years of its invasion, the bluespotted cornetfish was given the characterization of "Lessepsian sprinter" [25], and within seven years after its first finding in the eastern Mediterranean, it had spread through the entire basin [23]. The natural geographical distribution of the species is the Indo-Pacific Ocean, including the Red Sea and East Africa to Rapa and Easter Island, north to southern Japan, south to Australia and New Zealand and the eastern central Pacific Ocean, where the species ranges from Mexico to Panama [26]. The bluespotted cornetfish was first recorded in 2000 along the coasts of Israel [27], and soon after, it was documented along the Levantine coasts of Turkey [28,29] as well as in Rhodes [30]. Many more recordings of the species throughout the basin followed [22,23,31–53]. Nevertheless, there is evidence that in the Mediterranean, the species was first captured in 1975 off Beirut, Lebanon [24].

A fast range dispersion is also noticed for the red cornetfish *Fistularia petimba* Lacepède, 1803; however, all records but one come from a rather small number of collected individuals, and so far, there is scarce published information on its biology and ecology [54]. The species was first reported in the Mediterranean on 23 June 1996 off Cadiz, Spain, from a single record (SR) [55]. In the eastern basin the species was first recorded on 28 October 2016 and on 26 November 2016 in Antalya Bay (SR), Turkey [56]. More reports followed from Albania, Cyprus, Egypt, Greece, Israel, Lebanon, Syria and Turkey (countries presented in alphabetical order) [54,56–66]. Naturally, the species is distributed in the western Atlantic, from Florida to southern Brazil and Argentina, the eastern Atlantic from Galicia, Spain, to Cape Blanc and Cape Verde and as far south as Namibia and the Indo-Pacific Oceans from southern Japan to southern Australia, the Red Sea and East Africa [26,67–69]. Both *F. commersonii* and *F. petimba* live over soft substrates of the coastal waters and feed on small fishes and shrimps [21,26,54].

According to [70], the invasion of *F. commersonii* in the basin is probably attributed to only a couple of female individuals, suggesting a much-reduced genetic diversity. The results of subsequent studies [71–74] based on mitochondrial markers from samples collected from different areas of the Mediterranean, including Sardinia, Sicily, Tunisia, Lampedusa, Libya and Lebanon, suggested the involvement of two mitochondrial chains in the invasion of *F. commersonii*. That means higher haplotype diversities but lower than those from its native range. A genetic bottleneck may have caused the loss in genetic variation leading to fixation of specific lineages as an adaptive response to new environmental conditions [71–74]. Nevertheless, there is no remarkable difference in the genetic diversity of the Red Sea and Mediterranean populations [72].

Several authors have raised the possibility that *F. commersonii* may disturb the evolutionary course of native species through competitive exclusion, displacement, predation and other ecological and genetic mechanisms [46,75,76]. At the same time, concerns are expressed regarding the reduction of the biomass of species with commercial value such as the bogue *Boops boops* (Linnaeus, 1758), the European anchovy *Engraulis encrasicolus* (Linnaeus, 1758), the picarel *Spicara smaris* (Linnaeus, 1758) and the surmullet *Mullus surmuletus* (Linnaeus, 1758) [21,30,77,78], which would cause a decrease in the catches. This constitutes the main possible socioeconomic impact of the bluespotted cornetfish as it has been suspected of producing losses of income of the coastal small-scale fishers, although this has not been proven yet [78]. Additionally, the species raises the working hours of fishers for disentangling the individuals caught and repairing damage of the fishing gear [78].

So far, the deficiency of available data prevents any risk assessment with regard to the environmental impact of the species.

Based on knowledge from other IAS, such as the devil firefish *Pterois miles* (Bennett, 1828), the eradication of the cornetfish from the invaded areas is unlikely to be accomplished [79–83]. What is needed to be considered and investigated is all the possible solutions for these species to become economically advantageous. Targeted removals are a managerial strategy that could also benefit the ecosystem by controlling the cornetfish populations. As the available data on *F. petimba* is not sufficient, the positive elements about the presence of *F. commersonii*, exemplary in Rhodian marine waters, is its edibility and its regular presence in the catches of the small-scale fisheries [22,27,75,78,84–90]. Additionally, there is scientific interest in the involvement of *F. commersonii* in the production of cosmetics, beverages and food supplements [91,92].

On the other hand, *F. commersonii* may be proven valuable in the population control of other invasive species such as *P. miles*, which has been found in the stomach contents of the former [78,93].

Despite the variety of fishing gear [94,95], the most commonly applied in the small-scale fisheries of the Hellenic marine waters are two types of static nets, gill nets (GNSs) and trammel nets (GTRs) [94,96,97]. In regard to the mesh sizes of GNSs and GTRs, professional small-scale fishers select the appropriate from a variety of mesh sizes, according to the targeted species [98]. The bluespotted cornetfish can be effectively caught with the use of these static nets [22,27,75,78,84–90]. Although edible and with low to strong presence in artisanal catches, *F. commersonii* is still not heavily marketed [22,27,75,78,84–90]. It is thus subjected to a very low fishing pressure, being more a by-catch than a target fish, and only locally, the meat of larger specimens is appreciated. In the south Dodecanese Islands and Cyprus, the species reaches a market price of €5–10/kg and €6–10/kg, respectively [78,84,89].

The relatively recent introduction in the eastern Mediterranean and range expansion of the NIS *F. petimba* is raising the question of whether this species will act synergistically with its congeneric *F. commersonii*, amplifying any of the possible negative impacts of the bluespotted cornetfish in the Mediterranean. Assessing the diet of the two cornetfish could reveal any signs of a potential for competitive impact on indigenous species and trophic overlap, which is known to have important implications for the prediction of population dynamics of the predators and their common prey [99,100].

Currently, there is an urgent need for the development of innovative methods to control populations of IAS, as in the case of other marine species [101,102]. According to several studies (e.g., [102]) deeper research into the unknown and less studied aspects of the biology of alien species has the potential to contribute to the control of their spread or the development of new control methods of their population. Hence, the aim of the present study is to enrich the knowledge on the biology and ecology of *F. commersonii* and *F. petimba* and to provide new data on their populations from the coastal waters of Rhodes (Figure 1). Additionally, we anticipate that the provided information will contribute towards the development of sustainable fisheries on the grounds that, eventually, *F. commersonii*, and most probably *F. petimba*, will become a targeted species for the small-scale coastal fisheries of the Mediterranean and a new source of income for the fishers and small–medium enterprises. More specifically, for *F. commersonii*, various population characteristics were examined, such as the sex ratio, length–weight relationship (LWR), gonadosomatic index (GSI), length at first maturity (L_{50}), age and growth. For *F. petimba*, we made a preliminary report on the sex ratio, on the TL and TW ranges and on the similarities/differences with *F. commersonii* regarding their diet in a specific area of the coastal waters of Rhodes. The goal of our findings is to become the baseline for future research regarding the assessment of the two cornetfish in relation to fisheries and their commercial exploitation.

Figure 1. Map of Rhodes, Greece, and location of sampling areas. Colored areas: the monthly experimental fishing trials from April 2021 to March 2022; striped area: trials in November 2022 and March 2024; three ports—Faliraki, Lardos and Plimiri: random visits and collection of *Fistularia commersonii* individuals between November 2022 and October 2023 and in April and May of 2024.

2. Materials and Methods

Collected data were assessed for normality and heteroscedasticity with the Shapiro–Wilk and with the variance ratio and Levene's tests, respectively. When data failed to meet the requirements of homogeneity and normality assumptions, the Brunner–Munzel test was employed [103]. The Kruskal–Wallis test was employed when data departed from normality and homogeneity of variance, followed by Dwass–Steel–Critchlow–Flinger pairwise comparisons [104]. The evaluation of null hypothesis of equal sex proportion and comparison with published literature was performed with the use of the chi-square goodness-of-fit test [105]. Jamovi (Ver. 2.5.5) [106] was employed for statistical analysis at the 0.05 alpha level. The two-sample *t*-test was used to compare the equations between the sexes [104].

2.1. Study Area and Sampling Methodology

Rhodes, Greece, is an Eastern Mediterranean Island, located on the natural pathway of the unaided dispersion of NIS that enter the basin via the Suez Canal and constitutes the main secondary pathway of their further westward or northward expansion. Rhodian coastal waters are highly impacted by thermophilic Lessepsian species and present a high abundance of *F. commersonii* [84,90].

Three areas of the eastern coastal waters of Rhodes (Levantine Sea) (colored areas in Figure 1) were selected for monthly experimental fishing trials, conducted between April 2021 and March 2022. These areas were selected through the analysis of acquired questionnaires addressed to local professional fishers who indicated the regions with the highest presence of *F. commersonii.* Three Rhodian ports (named black dots in Figure 1) located along the eastern coastline of the island were chosen for random visits and collection of *F. commersonii* individuals between November 2022 and October 2023 and in April and May of 2024. Their selection was based on the fact that they are situated within the same coastline as areas 1–3. The Gulf of Trianda northwest of Rhodes (striped area in Figure 1) was selected on the basis of the bottom topography, which is ideal for the type of fishing gear we applied, the proximity to Levantine waters and the long timeline of data that the Hydrobiological Station of Rhodes/Hellenic Centre for Marine Research (HSR/HCMR) is gathering from that gulf. Trials in the gulf were conducted in November 2022 and March 2024.

Two fishing vessels of the Rhodian small-scale coastal fleet were employed for the monthly experimental fishing trials (April 2021 to March 2022), with a total length of 13.3 m and engine power of 106.5 KW and total length of 9.0 m and engine power of 7.35 KW, respectively. The fishing gear employed was GNSs and GTRs, as illustrated in [107] and described analytically in a recent study [90]. The individuals collected from random visits to the three aforementioned Rhodian ports were caught with GNSs. One fishing vessel was employed for the experimental fishing trials of November 2022 and March 2024 with anchor seining (SB), alias Danish seining [108], with a total length of 12.2 m and engine power of 113.94 KW. For all three types of fishing gear employed in the present study, depth ranged from 8 to 35 m.

All fishing gear was applied as typically performed by local fishers of Rhodes. The deployment of GNSs and GTRs was conducted in the early night hours. The former were retrieved approximately two hours after deployment and the latter during sunrise. On the other hand, SB was employed in the early hours of daylight for a duration of approximately one hour per haul. Total length (TL) excluding tail filament and total weight (TW) of each individual were measured to the nearest 0.1 cm and 0.01 g, respectively.

For the April 2021 to March 2022 monthly experimental fishing trials, the applied fishing gear was nylon static nets. They consisted of 600 m GNSs (1.7 m height, 22 mm knot-to-knot mesh size) and 600 m GTRs (1.7 m height, 24–32/130 mm knot-to-knot mesh sizes—inner and outer nets, respectively), and all had a three-strand retwisted twine (type 210/6, Momoi® Ako City, Japan). Weight-wise, the floats averaged 0.11 kg/m and the sinkers 0.32 kg/m. The 5 mm diameter of the float and sinker rope weighed 0.025 kg/m. The GNSs and GTRs had total weights per meter of 0.95 kg and 1.05 kg, respectively. Throughout the trials, two members of this study (G.K. and D.M.) were onboard to ensure that the relevant protocol and schedule were followed correctly. Both types of fishing gear were manually set out early in the evening, in parallel to the coast. Retrieval took place with hydraulic winches, at dawn for the GTRs and two hours post deployment for the GNSs, with mean soaking times of 1.5 h $\pm$ 7 min and 12.5 h $\pm$ 15 min, respectively. All individuals collected throughout the random visits to the three ports were also caught with

GTRs and GNSs, applied with the same deployment/retrieval schedule. However, the mesh size and total net length was not registered. All SB hauls were performed during morning hours with the fishing vessel anchored approximately 70 m from the coastline. The total length of the fishing gear was 350 m and the mesh size from the edges to the cod end was graded in a declining order: 500, 180, 32–34, 12, 11 and 8 mm. Each haul lasted approximately 35–40 min. Hydraulic winches were employed for the retrieval, revolving at a constant speed of approximately 0.30 m/s. G.K. was onboard for all hauls.

Substrate was determined with the use of the Humminbird 998c SI Combo monobeam sounder (Humminbird®, Johnson Outdoors Inc., Alpharetta, GA, USA), along with visual inspection via scuba diving in selected locations within each of the three areas (areas 1–3, Figure 1).

2.2. Population Structure

Population length frequency distributions (LFDs) were employed to discriminate among normal distributions, with each mode assumed to represent a cohort from the overall size–frequency distribution [109] using the NORMSEP method in the FiSAT II program (FAO, Rome, Italy) (version 1.2.2) [110]. Modal progression analysis (MPA) was used to decompose the composite LFDs via application of the maximum likelihood concept for separation of the normally distributed components of size-frequency samples [111]. The separation index among different cohorts was employed to determine statistically acceptable cohorts.

A catch curve based on net selectivity generated by applying linear regression to an ascending series of input points plotted from the capture probability against the length group was employed to calculate the length at first capture (L_c), representing a 50% capture probability.

2.3. Length–Weight Relationship

The LWR was determined independently for males and females and for the total population (sex-combined) by fitting the exponential curve to the data according to [112] (Equation (1)).

$$TW = a \times TL^{b} \tag{1}$$

where TL is total length (cm), TW total weight (g), "a" the intercept (growth factor) and "b" the slope of the relationship (allometry coefficient). To evaluate the allometric relationships (significant departure of the slope from 3), one sample *t*-test was used.

2.4. Age Composition and Growth

Using the software FiSAT II (FAO, Rome, Italy) (version 1.2.2.) [110], age classes were first determined via length frequency distribution using Bhattacharya's approach [113]. Modal progression analysis, which separates normally distributed components of size-frequency samples, was applied to refine the results using the maximum likelihood concept (NORMSEP) [114].

Growth parameters were calculated using the von Bertalanffy [115] growth equation (Equation (2)).

$$Lt = L\infty \times \left(1 - e^{-k \times (t - t_0)}\right) \tag{2}$$

where k (growth coefficient) is the rate at which the asymptotic length (L_∞) is approached, t is the age in years and t_0 is the hypothetical age at which the fish has zero length.

The index of growth (in length) performance [112] was derived using the von Bertalanffy parameters (Equation (3)).

$$\varphi' = \log K + 2 \times \log L\infty \tag{3}$$

The maximum lifespan was estimated according to [116] (Equation (4)).

$$\mathrm{tmax} = \frac{2.9957}{\mathrm{k}} + \mathrm{t}_0 \tag{4}$$

The inflection point (time when the growth rate starts to decrease) was estimated according to [117] (Equation (5)).

$$\text{Inflection point} = \mathrm{t}_0 + \frac{\ln_3}{\mathrm{K}} \tag{5}$$

2.5. Reproduction

The term "onset of sexual maturity" (L_{50}) refers to the point in time at which 50% of a population reaches sexual maturity. For every specimen, the sex and maturity stage were determined macroscopically. If a fish had developing, ripe, or spent ovaries, it was considered mature. Mature fish received a rating of 1, whereas immature or resting fish, which are thought to be non-reproductive, received a score of 0. The relationship between fish length and the probability of sexual maturity was modeled by fitting the data with a binary logistic regression.

The seasonal and annual reproductive cycle of the bluespotted cornetfish was assessed with the use of the GSI (Equation (6)) in accordance with [24] for the total population.

$$\mathrm{GSI}(\%) = \frac{\mathrm{GW}}{\mathrm{TW}} \times 100 \tag{6}$$

where GW is the gonad weight and TW the total weight.

Recruitment pattern was assessed via the reconstruction of the recruitment pulses from a time series of length–frequency data to determine the number of pulses per year and the relative strength of each pulse. The FiSAT II software was utilized to implement a routine that involved backward projection of length frequencies onto the time axis based on growth parameters. This allowed for the determination of the annual recruitment pulses and their relative strength. The routine involved the use of time series length–frequency data and growth parameters L_∞, K, and t_0 [118].

2.6. Mortality and Exploitation Rate and Probability of Capture—Lopt

Natural mortality (M) was calculated using the updated $\mathrm{Hoenig_{nls}}$ estimator according to [119] (Equation (7)).

$$\mathrm{M} = 4.899 \times {t_{max}}^{-0.916} \tag{7}$$

Total mortality (Z) was calculated using an empirical equation [120] (Equation (8)).

$$\mathrm{Z} = \mathrm{K} \times (\mathrm{L}\infty - \mathrm{L_{mean}}) / (\mathrm{L_{mean}} - \mathrm{L'}) \tag{8}$$

where L_{mean} is the mean length of all fish in a sample representing a steady-state population and L' is the cut-off length or the lower limit of the smallest length class included in the computation.

The length converted catch curve [121] was further employed to estimate Z.

The annual fishing mortality rate (F) was obtained by subtracting natural from Z, according to [109] (Equation (9)).

$$\mathrm{F} = \mathrm{Z} - \mathrm{M} \tag{9}$$

The exploitation rate (E), a measure of the number of fish that are caught from a population each year, was calculated as the ratio of F to Z [121] (Equation (10)).

$$\mathrm{E} = \mathrm{F}/\mathrm{Z} \tag{10}$$

The length class with the highest biomass (L_{opt}) (optimum length) was calculated according to [122] (Equation (11)).

$$\text{Lopt} = \frac{3 \times L\infty}{3 + \frac{M}{K}} \tag{11}$$

The selectivity curve's ascending data points, obtained via linear regression, were employed to estimate the probability of capture at the 25%, 50% and 75% levels [123].

2.7. Relative Y/R and B/R Analysis: Knife-Edge Selection

The knife-edge method [124] was used to evaluate the relative yield-per-recruit (Y'/R), the maximum exploitation rate (Emax) and the optimal exploitation rate (E_{opt}). Further biological reference points were calculated in accordance with [122] and [125,126], which included the optimal length (L_{opt}), optimal fishing mortality (F_{opt}), fishing mortality limit (F_{lim}) and optimal exploitation rate (E_{opt}).

2.8. Notes on the Biology of F. petimba

Total length (TL) excluding tail filament, standard length (SL) (from tip of snout to midcaudal—excluding tail filament) and total weight (TW) of each *F. petimba* individual caught in the March 2024 SB experimental trials were measured to the nearest 0.1 cm and 0.01 g, respectively. Each stomach was removed, examination of the content was accomplished under a Nikon SMZ800 stereoscope (Nikon Instruments Inc., New York, NY, USA) and identification of prey items was performed to the nearest possible taxonomic group [69,127–129]. To perform a preliminary comparison of the diet of the species with *F. commersonii*, an equal number of individuals of the latter, caught in the same hauls and of similar TL range, were chosen. They were measured for TL, SL and TW, and their stomach content was examined as in *F. petimba*.

The percentage frequency of occurrence (%F) of each prey item was calculated with the application of the formula proposed by [130] (Equation (12)).

$$\%\text{F} = (\text{ns}/\text{Ns}) \times 100 \tag{12}$$

where n_s is the number of stomachs containing a certain prey item and N_s is the total number of the examined stomachs.

3. Results

From the total of 299 *F. commersonii* collected between April 2021 and April 2024, 122 were males, 162 were females and 15 were unsexed individuals, presenting a M:F sex ratio of 1:1.33 in favor of females, which significantly departed from 1:1 ($x^2 = 5.63$, $p < 0.05$).

3.1. Study Area and Sampling Methodology

Rhodes has a coastline of 253 km [131]. The coastline that was involved in the experimental fishing trials (areas 1–3 and Gulf of Trianda) and that was covered by the fishers who provided the *F. commersonii* individuals during our random visits to the three ports is approximately 55 km. Reductively, the total coastline studied in the present work corresponds to almost 22% of the total coastline.

In total, 299 bluespotted cornetfish individuals were collected during the study along the coastal marine waters of Rhodes. Between April 2021 and March 2022, 207 individuals were collected through the monthly experimental fishing trials, 59 individuals were collected between November 2022 and October 2023 and in April and May of 2024 during random visits to the three Rhodian ports and another 7 individuals were collected through the experimental fishing trials in November 2022 and 13 on March 2024 from the Gulf of Trianda. Additionally, 13 bluespotted cornetfish individuals were collected in March 2024 from the latter area.

The coastal region of area 1 and the Gulf of Trianda are urbanized and densely populated, with extensive infrastructure, port facilities and a large number of hotel units. Less urbanized are area 2 and the ports of Faliraki and Lardos, with the coastal region bordering them presenting a mosaic of uses, partially residential, barren/unculturable and culturable land, with a small section under non-agricultural/other use. The coastal area of area 3 and Plimmiri port are almost entirely reserved for agricultural use, with only a small portion presenting residential use.

As far as the substrate is concerned, GTRs and GNSs were deployed over hard to sandy bottoms (10–25 m), with patches of Neptune grass *Posidonia oceanica* (Linnaeus) Delile, 1813, succeeded by clay dominance at depths below 25.00 m (area 1, Figure 1). In area 2, the bottom presented a variable composition, ranging from rocky with local concentrations of pebbly and sandy material to sandy dominated areas where *P. oceanica* meadows were virtually absent and patches were sparsely recorded. At depths below 25 m clay dominated. Sand and silty sand dominated the shallows in area 3, replaced by fine grained sediment (mainly clay) in the deeper parts. Within the depth range that the SB experimental hauls were conducted, the substrate is characterized by strong to moderate presence of *P. oceanica* and areas of sand in the shallows.

3.2. Population Structure

Mean length for the total population was 74.92 ± 16.69 cm (71.47 ± 11.46 cm and 77.77 ± 18.71 cm for males and females, respectively) and mean weight 318.82 ± 217.72 g (251.90 ± 120.26 g and 371.78 ± 256.21 g for males and females, respectively) (Figure 2).

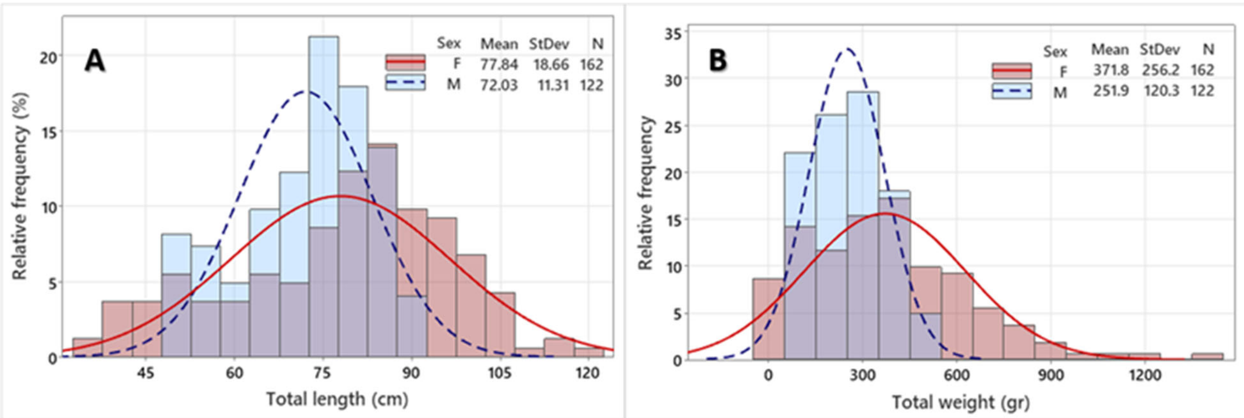

Figure 2. Length (**A**) and weight (**B**) frequency distribution of the 284 sexed individuals of *F. commersonii* from the coastal waters of Rhodes, with overlaid fitted normal distribution for each sex.

In terms of length and weight, females exhibited a more heterogeneous distribution than males (Figure 2) with the former significantly longer (Brunner–Munzel test statistic −4.43, $p < 0.001$) and heavier (Brunner–Munzel test statistic −4.05, $p < 0.001$) compared to males.

3.3. Length–Weight Relationship

A highly significant positive allometry was indicated for the total, male and female populations ($p < 0.001$) (Figure 3). No significant difference was observed between the male and female length–weight relation.

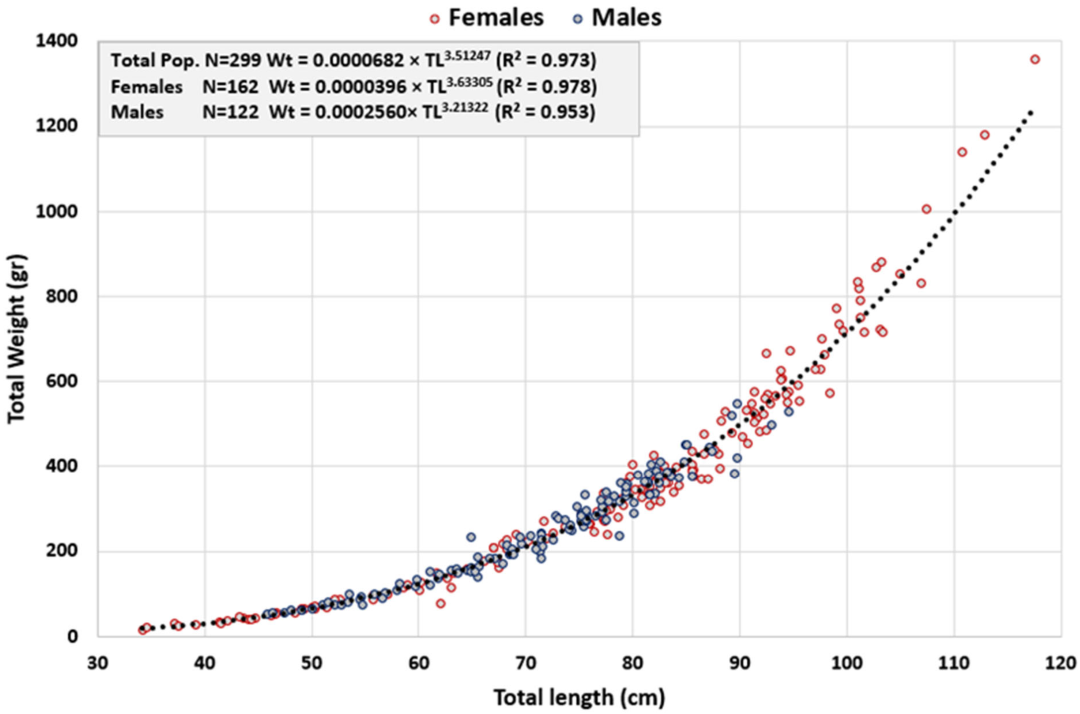

Figure 3. Length–weight relationship of 122 male and 162 female individuals of *F. commersonii* from the coastal waters of Rhodes.

3.4. Age Composition and Growth

The dominant cohort was the third-year class, comprising 41.45% of the population, out of the six age classes identified, followed by the second- (17.09% of the population) and the first-year class (21.93% of the population), respectively (Figure 4).

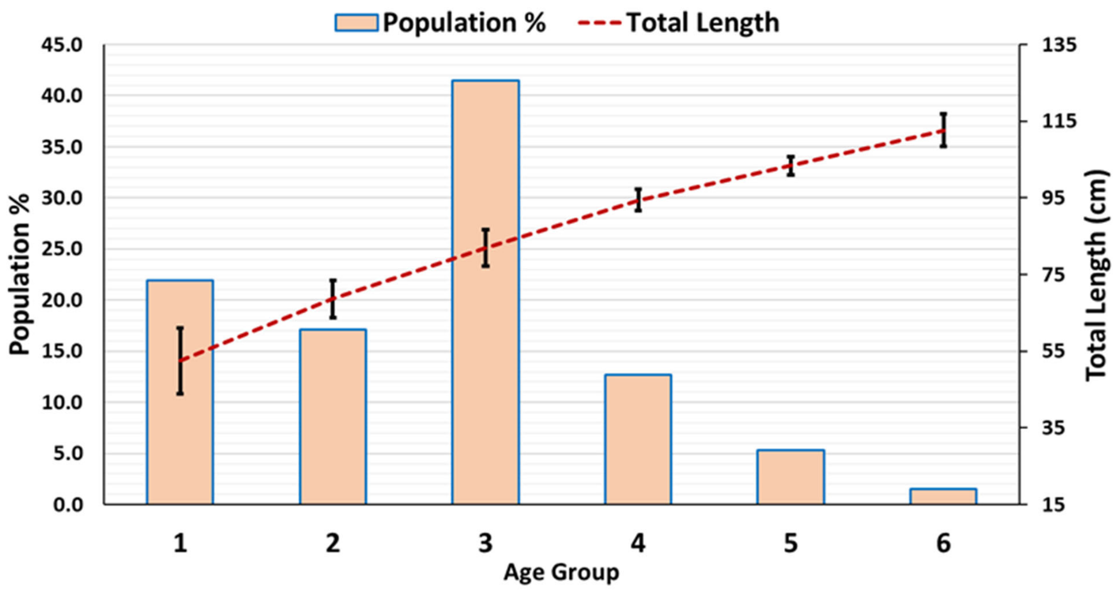

Figure 4. Characteristics of the identified age groups for all captured individuals of *F. commersonii* from the coastal waters of Rhodes. Confidence intervals indicate the standard deviation.

The Von Bertalanffy growth equation (Figure 5) for the total population was estimated as:

$$\text{Total length (cm)} = 138.554 \times \left(1 - e^{-0.230304 \times (\text{age} + 0.883531)}\right)$$

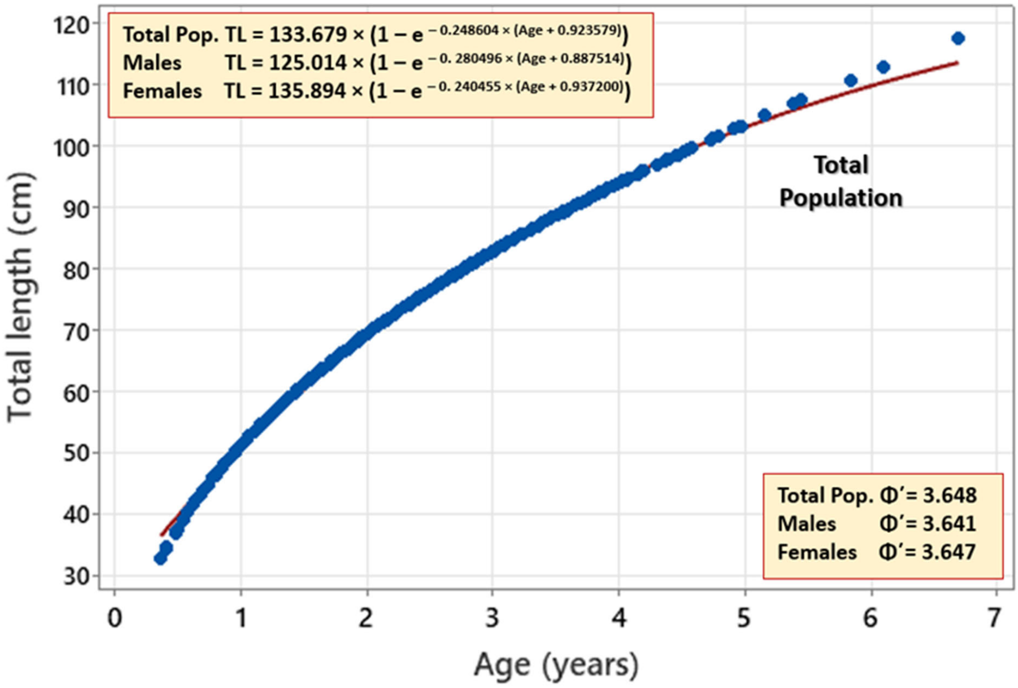

Figure 5. Von Bertalanffy growth equation and growth index (Φ′) for the total population and each sex of 122 male and 162 female individuals of *F. commersonii* from the coastal waters of Rhodes.

Asymptotic length L_∞ was estimated at 133.70 cm, 125.00 cm and 135.90 for the total population, males and females, respectively. Growth index (Φ′) was estimated as 3.65, 3.64 and 3.65 for the total population, males and females, respectively, indicating fast growth rates. Longevity was estimated at 11.1 years, 9.8 years and 11.5 years for the total population, males and females, respectively. Inflection point was estimated at 3.49 years for the total population.

3.5. Reproduction

According to the GSI, the highest reproductive intensity was exhibited during summer, followed by autumn (Figure 6A), with highly significant differences ($p < 0.001$) observed between summer and spring, summer and winter and autumn and winter, significant differences ($p < 0.01$) observed between autumn and spring and no significant differences ($p > 0.05$) observed between summer and autumn and spring and winter.

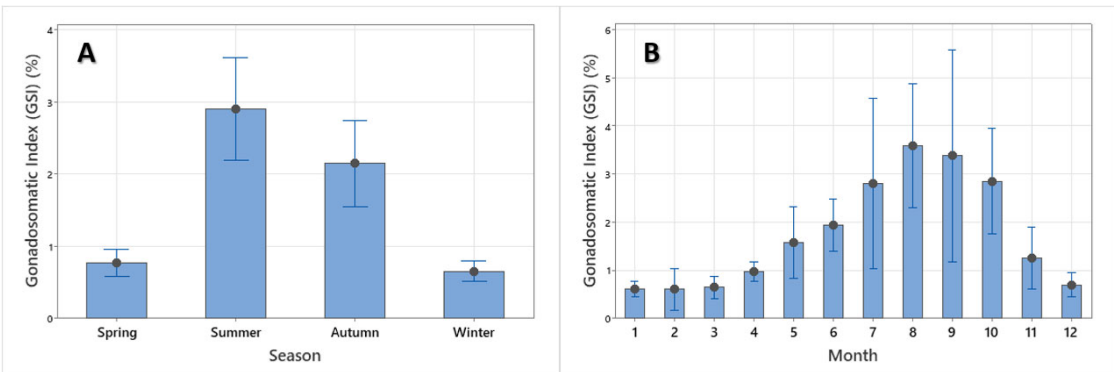

Figure 6. Mean seasonal (**A**) and monthly (**B**) GSI (bars indicate 95% confidence interval) for all captured individuals of *F. commersonii* from the coastal waters of Rhodes.

The annual recruitment pattern of *F. commersonii* (Figure 7) indicated that recruitment occurs in two prominent peaks during April–May (29.50% of the annual recruitment) and July–August (26.70% of the annual recruitment).

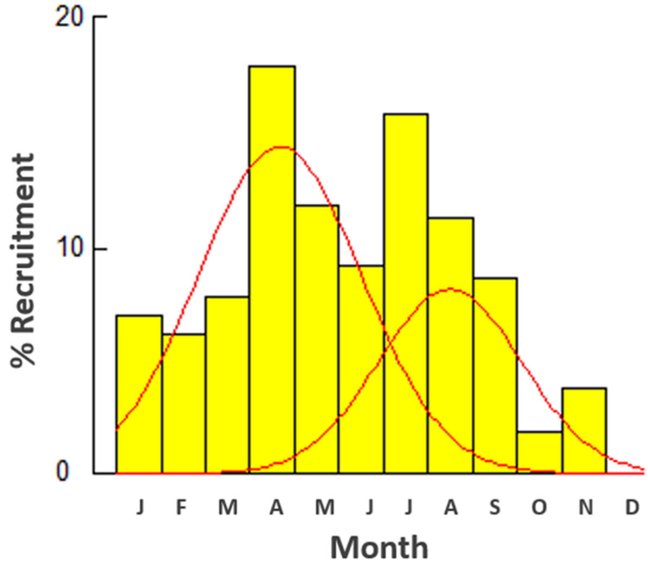

Figure 7. Monthly recruitment pattern of *F. commersonii* in the coastal waters of Rhodes, Greece. The superimposed red lines indicate the smoothed trend of recruitment distribution throughout the year.

The L_{50} was estimated at 65.52 cm in total length (1.8 years and 181.7 g) for the total population and 69.07 (2.0 years and 213.7 g) and 59.58 (1.4 years and 133.19 g) for males and females, respectively (Figure 8).

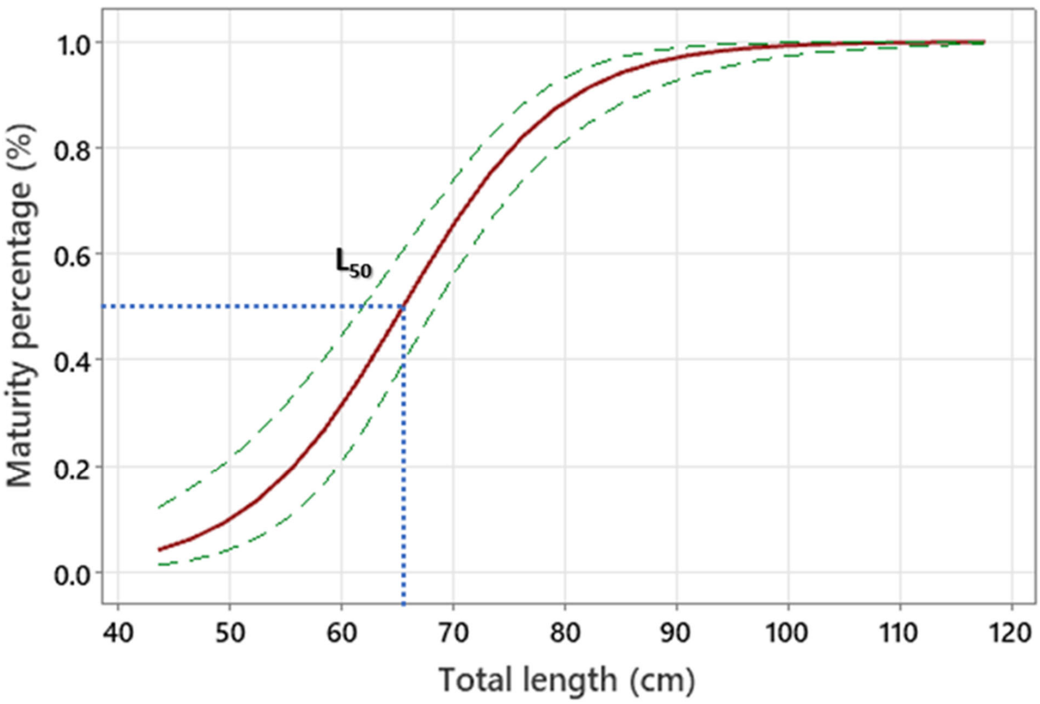

Figure 8. Binary logistic regression of the proportion of mature *F. commersonii* from the coastal waters of Rhodes, relative to its total length (red line indicates model fit, green dashed line indicates 95% C.I., blue dashed line indicates L_{50}).

3.6. Mortality and Exploitation Rate and Probability of Capture—Lopt

Natural mortality was estimated as 0.54, Z as 1.02 and F as 0.48. The exploitation ratio (E) was estimated at 0.47, indicating an underexploited population.

The probability of capture was estimated at 25% (LC_{25}), 50% (LC_{50}) and 75% (LC_{75}) levels as 70.11, 75.40 and 78.55 cm, respectively (Figure 9), with age at a 50% probability of capture (t_{50}) being estimated at 2.4 years.

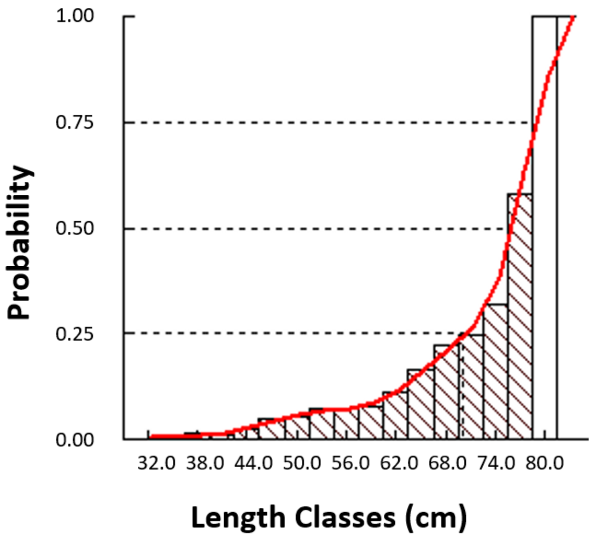

Figure 9. Probability of capture for different length classes (LC_{25}, LC_{50}, LC_{75}) of *F. commersonii* from the coastal waters of Rhodes.

The length class with the highest biomass (L_{opt}) was estimated at TL = 77.60 cm.

3.7. Relative Y/R and B/R Analysis: Knife-Edge Selection

The yield per recruit (Y/R) against F and E are shown in Figures 10 and 11, respectively. Results of the yield-per-recruit analysis and biological reference points are shown in Table 1.

Table 1. Relative yield/recruit analysis (knife-edge) and biological reference points *of F. commersonii* population from the coastal waters of Rhodes.

	E	**Y/R**	**B/R**
	0.01	0.006	0.860
	0.20	0.011	0.727
	0.30	0.016	0.603
	0.40	0.020	0.486
	0.50	0.023	0.380
	0.60	0.026	0.282
	0.70	0.028	0.196
	0.80	0.029	0.119
	0.90	0.030	0.054
	0.99	0.030	0.005
Biological reference points			
E_{max}	0.959		
$E_{0.1}$	0.819		
$E_{0.5}$	0.388		
F_{opt}	0.54		
F_{lim}	0.36		
E_{opt}	0.50		

E, exploitation rate; Y/R, yield per recruit; B/R, biomass per recruit; E_{max}, exploitation rate which produces the maximum yield; $E_{0.1}$, exploitation rate at which the marginal increase in relative yield per recruit is 1/10th of its value at E = 0; $E_{0.5}$, value of E under which the stock has been reduced to 50% of its unexploited biomass; F_{opt}, optimum fishing mortality; F_{lim}, fishing mortality limit; E_{opt}, optimum exploitation rate.

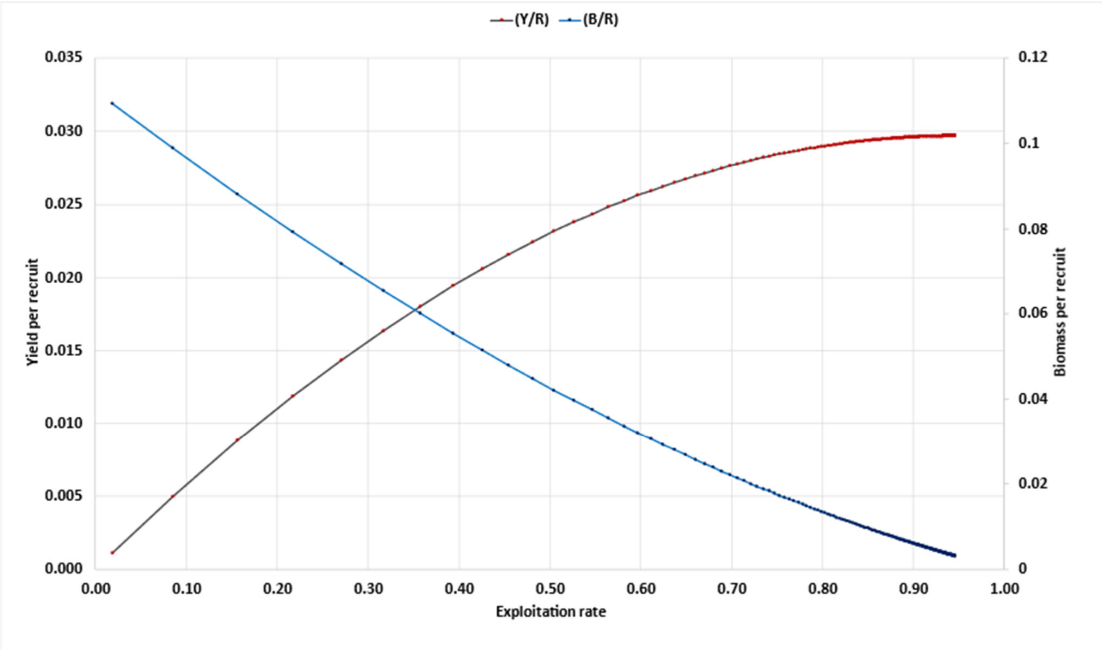

Figure 10. Yield per recruit (Y/R) and biomass per recruit (B/R) of *F. commersonii* collected from the coastal waters of Rhodes, for different fishing exploitation rates.

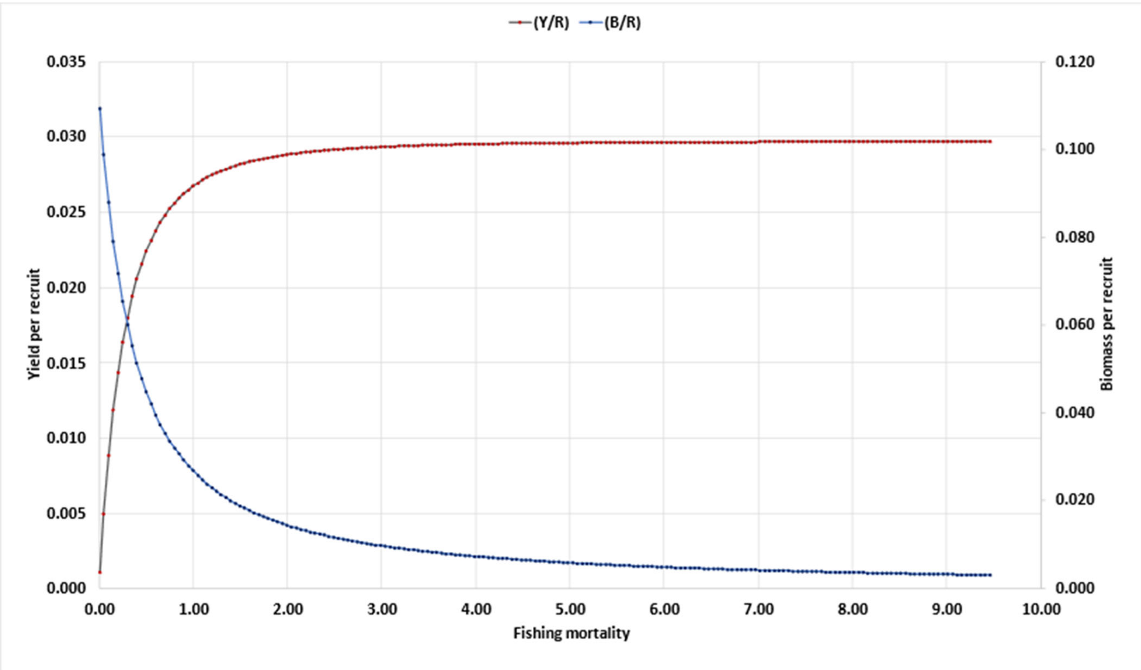

Figure 11. Yield per recruit (Y/R) and biomass per recruit (B/R) of *F. commersonii* collected from the coastal waters of Rhodes, for different fishing mortalities.

3.8. Notes on the Biology of F. petimba

The TL excluding tail filament of the 13 collected individuals of *F. petimba* ranged from 30.70 to 59.20 cm, whereas the TW ranged from 13.50 to 123.80 g. The M:F sex ratio of 1:2.25 was in favor of females. The TL excluding tail filament of the 13 individuals of *F. commersonii* ranged from 34.20 to 52.80 cm. The TW ranged from 16.40 to 74.20 g. The M:F sex ratio of 1:5.5 was in favor of females.

Interestingly, in *F. commersonii* the diet was dominated by fish, followed by crustaceans, whereas in *F. petimba* the prevailing prey items were crustaceans, followed by fish and mollusks (Table 2). None of the stomachs of all 26 individuals examined were empty.

Table 2. Prey items of the 13 individuals of *F. commersonii* and the 13 individuals of *F. petimba* caught with BS on 11 March 2024 in the Gulf of Trianda, Rhodes.

	Taxonomic Group	Family	Species	N	%N	F	%F
***F. commersonii* (N = 13)**	*Actinopterygii*		*Actinopterygii gen.* spp.	13	76.47	8	61.54
		Sparidae	NA	1	5.88	1	7.69
		Gobiidae	*Vanderhorstia mertensi*	1	5.88	1	7.69
		Total fish		15	88.24	10	76.92
	Decapoda		*Decapoda gen.* spp.	1	5.88	1	7.69
		Sergestidae	NA	1	5.88	1	7.69
		Total crustaceans		2	11.76	2	15.38
		Total prey items		**17**			
***F. petimba* (N = 13)**	*Actinopterygii*		*Actinopterygii gen.* spp.	10	20.41	7	53.85
		Gobiidae	*Vanderhorstia mertensi*	5	10.20	4	30.77
		Gobiidae	NA	1	2.04	1	7.69
		Total fish		16	32.65	11	84.62
	Decapoda		*Dendrobranchiata gen.* spp.	3	6.12	1	7.69
			Brachyura gen. spp.	1	2.04	1	7.69
			Brachyura (larvae) gen. spp.	24	48.98	2	15.38
		Galatheidae	NA	1	2.04	1	7.69
		Total crustaceans		29	59.18	5	38.46
	Cephalopoda		*Cephalopoda gen.* spp.	2	4.08	2	15.38
	Gastropoda	*Cerithiidae*	*Cerithium scabridum*	2	4.08	2	15.38
		Total molluscs		4	8.16	4	30.77
		Total prey items		**49**			

N, number of prey items; %N, percentage of a certain prey item in the total number of prey items; F, frequency of occurrence of each prey item; %F, percentage frequency of occurrence of each prey item and NA, not applicable. With red the identified non-indigenous species.

The finding of *Vanderhorstia mertensi* Klausewitz, 1974, in the stomach content of *F. commersonii* and *F. petimba* constitutes the second published record of the species for the Hellenic waters [60] and the first for the marine waters of the Dodecanese Islands.

4. Discussion

The Mediterranean Sea is one of the most invaded marine areas by alien species. IAS effect biodiversity, ecosystem services, human health and economy [12,75,78,88,132,133]. Although the drivers underlying their establishment have not become clear, their expansion is closely related to variables such as habitat degradation or loss, fishery pressure, rise of water temperature and food availability [76,134,135], which also have an effect on the life history traits of fish such as the GSI and spawning period [136]. *Fistularia commersonii* has exhibited a rapid expansion in the Mediterranean and has built sustainable populations throughout. However, little is known about the genetic diversity and population connectedness of *F. commersonii* and nothing for *F. petimba*. The patterns of gene flow and evolutionary dynamics within and between populations of *F. commersonii* and *F. petimba* should be clarified by incorporating genetic markers and population genetic analysis.

We consider that the percentage of the studied coastline herein is quite sufficient for having a thorough understanding of the life-history features of the species as well as its ecological adaptations in the coastal waters of Rhodes. Nevertheless, in a future study, we could investigate any possible spatial variations between the individuals of the north-western (Aegean Sea) and the southeastern (Levantine Sea) coastlines. Spatial differences have been documented elsewhere for other IAS, such as for the reproduction of the silver-cheeked toadfish *Lagocephalus sceleratus* (Gmelin, 1789) in Cyprus [137]. It is worth mentioning that the areas studied herein are the most popular fishing grounds for the local, Rhodian fishers and that the involvement of more areas would have required more resources.

Throughout our study, *F. commersonii* was collected over all types of substrates. These include hard to sandy bottoms with patches or meadows of *P. oceanica*, sand and silty sand and rocky bottoms with local concentrations of pebbly and sandy material. Based on our results, the species demonstrates a broad habitat utilization. However, in future work we should concentrate on the how habitat preferences impact the distribution and abundance of the bluespotted cornetfish.

In the present study, the M:F ratio of the bluespotted cornetfish was estimated at 1:1.33. Other reported M:F ratios from the Mediterranean include 1:1.52 from Lebanon [22], 1:2.83 from south of Sicily [138], 1:1.9 from Tunisia (χ^2, n = 32, $p < 0.05$) [139], 1: 7.1 (χ^2, n = 81, $p < 0.05$) from Tunisia [140] and 1:1.43 from Iskenderun Bay, Turkey [141]. The profound resemblance is that all M:F ratios are in favor of the females and that our ratio is closer to that from southeastern Turkey. Possible causes of that variation could be the métier applied in the fishing trials, the different growth rates between males and females and mortality [142–144].

The mean length of males in the present study was 71.47 ± 11.46 cm and females 77.77 ± 18.71 cm, with the latter significantly longer than males. The smallest and largest in length male had a TL of 45.80 and 94.60 cm respectively. The smallest and largest in length female had a TL of 34.20 and 117.60 cm respectively. Thus, the TL range of the 299 individuals collected in the present study coincides with that of the female individuals. The length range of the individuals studied in other research is summarized in [145]. Apparently, the smallest individual studied in the basin had a standard length (SL) of 5.00 cm collected from Rhodes [146], whereas the longest had a TL of 115.10 cm collected from the coastal waters of Benghazi, Libya [147,148]. However, the individual with the highest reported TL of 116.50 cm (TW 1291.88 g) was caught at İskenderun Bay, Turkey, [149] and was later replaced by the TL of 117.60 cm (TW of 1353.80 g), belonging to the largest individual assessed in the present study [150]. Worldwide, the largest known individual (TL 160 cm) has been reported from within the natural range of the species, the Indo-Pacific [85]. Nevertheless, in the Mediterranean, we estimated that L_∞, the largest size that the species can grow to, is 133.70 cm for the total population, 125.00 cm TL for the male and 135.90 cm TL for the female.

In other studies from the basin, besides those listed in [145], the mean TL reported for males is 77.70 ± 0.90 cm [139] and 87.37 ± 2.49 cm [140] and the mean TL for females is 82.40 ± 0.90 cm [139] and 94.79 ± 0.95 cm [140]. Additionally, the TL range for sex combined studied populations is 95.80 to 118 cm [140], 69.00 to 104.00 cm [138] and 12.00 to 81.00 cm 37.90 ± 9.30 cm [151], and the TL of males is 74.00 cm to 81.80 cm [139] and that of females 75.00 to 92.40 cm [139]. It should be mentioned that the differences in TL and TW are affected by food availability, environmental conditions, sex, type of employed fishing gear, number of studied individuals, season and habitat [145,152].

The mean weight of our male and female individuals was 251.90 ± 120.26 g and 371.78 ± 256.21 g, respectively, with the latter significantly longer than males, attributed to the fact that females become heavier than males. The lightest male and female individuals had a TW of 53.30 g and 16.40 g, respectively. The heaviest male individual had a TW of 548.10 g whereas the heaviest female was 1357.80 g. Throughout the literature, the studied individuals of each published work do not have the same mean TW or TW range, because each study uses a different number of individuals and different size ranges. Indicatively, some of the reported sex combined mean TW are: 422.20 ± 17.30 g from Tunisia [140], 263 ± 111.20 g from Egypt [151] and 136.33 ± 135.42 g from Egypt [145]. Some of the reported sex combined TW range are 5.00–1055.00 g from Egypt [145], 155–798 g from Sicily [138], 9.00–1600.00 g from Egypt [151], 250.00–1135.00 g from Tunisia [140] and 4.00–599.58 g from Turkey [141].

For management purposes the structure of the populations of a certain species must be studied. Plotting size as a function of age allows for the measurement of a species' growth rate. Our age estimation of the bluespotted cornetfish resulted in six age classes (TL range 34.20 to 117.60 cm), and regarding longevity, it was shown that females live longer than males (11.5 vs. 9.8 years). Most individuals belonged to the third-year class (41.45% of total, TL range of 77 to 87 cm). Based on the vertebrae examination of several bluespotted cornetfish from Sicily for the determination of age, [147] estimated ages range from 2 to 4 years for individuals of TL 73.00 to 107.50 cm. Most of their specimens were from the TL range of 75–85 cm, as in the present work. On the other hand, [138] determined ages from 3 to 5 years, with the maximum age belonging to a female of TL 87.00 cm, based on otolith examination of 23 individuals from Sicilian waters. Our results seem to fit better with [147].

Length–weight relationship is an important tool in fisheries biology and in the research for fisheries evaluation [153]. In regard to an invasive species, LWR reveals how its population has changed temporally and spatially in the invaded habitat [154]. The "a" and "b" values for all individuals (sex combined) were 0.00009 and 3.4407, and for males they were 0.00008 and 3.4666 and for females 0.00008 and 3.4753, respectively. *F. commersonii* exhibits positive allometry in the under-study area, which means that fish weight increases with length and both sexes grow in a similar way. Earlier, [138,145] summarized the LWRs for *F. commersonii* reported by various authors throughout the Mediterranean Sea. Out of the nine LWRs listed, the three that demonstrate negative allometric growth were based on individuals collected from Turkish marine waters (southern Aegean Sea and Iskenderun Bay). In all other areas, including our study, the species has exhibited positive allometry (Rhodes, Greece, Lebanon and Syria, Libya, Sicily and Egypt), [22,139,142,145–148,155,156]. Isometric growth has been reported in [139,140]. Quite recently, ref. [150] reported that their estimated slope for individuals of *F. commersonii* collected from coastal waters of Rhodes was significantly different from at least five other studies of the species [22,138,151,155,156] and pointed out that this could be related to the applied fishing gear for the collection of individuals with an additional/combined possible effect of the collection depth. We believe this is a point that should be further investigated in future works.

The estimated asymptotic length, K and t_0 (L_∞ = 133.70 cm, k = 0.23, t_0 = 0.88) are different from those reported by [147] (L_∞ = 102.39 cm, K = 0.49 and t_0 = –0.57) and by [138] (L_∞ = 101.4 cm, K = 0.52; A_0 = 0). On the other hand, the growth index Φ' estimation (Φ' = 3.65) is close to that of [147] (Φ' = 3.71), both indicating that the bluespotted cornetfish is a fast-growing species.

Studying and understanding reproductive biology are essential for fish stock assessment and fisheries management. *Fistularia commersonii* has reproductively adapted to the conditions occurring in the Mediterranean. It is a multispawner species with a prolonged reproductive period. In our study, through the analysis of the bluespotted cornetfish's GSI we concluded that the reproduction peak for the species in Rhodes takes place during summer. The highest value of GSI was obtained in August with reproduction between May and October with a peak in the summer months. The results agree with a previous study from Lebanon which revealed that the reproductive season lasted at least six months, from May to October, with a peak in August [24]. The spawning peak has been reported within June and July in Syrian and Lebanese waters, where the reproductive season was reported to last from May to August [46,75]. Prior to 2013, all reports on the maturity stage of individuals collected throughout the Mediterranean were summarized by [157], agreeing on the prolonged reproduction period and the peak within Summer. The same conclusion comes from [139], based on individuals collected within October from Tunisian coastal waters.

The estimated L_{50}, alias the TL where the onset of sexual maturity takes place, was estimated at 59.58 cm (1.4 years and 133.19 g) for males and at 69.07 cm (2.0 years and 213.70 g) for females. The values for males are close to those reported from Lebanon and Syria, 54.70 cm (TL) and 56.00 cm (SL) [24,75]. The values for females are closer to that reported from Lebanon, 65.40 cm (TL), and more distant from the value reported from

Syria, 57.50 cm (SL) [24,75]. Considering the species' longevity, *F. commersonii* presents an interestingly long reproductively active period. In combination with the high fecundity rate and the extended reproduction period [46], the species possesses important key elements for being able to sustain its population and compete within its ecological niche, thus being a successful invader.

To comprehend population dynamics of a certain species, it is important to understand mortality estimates associated with growth parameters [158]. In the studied area, our results show that the fishing mortality (F) of *F. commersonii* was equal to 0.48 and the natural mortality (M) was equal to 0.54, suggesting an exploitation rate lower than 0.50 (E = 0.47). This is an indication of an underexploited population, given the fact that the bluespotted cornetfish is an edible species. The estimated F_{opt} and F_{lim} as 0.54 and 0.36, respectively, indicate a potential for further increase of F in the case of commercially exploiting the species. The difference between the E_{opt} and the current E, estimated as 0.50 and 0.47, respectively, further supports this indication, making it clear that *F. commersonii* has the potential of becoming a marketable fish with a broader market range. While there is a gap between the present and the optimal exploitation rates, indicating a potential for increased fishing, this interpretation must be approached with caution. The lack of an estimation of population density prevents us from accurately determining the potential absolute catch. Without this crucial information, it is unclear whether the increased exploitation can significantly contribute to the local fishery. Therefore, further research to estimate population density is essential before making any management decisions regarding fishing intensity. Encouragingly, the species is already being sold in fish markets of the eastern Mediterranean at an affordable price [52,78,84,89], and provided a sustainable fishery for this resource is ensured, this practice should be adopted in more areas. Important characteristics of the species that can lure any prospective buyer is the white and palatable flesh without "spines" [22]. The peculiar elongate shape of the fish is a character that the consumer can become accustomed to.

The nutritional value of *F. commersonii* in terms of fatty acids content has been recently assessed. The species demonstrates an appealing profile in polyunsaturated fatty acids (PUFAs), ω-3, ω-6 and DHA/EPA [159]. Additional information on the exploitation of the bluespotted cornetfish derives from the project EXPLIAS, where the extraction and enclosure of PUFAs and collagen in cosmetics and food products were tested with high commercial potentiality, and other work from Greece [91,92]. The results of the aforementioned work are encouraging toward the conversion of this invader to value added products, directly benefiting fishers, small-medium scale enterprises and biodiversity, since the targeted removals can assist in the population control of the bluespotted cornetfish. In terms of protein content, the species was found to have a 21.80% protein content expressed as a percentage of wet tissue weight [160], which is equal to that of the raw red muscle meat [161].

The introduction of the bluespotted cornetfish as a competitive and nutritionally important fishery product in the fish markets throughout Greece demands abbreviated efforts from relevant stakeholders such as unions of professional fishers and consumer associations and government agencies. Towards that direction, we propose the conduct of gastronomy events held in multiple urban centers, such as coastal cities with high tourist traffic, in hotels, restaurants and similar venues. The promotion of the species as a new and nutritionally important food source must be combined with the element of environmental protection since the goal is the decrease of the population size of an IAS. According to the second management measure of Article 19 of the EU Regulation No 1143/2014, the commercial use of already established IAS is not prohibited [162].

In parallel, a second goal can be a low to substantial contribution to the economy of the coastal small-scale fisheries of the Mediterranean, especially in the areas where *F. commersonii* thrives [84,90,163]. This potentially new fisheries resource presupposes adequate management and monitoring for ensuring sustainability [164,165].

Notes on the Biology of F. petimba

The TL excluding the tail filament of *F. petimba* in a study from Cyprus [54] ranged from 30.60 to 53.50 cm, which is very similar to the range we observed, 30.70 to 59.20 cm. Also, the TW range of our specimens (13.50 to 123.80 g) closely matches the range (9.70 to 97.80 g) reported in the study from Cyprus [54].

A previous survey with the deployment of SB in the Gulf of Trianda conducted in November 2022 by HSR/HCMR yielded only seven individuals of *F. petimba* that ranged from 29.40 to 49.60 cm in TL (Kondylatos, unpublished data). Approximately one and a half years later, in the present study, the largest individual caught is more than double in TL. Whether the species has settled in the Rhodian marine waters and has developed viable populations is a point of further investigation.

While the fish dominated diet of *F. commersonii* agrees with previous studies [21,139,140,146,147,166], in *F. petimba*, the prevailing prey items were crustaceans, followed by fish and mollusks, in contrast with a previous study from Cyprus [54]. Nevertheless, between the two cornetfish there are similarities regarding the taxonomic groups that the prey items belong to, although we cannot be certain that they compete over the same species. None of the stomachs of the 13 *F. petimba* individuals was found empty. Additionally, there were no commercially important fish species or families recorded in the stomach contents, although the SB hauls yielded a considerable amount of biomass of commercially important species, such as *B. boops* and *S. smaris*. This could be attributed to the fact that most of the fish prey items in the examined stomachs were in a partially to well digested stage, prohibiting the identification to species level.

The ecological aspects of *F. petimba* in Rhodian coastal waters lie within the fact that all individuals were caught over *P. oceanica* meadows and sandy substrate, in agreement with [167], and that they had consumed prey items which are connected to such substrates, rather than pelagic species such as *S. smaris* [26]. The red cornetfish is a bottom dwelling species, associated with demersal and benthic species, and our results agree with the feeding habits of the species within its native range, where it is known to feed near the bottom [167]. Strong proof of this is the presence of *Vanderhorstia mertensi* in the diet of *F. petimba*, which suggests a preference towards benthic prey, at least for the individuals with a TL less than 60.00 cm. The collected number of individuals presented herein is small, produced by specific, benthic fishing gear. Safer results have to be based on regular, monthly monitoring of the Rhodian sublittoral waters and a larger number of individuals, which should incorporate the use of static nets and verify our belief that the species has become established in the area. Regardless, the consumption of NIS by NIS is a fact that cannot be neglected. Such a successful predation has been documented for other NIS, notably *F. commersonii*. The consumption of NIS by the latter species has been positively commented on for its potential to contribute in the population control of NIS and especially the IAS devil firefish [78,93].

Vanderhorstia mertensi has been recorded in various regions of the eastern Mediterranean [54,60,129,168–170]. Our finding bridges a gap between the eastern findings and the westernmost record of the species in the basin.

To determine the market potential of *F. petimba* and the sustainability of this market, more studies must be carried out. So far, large populations of this cornetfish in the basin have not been revealed [54,56–58,60–65,171,172]. Hopefully, the potential exploitation of the species has already been initiated [173].

To date, assessment of the impact of *F. commersonii* on the ecosystem is mainly based on indirect observations such as stomach content analysis, while the possible negative effects have been projected via modelling and scientific estimates. These possibilities can only be certified, or not, via direct in situ observations. Understanding the age, reproduction, dietary patterns and stock assessment of *F. commersonii* in the Mediterranean Sea requires additional biological research.

5. Conclusions

In the under-study area, *F. commersonii* is thriving. Six age classes were identified and the onset of sexual maturity the population was estimated at the TL of 65.52 cm. Longevity was estimated at 11.1 years for the total population. The reproductive intensity of the species was highest during summer, followed by autumn. GSI peaked in August. The estimated optimal fishing mortality and fishing mortality limit indicate that the bluespotted cornetfish is unexploited in Rhodian waters. The existing, limited commercial exploitation of the species can be amplified. New information is provided in the current study regarding the population structure and life history characteristics of the invasive *F. commersonii* in Rhodian coastal waters, which is essential for developing and implementing management strategies. On the other hand, the red cornetfish has made its presence in the area since 2022, and the possible interaction with its congeneric on the prey species must be further assessed. So far, we can only point out that there are similarities between the taxonomic groups of the prey items of the two species, although we cannot be certain that they compete over the same species, except for the NIS *Vanderhorstia mertensi*, which apparently is spreading in the Eastern Mediterranean. This study presents valuable data on both cornetfishes, hence enhancing their data pool for further assessment of their possible environmental impact. Nevertheless, more biological and ecological research is required.

Author Contributions: Conceptualization: G.K.; methodology: G.K.; software: G.K. and D.K.; validation: G.K. and D.K.; formal analysis: G.K., A.T. and D.K.; investigation: G.K., A.T., M.C., E.P., D.M., K.K. and D.K.; resources: G.K.; data curation: G.K., A.T., D.P. and K.K.; writing—original draft preparation: G.K., A.T. and K.K.; writing—review and editing: G.K., A.T., M.C., E.P., K.K., D.P. and D.K.; visualization: G.K. and D.K.; supervision, D.K.; project administration: G.K.; funding acquisition: G.K. All authors have read and agreed to the published version of the manuscript.

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