

Mediterranean Marine Science

Vol 17, No 1 (2016)

VOL 17, No 1 (2016)



Comparative Study of the Length-Weight Relationships of Some Fish Species along the Turkish Coasts

S. GÜNDÖĞDU, M. BAYLAN, C. ÇEVİK

doi: [10.12681/mms.1280](https://doi.org/10.12681/mms.1280)

To cite this article:

GÜNDÖĞDU, S., BAYLAN, M., & ÇEVİK, C. (2015). Comparative Study of the Length-Weight Relationships of Some Fish Species along the Turkish Coasts. *Mediterranean Marine Science*, 17(1), 80–108.
<https://doi.org/10.12681/mms.1280>

Comparative Study of the Length-Weight Relationships of Some Fish Species along the Turkish Coasts

S. GÜNDÖĞDU, M. BAYLAN and C. ÇEVIK

Fisheries Faculty, Cukurova University, 01330, Adana, Turkey

Correspondence: Sedat Gündoğdu, Cukurova University, Faculty of Fisheries, Department of Basic Science, 01330, Adana, Turkey

Handling Editor: Praskevi Karachle

Received: 26 February 2015; Accepted: 1 September 2015; Published on line: 20 January 2016

Abstract

This study presents 738 length-weight relationships for 242 species found in Turkish seas. All length-weight relationships presented were collected from a total of 33 studies. These studies were all performed in Turkish coastal waters between 1997 and 2013. For all studies, the median of a value was calculated as 0.014 and the median of b value was calculated as 3.016.

Keywords: Weight-Length Relationships, Black Sea, Mediterranean Sea, Marmara Sea, Aegean Sea, Turkish marine waters.

Introduction

Length weight relationship (LWR) studies have an important role in estimating population biomass, growth rate determination, determining the stock status of fishes and in many other subjects (Pauly, 1983; Safran, 1992; Petrakis & Stergiou, 1995; Gonçalves *et al.*, 1997; Stergiou & Moutopoulos, 2001; Morey *et al.*, 2003; Torcu-Koç *et al.*, 2006). These also carry a significant importance for Fishbase (Froese & Pauly, 2014). The number of these studies has been steadily increasing and this makes the functions of databases like Fishbase more comprehensible (Froese *et al.*, 2011). Despite this importance, the number of comparative studies on LWR has remained quite low. No studies other than Stergiou & Moutopoulos, (2001), Froese, (2006), Torcu-Koç *et al.*, (2008), Froese *et al.*, (2011) and Froese *et al.*, (2014) have been found in literature. Among these studies, Stergiou & Moutopoulos, (2001) has gathered the LWR data of fishes in Greek waters, and Torcu-Koç *et al.*, (2008) has gathered the LWR data of a limited number of lessepsian fishes in Turkish waters. Froese, (2006) and Froese *et al.*, (2014) had analysed the length-weight relationships of all fishes available on the Fishbase website using meta-analysis and Bayesian methods. Froese *et al.*, (2011), on the other hand, lists the important issues that must be considered during the preparation of length-weight relationships for publication.

Turkey is a country with four different marine systems. All four marine systems have different ecological characteristics. Even though there had been many LWR studies on those four seas, except for Torcu-Koç *et al.*, (2008) where LWR of 24 different lessepsian fish spe-

cies were gathered, no wide scale and comparative study was discovered. In this study, a total of 738 LWR for 242 different fish species were examined for Turkish marine waters.

Materials and Method

All LWR in this study were gathered from a total of 33 studies performed between the years 1997-2013 in the seas of Turkey (Table 1). The studies were evaluated in four main marine regions: Black Sea, Marmara, Aegean and Mediterranean. Some of studies presented length and weight in units other than in centimeters and grams. According to Froese, (2006) this did not affect b value, but the intercept a needed to be converted with the following equation:

$$a' = a10^b \text{ (if length was given in mm and weight in g)}$$

Different length measurements types also affect a but not b ; especially, for the same sample, a increases from total- to fork to standard length (Froese, 2006). For this reason studies were classified for length type and analyzed separately. The descriptive statistics of a , b and r^2 values estimated by LWR were given for all length type separately. Both LWR parameters, a and b , were tested at the family level and compared per study area using one way variance analysis (ANOVA). In the cases when ANOVA results are significant, Duncan multiple comparison test was used to determine which group this difference comes from (Zar, 1999; Gündoğdu, 2014). To determine the similarities of families with regards to a and b values, hierarchical clustering based on Euclidian distance was applied and Ward's method was used (Gor-

don, 1999). The b value is 3 or around 3 for the majority of fishes (Tesch, 1968). $b=3$ means the fish demonstrates isometric growth, and situations to the contrary are taken to be allometric growth ($b<3$: negative allometry, $b>3$: positive allometry). For determination of whether b value is different from 3, student t-test was applied.

Joint LWR equations on the family level for each length type were estimated with the help of the median values of the a and b parameters of each family. The correlation between a and b parameters was calculated with the help of the Pearson correlation multiplier for all species together. Froese, (2000) recommend the application of a scatter plot between $\log(a)$ and b to demonstrate the interdependency between a and b parameters.

A scatter plot between $\log(a)$ and b values was drawn for most reported species to determine the outlier values present in LWR, from, which outliers should be identified and those relationships must be considered problematic (Stergiou & Moutopoulos, 2001; Froese, 2000).

All statistical analysis was performed using the IBM SPSS v20 and R package software and the level of significance was determined as 5%.

Results

The a , b , a' , R^2 , fishing method, year of sampling, L_{min} , L_{max} location where study conducted and the season of sampling of each species , are given in Table 1, 2 and 3. The highest number of studies were performed in the Aegean Sea ($n=15$) and the lowest number were performed in the Black Sea ($n=3$) (Table 4). Table 1 shown that 236 species were studied with total length, table 2 shown that 40 species were studied with fork length and table 3 shown that 9 species were studied with disc width. The highest number of LWR studies were performed for Sparidae (13.7%, $n=101$) and *Mullus barbatus* (2%, $n=15$).

Graphs for b values for all length-weight relationships (for each length type separately) are shown in Figure 1 after excluding questionable records. The median values b was calculated as 3.05 for total length, 3.009 for fork length and 3.05 for disc width. For all LWR b values were not different from 3 ($p>0.05$).

Three significantly different ($p<0.05$) groups of species were formed as a result of the hierarchical clustering analysis based on the median values of a and b parameters after excluding questionable records (Fig. 2).

The LWR equation estimated from all studies was determined as,

$$W=0.009L^{3.05}(n=640, r^2=0.99, \text{total length})$$

$$W=0.0165L^{3.009}(n=56, r^2=0.99, \text{fork length})$$

$$W=0.0169L^{3.05}(n=13, r^2=0.99, \text{disc width})$$

Significant ($p<0.05$; Fig. 3) correlation value were calculated for all families as -0.417. $\log(a)$ - b scatter plot

for all families, it was discovered that the grouping is mostly around 3 (Fig. 3).

Some of species that have more than ten LWR and that have outliers are considered. It was determined that *M. merluccius* had two outliers and the others had one outlier each (Fig. 4).

Considering the seasons in which the studies were performed, it is noted that 25 studies were performed with samples gathered over a period of one year while the remaining 8 studies were performed only during a specific period of the year (Table 1, 2 and 3).

Discussion

In Turkish waters 512 fish species have been reported (Bilecenoglu *et al.*, 2014). Among these species, Gobiidae (43 species), Sparidae (21 species), Blenniidae (20 species) and Labridae (20 species) families are represented by the highest numbers of species. However, the numbers of species focused on by the studies gathered by this study doesn't match Bilecenoglu *et al.*, (2014) except for Sparidae. The main reason for this is the preference of the trawling method of fishing for the studies gathered in this study, as this prevents the sampling of the fish species living in coastal waters. Considering catching methods of studies gathered in this study, most of studies used trawl as sampling method (Table 1, 2 and 3). For example, most species belonging to the Gobiidae family live in coastal waters. Thus, it is not possible for these species to be caught by sampling performed using trawl fishing methods (Miller, 1986). When the most heavily studied species are examined, it can be seen that these species match with the ones that are most heavily fished or that are most prominent among the fishes caught using the trawl fishing methods. In fact, the target species and bycatch compositions of fisheries in all four seas are parallel to these three species (Özbilgin & Tosunoğlu, 2003; Özbilgin *et al.*, 2006; Yazıcı *et al.*, 2006; Atar & Malal, 2010; Ceylan *et al.*, 2013).

b value varies between 1.19 (*Cepola macroptalma*, from Demirel & Dalkara, 2012) and 4.15 (*Raja miraletus* from Filiz & Bilge, 2004) for all species. Also, 95% of these values vary between 2.99 and 3.028, which mean the median value of 3 accepted for all fish species is a relevant value. The study performed by Froese, (2006) on all fishes included in Fishbase demonstrates that a range close to this (2.94-3.07) is applicable for 95% of all fishes. Indeed, the t-test performed and given above shows that when all values are considered, b values aren't different from 3. This also matches the 2.5-3.5 range given by Froese, (2006) and Carlander, (1997) for the b value. However, there are also species with exceptional b values such as *C. macroptalma* and *R. miraletus*. It is already supposed that the families that these two mentioned species belong to were placed in different clusters as a result

Table 1. Parameters of the length-weight relationship [weight (in g) and length (in cm and total length)] of marine fish species from Turkish marine waters. (M, male; F, female; C, combined); Location= Place where study conducted (AS, Aegean Sea; BS, Black Sea; MS, Marmara Sea; Medit, Mediterranean Sea); Year= year of sampling; Season = sampling season (ASC, all seasons combined; F-W, Fall-Winter; W-S, Winter-Spring); FM= fishing method (T, trawl; L, Longline; BS, beach seine; GN, gill nets; TR, trammel); a= the intercept of the relationship provided by source; a'= the original standardized intercept corresponding to cm, g (this is calculated only for length given in mm); b= the slope of the relationship; = coefficient of determination; n= the sample size; Species are listed in alphabetical order.

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source	
ASC	MS	<i>Aidablennius sphynx</i>	12	C	2007	BS	2	7.9	0.00820	3.11	0.99
ASC	Medit	<i>Alepes djedaba**</i>	70	C	1997-1998	T-GN	13	19.2	0.00075	2.82	0.86
ASC	AS	<i>Alosa fallax</i>	32	C	2004-2005	GN-TR	17.6	24.6	0.01020	2.93	0.88
F-W	BS	<i>Alosa pontica</i>	227	C	2004-2005	T	11.9	27.6	0.00460	3.12	0.94
ASC	AS	<i>Anthias anthias</i>	16	C	2005-2006	T	6.5	26.9	0.02500	3.02	0.98
ASC	AS	<i>Aphanianus fasciatus</i>	143	C	1998-2001	TR-GN-T-BS	2.7	7.1	0.00600	3.53	0.97
ASC	AS	<i>Apogon imberbis</i>	12	C	2004-2005	GN-TR	9.7	12.8	0.11350	2.12	0.69
Winter	Medit	<i>Apogon nigripinnis</i>	30	C	2007-2008	T	7.1	5.53	0.04840	2.49	0.98
ASC	Medit	<i>Apogon nigripinnis**</i>	22	C	1997-1998	T-GN	4.1	8.5	0.00002	0.0203	3.00
Fall	AS	<i>Apogon quenetti</i>	11	C	2011	T	7.1	12.3	0.08690	3.06	0.92
Winter	Medit	<i>Apogon quenetti</i>	48	C	2007-2008	T	12.3	9.94	0.01570	3.06	0.95
Spring	AS	<i>Argentina sphyraena</i>	238	C	2003	T	7.5	20.7	0.00620	2.93	0.93
ASC	AS	<i>Argentina sphyraena</i>	92	C	2005-2006	T	8	20.6	0.00426	3.08	0.98
ASC	Medit	<i>Argyropelecus hemigymnus</i>	27	C	2009-2011	T	2.6	5.1	0.00420	3.59	0.87
ASC	AS	<i>Arnoglossus imperialis</i>	36	C	2006-2008	T	7.6	15.2	0.00390	3.30	0.94
ASC	MS	<i>Arnoglossus kessleri***</i>	24	C	2000-2001	L-BS	4.2	8.7	0.00004	0.1221	3.47
ASC	BS	<i>Arnoglossus kessleri</i>	60	C	2007	T	4.3	9.8	0.02100	2.98	0.73
ASC	AS	<i>Arnoglossus kessleri</i>	7	C	2005-2006	T	20	25.5	0.01850	2.74	0.96
ASC	AS	<i>Arnoglossus kessleri</i>	76	C	2002	T	6	8.9	0.01790	2.60	0.88
ASC	MS	<i>Arnoglossus kessleri</i>	44	C	2007	BS	2.9	9.8	0.00673	3.15	0.97
ASC	AS	<i>Arnoglossus kessleri*</i>	32	C	1997-2000	T	52	95	0.00004	3.12	0.94
ASC	MS	<i>Arnoglossus laterna***</i>	7	C	2000-2001	L-BS	5.2	12.3	0.00207	0.9682	2.67
ASC	AS	<i>Arnoglossus laterna</i>	8	C	2004-2005	GN-TR	7.6	18.3	0.01500	2.75	0.99
ASC	MS	<i>Arnoglossus laterna*</i>	328	C	2009-2011	T	6	19.5	0.01300	2.79	0.87
ASC	Medit	<i>Arnoglossus laterna</i>	291	C	2001-2003	T-L	4.5	13.4	0.01220	2.84	0.95
ASC	AS	<i>Arnoglossus laterna</i>	1078	C	2005	T	4.5	14.9	0.00970	2.91	0.96
ASC	Medit	<i>Arnoglossus laterna</i>	594	C	1999-2000	T	2.2	11.8	0.00800	3.01	0.97
ASC	AS	<i>Arnoglossus laterna</i>	796	C	2002	T	5.6	17.1	0.00730	3.01	0.97
ASC	AS	<i>Arnoglossus laterna</i>	1805	C	2005-2006	T	5.5	24.2	0.00719	3.01	0.98
ASC	AS	<i>Arnoglossus laterna</i>	1629	C	2005-2006	T	11.7	24.1	0.00710	3.05	0.97
F-W	MS	<i>Arnoglossus laterna</i>	58	C	2006-2007	T	6.8	20	0.00680	3.02	0.96

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source
ASC	AS	<i>Arnoglossus laterna</i>	721	C	1998-2001	TR-GN-T-BS	6.8	21.9	0.00520	3.17 Ozaydin and Taskavak (2006)
ASC	AS	<i>Arnoglossus laterna</i>	57	C	2006-2008	T	8.8	20.2	0.0046	3.18 Ozekinci et al. (2009)
ASC	AS	<i>Arnoglossus laterna</i>	328	C	1997-2000	T	55	20.5	0.0002	3.24 Türker et al. (2008)
ASC	AS	<i>Arnoglossus rieppelli</i>	13	C	2006-2008	T	7.5	16.2	0.0081	2.92 Ozekinci et al. (2009)
ASC	AS	<i>Arnoglossus thori</i>	6	C	2002	T	19.6	29.5	0.0442	2.16 Bayhan et al. (2008)
ASC	AS	<i>Arnoglossus thori</i>	20	C	2005	T	6.1	7.9	0.0288	2.48 Ozaydin et al. (2007)
ASC	AS	<i>Arnoglossus thori</i>	8	C	2004-2005	GN-TR	8.5	11.2	0.0068	3.12 Karakulak et al. (2006)
ASC	AS	<i>Arnoglossus thori</i>	371	C	2005-2006	T	29	51.3	0.0054	3.26 İlkyaz et al. (2008)
ASC	AS	<i>Arnoglossus thori</i>	15	C	2006-2008	T	8	13.1	0.0026	3.56 Ozekinci et al. (2009)
ASC	AS	<i>Arnoglossus thori*</i>	170	C	1997-2000	T	65	225	0.0001	2.95 Türker et al. (2008)
ASC	MS	<i>Atherina boyeri**</i>	606	C	2000-2001	L-BS	2.5	11.2	0.0005	0.7383 Keskin and Gaygusuz (2010)
F-W	MS	<i>Atherina boyeri</i>	14	C	2006-2007	T	7.6	11.7	0.0015	3.49 Bok et al. (2011)
ASC	MS	<i>Atherina hepsetus***</i>	65	C	2000-2001	L-BS	2.7	14.8	0.0004	0.6371 Keskin and Gaygusuz (2010)
Fall	AS	<i>Autopus filamentosus</i>	11	C	2011	T	23.7	32.8	0.0065	3.10 Yapıcı et al. (2015)
ASC	Medit	<i>Balistes capricrus</i>	123	C	2001-2003	T-L	5.9	40.9	0.0678	2.43 Sangun et al. (2007)
ASC	MS	<i>Beloche belone***</i>	10	C	2000-2001	L-BS	3.4	12	0.0003	0.0651 Keskin and Gaygusuz (2010)
ASC	AS	<i>Beloche belone</i>	416	C	1998-2001	TR-GN-T-BS	26	60.5	0.0003	3.37 Ozaydin and Taskavak (2006)
ASC	Medit	<i>Blennius ocellaris</i>	31	C	2001-2003	T-L	6.8	17.2	0.0411	2.61 Sangun et al. (2007)
F-W	MS	<i>Blennius ocellaris</i>	15	C	2006-2007	T	11.2	13.7	0.0381	2.56 Bok et al. (2011)
ASC	AS	<i>Blennius ocellaris</i>	23	C	2005	T	9.2	14.3	0.0183	2.91 Ozaydin et al. (2007)
ASC	Medit	<i>Blennius ocellaris</i>	43	C	1999-2000	T	4.1	9.6	0.0172	2.89 Çiçek et al. (2006)
ASC	AS	<i>Blennius ocellaris</i>	36	C	2005-2006	T	7	14.2	0.0169	2.93 İsmen et al. (2007)
ASC	AS	<i>Blennius ocellaris</i>	204	C	2005-2006	T	23.9	45.1	0.0167	2.97 İlkyaz et al. (2008)
F-W	AS	<i>Boops boops</i>	32	C	2006	TR-L	21.4	16.5	0.0085	3.09 Ceyhan et al. (2009)
ASC	Medit	<i>Boops boops*</i>	124	C	2012-2013	T	10	20.2	0.0139	2.82 Özvarol (2014)
ASC	Medit	<i>Boops boops</i>	391	C	1999-2000	T	7.5	21.4	0.00800	3.05 Çiçek et al. (2006)
ASC	AS	<i>Boops boops</i>	172	C	2001-2003	T-L	11.2	21.1	0.00720	3.08 Sangun et al. (2007)
ASC	AS	<i>Boops boops</i>	39	C	2005	T	11.3	16.7	0.00570	3.35 Ozaydin et al. (2007)
ASC	AS	<i>Boops boops</i>	378	C	2005-2006	T	24.5	37.4	0.00500	3.24 İlkyaz et al. (2008)
ASC	AS	<i>Boops boops</i>	518	C	2004-2005	GN-TR	10.2	32.1	0.00480	3.26 Karakulak et al. (2006)
ASC	AS	<i>Boops boops</i>	189	C	2005-2006	T	10.5	22	0.00450	3.24 İsmen et al. (2007)
ASC	AS	<i>Boops boops*</i>	1231	C	1997-2000	T	94	221	0.00011	2.92 Türker et al. (2008)
ASC	Medit	<i>Bothus podas</i>	90	C	2001-2003	T-L	6.2	15.7	0.00960	3.00 Sangun et al. (2007)
ASC	Medit	<i>Bothus podas</i>	1498	C	1999-2000	T	4.2	17.3	0.00900	3.10 Çiçek et al. (2006)
ASC	AS	<i>Bothus podas</i>	17	C	2005	T	11	18.7	0.00400	3.39 Ozaydin et al. (2007)
ASC	Medit	<i>Bregmaceros atlanticus</i>	16	C	2001-2003	T-L	5.95	7.6	0.00320	3.29 Sangun et al. (2007)

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	a'	b	Source
ASC	AS	<i>Buglossidium luteum</i>	28	C	2002	T	7.3	9.6	0.02400 Bayhan et al. (2008)
F-W	MS	<i>Buglossidium luteum</i>	27	C	2006-2007	T	9.5	20	0.01950 Bok et al. (2011)
ASC	AS	<i>Buglossidium luteum</i>	123	C	2005	T	7	11.4	0.01500 Ozaydin et al. (2007)
ASC	AS	<i>Buglossidium luteum</i>	862	C	2005-2006	T	16.1	35.2	0.00910 Ilkyaz et al. (2008)
ASC	MS	<i>Buglossidium luteum</i>	55	C	2009-2011	T	8.4	15.1	0.00500 Demirel and Dalkara (2012)
Spring	AS	<i>Caenorinchus caelorhincus</i>	208	C	2003	T	9	21.6	0.00650 Filiz and Bilge (2004)
ASC	AS	<i>Caenorinchus caelorhincus</i>	332	C	2005-2006	T	8.5	27.5	0.00347 Ismen et al. (2007)
Fall	AS	<i>Callianthias ruber</i>	44	C	2011	T	5.7	13.5	0.02430 Yapici et al. (2015)
Winter	Medit	<i>Callionymus filamentosus</i>	43	C	2007-2008	T	10.7	9.15	0.03230 Erguden et al. (2009)
ASC	Medit	<i>Callionymus filamentosus**</i>	92	C	1997-1998	T-GN	5.8	10.2	0.00003 Taskavak and Bilecenoglu (2001)
ASC	MS	<i>Callionymus lyra</i>	99	C	2009-2011	T	6.5	22.5	0.02100 Demirel and Dalkara (2012)
F-W	MS	<i>Callionymus lyra</i>	87	C	2006-2007	T	6.4	22.6	0.00870 Bok et al. (2011)
ASC	AS	<i>Callionymus maculatus</i>	49	C	2005-2006	T	8.7	16.6	0.00660 Ilkyaz et al. (2008)
ASC	MS	<i>Callionymus pusillus</i>	20	C	2007	BS	3.8	10.7	0.03137 Ozen et al. (2009)
ASC	MS	<i>Callionymus risso **</i>	13	C	2000-2001	L-BS	3.2	7	0.00137 Keskin and Gaygusuz (2010)
ASC	MS	<i>Callionymus risso</i>	42	C	2007	BS	2.4	6.4	0.01407 Bok et al. (2011)
F-W	MS	<i>Callionymus risso</i>	15	C	2006-2007	T	11.6	18.2	0.00790 Filiz and Bilge (2004)
Spring	AS	<i>Capros aper</i>	455	C	2003	T	2.9	10.1	0.02320 Ismen et al. (2007)
ASC	AS	<i>Capros aper</i>	35	C	2005-2006	T	4.4	9.1	0.01445 Gokce et al. (2010)
F-W	Medit	<i>Caranx cryos</i>	21	C	2008-2009	GN-TR	13.4	24	0.01000 Çiçek et al. (2006)
ASC	Medit	<i>Centracanthus cirrus</i>	102	C	1999-2000	T	8.7	13.7	0.00810 Demirel and Dalkara (2012)
ASC	MS	<i>Cepola macrophthalma</i>	20	C	2009-2011	T	18.5	43.1	0.33900 Bok et al. (2011)
F-W	MS	<i>Cepola macrophthalma</i>	17	C	2006-2007	T	20.8	46.7	0.09340 Ozaydin et al. (2007)
ASC	AS	<i>Cepola macrophthalma</i>	881	C	2005	T	16.2	50.9	0.07410 Ilkyaz et al. (2008)
ASC	AS	<i>Cepola macrophthalma</i>	635	C	2005-2006	T	8.3	13.6	0.07160 Ismen et al. (2007)
ASC	AS	<i>Cepola macrophthalma</i>	136	C	2005-2006	T	19.1	49.6	0.03461 1.51 0.84
ASC	AS	<i>Cepola macrophthalma</i>	254	C	1998-2001	TR-GN-T-BS	12.2	50.6	0.02030 Özvarol (2014)
ASC	AS	<i>Cepola rubescens</i>	356	C	1997-2000	T	3	43.7	0.13790 Ismen et al. (2007)
ASC	MS	<i>Chalaroderma ocellata</i>	21	C	2009-2011	T	9.8	14.7	0.01800 1.44 0.88
Fall	AS	<i>Champsodon nudivittis</i>	111	C	2011	T	6.2	12.7	0.00490 Demirel and Dalkara (2012)
ASC	AS	<i>Chelidonichthys garnardu</i>	304	C	1997-2000	T	94	224	0.00006 Yapici et al. (2015)
ASC	Medit	<i>Chelidonichthys lastoviza</i>	28	C	2012-2013	T	10.1	20	0.02720 Türker et al. (2008)
ASC	AS	<i>Chelidonichthys lastoviza</i>	88	C	2005-2006	T	11.5	21.2	0.01056 Özvarol (2014)
ASC	Medit	<i>Chelidonichthys lastoviza</i>	75	C	2001-2003	TL	6.5	19.3	0.00850 Ismen et al. (2007)
ASC	AS	<i>Chelidonichthys lastoviza</i>	67	C	2005-2006	T	24.7	51.2	0.00800 Sangun et al. (2007)
ASC	AS	<i>Chelidonichthys lastoviza</i>	7	C	2004-2005	GN-TR	15.2	19.5	0.00430 Ilkyaz et al. (2008)
									Karakulak et al. (2006) (continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source
ASC	AS	<i>Chelidonichthys lastoviza</i> *	128	C	1997-2000	T	75	780	0.00011	Türker et al. (2008)
ASC	MS	<i>Chelidonichthys lucerna</i> ***	17	C	2000-2001	L-BS	6.3	15.1	0.00113	Keskin and Gaygusuz (2010)
ASC	Medit	<i>Chelidonichthys lucerna</i>	474	C	2001-2003	T-L	6.7	24.5	0.01660	Sangun et al. (2007)
ASC	Medit	<i>Chelidonichthys lucerna</i>	137	C	1999-2000	T	2.2	30.3	0.01350	Çiçek et al. (2006)
F-W	Medit	<i>Chelidonichthys lucerna</i>	3	C	2008-2009	GN-TR	9.5	23.5	0.01060	Gökce et al. (2010)
F-W	MS	<i>Chelidonichthys lucerna</i>	90	C	2006-2007	T	8	64	0.01000	Bök et al. (2011)
ASC	AS	<i>Chelidonichthys lucerna</i>	829	C	2005-2006	T	12.5	76	0.00960	Işmen et al. (2007)
ASC	MS	<i>Chelidonichthys lucerna</i>	352	C	2009-2011	T	10.5	56	0.00900	Demirel and Dalkara (2012)
ASC	AS	<i>Chelidonichthys lucerna</i>	121	C	2005-2006	T	24.1	78.2	0.00430	İlyaz et al. (2008)
ASC	MS	<i>Chelon labrosus</i> **	6	C	2000-2001	L-BS	3.6	15.3	0.00071	Keskin and Gaygusuz (2010)
Spring	AS	<i>Chimaera monstrosa</i>	17	C	2003	T	13.1	75.3	0.00280	Filiz and Bilge (2004)
Spring	AS	<i>Chlorophthalmus agassizii</i>	378	C	2003	T	7.7	17.5	0.00270	Filiz and Bilge (2004)
ASC	AS	<i>Chromis chromis</i>	141	C	2004-2005	GN-TR	8.7	14	0.02750	Karakulak et al. (2006)
ASC	AS	<i>Citharus linguatula</i>	409	C	1998-2001	TR-GN-T-BS	8.4	22.7	0.05400	Özaydin and Taskavak (2006)
ASC	MS	<i>Citharus linguatula</i>	108	C	2009-2011	T	7.3	22.5	0.02900	Demirel and Dalkara (2012)
ASC	Medit	<i>Citharus linguatula</i>	44	C	2012-2013	T	8	19.2	0.01330	Özvarol (2014)
ASC	AS	<i>Citharus linguatula</i>	338	C	2001-2003	T-L	6.5	21.3	0.01140	Sangun et al. (2007)
ASC	AS	<i>Citharus linguatula</i>	1755	C	2006-2008	T	8.2	23.5	0.00610	Ozekinci et al. (2009)
ASC	Medit	<i>Citharus linguatula</i>	922	C	1999-2000	T	3.5	21	0.00580	Çiçek et al. (2006)
ASC	AS	<i>Citharus linguatula</i>	1513	C	2005-2006	T	8.9	23.8	0.00540	İlyaz et al. (2008)
ASC	AS	<i>Citharus linguatula</i>	1724	C	2005	T	8.2	24.5	0.00530	Özaydin et al. (2007)
ASC	AS	<i>Citharus linguatula</i>	716	C	2002	T	8.2	22.8	0.00480	Bayhan et al. (2008)
ASC	AS	<i>Citharus linguatula</i>	8	C	2004-2005	GN-TR	15.1	18.9	0.00090	Karakulak et al. (2006)
ASC	AS	<i>Citharus linguatula</i> *	1236	C	1997-2000	T	69	23.7	0.00002	Türker et al. (2008)
ASC	MS	<i>Clinirachus argentatus</i>	99	C	2007	BS	2.6	7.9	0.00602	Ozen et al. (2009)
Spring	AS	<i>Conger conger</i>	22	C	2003	T	32.2	65.4	0.00050	Filiz and Bilge (2004)
ASC	AS	<i>Conger conger</i>	25	C	2005-2006	T	40.1	64.5	0.00039	Işmen et al. (2007)
ASC	AS	<i>Conger conger</i>	10	C	2005	T	37.2	49.5	0.00030	Özaydin et al. (2007)
ASC	AS	<i>Conger conger</i>	8	C	2004-2005	GN-TR	20.9	62.5	0.00020	Karakulak et al. (2006)
ASC	AS	<i>Conger conger</i>	20	C	2005-2006	T	4.9	12.3	0.00010	İlyaz et al. (2008)
ASC	AS	<i>Coris julis</i>	35	C	2004-2005	GN-TR	13.4	18.2	0.00820	Karakulak et al. (2006)
ASC	AS	<i>Coris julis</i>	183	C	2005	T	6.1	13.6	0.00680	Özaydin et al. (2007)
ASC	AS	<i>Coris julis</i>	16	C	2005-2006	T	16.4	22.1	0.00399	Işmen et al. (2007)
ASC	Medit	<i>Cynoglossus sinusarabici</i>	96	C	2001-2003	T-L	8.2	18.2	0.03080	Sangun et al. (2007)
Winter	Medit	<i>Cynoglossus sinusarabici</i>	53	C	2007-2008	T	17.1	12.48	0.02390	Erguden et al. (2009)
ASC	Medit	<i>Cynoglossus sinusarabici</i>	235	C	1999-2000	T	4.5	15.5	0.00720	Çiçek et al. (2006)

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	a'	b	Source
ASC	Medit	<i>Cynoglossus sinuosalabici**</i>	32	C	1997-1998	T-GN	9.6	13.3	0.00001
ASC	Medit	<i>Dasyatis centroura</i>	4	C	2009-2011	T	141.1	220	0.00300
ASC	AS	<i>Dasyatis pastinaca</i>	12	C	2004-2005	GN-TR	29.2	37.8	0.11680
Spring	AS	<i>Dasyatis pastinaca</i>	29	C	2003	T	37.3	74.2	0.01490
ASC	AS	<i>Dasyatis pastinaca</i>	48	C	2005-2006	T	20.5	66	0.01259
ASC	AS	<i>Dasyatis pastinaca</i>	14	C	1999-2000	T	40	74.2	0.00850
ASC	AS	<i>Dasyatis pastinaca</i>	16	C	2005	T	44.2	138	0.00230
ASC	AS	<i>Dasyatis pastinaca</i>	334	C	1999-2003	T	23.4	100.9	0.00200
ASC	AS	<i>Dasyatis pastinaca</i>	71	C	2005-2007	T	37.5	114	0.00074
ASC	AS	<i>Deltentosteus quadrifasciatus</i>	883	C	2005-2006	T	16.3	40.2	0.00400
F-W	AS	<i>Dentex dentex</i>	39	C	2006	TR-L	23.5	15	0.01050
Fall	Medit	<i>Dentex dentex</i>	16	C	2000	L	31.4	51	0.08610
ASC	AS	<i>Dentex dentex</i>	22	C	2004-2005	GN-TR	16.8	61.5	0.01070
F-W	Medit	<i>Dentex dentex</i>	5	C	2008-2009	GN-TR	15.9	18.4	0.00310
Fall	Medit	<i>Dentex gibbosus</i>	34	C	2000	L	17.68	47.3	0.03410
ASC	AS	<i>Dentex macrophthalmus</i>	249	C	2005-2006	T	8.7	19.9	0.02100
F-W	AS	<i>Dentex macrocanthus</i>	8	C	2006	TR-L	18	14.8	0.11860
ASC	AS	<i>Dentex maroccanus</i>	146	C	2005-2006	T	14.2	26.5	0.02827
ASC	AS	<i>Dentex maroccanus</i>	9	C	2004-2005	GN-TR	18.9	34	0.00880
ASC	Medit	<i>Dipodus metopoclampus</i>	7	C	2009-2011	T	6.6	10.6	0.01360
F-W	AS	<i>Dicentrarchus labrax</i>	28	C	2006	TR-L	36.9	24.5	0.03590
F-W	AS	<i>Diplodus annularis</i>	159	C	2006	TR-L	14.8	9.5	0.01440
ASC	MS	<i>Diplodus annularis * ***</i>	7	C	2000-2001	L-BS	3.6	16.9	0.00134
ASC	Medit	<i>Diplodus annularis</i>	154	C	2001-2003	T-L	10.3	15	0.03700
F-W	MS	<i>Diplodus annularis</i>	15	C	2006-2007	T	7	16.7	0.02200
ASC	AS	<i>Diplodus annularis</i>	159	C	2002-2003	L	9.5	16	0.01790
F-W	Medit	<i>Diplodus annularis</i>	33	C	2008-2009	GN-TR	12.2	15	0.01730
ASC	AS	<i>Diplodus annularis</i>	108	C	2005-2006	T	8.8	15.6	0.01602
ASC	AS	<i>Diplodus annularis</i>	1443	C	2005-2006	T	11.9	17.1	0.01230
ASC	Medit	<i>Diplodus annularis</i>	89	C	1999-2000	T	7.9	16.7	0.01130
ASC	AS	<i>Diplodus annularis</i>	372	C	2004-2005	GN-TR	7.7	17.7	0.00680
ASC	MS	<i>Diplodus annularis *</i>	81	C	2009-2011	T	10	16.7	0.00400
ASC	AS	<i>Diplodus annularis *</i>	887	C	1997-2000	T	73	138	0.00051
ASC	MS	<i>Diplodus punctazzo **</i>	18	C	2000-2001	L-BS	2.6	7.6	0.00114
ASC	AS	<i>Diplodus punctazzo</i>	7	C	2004-2005	GN-TR	15.2	25.2	0.00440
F-W	AS	<i>Diplodus sargus</i>	33	C	2006	TR-L	21.3	16	0.00610

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source	
F-W	Medit	<i>Diplodus sargus</i>	26	C	2008-2009	GN-TR	11.6	18.1	0.06080	2.50	0.93
Fall	Medit	<i>Diplodus sargus</i>	33	C	2000	L	14.9	26.7	0.03420	2.81	0.85
ASC	Medit	<i>Diplodus sargus</i>	36	C	2001-2003	T-L	11.2	25.3	0.01080	3.17	0.99
F-W	AS	<i>Diplodus vulgaris</i>	69	C	2006	TR-L	19.2	9.6	0.00690	3.21	0.99
ASC	AS	<i>Diplodus vulgaris</i>	93	C	2004-2005	GN-TR	9	25	0.08580	2.43	0.65
ASC	AS	<i>Diplodus vulgaris</i>	69	C	2002-2003	L	9.6	26.5	0.01450	3.03	0.99
Fall	Medit	<i>Diplodus vulgaris</i>	105	C	2000	L	13.2	27	0.01310	3.12	0.93
ASC	AS	<i>Diplodus vulgaris</i>	23	C	2005-2006	T	10.2	19.1	0.00925	3.14	0.94
F-W	Medit	<i>Diplodus vulgaris</i>	22	C	2008-2009	GN-TR	11.7	17.9	0.00890	3.19	0.99
ASC	AS	<i>Diplodus vulgaris</i>	242	C	2005-2006	T	6.6	8.6	0.00380	3.53	0.98
ASC	AS	<i>Dipturus oxyrinchus</i>	118	C	2005-2006	T	10	63.2	0.00423	3.29	1.00
ASC	AS	<i>Dipturus oxyrinchus</i>	179	C	2005-2007	T	14.9	100	0.00083	3.35	1.00
Spring	AS	<i>Dipturus oxyrinchus</i>	8	C	2003	T	17.9	62.2	0.00070	3.40	0.99
ASC	Medit	<i>Dussumieri aacta**</i>	27	C	1997-1998	T-GN	14	16.9	0.00001	0.0062	0.03
Winter	Medit	<i>Dussumieri elopsoides</i>	59	C	2007-2008	T	16.4	12.42	0.00550	3.12	0.99
ASC	Medit	<i>Echelus myrus</i>	14	C	2001-2003	T-L	30.9	67.5	0.01310	2.28	0.98
ASC	Medit	<i>Echelus myrus</i>	310	C	1999-2000	T	4.4	49.5	0.00410	2.66	0.97
ASC	AS	<i>Echelus myrus</i>	39	C	2005-2006	T	7.3	12.2	0.00010	3.41	0.97
ASC	MS	<i>Echichtys viphera</i>	24	C	2007	BS	1.7	14.3	0.01664	2.71	0.99
F-W	BS	<i>Engraulis encrasicolus</i>	575	C	2004-2005	T	8	14.7	0.01740	2.60	0.85
ASC	Medit	<i>Engraulis encrasicolus</i>	392	C	2001-2003	T-L	7	17	0.01560	2.66	0.96
ASC	AS	<i>Engraulis encrasicolus</i>	212	C	2005-2006	T	8.1	14.8	0.00529	2.97	0.87
ASC	Medit	<i>Engraulis encrasicolus</i>	630	C	1999-2000	T	4.3	13.7	0.00370	3.18	0.96
ASC	AS	<i>Engraulis encrasicolus</i>	28	C	1997-2000	T	85	134	0.00021	2.77	0.66
ASC	Medit	<i>Epinephelus marginatus</i>	48	C	2001-2003	T-L	13.1	29.4	0.01160	3.07	0.91
F-W	AS	<i>Epinephelus aeneus</i>	36	C	2006	TR-L	21	16	0.00940	3.27	0.95
ASC	AS	<i>Epinephelus aeneus</i>	125	C	2002-2003	L	18.6	56.6	0.01780	2.86	0.94
Fall	Medit	<i>Epinephelus aeneus</i>	89	C	2000	L	17.4	67.5	0.01520	2.90	0.97
ASC	Medit	<i>Epinephelus aeneus</i>	24	C	2001-2003	T-L	16	42.2	0.01200	2.99	0.99
F-W	AS	<i>Epinephelus costae</i>	365	C	2006	TR-L	18.9	12	0.01020	3.21	0.94
Fall	Medit	<i>Epinephelus costae</i>	53	C	2000	L	14.2	55.4	0.08850	2.39	0.93
ASC	AS	<i>Epinephelus costae</i>	59	C	2002-2003	L	14.6	45	0.02660	2.74	0.97
ASC	AS	<i>Epinephelus spinax</i>	11	U	2005-2009	T	10.6	45	0.00230	3.23	0.95
ASC	AS	<i>Epinephelus spinax</i>	24	C	2005-2006	T	10.6	45	0.00172	3.27	0.92
Winter	Medit	<i>Etrumeus teres</i>	61	C	2007-2008	T	16.7	1346	0.00780	2.99	0.97
F-W	MS	<i>Eutrigla gurnardus</i>	67	C	2006-2007	T	9.6	22.8	0.01050	2.96	0.96

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a'	b	Source
ASC	AS	<i>Eutrigla gurnardus</i>	7	C	2005-2006	T	9.9	42	0.01040 İlyyaz et al. (2008)
ASC	MS	<i>Eutrigla gurnardus</i>	633	C	2009-2011	T	10.1	25.6	0.00700 Demirel and Dalkara (2012)
ASC	AS	<i>Eutrigla gurnardus</i>	23	C	2005	T	11.2	20.3	0.00390 Ozaydin et al. (2007)
ASC	AS	<i>Eutrigla gurnardus</i>	251	C	2005-2006	T	10.9	21.2	0.00250 Ismen et al. (2007)
Winter	Medit	<i>Fistularia commersonii</i>	12	C	2007-2008	T	65	60	0.01120 Erguden et al. (2009)
ASC	AS	<i>Gadilulus argenteus</i>	331	C	2005-2006	T	6.7	13.5	0.01414 Ismen et al. (2007)
Spring	AS	<i>Gadilulus argenteus</i>	110	C	2003	T	6.4	10.5	0.00560 Filiz and Bilge (2004)
ASC	MS	<i>Gaidropsarus mediterraneus**</i>	8	C	2000-2001	L-BS	4.2	20.7	0.00068 Keskin and Gaygusuz (2010)
F-W	MS	<i>Gaidropsarus mediterraneus</i>	56	C	2006-2007	T	8.2	14.3	0.00300 Bok et al. (2011)
ASC	AS	<i>Galeus melastomus</i>	93	C	2005-2006	T	12	31.7	0.00238 Ismen et al. (2007)
ASC	AS	<i>Galeus melastomus</i>	303	U	2005-2009	T	11.3	31.7	0.00160 Ismen et al. (2009)
Fall	AS	<i>Gnathophis mystax</i>	466	C	2011	T	17.3	39.7	0.00150 Yapıcı et al. (2015)
ASC	BS	<i>Gobius batrachocephalus</i>	184	C	2007	T	5.5	18	0.02400 Bok et al. (2011)
ASC	MS	<i>Gobius geniporus</i>	20	C	2007	BS	4.1	15.3	0.00646 Ak et al. (2009)
ASC	BS	<i>Gobius melanostomus</i>	73	C	2007	T	9.1	35	0.01000 Kalayci et al. (2007)
F-W	BS	<i>Gobius niger</i>	227	C	2004-2005	T	8	25.3	0.01660 Ak et al. (2009)
F-W	MS	<i>Gobius niger</i>	286	C	2006-2007	T	6.9	15	0.01150 Ozzen et al. (2009)
W-S	BS	<i>Gobius niger</i>	113	C	2009-2011	T	7.6	13.2	0.01130 Demirhan and Can (2007)
ASC	BS	<i>Gobius niger</i>	208	C	2007	T	5.6	15.7	0.00900 Ozaydin et al. (2007)
ASC	MS	<i>Gobius niger</i>	83	C	2009-2011	T	8	14.3	0.00800 İlyyaz et al. (2008)
ASC	AS	<i>Gobius niger</i>	447	C	2005	T	7.7	16.5	0.00750 Çırçık et al. (2006)
ASC	AS	<i>Gobius niger</i>	618	C	2005-2006	T	15.3	36.6	0.00650 Ozen et al. (2009)
ASC	AS	<i>Gobius niger</i>	272	C	1999-2000	T	2.1	12.2	0.00470 Keskin and Gaygusuz (2010)
ASC	MS	<i>Gobius paganellus</i>	161	C	2007	BS	2.7	11.8	0.01130 Ozaydin et al. (2007)
ASC	MS	<i>Gymnammodytes cicerelus**</i>	13	C	2000-2001	L-BS	6.6	9.7	0.00012 Yeldan and Avsar (2007)
ASC	AS	<i>Gymnura altavela</i>	17	C	2005	T	37.6	95	0.04490 Ak et al. (2009)
Spring	AS	<i>Gymnura altavela</i>	9	C	2003	T	37.5	72	0.02680 Filiz and Bilge (2004)
ASC	Medit	<i>Gymnura altavela</i>	107	C	1999-2003	T	30.2	83.5	0.00900 Ismen et al. (2007)
ASC	AS	<i>Helicolenus dactylopterus</i>	96	C	2005-2006	T	7.6	20.5	0.01628 Ismen et al. (2007)
Spring	AS	<i>Helicolenus dactylopterus</i>	178	C	2003	T	5.5	13.5	0.00790 Ismen et al. (2009)
ASC	AS	<i>Heptranchias perlo</i>	18	C	2005-2009	T	68.6	105	0.00470 Yeldan and Avsar (2007)
ASC	AS	<i>Heptranchias perlo</i>	14	C	2005-2006	T	68.6	105	0.00424 Ismen et al. (2007)
ASC	AS	<i>Hexanchus griseus</i>	7	F	2005-2009	T	80	170	0.00020 Ismen et al. (2009)
ASC	AS	<i>Hexanchus griseus</i>	5	C	2005-2006	T	80	114	0.00008 Ismen et al. (2007)
ASC	AS	<i>Hippocampus guttulatus</i>	200	C	2000-2002	TR	100	165	0.01000 Gürkan and Taskavak (2007)
ASC	BS	<i>Hippocampus hippocampus</i>	163	C	2007	T	2.7	13.7	0.00400 Ak et al. (2009)

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source	
ASC	AS	<i>Hippocampus hippocampus</i>	29	C	2000-2002	TR	80	140	0.00100	3.14	0.76
Spring	AS	<i>Hoplostethus mediterraneus</i>	137	C	2003	T	8	18	0.01490	2.95	0.98
ASC	AS	<i>Hoplostethus mediterraneus</i>	599	C	2005-2006	T	4.5	24.6	0.00890	3.16	0.99
		<i>mediterraneus</i>								Ismen et al. (2007)	
ASC	Medit	<i>Hymenocephalus italicus</i>	76	C	2009-2011	T	8.2	15.5	0.00770	2.45	0.77
Fall	AS	<i>Hymenocephalus italicus</i>	91	C	2011	T	7.4	14.9	0.00340	2.89	0.86
ASC	MS	<i>Labrus viridis</i>	72	C	2007	BS	3	12.6	0.01272	2.99	0.99
ASC	Medit	<i>Lagocephalus lagocephalus</i>	27	C	2001-2003	T-L	12.3	22.5	0.00660	3.30	0.85
Winter	Medit	<i>Lagocephalus spadiceus</i>	89	C	2007-2008	T	26.9	15.94	0.02040	2.90	0.94
ASC	Medit	<i>Lagocephalus spadiceus**</i>	19	C	1997-1998	T-GN	15.9	19.9	0.00002	0.0186	Taskavak and Bilecenoglu (2001)
Winter	Medit	<i>Lagocephalus suezensis</i>	86	C	2007-2008	T	16.7	12.9	0.02360	2.75	0.96
Fall	AS	<i>Lagocephalus suezensis</i>	15	C	2011	T	11.5	14.1	0.01890	2.75	0.94
ASC	Medit	<i>Leiognathus lunzingeri</i>	2212	C	1999-2000	T	2.1	10.7	0.00900	3.16	0.96
ASC	Medit	<i>Leiognathus lunzingeri</i>	632	C	2001-2003	T-L	1.9	10	0.00750	3.22	0.97
ASC	Medit	<i>Leiognathus lunzingeri**</i>	156	C	1997-1998	T-GN	4.9	10.4	0.00000	0.0065	Taskavak and Bilecenoglu (2001)
Winter	Medit	<i>Leiognathus lunzingeri</i>	358	C	2007-2008	T	10.9	7.29	0.00260	3.71	0.92
ASC	MS	<i>Lepadogaster lepadogaster</i>	4	C	2007	BS	4.1	5.1	0.00415	3.60	0.99
ASC	AS	<i>Lepidopus caudatus</i>	13	C	2005-2006	T	36.3	80	0.00047	3.05	0.99
Spring	AS	<i>Lepidopus caudatus</i>	40	C	2003	T	21.9	81.5	0.00040	3.11	0.99
ASC	AS	<i>Lepidorhombus boscii</i>	2242	C	2006-2008	T	10.9	40.8	0.00390	3.25	0.99
ASC	AS	<i>Lepidorhombus boscii</i>	521	C	2005-2006	T	10.2	39.5	0.00316	3.29	0.99
ASC	AS	<i>Lepidorhombus whiffagonis</i>	12	C	2006-2008	T	20.2	35.7	0.07260	2.33	0.91
ASC	MS	<i>Lepidotrigla cavillone</i>	143	C	2009-2011	T	5.9	14.2	0.03300	2.63	0.84
ASC	AS	<i>Lepidotrigla cavillone</i>	1428	C	2005-2006	T	12.7	33	0.00880	3.15	0.98
ASC	AS	<i>Lepidotrigla cavillone</i>	855	C	2005-2006	T	7	12.8	0.00442	3.41	0.90
ASC	AS	<i>Lepidotrigla cavillone</i>	377	C	1997-2000	T	75	141	0.00111	2.98	0.89
Spring	AS	<i>Lesueurigobius friesii</i>	17	C	2003	T	6.2	8.1	0.03920	2.13	0.72
F-W	MS	<i>Lesueurigobius friesii</i>	580	C	2006-2007	T	4.2	10.7	0.01600	2.53	0.85
ASC	AS	<i>Lesueurigobius friesii</i>	149	C	2005-2006	T	6.8	20.5	0.00890	2.89	0.96
ASC	AS	<i>Lesueurigobius friesii</i>	631	C	2005	T	4	9.1	0.00790	3.01	0.95
Fall	AS	<i>Lesueurigobius suerii</i>	13	C	2011	T	3.9	4.4	0.00960	2.93	0.91
ASC	Medit	<i>Leucoraja circularis</i>	6	C	2009-2011	T	44.5	82	0.00390	3.08	0.98
F-W	AS	<i>Lithognathus mormyrus</i>	141	C	2006	TR-L	23.7	14.5	0.00240	3.50	0.97
ASC	MS	<i>Lithognathus mormyrus**</i>	41	C	2000-2001	L-BS	2.6	8.5	0.00097	1.2072	3.10
F-W	Medit	<i>Lithognathus mormyrus</i>	6	C	2008-2009	GN-TR	16.4	23	0.01920	2.83	0.99

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	<i>a</i>	<i>a'</i>	<i>b</i>	Source
ASC	AS	<i>Lithognathus mormyrus</i>	55	C	2005-2006	T	9.2	30.5	0.01180	İlkyaz et al. (2008)
ASC	AS	<i>Lithognathus mormyrus</i>	36	C	2002-2003	L	1.6	27.8	0.00980	Akyol et al. (2007)
ASC	Medit	<i>Lithognathus mormyrus</i>	39	C	1999-2000	T	12.6	19.4	0.00920	Çiçek et al. (2006)
ASC	MS	<i>Liza aurata**</i>	446	C	2000-2001	L-BS	2.3	17.4	0.00088	Keskin and Gaygusuz (2010)
ASC	Medit	<i>Liza carinata**</i>	15	C	1997-1998	T-GN	16.7	18.7	0.00002	Taskavak and Bilecenoglu (2001)
ASC	MS	<i>Liza saliens**</i>	57	C	2000-2001	L-BS	2.3	18.6	0.00092	Keskin and Gaygusuz (2010)
ASC	AS	<i>Lophius budegassa</i>	29	C	2005-2006	T	7	45.4	0.01160	İlkyaz et al. (2008)
ASC	MS	<i>Lophius piscatorius</i>	15	C	2009-2011	T	9.3	18.2	0.02200	Demirel and Dalkara (2012)
ASC	AS	<i>Lophius piscatorius</i>	15	C	2005	T	22.3	67	0.01990	Ozaydin et al. (2007)
ASC	AS	<i>Lophius piscatorius</i>	94	C	1998-2001	TR-GN-T-BS	8	48	0.01460	Ozaydin and Taskavak (2006)
ASC	AS	<i>Lophius piscatorius</i>	445	C	2005-2006	T	11.2	83	0.01239	Ismen et al. (2007)
ASC	AS	<i>Lophius piscatorius</i>	30	C	2005-2006	T	6.1	9.6	0.01010	İlkyaz et al. (2008)
F-W	MS	<i>Lophius piscatorius</i>	40	C	2006-2007	T	36	54	0.00010	Bok et al. (2011)
Winter	Medit	<i>Leiognathus khunzingeri</i>	358	C	2007-2008	T	10.9	7.29	0.00260	Erguden et al. (2009)
ASC	MS	<i>Lepadogaster lepadogaster</i>	4	C	2007	BS	4.1	5.1	0.00415	Ozen et al. (2009)
ASC	AS	<i>Lepidopus caudatus</i>	13	C	2005-2006	T	36.3	80	0.00047	Ismen et al. (2007)
Spring	AS	<i>Lepidopus caudatus</i>	40	C	2003	T	21.9	81.5	0.00040	Filiz and Bilge (2004)
ASC	AS	<i>Lepidorhombus boscii</i>	2242	C	2006-2008	T	10.9	40.8	0.00390	Ozkincet al. (2009)
ASC	AS	<i>Lepidorhombus boscii</i>	521	C	2005-2006	T	10.2	39.5	0.00316	İsmen et al. (2007)
ASC	AS	<i>Lepidorhombus whiffagonis</i>	12	C	2006-2008	T	20.2	35.7	0.07260	Ozkincet al. (2009)
ASC	MS	<i>Lepidotrigla cavillone</i>	143	C	2009-2011	T	5.9	14.2	0.03300	Demirel and Dalkara (2012)
ASC	AS	<i>Lepidotrigla cavillone</i>	1428	C	2005-2006	T	12.7	33	0.00880	İlkyaz et al. (2008)
ASC	AS	<i>Lepidotrigla cavillone</i>	855	C	2005-2006	T	7	12.8	0.00442	Ismen et al. (2007)
ASC	AS	<i>Lepidotrigla cavillone</i>	377	C	1997-2000	T	75	141	0.00111	Türker et al. (2008)
Spring	AS	<i>Lesueurigobius friesii</i>	17	C	2003	T	6.2	8.1	0.03920	Filiz and Bilge (2004)
F-W	MS	<i>Lesueurigobius friesii</i>	580	C	2006-2007	T	4.2	10.7	0.01600	Bok et al. (2011)
ASC	AS	<i>Lesueurigobius friesii</i>	149	C	2005-2006	T	6.8	20.5	0.00890	İlkyaz et al. (2008)
ASC	AS	<i>Lesueurigobius friesii</i>	631	C	2005	T	4	9.1	0.00790	Ozaydin et al. (2007)
Fall	AS	<i>Lesueurigobius suerii</i>	13	C	2011	T	3.9	4.4	0.00960	Yapıcı et al. (2015)
ASC	Medit	<i>Leucoraja circularis</i>	6	C	2009-2011	T	44.5	82	0.00390	Deval et al. (2014)
F-W	AS	<i>Lithognathus mormyrus</i>	141	C	2006	TR-L	23.7	14.5	0.00240	Ceyhan et al. (2009)
ASC	MS	<i>Lithognathus mormyrus**</i>	41	C	2000-2001	L-BS	2.6	8.5	0.00097	Keskin and Gaygusuz (2010)
F-W	Medit	<i>Lithognathus mormyrus</i>	6	C	2008-2009	GN-TR	16.4	23	0.01920	Gökçe et al. (2010)
ASC	AS	<i>Lithognathus mormyrus</i>	55	C	2005-2006	T	9.2	30.5	0.01180	İlkyaz et al. (2008)
ASC	AS	<i>Lithognathus mormyrus</i>	36	C	2002-2003	L	16	27.8	0.00980	Akyol et al. (2007)
ASC	Medit	<i>Lithognathus mormyrus</i>	39	C	1999-2000	T	12.6	19.4	0.00920	Çiçek et al. (2006)

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source
ASC	MS	<i>Liza aurata**</i>	446	C	2000-2001	L-BS	2.3	17.4	0.9151	0.96
ASC	Medit	<i>Liza carinata**</i>	15	C	1997-1998	T-GN	16.7	18.7	0.00002	0.94
ASC	MS	<i>Liza saliens**</i>	57	C	2000-2001	L-BS	2.3	18.6	0.00092	0.99
ASC	AS	<i>Lophius budegassa</i>	29	C	2005-2006	T	7	45.4	0.01160	0.99
ASC	MS	<i>Lophius piscatorius</i>	15	C	2009-2011	T	9.3	18.2	0.02200	0.81
ASC	AS	<i>Lophius piscatorius</i>	15	C	2005	T	22.3	67	0.01990	0.99
ASC	AS	<i>Lophius piscatorius</i>	94	C	1998-2001	TR-GN-T-BS	8	48	0.01460	0.97
ASC	AS	<i>Lophius piscatorius</i>	445	C	2005-2006	T	11.2	83	0.01239	0.98
ASC	AS	<i>Lophius piscatorius</i>	30	C	2005-2006	T	6.1	9.6	0.01010	0.99
F-W	MS	<i>Lophius piscatorius</i>	40	C	2006-2007	T	36	54	0.00010	0.88
ASC	AS	<i>Lophius piscatorius*</i>	23	C	1997-2000	T	101	440	0.00002	0.97
Spring	AS	<i>Macroramphosus scolopax</i>	43	C	2003	T	7.1	11.4	0.00790	0.87
ASC	Medit	<i>Macroramphosus scolopax</i>	124	C	1999-2000	T	3.7	9.2	0.00590	0.97
ASC	MS	<i>Merlangius merlangus euxinus</i>	234	C	2009-2011	T	10.6	24.5	0.01200	0.93
ASC	AS	<i>Merlangius merlangus euxinus</i>	23	C	2005-2006	T	12.5	19.1	0.01020	0.89
ASC	AS	<i>Merlangius merlangus euxinus</i>	100	C	1998-2001	TR-GN-T-BS	16	31.7	0.00920	0.96
F-W	BS	<i>Merlangius merlangus euxinus</i>	904	C	2004-2005	T	7.7	22.7	0.00670	0.96
F-W	MS	<i>Merlangius merlangus euxinus</i>	166	C	2006-2007	T	7.6	24.2	0.00470	0.94
ASC	BS	<i>Merlangius merlangus euxinus</i>	943	C	2007	T	6.7	29.5	0.00400	0.98
F-W	AS	<i>Merluccius merluccius</i>	21	C	2006	TR-L	28.1	21.5	0.01990	0.94
ASC	AS	<i>Merluccius merluccius*</i>	2711	C	2005	T	2.7	48.8	0.98140	0.98
ASC	Medit	<i>Merluccius merluccius</i>	29	C	2001-2003	T-L	13.2	31	0.03370	0.93
ASC	MS	<i>Merluccius merluccius</i>	715	C	2009-2011	T	9.3	52	0.01000	0.94
ASC	Medit	<i>Merluccius merluccius</i>	31	C	2012-2013	T	16	28.7	0.00960	0.95
ASC	AS	<i>Merluccius merluccius</i>	501	C	1998-2001	TR-GN-T-BS	12.3	47	0.00500	0.98
ASC	AS	<i>Merluccius merluccius</i>	22	C	2004-2005	GN-TR	19.7	41.1	0.00490	0.98
ASC	Medit	<i>Merluccius merluccius</i>	567	C	1999-2000	T	3.1	29.9	0.00460	0.98
ASC	AS	<i>Merluccius merluccius</i>	2041	C	2005-2006	T	7.9	66	0.00439	0.98
ASC	AS	<i>Merluccius merluccius</i>	1499	C	2005-2006	T	6.9	9.6	0.00390	0.98
F-W	MS	<i>Merluccius merluccius</i>	319	C	2006-2007	T	8.9	44.8	0.00260	0.99
ASC	AS	<i>Merluccius merluccius</i>	166	C	1997-2000	T	158	372	0.00007	0.97
W-S	BS	<i>Mesogobius batrachocephalus</i>	37	C	2009-2011	T	7.2	13.3	0.02030	0.93
ASC	AS	<i>Microchirus ocellatus</i>	8	C	2006-2008	T	10.3	13.7	0.03260	0.97
ASC	AS	<i>Microchirus ocellatus</i>	6	C	2005-2006	T	5.5	19.8	0.00790	0.99
ASC	AS	<i>Microchirus variegatus</i>	29	C	2006-2008	T	10.1	15.5	0.01620	0.91
ASC	AS	<i>Microchirus variegatus</i>	10	C	2004-2005	GN-TR	10.1	14.6	0.01370	0.92

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	a'	b	Source
ASC	AS	<i>Microchirus variegatus</i>	36	C	2005-2006	T	4.4	12.5	0.00440 İlyyaz et al. (2008)
ASC	AS	<i>Microchirus variegatus</i>	36	C	2002	T	7.3	9.6	0.00300 Bayhan et al. (2008)
ASC	AS	<i>Micromesistius poutassou</i>	549	C	2005-2006	T	13.7	42.5	0.00350 Ismen et al. (2007)
ASC	AS	<i>Mola macrocephala</i>	192	C	2005-2006	T	27.7	63	0.00050 Ismen et al. (2007)
ASC	AS	<i>Monochirurus hispidus</i>	15	C	2006-2008	T	9.7	13.7	0.05650 Ozekinci et al. (2009)
ASC	AS	<i>Mullus barbatus*</i>	45	C	1997-2000	T	10	18.5	0.06100 Türker et al. (2008)
F-W	Medit	<i>Mullus barbatus</i>	8	C	2008-2009	GN-TR	11	20.4	0.01840 Golce et al. (2010)
ASC	MS	<i>Mullus barbatus</i>	94	C	2009-2011	T	9.6	22.7	0.01500 Demirel and Dalkara (2012)
F-W	BS	<i>Mullus barbatus</i>	176	C	2004-2005	T	6.6	18.4	0.01110 Kalayci et al. (2007)
ASC	AS	<i>Mullus barbatus</i>	3386	C	2005-2006	T	6	24.7	0.00762 Ismen et al. (2007)
ASC	Medit	<i>Mullus barbatus</i>	2021	C	1999-2000	T	3.8	21.5	0.00760 Çiçek et al. (2006)
ASC	Medit	<i>Mullus barbatus</i>	1565	C	2012-2013	T	8.7	21.5	0.00710 Özvarol (2014)
ASC	BS	<i>Mullus barbatus</i>	714	C	2007	T	6.1	21.9	0.00700 Ak et al. (2009)
ASC	AS	<i>Mullus barbatus</i>	1879	C	2005-2006	T	5.8	16.5	0.00660 İlyyaz et al. (2008)
W-S	BS	<i>Mullus barbatus</i>	432	C	2009-2011	T	6.8	14.6	0.00510 Demirhan and Can (2007)
F-W	MS	<i>Mullus barbatus</i>	99	C	2006-2007	T	10	15.7	0.00490 Bok et al. (2011)
ASC	AS	<i>Mullus barbatus</i>	76	C	2004-2005	GN-TR	12.5	22.3	0.00490 Karakulak et al. (2006)
ASC	Medit	<i>Mullus barbatus</i>	451	C	2001-2003	T-L	8.2	22	0.00320 Sangun et al. (2007)
F-W	AS	<i>Mullus surmuletus</i>	120	C	2006	TR-L	17.2	13.1	0.01720 Ceyhan et al. (2009)
ASC	MS	<i>Mullus surmuletus**</i>	17	C	2000-2001	L-BS	4.7	9.4	0.00045 Keskin and Gaygutzuz (2010)
F-W	MS	<i>Mullus surmuletus</i>	142	C	2006-2007	T	11	18	0.02400 Bok et al. (2011)
ASC	Medit	<i>Mullus surmuletus</i>	145	C	1999-2000	T	5.5	22.2	0.00820 Çiçek et al. (2006)
ASC	AS	<i>Mullus surmuletus</i>	601	C	2004-2005	GN-TR	10.9	29.9	0.00680 Karakulak et al. (2006)
ASC	MS	<i>Mullus surmuletus</i>	354	C	2009-2011	T	8.5	23	0.00600 Demirel and Dalkara (2012)
ASC	AS	<i>Mullus surmuletus</i>	59	C	2005-2006	T	11.2	23.8	0.00580 İlyyaz et al. (2008)
ASC	Medit	<i>Mullus surmuletus*</i>	45	C	2012-2013	T	13.7	24.5	0.00290 Özvarol (2014)
ASC	AS	<i>Mullus surmuletus</i>	354	C	2005-2009	T	53.7	154	0.00060 Ismen et al. (2009)
ASC	AS	<i>Mustelus asterias</i>	7	C	2005-2009	T	51.4	95.5	0.00440 Ozaydin et al. (2007)
ASC	AS	<i>Mustelus mustelus</i>	17	C	2005	T	46.8	152.2	0.00340 Ismen et al. (2009)
ASC	AS	<i>Mustelus mustelus</i>	70	C	2005-2009	T	5.8	11.6	0.00270 İlyyaz et al. (2008)
Spring	AS	<i>Mustelus mustelus</i>	148	C	2005-2006	T	58.9	152.2	0.00131 Filiz and Bilge (2004)
ASC	AS	<i>Mustelus mustelus</i>	26	C	2005-2006	T	38.3	97.5	0.00110 Filiz and Mater (2002)
ASC	AS	<i>Myliobatis aquila</i>	14	C	2005-2006	T	23.5	100	0.01252 Ismen et al. (2007)
Spring	AS	<i>Myliobatis aquila</i>	14	C	2003	T	47.5	76.5	0.00080 Filiz and Bilge (2004)
ASC	AS	<i>Myliobatis aquila</i>	66	C	2005-2007	T	29.5	121	0.00027 Yığın and Ismen (2009)

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source	
Winter	Medit	<i>Nemipterus randalli</i>	10	C	2007-2008	T	15.3	10.05	0.01300	2.69	0.98
ASC	Medit	<i>Nemipterus randalli</i>	143	C	2012-2013	T	9.5	22	0.01200	2.98	0.94
W-S	BS	<i>Neogobius melanostomus</i>	99	C	2009-2011	T	8.6	19.1	0.00470	3.39	0.95
ASC	MS	<i>Nerophis opifidion**</i>	177	C	2000-2001	L-BS	9.7	21.2	0.00020	2.75	0.82
ASC	AS	<i>Nerophis opifidion</i>	11	C	1998-2001	TR-GN-TBS	10.3	18.2	0.00090	2.13	0.82
ASC	AS	<i>Nerophis opifidion</i>	86	C	2000-2002	TR	78	214	0.00000	2.42	0.74
ASC	Medit	<i>Nettiastoma melanurum</i>	75	C	2009-2011	T	25.1	79.8	0.00020	3.18	0.94
ASC	Medit	<i>Nezumia aequalis</i>	72	C	2009-2011	T	8.4	20.3	0.00420	2.80	0.83
Fall	Medit	<i>Oblada melanura</i>	22	C	2000	L	15.6	27	0.03220	2.70	0.96
ASC	AS	<i>Oblada melanura</i>	316	C	2004-2005	GN-TR	9.1	19.8	0.00340	3.46	0.92
ASC	MS	<i>Oedaleichthys labeo**</i>	41	C	2000-2001	L-BS	2.5	13.2	0.00115	0.7829	0.97
ASC	AS	<i>Ophidion barbanum</i>	9	C	2004-2005	GN-TR	19.7	25.4	0.07620	2.08	0.80
ASC	MS	<i>Ophidion barbatum</i>	15	C	2007	BS	7.3	17.7	0.00291	3.24	0.98
ASC	AS	<i>Ophidion barbatum</i>	44	C	2005-2006	T	9.5	20.2	0.00175	3.32	0.97
ASC	AS	<i>Ophisurus serpens</i>	41	C	2001-2003	T-L	12.1	50.1	0.00150	2.96	0.99
ASC	Medit	<i>Oxyurichthys petersii**</i>	112	C	1997-1998	T-GN	6.1	12.2	0.00001	0.0101	0.98
Winter	Medit	<i>Oxyurichthys petersii</i>	175	C	2007-2008	T	19.2	13.3	0.00640	2.86	0.89
ASC	Medit	<i>Pagellus acarne</i>	83	C	2001-2003	TL	11	17	0.01860	2.84	0.91
ASC	AS	<i>Pagellus acarne</i>	334	C	2005-2006	T	16.4	51.6	0.01040	3.06	0.93
ASC	Medit	<i>Pagellus acarne</i>	901	C	1999-2000	T	3.6	15.3	0.00750	3.15	0.95
ASC	AS	<i>Pagellus bogaraveo</i>	77	C	2005-2006	T	10.1	19.8	0.01560	2.93	0.95
ASC	AS	<i>Pagellus bogaraveo</i>	2355	C	2005-2006	T	6.5	25.1	0.00747	3.20	0.96
F-W	AS	<i>Pagellus erythrinus</i>	125	C	2006	TR-L	30.9	18.6	0.00620	3.04	0.94
ASC	Medit	<i>Pagellus erythrinus</i>	87	C	2012-2013	T	11.6	21.5	0.05110	2.51	0.95
F-W	Medit	<i>Pagellus erythrinus</i>	43	C	2008-2009	GN-TR	13.3	20.2	0.04120	2.58	0.95
ASC	AS	<i>Pagellus erythrinus</i>	365	C	2002-2003	L	12	30	0.01760	2.89	0.94
ASC	Medit	<i>Pagellus erythrinus</i>	1787	C	1999-2000	T	1.4	18.6	0.01520	2.84	0.97
ASC	AS	<i>Pagellus erythrinus</i>	222	C	2001-2003	T-L	7.9	31.58	0.01450	2.91	0.94
ASC	AS	<i>Pagellus erythrinus</i>	1014	C	2005-2006	T	12.1	42.3	0.01340	2.98	0.98
ASC	AS	<i>Pagellus erythrinus</i>	169	C	2004-2005	GN-TR	9.9	29.8	0.01240	3.01	0.94
Fall	Medit	<i>Pagrus caeruleostris</i>	311	C	2000	L	12.5	38.8	0.06710	2.52	0.90
ASC	Medit	<i>Pagrus caeruleostris</i>	684	C	2001-2003	T-L	5.5	20.4	0.01250	3.00	0.97
ASC	AS	<i>Pagrus caeruleostris</i>	10	C	2005-2006	T	6.5	23.7	0.00280	3.48	0.98
ASC	Medit	<i>Pagrus pagrus</i>	127	C	2012-2013	T	9.5	19	0.01860	2.92	0.94

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	<i>a'</i>	<i>b</i>	Source				
ASC	AS	<i>Pagrus pagrus</i>	18	C	2005-2006	T	27.7	83	İlyayz et al. (2008)				
ASC	MS	<i>Parablemmis sanguinolentus</i> **	10	C	2000-2001	L-BS	3.1	14.7	0.00082	1.1990	3.17	0.99	Keskin and Gaygusz (2010)
ASC	MS	<i>Parablemmis tentacularis</i> **	64	C	2000-2001	L-BS	3.5	10	0.00072	0.9601	3.13	0.97	Keskin and Gaygusz (2010)
ASC	Medit	<i>Pelates quadrilineatus</i> **	76	C	1997-1998	T-GN	7.9	12.1	0.00001	0.0134	2.96	0.97	Taskavak and Bilecenoglu (2001)
ASC	Medit	<i>Pempheris vanicolensis</i> **	46	C	1997-1998	T-GN	7.7	15.5	0.00001	0.0120	3.03	0.95	Taskavak and Bilecenoglu (2001)
Spring	AS	<i>Pristiedion cataphractum</i>	11	C	2003	T	8.1	21.2	0.00480	2.97	0.99	Filiz and Bilge (2004)	
ASC	AS	<i>Phycis blemonoidea</i>	359	C	2005-2006	T	16	42.5	0.00209	3.38	0.97	Ismen et al. (2007)	
Spring	AS	<i>Phycis blemonoidea</i>	12	C	2003	T	12.3	15	0.00170	3.55	0.89	Filiz and Bilge (2004)	
ASC	AS	<i>Phycis phycis</i>	59	C	2004-2005	GN-TR	13.7	44.5	0.00520	3.19	0.99	Karakulak et al. (2006)	
ASC	BS	<i>Platichthys flesus</i>	51	C	2007	T	19.1	38.5	0.00700	3.09	0.95	Ak et al. (2009)	
Fall	Medit	<i>Pomadasys incisus</i>	106	C	2000	L	13.4	21.2	0.04650	2.60	0.91	Can et al. (2002)	
ASC	Medit	<i>Pomadasys incisus</i>	23	C	2001-2003	T-L	11.9	19	0.01990	2.83	0.97	Sangun et al. (2007)	
ASC	MS	<i>Pomatomus saltatrix</i>	17	C	2009-2011	T	14.5	18.5	0.38700	2.77	0.85	Demirel and Dalkara (2012)	
F-W	MS	<i>Pomatomus saltatrix</i>	290	C	2006-2007	T	10.6	24	0.03250	2.53	0.86	Bok et al. (2011)	
F-W	BS	<i>Pomatomus saltatrix</i>	143	C	2004-2005	T	13.2	21.7	0.01300	2.86	0.92	Kalayci et al. (2007)	
ASC	BS	<i>Pomatomus saltatrix</i>	14	C	2007	T	11.6	22.2	0.00300	3.34	0.98	Ak et al. (2009)	
ASC	MS	<i>Pomatoschistus bathi</i> **	19	C	2000-2001	L-BS	2.8	6.3	0.00052	0.9141	3.25	0.98	Keskin and Gaygusz (2010)
ASC	MS	<i>Pomatoschistus marmoratus</i>	71	C	2009-2011	T	3.7	9	0.00400	2.52	0.72	Demirel and Dalkara (2012)	
ASC	MS	<i>Pomatoschistus minutus</i>	16	C	2007	BS	5.5	6.7	0.00363	3.19	0.97	Ozen et al. (2009)	
ASC	MS	<i>Pomatoschistus pictus</i>	12	C	2007	BS	4.2	5.6	0.00599	3.12	0.98	Ozen et al. (2009)	
ASC	Medit	<i>Raja asterias</i>	113	C	1999-2003	T	22.2	61.2	0.00130	3.39	0.97	Yeldan and Aysar (2007)	
F-W	MS	<i>Raja asterias</i>	30	C	2006-2007	T	43	79	0.00000	3.24	0.97	Bok et al. (2011)	
ASC	MS	<i>Raja clavata</i> *	170	C	2009-2011	T	9.6	65	0.11300	2.42	0.77	Demirel and Dalkara (2012)	
ASC	AS	<i>Raja clavata</i>	112	C	2005-2006	T	6	60	0.01300	3.12	1.00	Ismen et al. (2007)	
ASC	Medit	<i>Raja clavata</i>	77	C	1999-2003	T	29.3	64.6	0.00370	3.08	0.98	Yeldan and Aysar (2007)	
W-S	BS	<i>Raja clavata</i>	27	C	2009-2011	T	10.7	95.2	0.00190	3.24	0.99	Demirhan and Can (2007)	
ASC	AS	<i>Raja clavata</i>	226	C	2005-2007	T	10	88	0.00163	3.32	0.99	Yıldırım and Ismen (2009)	
ASC	AS	<i>Raja clavata</i>	37	C	2003	T	20.5	99	0.00160	3.30	0.94	Filiz and Bilge (2004)	
Spring	AS	<i>Raja clavata</i>	31	C	1999-2000	T	20.5	17.75	0.00160	3.29	0.93	Filiz and Mater (2002)	
F-W	MS	<i>Raja clavata</i> *	24	C	2006-2007	T	12.2	70	0.00001	2.87	0.89	Bok et al. (2011)	
ASC	AS	<i>Raja miraleucus</i>	30	C	2005-2006	T	6.5	30.5	0.00891	3.22	0.97	Ismen et al. (2007)	
ASC	AS	<i>Raja miraleucus</i>	12	C	2005	T	39	53.5	0.00630	2.95	0.97	Ozaydin et al. (2007)	
ASC	AS	<i>Raja miraleucus</i>	52	C	2005-2007	T	10.5	53.5	0.00173	3.27	0.95	Yıldırım and Ismen (2009)	
Spring	AS	<i>Raja miraleucus</i>	13	C	2003	T	30	50.5	0.00010	4.15	0.93	Filiz and Bilge (2004)	
ASC	AS	<i>Raja miraleucus</i>	13	C	1999-2000	T	30	56.5	0.00010	4.02	0.93	Filiz and Mater (2002)	

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a'	b	Source
ASC	AS	<i>Raja radula</i>	49	C	2005-2006	T	12.5	39	0.01131 Ismen et al. (2007)
ASC	AS	<i>Raja radula</i>	25	C	2004-2005	GN-TR	17.4	70	0.00300 Karakulak et al. (2006)
ASC	AS	<i>Raja radula</i>	204	C	2005-2007	T	17	61	0.00205 Yığın and Ismen (2009)
ASC	Medit	<i>Raja radula</i>	295	C	1999-2003	T	21.1	68.1	0.00120 Yeldan and Avsar (2007)
ASC	Medit	<i>Rhinobatos cemiculus</i>	262	M	2010-2011	L-T-GN	32	149	0.00265 Basusta et al. (2012)
ASC	Medit	<i>Rhinobatos rhinobatos</i>	20	M	2010-2012	L-T-GN	35	125	0.00110 Basusta et al. (2012)
ASC	AS	<i>Rostroraja alba</i>	11	C	2005	T	25.2	53.4	0.00900 Ozaydin et al. (2007)
ASC	AS	<i>Rostroraja alba</i>	43	C	2005-2006	T	9.5	93	0.00662 Ismen et al. (2007)
Fall	AS	<i>Rostroraja alba</i>	12	C	2011	T	26.1	52	0.00210 Yapıci et al. (2015)
ASC	AS	<i>Rostroraja alba</i>	126	C	2005-2007	T	14	159	0.00194 Yığın and Ismen (2009)
ASC	MS	<i>Sallaria pavo</i>	14	C	2007	BS	3.7	12.2	0.01653 Ozen et al. (2009)
ASC	MS	<i>Sardina pilchardus**</i>	38	C	2000-2001	L-BS	4.7	6.7	0.00015 Keskin and Gaygusuz (2010)
ASC	AS	<i>Sardina pilchardus</i>	87	C	1997-2000	T	80	142	0.00031 Türker et al. (2008)
ASC	MS	<i>Sardinella aurita**</i>	24	C	2000-2001	L-BS	4.6	6.8	0.00031 Keskin and Gaygusuz (2010)
F-W	MS	<i>Sardinella aurita</i>	16	C	2006-2007	T	9.9	16.8	0.03330 Bok et al. (2011)
ASC	AS	<i>Sardinella aurita</i>	50	C	2004-2005	GN-TR	16.4	26.2	0.00620 Karakulak et al. (2006)
ASC	Medit	<i>Sargocentron rubrum**</i>	38	C	1997-1998	T-GN	12	16.7	0.00002 Taskavak and Bilecenoglu (2001)
Fall	Medit	<i>Sargocentron rubrum</i>	57	C	2000	L	12.9	21.4	0.00910 Can et al. (2002)
ASC	AS	<i>Sarpa salpa</i>	80	C	2004-2005	GN-TR	11.1	31.2	0.00870 Karakulak et al. (2006)
F-W	AS	<i>Saurida undosquamis</i>	80	C	2006	TR-L	26.1	19.6	0.00420 Ceyhan et al. (2009)
Fall	Medit	<i>Saurida undosquamis</i>	100	C	2000	L	17.4	33.1	0.01170 Özvarol (2014)
F-W	Medit	<i>Saurida undosquamis</i>	79	C	2008-2009	GN-TR	12.8	36.4	0.01050 Keskin and Gaygusuz (2010)
Winter	Medit	<i>Saurida undosquamis</i>	304	C	2007-2008	T	34	19.92	0.00630 Karakulak et al. (2006)
ASC	AS	<i>Saurida undosquamis</i>	80	C	2002-2003	L	19.6	33.1	0.00460 Erguden et al. (2009)
ASC	Medit	<i>Saurida undosquamis</i>	1801	C	1999-2000	T	5	33	0.00390 Akyol et al. (2007)
ASC	Medit	<i>Saurida undosquamis</i>	416	C	2001-2003	T-L	10.6	26.1	0.00390 Çiçek et al. (2006)
ASC	Medit	<i>Saurida undosquamis</i>	211	C	2012-2013	T	11.5	35.5	0.00370 Sangun et al. (2007)
ASC	MS	<i>Sciaena umbra**</i>	12	C	2000-2001	L-BS	2.9	12	0.00069 Özvarol (2014)
ASC	AS	<i>Sciaena umbra</i>	24	C	2004-2005	GN-TR	13.9	29.8	0.00550 Keskin and Gaygusuz (2010)
ASC	AS	<i>Scomber japonicus</i>	25	C	2004-2005	GN-TR	18.1	31.2	0.00640 Karakulak et al. (2006)
ASC	Medit	<i>Scomber japonicus</i>	11	C	2001-2003	T-L	17.1	22	0.00560 Sangun et al. (2007)
ASC	AS	<i>Scomber japonicus</i>	45	C	2005-2006	T	12.2	22	0.00164 Ismen et al. (2007)
ASC	AS	<i>Scomber scombrus</i>	100	C	2005-2006	T	13.6	24	0.00286 Ismen et al. (2007)
ASC	AS	<i>Scomber scombrus</i>	54	C	2004-2005	GN-TR	22	31.1	0.00250 Karakulak et al. (2006)
ASC	AS	<i>Scomber scombrus</i>	52	C	1997-2000	T	158	217	0.00000 Türker et al. (2008)
ASC	AS	<i>Scophthalmus rhombus</i>	10	C	2006-2008	T	32	48.9	0.00290 Ozekinci et al. (2009)

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	a'	b	Source
ASC	BS	<i>Scyliorhinus maximus</i>	63	C	2007	T	10	61	0.00700
ASC	Medit	<i>Scorpaena elongata</i>	114	C	2009-2011	T	5.6	42.1	0.02300
ASC	AS	<i>Scorpaena notata</i>	113	C	2005-2006	T	5.8	20.2	0.03291
ASC	AS	<i>Scorpaena notata</i>	565	C	2005	T	8.4	17	0.02130
ASC	AS	<i>Scorpaena notata</i>	357	C	2005-2006	T	7.5	18.7	0.01670
ASC	AS	<i>Scorpaena notata</i>	108	C	2004-2005	GN-TR	8.1	15.1	0.01650
ASC	AS	<i>Scorpaena notata</i>	52	C	1998-2001	TR-GN-T-BS	7.9	24.3	0.01400
ASC	MS	<i>Scorpaena porcus**</i>	45	C	2000-2001	L-BS	4.9	19	0.00158
ASC	AS	<i>Scorpaena porcus</i>	10	C	2005-2006	T	10	22	0.02555
ASC	AS	<i>Scorpaena porcus</i>	9	C	2005-2006	T	31.2	85.5	0.02150
ASC	AS	<i>Scorpaena porcus</i>	255	C	2004-2005	GN-TR	8	27.3	0.02150
ASC	AS	<i>Scorpaena porcus</i>	50	C	1998-2001	TR-GN-T-BS	14.1	25.6	0.02010
F-W	BS	<i>Scorpaena porcus</i>	136	C	2004-2005	T	8.5	29.2	0.01730
ASC	AS	<i>Scorpaena porcus</i>	86	C	2005	T	8.6	27.2	0.01590
W-S	BS	<i>Scorpaena porcus</i>	470	C	2009-2011	T	4.6	17.5	0.01240
ASC	BS	<i>Scorpaena porcus</i>	351	C	2007	T	5	34.2	0.00900
F-W	MS	<i>Scorpaena porcus</i>	15	C	2006-2007	T	17.3	21.4	0.00670
ASC	AS	<i>Scorpaena scrofa</i>	12	C	2005	T	10.5	28.3	0.04480
ASC	AS	<i>Scorpaena scrofa</i>	129	C	1998-2001	TR-GN-T-BS	8.2	30.1	0.02910
ASC	AS	<i>Scorpaena scrofa</i>	15	C	2004-2005	GN-TR	12.3	39.1	0.01800
ASC	MS	<i>Scyliorhinus canicula</i>	189	C	2009-2011	T	20	50	0.00400
ASC	AS	<i>Scyliorhinus canicula</i>	1888	U	2005-2009	T	9.6	91.3	0.00170
ASC	AS	<i>Scyliorhinus canicula</i>	1501	C	2005-2006	T	9.6	62	0.00169
ASC	AS	<i>Scyliorhinus canicula</i>	113	C	1999-2000	T	17.5	52.5	0.00160
Spring	AS	<i>Scyliorhinus canicula</i>	637	C	2003	T	10.5	50.9	0.00120
ASC	AS	<i>Scyliorhinus canicula</i>	744	C	2005-2006	T	12.2	19.1	0.00120
ASC	AS	<i>Scyliorhinus canicula</i>	187	C	2005	T	28.6	51.5	0.00060
ASC	AS	<i>Scyliorhinus canicula*</i>	112	C	1997-2000	T	24.6	78.6	0.00002
ASC	AS	<i>Scyliorhinus stellaris</i>	34	C	2005	T	14.5	71	0.00650
ASC	AS	<i>Scyliorhinus stellaris</i>	11	C	2005-2006	T	7	16.3	0.00200
ASC	AS	<i>Scyliorhinus stellaris</i>	12	U	2005-2009	T	16.5	61.6	0.00090
ASC	Medit	<i>Serranus cabrilla</i>	126	C	2001-2003	T-L	7.1	18.9	0.06620
ASC	Medit	<i>Serranus cabrilla</i>	41	C	1999-2000	T	5.5	8.9	0.01310
ASC	AS	<i>Serranus cabrilla</i>	714	C	2005-2006	T	47.1	88.3	0.01240
ASC	AS	<i>Serranus cabrilla</i>	200	C	1998-2001	TR-GN-T-BS	11.9	21.8	0.01220
ASC	AS	<i>Serranus cabrilla</i>	91	C	2004-2005	GN-TR	11.9	19.8	0.01120

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source
ASC	AS	<i>Serranus cabrilla</i>	974	C	2005	T	7.4	26	0.01110	Ozaydin et al. (2007)
F-W	MS	<i>Serranus cabrilla</i>	15	C	2006-2007	T	6.9	11.7	0.00910	Bok et al. (2011)
ASC	Medit	<i>Serranus cabrilla</i>	52	C	2012-2013	T	9	18.5	0.00910	Özvarol (2014)
ASC	AS	<i>Serranus cabrilla</i>	34	C	2005-2006	T	11	27.5	0.00861	Ismen et al. (2007)
ASC	AS	<i>Serranus cabrilla</i>	602	C	1997-2000	T	87	234	0.00071	Türker et al. (2008)
ASC	MS	<i>Serranus hepatus***</i>	5	C	2000-2001	L-BS	2	6.8	0.00153	Keskin and Gaygusuz (2010)
ASC	AS	<i>Serranus hepatus</i>	78	C	1997-2000	T	78	114	0.04100	Türker et al. (2008)
ASC	MS	<i>Serranus hepatus</i>	379	C	2009-2011	T	6.5	13.7	0.03600	Demirel and Dalkara (2012)
F-W	MS	<i>Serranus hepatus</i>	111	C	2006-2007	T	5.9	11.8	0.03190	Bok et al. (2011)
ASC	Medit	<i>Serranus hepatus</i>	100	C	2012-2013	T	5.8	13.9	0.02880	Özvarol (2014)
ASC	AS	<i>Serranus hepatus</i>	2543	C	2005	T	6.7	11.6	0.02410	Ozaydin et al. (2007)
ASC	AS	<i>Serranus hepatus</i>	143	C	1998-2001	TR-GN-T-BS	5.7	11.1	0.01620	Ozaydin and Taskavak (2006)
ASC	AS	<i>Serranus hepatus</i>	584	C	1999-2000	T	2.4	10.5	0.01610	Çiçek et al. (2006)
ASC	AS	<i>Serranus hepatus</i>	1285	C	2005-2006	T	6.2	15.2	0.01490	İlkyaz et al. (2008)
ASC	Medit	<i>Serranus hepatus</i>	573	C	2001-2003	T-L	4.8	13	0.01430	Sangun et al. (2007)
ASC	AS	<i>Serranus hepatus</i>	313	C	2005	T	8.3	23.5	0.00970	Ozaydin et al. (2007)
ASC	AS	<i>Serranus scriba</i>	311	C	2004-2005	GN-TR	10.2	21.3	0.00650	Karakulak et al. (2006)
ASC	Medit	<i>Serranus scriba</i>	8	C	2001-2003	TL	13.6	17	0.00440	Sangun et al. (2007)
F-W	AS	<i>Siganus luridus</i>	22	C	2006	TR-L	16.5	13.2	0.01450	Ceyhan et al. (2009)
Winter	Medit	<i>Siganus luridus</i>	21	C	2007-2008	T	16.3	14.19	0.01360	Erguden et al. (2009)
F-W	AS	<i>Siganus rivulatus</i>	56	C	2006	TR-L	16.2	11.7	0.00980	Gokce et al. (2010)
Winter	Medit	<i>Siganus rivulatus</i>	122	C	2007-2008	T	18	15.61	0.01700	Ceyhan et al. (2009)
F-W	Medit	<i>Siganus rivulatus</i>	5	C	2008-2009	GN-TR	8	19.9	0.01270	Erguden et al. (2009)
ASC	Medit	<i>Siganus rivulatus**</i>	355	C	1997-1998	T-GN	10.7	24.1	0.00000	Taskavak and Bilecenoglu (2001)
Winter	Medit	<i>Sillago sihama</i>	23	C	2007-2008	T	20.5	14.52	0.00530	Erguden et al. (2009)
ASC	Medit	<i>Sillago sihama**</i>	108	C	1997-1998	T-GN	9.4	20.3	0.00000	Taskavak and Bilecenoglu (2001)
F-W	MS	<i>Solea kleinii</i>	20	C	2006-2007	T	4.6	25.9	0.03140	Bok et al. (2011)
ASC	MS	<i>Solea nasuta**</i>	5	C	2000-2001	L-BS	5.7	17.6	0.00050	Keskin and Gaygusuz (2010)
ASC	BS	<i>Solea nasuta</i>	100	C	2007	T	11.3	21.7	0.01600	Ak et al. (2009)
F-W	Medit	<i>Solea solea</i>	13	C	2008-2009	GN-TR	11.2	24.4	0.04900	Gokce et al. (2010)
ASC	AS	<i>Solea solea</i>	44	C	2002	T	9.2	15.5	0.02320	Bayhan et al. (2008)
ASC	AS	<i>Solea solea</i>	130	C	2006-2008	T	10	32	0.01920	Ozekinci et al. (2009)
ASC	MS	<i>Solea solea</i>	53	C	2009-2011	T	20	33.2	0.00600	Demirel and Dalkara (2012)
F-W	MS	<i>Solea solea</i>	55	C	2006-2007	T	6.9	16	0.00430	Bok et al. (2011)
ASC	AS	<i>Solea solea</i>	79	C	2005-2006	T	14.7	39.2	0.00375	Ismen et al. (2007)
ASC	AS	<i>Solea solea</i>	72	C	2005-2006	T	4.5	8.4	0.00300	İlkyaz et al. (2008)

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source
ASC	AS	<i>Solea solea</i>	74	C	1998-2001	TR-GN-T-BS	20.4	37	0.00220	3.39 Ozaydin and Taskavak (2006)
ASC	AS	<i>Solea solea</i>	110	C	2005	T	19.7	31.9	0.00210	3.20 Ozaydin et al. (2007)
F-W	AS	<i>Sparus aurata</i>	59	C	2006	TR-L	26.7	14.6	0.01760	2.89 Ceyhan et al. (2009)
Fall	Medit	<i>Sparus aurata</i>	21	C	2000	L	16.9	32	0.04060	2.68 Can et al. (2002)
ASC	Medit	<i>Sparus aurata</i>	298	C	2001-2003	T-L	10.3	31.8	0.02200	2.84 Sangun et al. (2007)
ASC	Medit	<i>Sparus aurata</i>	13	C	1999-2000	T	15.5	27.9	0.01450	2.99 Çiçek et al. (2006)
ASC	AS	<i>Sparus aurata</i>	141	C	2002-2003	L	14.5	32.6	0.01220	3.03 Akyol et al. (2007)
ASC	AS	<i>Sparus aurata</i>	123	C	2005-2006	T	14.6	26.4	0.01000	3.09 İlkyaz et al. (2008)
ASC	Medit	<i>Sphyraena chrysotaenia**</i>	54	C	1997-1998	T-GN	12.6	23.1	0.00003	0.0124 Taskavak and Bilecenoglu (2001)
Winter	Medit	<i>Sphyraena chrysotaenia</i>	67	C	2007-2008	T	32.2	28.93	0.00110	3.41 Erguden et al. (2009)
ASC	Medit	<i>Spicara flexuosa</i>	440	C	2012-2013	T	9	17.3	0.02600	2.66 Özvarol (2014)
F-W	Medit	<i>Spicara maena</i>	17	C	2008-2009	GN-TR	13.3	17.9	0.02150	2.80 Gökce et al. (2010)
ASC	AS	<i>Spicara maena</i>	1081	C	2005-2006	T	15.2	59.3	0.01210	2.97 İlkyaz et al. (2008)
ASC	MS	<i>Spicara maena</i>	175	C	2009-2011	T	10.4	18	0.01000	3.03 Demirel and Dalkara (2012)
ASC	AS	<i>Spicara maena</i>	353	C	2005-2006	T	8.8	17.8	0.00984	3.01 İsmen et al. (2007)
ASC	Medit	<i>Spicara maena</i>	1381	C	1999-2000	T	4.2	17.8	0.00810	3.12 Çiçek et al. (2006)
ASC	Medit	<i>Spicara maena</i>	298	C	2001-2003	T-L	8.7	17.1	0.00800	3.09 Sangun et al. (2007)
ASC	AS	<i>Spicara maena</i>	830	C	2004-2005	GN-TR	11	22	0.00280	3.51 Karakulak et al. (2006)
ASC	Medit	<i>Spicara smaris</i>	176	C	2001-2003	T-L	7.5	16.9	0.02880	2.59 Sangun et al. (2007)
ASC	Medit	<i>Spicara smaris</i>	360	C	1999-2000	T	4.9	14.9	0.01950	2.67 Çiçek et al. (2006)
ASC	AS	<i>Spicara smaris</i>	130	C	2004-2005	GN-TR	11.5	18.7	0.01380	2.88 Karakulak et al. (2006)
ASC	AS	<i>Spicara smaris</i>	1449	C	2005-2006	T	8.2	18.6	0.01180	2.92 İsmen et al. (2007)
ASC	BS	<i>Spicara smaris</i>	528	C	2007	T	8.3	24.2	0.00900	3.01 Ak et al. (2009)
F-W	MS	<i>Spicara smaris</i>	403	C	2006-2007	T	5.9	17.7	0.00890	3.08 Bok et al. (2011)
ASC	AS	<i>Spicara smaris</i>	42	C	2005-2006	T	12	51.4	0.00770	3.07 İlkyaz et al. (2008)
F-W	BS	<i>Spicara smaris</i>	83	C	2004-2005	T	11.2	20	0.00630	3.15 Kalayci et al. (2007)
ASC	AS	<i>Spicara smaris*</i>	139	C	1997-2000	T	105	157	0.00031	2.86 Türker et al. (2008)
ASC	AS	<i>Spondylisoma cantharus</i>	46	C	2004-2005	GN-TR	8.2	28.7	0.01920	2.87 Karakulak et al. (2006)
ASC	AS	<i>Spondylisoma cantharus</i>	45	C	2005-2006	T	9.6	22.7	0.00902	3.18 İsmen et al. (2007)
ASC	MS	<i>Sprattus sprattus**</i>	52	C	2000-2001	L-BS	3.8	5.5	0.00023	0.7758 Keskin and Gaygusuz (2010)
F-W	BS	<i>Sprattus sprattus</i>	5087	C	2004-2005	T	5.6	12.6	0.00790	2.87 Kalayci et al. (2007)
ASC	AS	<i>Squalus acanthias</i>	565	C	2005-2009	T	17.1	115	0.00370	3.05 İsmen et al. (2009)
Spring	AS	<i>Squalus acanthias</i>	32	C	2003	T	27	70.5	0.00310	3.11 Filiz and Bilge (2004)
ASC	AS	<i>Squalus acanthias</i>	32	C	1999-2000	T	27	70.5	0.00310	3.11 Filiz and Mater (2002)
F-W	MS	<i>Squalus acanthias</i>	8	C	2006-2007	T	41	52	0.00003	2.62 Bok et al. (2011)
ASC	AS	<i>Squalus blainvilliei</i>	299	C	2005-2006	T	21.5	117.5	0.00345	3.06 İsmen et al. (2007)

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source			
ASC	AS	<i>Squalus blainvilliei</i>	27	C	2005-2009	T	30.5	121.6	0.00300	3.07	0.99	Ismen et al. (2009)	
F-W	MS	<i>Squalus blainvilliei</i>	18	C	2006-2007	T	38	56	0.00004	2.48	0.96	Bok et al. (2011)	
ASC	Medit	<i>Stephanolepis diaspros</i>	52	C	2001-2003	T-L	7.3	14.2	0.02760	2.83	0.98	Sangun et al. (2007)	
Winter	Medit	<i>Stephanolepis diaspros</i>	56	C	2007-2008	T	13.5	11.62	0.01460	3.08	0.98	Erguden et al. (2009)	
ASC	Medit	<i>Stephanolepis diaspros**</i>	207	C	1997-1998	T-GN	7.1	13	0.00001	0.0104	3.19	0.92	Taskavak and Bilecenoglu (2001)
ASC	Medit	<i>Stomias boa</i>	52	C	2009-2011	T	10	25.9	0.00050	3.36	0.94	Deval et al. (2014)	
ASC	MS	<i>Sympodus cinereus**</i>	173	C	2000-2001	L-BS	2.3	11.3	0.00093	1.4044	3.18	0.99	Keskin and Gaygusuz (2010)
ASC	AS	<i>Sympodus cinereus</i>	20	C	2005	T	4	7	0.01140	3.07	0.96	Ozaydin et al. (2007)	
ASC	AS	<i>Sympodus cinereus</i>	8	C	2005-2006	T	9	45.5	0.00780	3.26	0.99	İlkyaz et al. (2008)	
ASC	AS	<i>Sympodus doderleinii</i>	15	C	2005	T	5.5	9.6	0.01100	3.12	0.96	Ozaydin et al. (2007)	
ASC	AS	<i>Sympodus mediterraneus</i>	39	C	2004-2005	GN-TR	9.8	16.4	0.01730	2.90	0.94	Karakulak et al. (2006)	
ASC	AS	<i>Sympodus mediterraneus</i>	39	C	2005	T	4.9	20.2	0.01270	3.08	0.98	Ozaydin et al. (2007)	
ASC	MS	<i>Sympodus ocellatus**</i>	575	C	2000-2001	L-BS	1.8	10.7	0.00102	1.2263	3.08	Keskin and Gaygusuz (2010)	
ASC	AS	<i>Sympodus ocellatus</i>	216	C	2005	T	4.7	9.2	0.00850	3.22	0.96	Ozaydin et al. (2007)	
ASC	MS	<i>Sympodus roissali**</i>	22	C	2000-2001	L-BS	2.4	14.1	0.00069	1.6782	3.39	0.99	Keskin and Gaygusuz (2010)
ASC	AS	<i>Sympodus rostratus</i>	19	C	2004-2005	GN-TR	9.6	12.7	0.01770	2.84	0.84	Karakulak et al. (2006)	
ASC	AS	<i>Sympodus rostratus</i>	36	C	2005	T	7.1	10.9	0.00490	3.46	0.98	Ozaydin et al. (2007)	
ASC	MS	<i>Sympodus tinca**</i>	41	C	2000-2001	L-BS	2.1	15.5	0.00111	1.3910	3.10	0.99	Keskin and Gaygusuz (2010)
ASC	AS	<i>Sympodus tinca</i>	89	C	2005	T	6.7	23	0.01830	2.91	0.98	Ozaydin et al. (2007)	
ASC	AS	<i>Sympodus tinca</i>	248	C	2004-2005	GN-TR	10	26.8	0.01090	3.05	0.97	Karakulak et al. (2006)	
Fall	Medit	<i>Sympodus tinca</i>	10	C	2000	L	12.1	17.2	0.00210	3.68	0.99	Can et al. (2002)	
ASC	AS	<i>Syphurus nigrescens</i>	182	C	2005-2006	T	7.7	12.7	0.00380	2.98	0.96	İlkyaz et al. (2008)	
ASC	AS	<i>Syphurus nigrescens</i>	7	C	2006-2008	T	9.8	10.9	0.00750	3.15	0.91	Ozekinci et al. (2009)	
Fall	AS	<i>Syphurus nigrescens</i>	10	C	2011	T	7.8	10.6	0.00270	3.50	0.96	Yapıcı et al. (2015)	
ASC	Medit	<i>Synchiropus phaeton</i>	65	C	2009-2011	T	4.8	13.3	0.01910	2.35	0.97	Deval et al. (2014)	
ASC	MS	<i>Syngnathus abaster**</i>	298	C	2000-2001	L-BS	2.1	12.6	0.00020	0.3034	3.18	0.90	Keskin and Gaygusuz (2010)
ASC	MS	<i>Syngnathus acus**</i>	15	C	2000-2001	L-BS	10.3	37.8	0.00040	0.46689	3.07	0.96	Keskin and Gaygusuz (2010)
F-W	MS	<i>Syngnathus acus</i>	17	C	2006-2007	T	21.3	28.4	0.00030	3.12	0.93	Bok et al. (2011)	
ASC	AS	<i>Syngnathus acus</i>	202	C	1998-2001	TR-GN-T-BS	6.1	20.7	0.00010	3.63	0.97	Ozaydin and Taskavak (2006)	
ASC	AS	<i>Syngnathus acus</i>	570	C	2000-2002	TR	33	256	0.00000	3.54	0.95	Gürkan and Taskavak (2007)	
ASC	MS	<i>Syngnathus typhle**</i>	375	C	2000-2001	L-BS	6.2	31.6	0.00020	0.3141	3.20	0.97	Keskin and Gaygusuz (2010)
ASC	AS	<i>Syngnathus typhle</i>	125	C	2000-2002	TR	40	258	0.00000	3.00	0.96	Gürkan and Taskavak (2007)	
ASC	Medit	<i>Synodus saurus</i>	161	C	1999-2000	T	10.7	31	0.00730	3.02	0.96	Çiçek et al. (2006)	

(continued)

Table I. (Continued)

Season	Location	Species	N	Sex	Year	FM	<i>a</i>	<i>a'</i>	<i>b</i>	Source
ASC	AS	<i>Synognathus typhle</i>	14	C	1998-2001	TR-GN-T-TBS	7.5	20.3	0.00020	3.22 Ozaydin and Taskavak (2006)
ASC	AS	<i>Torpedo marmorata</i>	20	C	2005-2006	T	13.2	28.6	0.05920	2.64 İsmen et al. (2007)
ASC	AS	<i>Torpedo marmorata</i>	12	C	2005	T	10.3	37	0.05350	2.64 Ozaydin et al. (2007)
ASC	AS	<i>Torpedo marmorata</i>	20	C	1999-2000	T	9.6	25	0.04880	2.69 Filiz and Mater (2002)
Spring	AS	<i>Torpedo marmorata</i>	37	C	2003	T	9.2	34	0.02730	2.91 Filiz and Bilge (2004)
ASC	AS	<i>Torpedo marmorata</i>	35	C	2005-2006	T	8.1	14.1	0.02320	2.98 İlkyaz et al. (2008)
ASC	AS	<i>Torpedo marmorata</i>	22	C	2004-2005	GN-TR	16.4	38.9	0.01390	3.10 Karakulak et al. (2006)
ASC	Medit	<i>Torpedo nobiliana</i>	92	M	2010-2013	L-T-GN	12	35	0.01500	3.06 Basusta et al. (2012)
ASC	AS	<i>Trachinus draco</i>	32	C	2004-2005	GN-TR	4.4	35.2	0.02430	2.58 Karakulak et al. (2006)
ASC	AS	<i>Trachinus draco</i>	95	C	2005-2006	T	8.2	28.2	0.00520	3.10 İlkyaz et al. (2008)
ASC	Medit	<i>Trachinus draco</i>	54	C	2001-2003	T-L	9	20	0.00520	3.09 Sangun et al. (2007)
ASC	BS	<i>Trachinus draco</i>	338	C	2007	T	5	35	0.00400	3.43 Ak et al. (2009)
ASC	AS	<i>Trachinus draco</i>	45	C	2005	T	17.2	34.1	0.00400	3.18 Ozaydin et al. (2007)
ASC	AS	<i>Trachinus draco</i>	1025	C	2005-2006	T	15	37	0.00366	3.20 İsmen et al. (2007)
ASC	MS	<i>Trachurus mediterraneus</i>	496	C	2009-2011	T	7.5	18.5	0.01800	2.73 Demirel and Dalkara (2012)
ASC	Medit	<i>Trachurus mediterraneus</i>	373	C	2001-2003	T-L	7	19.1	0.01280	2.81 Sangun et al. (2007)
ASC	AS	<i>Trachurus mediterraneus</i>	718	C	1999-2000	T	2.6	16	0.01080	2.86 Çiçek et al. (2006)
ASC	AS	<i>Trachurus mediterraneus</i>	31	C	2004-2005	GN-TR	14.2	26.6	0.00470	3.17 Karakulak et al. (2006)
ASC	AS	<i>Trachurus mediterraneus</i>	446	C	2005-2006	T	7.5	20.9	0.00318	3.37 İsmen et al. (2007)
ASC	AS	<i>Trachurus mediterraneus*</i>	76	C	1997-2000	T	73	225	0.00041	3.10 Türker et al. (2008)
ASC	MS	<i>Trachurus trachurus*</i>	156	C	2009-2011	T	11.2	21	0.02700	2.95 Demirel and Dalkara (2012)
ASC	AS	<i>Trachurus trachurus</i>	264	C	2004-2005	GN-TR	10.5	24.3	0.01130	2.90 Karakulak et al. (2006)
F-W	BS	<i>Trachurus trachurus</i>	747	C	2004-2005	T	7.3	18.3	0.00860	2.98 Kalayci et al. (2007)
F-W	MS	<i>Trachurus trachurus</i>	307	C	2006-2007	T	8	16.4	0.00560	3.13 Bok et al. (2011)
ASC	AS	<i>Trachurus trachurus</i>	159	C	2005-2006	T	13.7	24.5	0.00470	3.20 İlkyaz et al. (2008)
ASC	AS	<i>Trachurus trachurus</i>	1205	C	2005-2006	T	7.5	33	0.00467	3.20 İsmen et al. (2007)
ASC	AS	<i>Trachurus trachurus</i>	267	C	2007	T	6	15.7	0.00400	3.25 Ak et al. (2009)
ASC	AS	<i>Trachurus trachurus</i> *	174	C	1997-2000	T	78	243	0.00021	2.88 Türker et al. (2008)
ASC	Medit	<i>Trichiurus lepturus</i>	84	C	2001-2003	T-L	20.5	58.8	0.00830	2.33 Sangun et al. (2007)
ASC	AS	<i>Trigla lyra</i>	26	C	2005-2006	T	25.6	125.1	0.01700	2.74 İlkyaz et al. (2008)
ASC	MS	<i>Trigla lyra</i>	27	C	2009-2011	T	16.5	32.3	0.01200	2.83 Demirel and Dalkara (2012)
ASC	AS	<i>Trigla lyra</i>	531	C	2005-2006	T	18.6	47.1	0.00915	2.94 İsmen et al. (2007)
F-W	MS	<i>Trigla lyra</i>	96	C	2006-2007	T	4.5	51	0.00620	3.05 Bok et al. (2011)

(continued)

Table 1. (Continued)

Season	Location	Species	N	Sex	Year	FM	a	a'	b	Source	
ASC	MS	<i>Trigloporus lastoviza</i>	44	C	2009-2011	T	5,5	18	0,04900	2,57	0,97
ASC	MS	<i>Tripterygion delaisi</i>	7	C	2007	BS	2,8	5,6	0,00605	3,07	0,99
ASC	MS	<i>Tripterygion tripteronotus</i>	8	C	2007	BS	2,9	6,2	0,00593	3,16	0,98
Fall	AS	<i>Trisopterus capelanus</i>	695	C	2011	T	8,5	22,2	0,00710	3,17	0,98
ASC	AS	<i>Trisopterus minutus</i>	980	C	2005-2006	T	23,5	54,5	0,00650	3,18	0,98
ASC	AS	<i>Trisopterus luscus capelanus</i>	14	C	1997-2000	T	131	200	0,00004	3,19	0,87
ASC	AS	<i>Trisopterus minutus</i>	780	C	2005	T	8,4	22,6	0,00710	3,17	0,98
ASC	AS	<i>Trisopterus minutus</i>	158	C	1998-2001	TR-GN-TBS	12,1	19,9	0,00670	3,18	0,94
ASC	AS	<i>Trisopterus minutus</i>	229	C	2005-2006	T	10,2	20,6	0,00563	3,20	0,95
ASC	Medit	<i>Upeneus moluccensis**</i>	265	C	1997-1998	T-GN	10,2	17	0,00001	0,0142	0,97
F-W	Medit	<i>Upeneus moluccensis</i>	5	C	2008-2009	GN-TR	12,2	19,5	0,00590	3,24	0,99
ASC	Medit	<i>Upeneus moluccensis</i>	975	C	1999-2000	T	4,9	19	0,00550	3,26	0,99
ASC	Medit	<i>Upeneus moluccensis</i>	93	C	2012-2013	T	9,5	19,2	0,00530	3,23	0,81
Winter	Medit	<i>Upeneus moluccensis</i>	297	C	2007-2008	T	17,7	11,98	0,00340	3,44	0,95
ASC	Medit	<i>Upeneus moluccensis</i>	651	C	2001-2003	T-L	7	18	0,00240	3,56	0,98
Winter	Medit	<i>Upeneus pori</i>	210	C	2007-2008	T	1,7	11,63	0,01570	2,82	0,96
ASC	Medit	<i>Upeneus pori</i>	1225	C	1999-2000	T	5,1	15,5	0,00870	3,05	0,96
ASC	Medit	<i>Upeneus pori**</i>	102	C	1997-1998	T-GN	9,1	14,7	0,00000	0,0050	3,26
ASC	AS	<i>Uranoscopus scaber</i>	62	C	2004-2005	GN-TR	10,8	30,6	0,01560	3,00	0,89
ASC	MS	<i>Uranoscopus scaber</i>	49	C	2009-2011	T	8	25,1	0,01500	3,06	0,94
W-S	BS	<i>Uranoscopus scaber</i>	69	C	2009-2011	T	5,3	21,8	0,01500	3,05	0,98
F-W	MS	<i>Uranoscopus scaber</i>	82	C	2006-2007	T	10,7	24,6	0,01090	3,15	0,97
ASC	Medit	<i>Uranoscopus scaber</i>	92	C	2001-2003	T-L	5,2	24,7	0,01030	3,15	0,99
ASC	AS	<i>Uranoscopus scaber</i>	157	C	2005	T	10,1	29,1	0,01000	3,19	0,98
ASC	AS	<i>Uranoscopus scaber</i>	219	C	2005-2006	T	12,2	20,2	0,00970	3,21	0,99
ASC	AS	<i>Uranoscopus scaber</i>	71	C	2005-2006	T	12,5	27,4	0,00804	3,25	0,95
ASC	BS	<i>Uranoscopus scaber</i>	620	C	2007	T	1,8	56,4	0,00800	3,23	0,82
ASC	MS	<i>Zebroides zebra</i>	5	C	2007	BS	2,6	3,8	0,00973	2,94	0,98
ASC	Medit	<i>Zeus faber</i>	261	C	1999-2000	T	2,1	20,8	0,03270	2,71	0,98
ASC	AS	<i>Zeus faber</i>	83	C	2005-2006	T	10,1	15,1	0,01770	2,95	0,99
ASC	AS	<i>Zeus faber</i>	242	C	2005-2006	T	5,5	57,5	0,01477	2,99	0,99
ASC	AS	<i>Zosterisessor ophiocephalus</i>	168	C	1998-2001	TR-GN-TBS	9,3	20,5	0,00440	3,31	0,98

Table 2. Parameters of the length-weight relationship [weight (in g) and length (in cm and fork length)] of marine fish species from Turkish marine waters. Sex: (M, male; F, female; C, combined); Location= Place where study conducted (AS, Aegean Sea; BS, Black Sea; MS, Marmara Sea; Medit, Mediterranean Sea) Year= year of sampling; Season = sampling season (ASC, all seasons combined; F-W, Fall-Winter; W-S, Winter-Spring); FM= fishing method (T, trawl; L, Longline; BS, beach seine; GN, gill nets; TR, trammel); a= the intercept of the relationship provided by source; b= the slope of the relationship; n= the sample size; Species are listed in alphabetical order.

Season	Location	Species	N	Sex	Year	SM	a	b	Source			
ASC	AS	<i>Atherina boyeri</i>	138	C	1998-2001	TR-GN-T-BS	4.8	9.8	0.0048	3.165	0.98	Ozaydin and Taskavak (2006)
ASC	AS	<i>Boops boops</i>	1197	C	1998-2001	TR-GN-T-BS	10.7	23.5	0.0127	3.033	0.92	Ozaydin and Taskavak (2006)
ASC	AS	<i>Chelidonichthys lastoviza</i>	366	C	2005	T	8.2	19.8	0.0124	3.008	0.974	Ozaydin et al. (2007)
ASC	AS	<i>Chelidonichthys lucerna</i>	85	C	2005	T	16.2	41.1	0.0057	3.019	0.977	Ozaydin et al. (2007)
ASC	AS	<i>Chelon labrosus</i>	94	C	1998-2001	TR-GN-T-BS	13.5	24.9	0.0533	2.523	0.97	Ozaydin and Taskavak (2006)
ASC	AS	<i>Chromis chromis</i>	27	C	2005	T	8.2	11.2	0.0144	3.066	0.953	Ozaydin et al. (2007)
ASC	AS	<i>Dentex dentex</i>	17	C	2005	T	17.8	29.7	0.0164	3.032	0.985	Ozaydin et al. (2007)
ASC	AS	<i>Dentex macrophthalmus</i>	51	C	1998-2001	TR-GN-T-BS	9.9	19.5	0.0178	3.051	0.97	Ozaydin and Taskavak (2006)
ASC	AS	<i>Diplodus annularis</i>	929	C	1998-2001	TR-GN-T-BS	7.9	16.8	0.0245	2.973	0.94	Ozaydin and Taskavak (2006)
ASC	AS	<i>Diplodus vulgaris</i>	2517	C	2005	T	5.1	16.1	0.019	3.046	0.93	Ozaydin et al. (2007)
ASC	AS	<i>Diplodus puntazzo</i>	27	C	2005	T	8.6	21.4	0.0423	2.775	0.996	Ozaydin et al. (2007)
ASC	AS	<i>Diplodus vulgaris</i>	63	C	1998-2001	TR-GN-T-BS	8	15.4	0.0184	3.094	0.98	Ozaydin and Taskavak (2006)
ASC	AS	<i>Diplodus vulgaris</i>	1615	C	2005	T	5.5	23.1	0.0344	2.841	0.95	Ozaydin et al. (2007)
ASC	AS	<i>Engraulis encrasicolus</i>	513	C	1998-2001	TR-GN-T-BS	10.5	14.9	0.0116	2.84	0.94	Ozaydin and Taskavak (2006)
ASC	AS	<i>Gobius niger</i>	727	C	1998-2001	TR-GN-T-BS	6	15.6	0.0134	2.914	0.94	Ozaydin and Taskavak (2006)
ASC	AS	<i>Lepidorhigla carvillone</i>	31	C	1998-2001	TR-GN-T-BS	8	21.1	0.0101	3.143	0.95	Ozaydin and Taskavak (2006)
ASC	AS	<i>Lepidorhigla carvillone</i>	1517	C	2005	T	3.8	15.3	0.0117	3.051	0.95	Ozaydin et al. (2007)
ASC	AS	<i>Lithognathus mormyrus</i>	35	C	1998-2001	TR-GN-T-BS	15.5	22	0.0094	3.181	0.96	Ozaydin and Taskavak (2006)
ASC	AS	<i>Liza aurata</i>	81	C	1998-2001	TR-GN-T-BS	15.7	27.8	0.0113	3.016	0.93	Ozaydin and Taskavak (2006)
ASC	AS	<i>Liza saliens</i>	329	C	1998-2001	TR-GN-T-BS	15.8	35	0.012	2.99	0.95	Ozaydin and Taskavak (2006)
ASC	AS	<i>Mullus barbatus</i>	479	C	1998-2001	TR-GN-T-BS	7.5	20	0.0102	3.176	0.96	Ozaydin and Taskavak (2006)
ASC	AS	<i>Mullus barbatus</i>	1910	C	2005	T	5.4	21.2	0.0089	3.233	0.981	Ozaydin et al. (2007)
ASC	AS	<i>Mullus surmuletus</i>	51	C	1998-2001	TR-GN-T-BS	8.4	17	0.0167	3.011	0.96	Ozaydin and Taskavak (2006)
ASC	AS	<i>Mullus surmuletus</i>	117	C	2005	T	7.4	21.9	0.0106	3.202	0.99	Ozaydin et al. (2007)
F-W	AS	<i>Pagellus acarne</i>	46	C	2006	TR-L	14.1	12.1	0.0088	3.112	0.952	Ceyhan et al. (2009)
ASC	AS	<i>Pagellus acarne</i>	335	C	1998-2001	TR-GN-T-BS	8.6	14.5	0.0942	2.086	0.95	Ozaydin and Taskavak (2006)
ASC	AS	<i>Pagellus acarne</i>	303	C	2005	T	9.4	17.5	0.0302	2.782	0.963	Ozaydin et al. (2007)

(continued)

Table 2. (Continued)

Season	Location	Species	N	Sex	Year	SM	a	b	Source
ASC	AS	<i>Pagellus bogaraveo</i>	51	C	2005	T	8.8	17.9	Ozaydin et al. (2007)
ASC	AS	<i>Pagellus erythrinus</i>	226	C	1998-2001	TR-GN-TBS	9	25.2	Ozaydin and Taskavak (2006)
ASC	AS	<i>Pagellus erythrinus</i>	495	C	2005	T	5.9	19.5	Ozaydin et al. (2007)
ASC	AS	<i>Pagrus pagrus</i>	12	C	2005	T	10.3	15.7	Ozaydin et al. (2007)
ASC	AS	<i>Sardina pilchardus</i>	388	C	1998-2001	TR-GN-TBS	9.2	14	Ozaydin and Taskavak (2006)
ASC	AS	<i>Sardinella aurita</i>	677	C	1998-2001	TR-GN-TBS	13	24.2	Ozaydin and Taskavak (2006)
F-W	AS	<i>Sarpa salpa</i>	77	C	2006	TR-L	18.2	14	Ceyhan et al. (2009)
ASC	AS	<i>Sarpa salpa</i>	93	C	1998-2001	TR-GN-TBS	13.9	27.5	Ozaydin and Taskavak (2006)
F-W	AS	<i>Scomber japonicus</i>	16	C	2006	TR-L	26.7	20.5	Ceyhan et al. (2009)
ASC	AS	<i>Scomber japonicus</i>	129	C	1998-2001	TR-GN-TBS	12.5	26	Ozaydin and Taskavak (2006)
ASC	AS	<i>Scomber scombrus</i>	50	C	1998-2001	TR-GN-TBS	19	28.5	Ozaydin and Taskavak (2006)
F-W	AS	<i>Seriola dumerilii</i>	14	C	2006	TR-L	24.1	22	Ceyhan et al. (2009)
ASC	AS	<i>Sparus aurata</i>	72	C	1998-2001	TR-GN-TBS	15.3	28	Ozaydin and Taskavak (2006)
ASC	AS	<i>Sparus aurata</i>	10	C	2005	T	18	26.1	Ozaydin et al. (2007)
F-W	AS	<i>Sphyrna chrysotaenia</i>	57	C	2006	TR-L	21.9	19.2	Ceyhan et al. (2009)
F-W	AS	<i>Sphyrna sphyraena</i>	78	C	2006	TR-L	27.1	21	Ozaydin and Taskavak (2006)
ASC	AS	<i>Spicara flexuosa</i>	765	C	1998-2001	TR-GN-TBS	8.3	18	Ceyhan et al. (2009)
ASC	AS	<i>Spicara maena</i>	194	C	1998-2001	TR-GN-TBS	8.7	19.5	Ozaydin and Taskavak (2006)
ASC	AS	<i>Spicara maena</i>	494	C	2005	T	9	18.1	Ozaydin et al. (2007)
ASC	AS	<i>Spicara smaris</i>	163	C	1998-2001	TR-GN-TBS	8.3	16.8	Ozaydin and Taskavak (2006)
ASC	AS	<i>Spicara smaris</i>	27	C	2005	T	10	15.1	Ozaydin et al. (2007)
ASC	AS	<i>Spondylisoma cantharus</i>	66	C	2005	T	8.4	18.5	Ozaydin et al. (2007)
F-W	AS	<i>Trachurus mediterraneus</i>	45	C	2006	TR-L	22.7	16.5	Ceyhan et al. (2009)
ASC	AS	<i>Trachurus mediterraneus</i>	549	C	1998-2001	TR-GN-TBS	9.3	22.6	Ozaydin and Taskavak (2006)
ASC	AS	<i>Trachurus mediterraneus</i>	12	C	2005	T	6.8	16.3	Ozaydin et al. (2007)
ASC	AS	<i>Trachurus trachurus</i>	575	C	1998-2001	TR-GN-TBS	10.3	25.6	Ozaydin and Taskavak (2006)
ASC	AS	<i>Trachurus trachurus</i>	501	C	2005	T	6.1	16.9	Ozaydin et al. (2007)
ASC	AS	<i>Trigla lucerna</i>	470	C	1998-2001	TR-GN-TBS	12.7	34.4	Ozaydin and Taskavak (2006)
F-W	AS	<i>Upeneus moluccensis</i>	51	C	2006	TR-L	12.7	10	Ceyhan et al. (2009)

Table 3. Parameters of the length-weight relationship [weight (in g) and length (in cm and disk width)] of marine fish species from Turkish marine waters. Sex: (M, male; F, female; C, combined); Location= Place where study conducted (AS, Aegean Sea; BS, Black Sea; MS, Marmara Sea; Medit, Mediterranean Sea) Year= year of sampling; Season = sampling season (ASC, all seasons combined; F-W, Fall-Winter; W-S, Winter-Spring); FM= fishing method (T, trawl; L, Longline; BS, beach seine; GN, gill nets; TR, trammel); a= the intercept of the relationship provided by source;b= the slope of the relationship; n= the sample size; Species are listed in alphabetical order.

Season	Location	Species	N	Sex	Year	SM	a	b	Source
ASC	Medit	<i>Dasyatis pastinaca</i>	417	M	2010-2011	L-T-GN	15	64	0.0419
ASC	AS	<i>Dasyatis pastinaca</i>	31	C	2005-2006	T	20.8	36	0.0102
ASC	Medit	<i>Gymnura altavela</i>	104	M	2010-2011	L-T-GN	30	127	0.017
ASC	AS	<i>Gymnura altavela</i>	9	C	2005-2006	T	11.2	24.1	0.0025
ASC	AS	<i>Myliobatis aquila</i>	39	C	2005-2006	T	4.6	8.6	0.0058
ASC	Medit	<i>Pteromylaeus bovinus</i>	22	M	2010-2011	L-T-GN	32	86	0.0194
ASC	Medit	<i>Raja clavata</i>	75	M	2010-2011	L-T-GN	25	70	0.023
ASC	AS	<i>Raja clavata</i>	24	C	2005-2006	T	19	43.2	0.0335
ASC	Medit	<i>Raja miraletus</i>	22	M	2010-2011	L-T-GN	24	54	0.0021
ASC	AS	<i>Raja miraletus</i>	10	C	2005-2006	T	5	9.2	0.0346
ASC	AS	<i>Raja polystigma</i>	18	C	2005-2006	T	6.7	21.3	0.0218
ASC	Medit	<i>Rhinoptera marginata</i>	17	M	2010-2011	L-T-GN	13	92	0.01
ASC	AS	<i>Rositoraja alba</i>	5	C	2005-2006	T	7.8	18.3	0.0083

of the clustering analysis performed. As a result, the number of factors affecting the differences in *b* value is quite high. The feeding and the habitat of the fishes are only two among these many factors. Along with this, differences between geographic regions, sample size and similar factors may also cause this value to change (Tesch, 1968; Wootten, 1990). Indeed, the difference shown in Table 4 makes the effect of geographic region differences on the *b* parameter clear.

The *a* parameter indicates the point the logarithmic form of the LWR intercepts the axis. Thus the *a* value is directly related to the growth rate of the fish (Froese, 2006). In this sense, it can be seen that *a* increases as the *b* value decreases, thus having an inverse relationship (Fig. 3). When all LWR are considered, it can be seen that 95% of *a* values fall between the range of 0.0123-0.0187. The distribution roughly matches the log-normal distribution, but it is strongly inclined towards the left hand side. Also, the number of species with a very low *a* value is quite high (Table 1, 2 and 3). Froese, (2000), Stergiou & Moutopoulos, (2001) and Froese, (2006) have stated that if there are multiple studies for a species, if a scatter plot of $\log(a)$ and *b* values acquired from the studies on said species, the detection of outliers becomes possible. Based on this, four species (*A. laterna*, *M. merluccius*, *C. linguatula* and *R. clavata*), that have six or more studies on them each were examined this way (Fig. 4). The circled outliers indicate the problematic studies for that species. These outliers also cause a drop in Froese, (2006) states that a more solid regression analysis performed after removing outlier observations would be strong enough to explain the variance 99%.

It can be seen in Figure 3 that when a scatter diagram for $\log(a)$ and *b* is drawn most estimates are distributed at and around 3. This makes it possible to say that most of the species present in Turkish waters show an isometric growth. This conclusion is supported when the four families with the highest distribution stated for Turkey's fish fauna in Bilecenoglu *et al.*, (2014). Again Fishbase records support this statement.

Another reason for the variance in estimates and outlier observations is the seasonal effects. It is not possible to sample all size classes of a species in studies performed at a certain part of the year. According to Froese *et al.*, (2011), a good LWR study can be possible only by year-long sampling, allowing all size classes to be sampled, and making it possible to make better estimates.

As a result, this study offers a collected list of the LWR parameters for most species prevalent in Turkey's seas. In addition, it will serve as an effective resource in demonstrating the factors that impact both parameters in general.

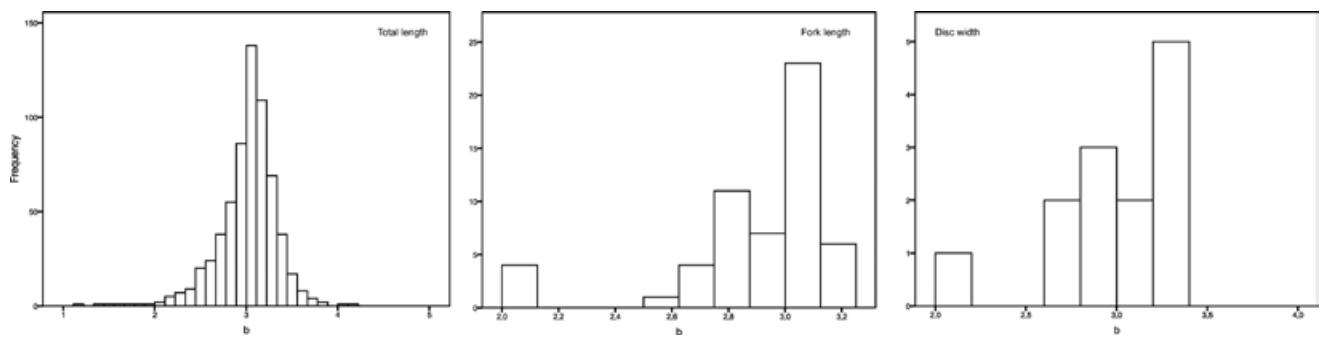


Fig. 1: Frequency distribution of exponent b based on 709 records for 242 species.

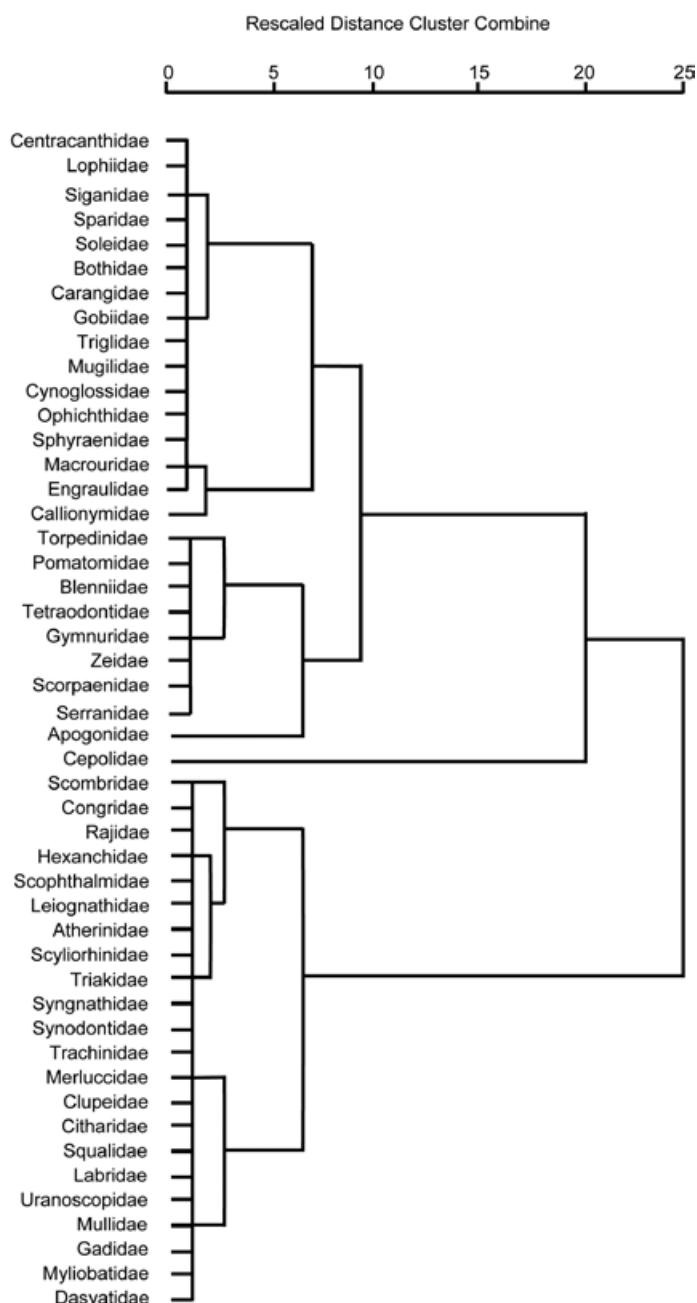


Fig. 2: Similarity dendrogram for LWR parameters based on families. The average and medians of a and b values of the clusters determined by hierarchical clustering; (the letters above indicate differences and questionable records were excluded) Cluster-1=0.016^a. Cluster-2= 0.007^b. Cluster-3=0.071^c.

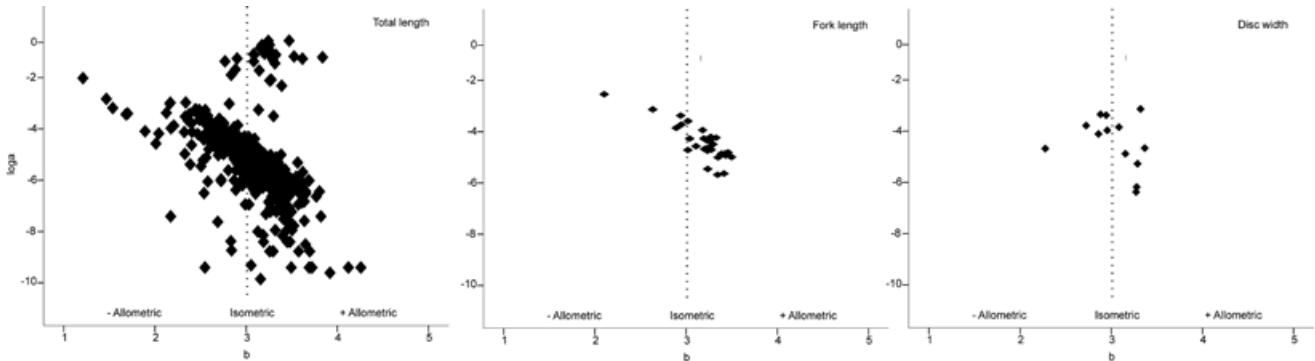


Fig. 3: Scatter plot of mean log a over mean b for 242 fish species. Areas of negative allometric, isometric and positive allometric change in body weight relative to body length are indicated.

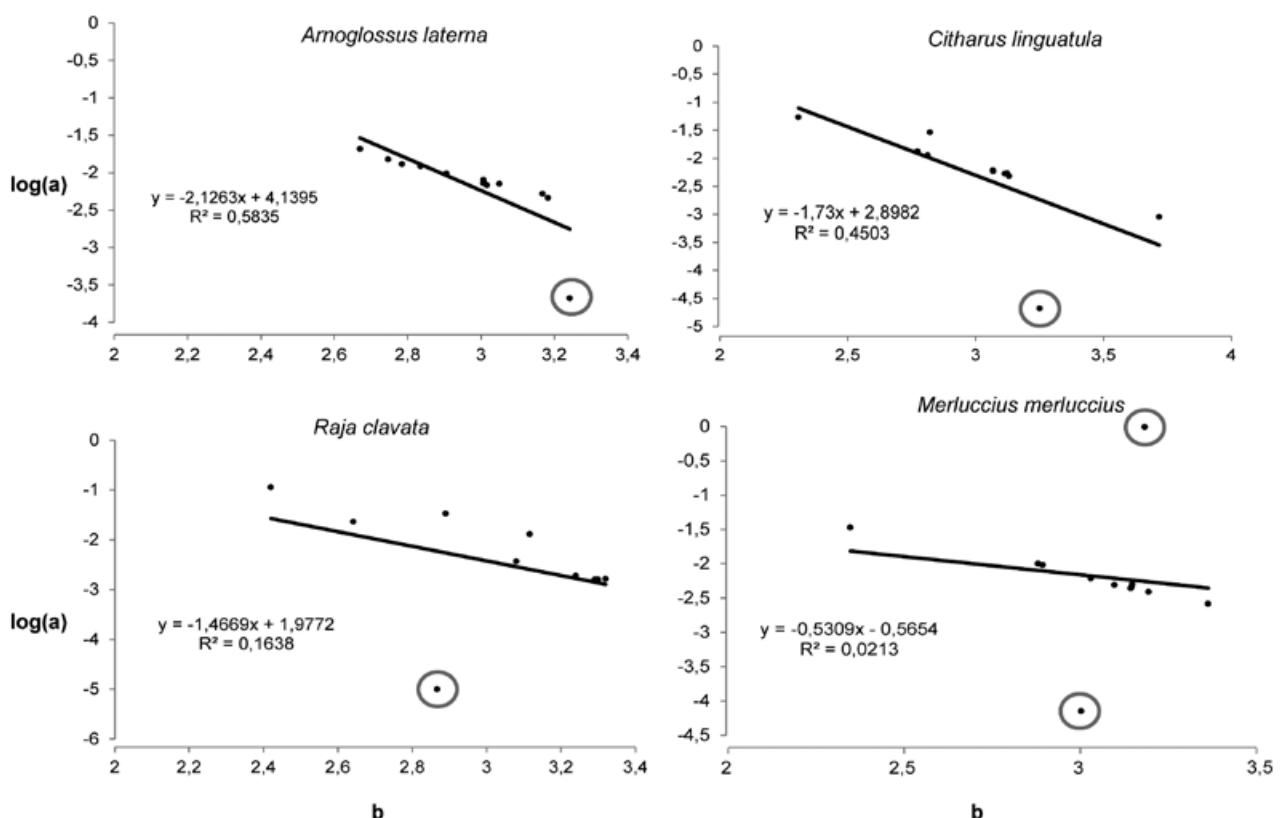


Fig. 4: The $\log(a)$ vs b graph of 4 species with more than 10 studies. The circled points are the outliers.

References

- Ak, O., Kutlu, S., Aydin, I., 2009. Length-weight relationship for 16 fish species from the Eastern Black Sea, Turkey. *Turkish Journal of Fisheries and Aquatic Science*, 9, 125-126.
- Akyol, O., Kinacigil, H., Şevik, R., 2007. Longline fishery and length-weight relationships for selected fish species in Gökova Bay Aegean Sea, Turkey. *International Journal of Natural and Engineering Sciences*, 1, 1-4.
- Arbuckle, J. L., 2013. *IBM® SPSS® Amos™ 20 User's Guide*. Chicago, IL: IBM.
- Atar, H., Malal, S. 2010. Determination of bycatch and discard catch rates on trawl fishing in Mersin-Anamur fish-
- ing ground. *Journal of Food, Agriculture Environment*, 81, 348-352.
- Başusta, A., Başusta, N., Sulikowski, J., Driggers, W., Demirhan, S., Cicek, E., 2012. Length-weight relationships for nine species of batoids from the Iskenderun Bay, Turkey. *Journal of Applied Ichthyology*, 28 (5), 850-851.
- Bayhan, B., Sever, T. M., Taşkavak, E., 2008. Length-weight relationships of seven flatfishes Pisces: Pleuronectiformes from Aegean Sea. *Turkish Journal of Fisheries and Aquatic Science*, 8, 377-389.
- Bilecenoglu, M., Kaya, M., Cinangir, B., Çiçek, E., 2014. An updated checklist of the marine fishes of Turkey. *Turkish Journal of Zoology*, 38, 901-929. doi: 10.3906/zoo-1405-60

- Bok, T., Gokturk, D., Kahraman, A. E., Alicli, T. Z., Acun, T., Ates, C., 2011. Length-Weight Relationships of 34 Fish Species from the Sea of Marmara, Turkey. *Journal of Animal and Veterinary Advances*, 10 (23), 3037-3042.
- Can, M. F., Başusta, N., Çekiç, M., 2002. Weight-length relationships for selected fish species of the small-scale fisheries off the south coast of Iskenderun Bay. *Turkish Journal of Veterinary and Animal Sciences*, 26 (5), 1181-1183.
- Carlander, K., 1997. *Handbook of freshwater fishery biology: Volume 1. Life history data on freshwater fishes of the United States and Canada*, Wiley-Blackwell, USA, 752 pp.
- Ceyhan, T., Akyol, O., Erdem, M., 2009. Length-Weight Relationships of Fishes from Gokova Bay, Turkey Aegean Sea. *Turkish Journal of Zoology*, 33, 69-72.
- Ceylan, Y., Şahin, C., Kalayci, F., 2013. Bottom trawl fishery discards in the Black Sea coast of Turkey. *Mediterranean Marine Science*, 15 (1), 156-164.
- Cicek, E., Avsar, D., Yeldan, H., Ozutok, M., 2006. Length-weight relationships for 31 teleost fishes caught by bottom trawl net in the Babadillimani Bight northeastern Mediterranean. *Journal of Applied Ichthyology*, 22 (4), 290-292.
- Demirel, N., Dalkara, E. M., 2012. Weight-length relationships of 28 fish species in the Sea of Marmara. *Turkish Journal of Zoology*, 36 (6), 785-791.
- Demirhan, S., Can, M., 2007. Length-weight relationships for seven fish species from the southeastern Black Sea. *Journal of Applied Ichthyology*, 23 (3), 282-283.
- Deval, M., Güven, O., Saygu, İ., Kabapçioğlu, T., 2014. Length-weight relationships of 10 fish species found off Antalya Bay, eastern Mediterranean. *Journal of Applied Ichthyology*, 30 (3), 567-568.
- Dulvy, N. K., Reynolds, J. D., 1997. Evolutionary transitions among egg-laying, live-bearing and maternal inputs in sharks and rays. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 264 (1386), 1309-1315.
- Erguden, D., Turan, C., Gurlek, M., 2009. Weight-length relationships for 20 Lessepsian fish species caught by bottom trawl on the coast of Iskenderun Bay NE Mediterranean Sea, Turkey. *Journal of Applied Ichthyology*, 25 (1), 133-135.
- Filiz, H., Bilge, G., 2004. Length-weight relationships of 24 fish species from the North Aegean Sea, Turkey. *Journal of Applied Ichthyology*, 20 (5), 431-432.
- Filiz, H., Mater, S., 2002. A preliminary study on length-weight relationships for seven elasmobranch species from North Aegean Sea, Turkey. *EÜ Su Ürünleri Dergisi*, 19 (3-4), 401-409.
- Froese, R., 2000. Evaluating length-weight relationships. In; FishBase 2000: concepts, design and data sources Froese, R Pauly, D ed., ICLARM. 1594, 133. Los Banos, Laguna, Philippines
- Froese, R., 2006. Cube law, condition factor and weight-length relationships: history, meta-analysis and recommendations. *Journal of Applied Ichthyology*, 22 (4), 241-253.
- Froese, R., Pauly, D., 2014, 11/2014. *FishBase*. Retrieved 11, 2014, from www.fishbase.org
- Froese, R., Thorson, J. T., Reyes, R. B., 2014. A Bayesian approach for estimating length-weight relationships in fishes. *Journal of Applied Ichthyology*, 30 (1), 78-85.
- Froese, R., Tsikliras, A., Stergiou, K., 2011. Editorial Note on Weight-Length Relations of Fishes. *Acta Ichthyologica Et Piscatoria*, 41 (4), 261-263.
- Gonçalves, J., Bentes, L., Lino, P. G., Ribeiro, J., Canario, A. Vet al., 1997. Weight-length relationships for selected fish species of the small-scale demersal fisheries of the south and south-west coast of Portugal. *Fisheries Research*, 30 (3), 253-256.
- Gordon, A., 1999. *Classification 2nd ed.* CRC Press, New York, 272 pp.
- Gökçe, G., Cekic, M., Filiz, H., 2010. Length-weight relationships of marine fishes off Yumurtalik coast İskenderun Bay, Turkey. *Turkish Journal of Zoology*, 34 (1), 101-104.
- Gurkan, S., Taskavak, E., 2007. Length-weight relationships for syngnathid fishes of the Aegean Sea, Turkey. *Belgian Journal of Zoology*, 137 (2), 219.
- Gündoğdu, S., 2014. The Usage of Common Multiple Comparison Tests Post-Hoc in Fisheries Sciences. *Journal of FisheriesSciences.com*, 8 (4), 310-316.
- Ilkyaz, A., Metin, G., Soykan, O., Kinacigil, H., 2008. Length-weight relationship of 62 fish species from the Central Aegean Sea, Turkey. *Journal of Applied Ichthyology*, 24 (6), 699-702.
- Ismen, A., Cigdem Yigin, C., Altinagac, U., Ayaz, A., 2009. Length-weight relationships for ten shark species from Saros Bay North Aegean Sea. *Journal of Applied Ichthyology*, 25 (1), 109-112.
- Ismen, A., Ozen, O., Altinagac, U., Ozekinci, U., Ayaz, A., 2007. Weight-length relationships of 63 fish species in Saros Bay, Turkey. *Journal of Applied Ichthyology*, 23 (6), 707-708.
- Kalayci, F., Samsun, N., Bilgin, S., Samsun, O., 2007. Length-weight relationship of 10 fish species caught by bottom trawl and midwater trawl from the Middle Black Sea, Turkey. *Turkish Journal of Fisheries and Aquatic Sciences*, 7, 33-36.
- Karakulak, F., Erk, H., Bilgin, B., 2006. Length-weight relationships for 47 coastal fish species from the northern Aegean Sea, Turkey. *Journal of Applied Ichthyology*, 22 (4), 274-278.
- Keskin, Ç., Gaygusuz, Ö., 2010. Length-weight relationships of fishes in shallow waters of Erdek Bay Sea of Marmara, Turkey. *IUFS Journal of Biology*, 69(1), 25-32
- Kulbicki, M., Guillemot, N., Amand, M., 2005. A general approach to length-weight relationships for New Caledonian lagoon fishes. *Cybium*, 29 (3), 235-252.
- Miller, P. 1986. Gobiidae. p. 1019-1085. In: *Fishes of the North-eastern Atlantic and the Mediterranean Vol. III*, Whitehead, P., Bauchot, M., Hureau, J., Nielsen, J., Tortone E. (Eds). Paris, UNESCO.
- Morey, G., Moranta, J., Massuti, E., Grau, A., Linde, M., et al., 2003. Weight-length relationships of littoral to lower slope fishes from the western Mediterranean. *Fisheries Research*, 62 (1), 89-96.
- Ozaydin, O., Taskavak, E., 2006. Length-weight relationships for 47 fish species from Izmir Bay eastern Aegean Sea, Turkey. *Acta Adriatica*, 47 (2), 211.
- Ozen, O., Ayyildiz, H., Oztekin, A., Altin, A., 2009. Length-weight relationships of 17 less-studied fish species from Çanakkale, Marmara region of Turkey. *Journal of Applied Ichthyology*, 25 (2), 238-239.
- Özaydin, O., Uçkun, D., Akalın, S., Leblebici, S., Tosunoğlu, Z., 2007. Length-weight relationships of fishes captured from Izmir Bay, Central Aegean Sea. *Journal of Applied Ichthyology*, 23 (6), 695-696.

- Özbilgin, H., Tosunoğlu, Z. 2003. Comparison of the selectivities of double and single codends. *Fisheries Research*, 63 (1), 143-147.
- Özbilgin, Y., Tosunoğlu, Z., Özbilgin, H., 2006. By-catch in a 40 mm PE demersal trawl codend. *Turkish Journal of Veterinary and Animal Sciences*, 30, 179-185.
- Özekinci, U., Cengiz, Ö., Ismen, A., Altinagac, U., Ayaz, A., 2009. Length-weight relationships of thirteen flatfishes Pisces: Pleuronectiformes from Saroz Bay North Aegean Sea, Turkey. *Journal of Animal and Veterinary Advances*, 8 (9), 1800-1801.
- Özvarol, Y., 2014. Length-weight relationships of 14 fish species from the Gulf of Antalya northeastern Mediterranean Sea, Turkey. *Turkish Journal of Zoology*, 38 (3), 342-346.
- Pauly, D. 1983. *Some simple methods for the assessment of tropical fish stocks*. FAO Fisheries Technical Paper, Rome, 52 pp.
- Petrakis, G., Stergiou, K., 1995. Weight-length relationships for 33 fish species in Greek waters. *Fisheries Research*, 21 (3), 465-469.
- Safran, P., 1992. Theoretical analysis of the weight-length relationship in fish juveniles. *Marine Biology*, 112 (4), 545-551.
- Sangun, L., Akamca, E., Akar, M., 2007. Weight-length relationships for 39 fish species from the north-eastern Mediterranean coast of Turkey. *Turkish Journal of Fisheries and Aquatic Sciences*, 7 (1), 37-40.
- Stergiou, K., 1993. Abundance-depth relationship, condition factor and adaptive value of zooplanktophagy for red bandfish, *Cepola macrophthalma*. *Journal of fish biology*, 42 (5), 645-660.
- Stergiou, K., Economidis, P., Sinis, A. 1992. Age, growth and mortality of red bandfish, *Cepola macrophthalma* L., in the western Aegean Sea Greece. *Journal of fish biology*, 40 (3), 395-418.
- Stergiou, K., Moutopoulos, D., 2001. A review of length-weight relationships of fishes from Greek marine waters. *Naga, the ICLARM quarterly*, 24 (1-2), 23-39.
- Taskavak, E., Bilecenoglu, M., 2001. Length-weight relationships for 18 Lessepsian Red Sea immigrant fish species from the eastern Mediterranean coast of Turkey. *Journal of the Marine Biological Association of the United Kingdom*, 81(5), 895-896.
- Team, R. D. C., 2013. *R Foundation for statistical computing*. Vienna, Austria.
- Tesch, F., 1968. Age and growth. p. 93-123. In: *Methods for assessment of fish production in fresh waters* Ricker W. (Eds). Blackwell Scientific Publications, Oxford.
- Torcu-Koc, H., Erdogan, Z., Treer, T., 2006. A review of length-weight relationships of fishes from freshwaters of Turkey. *Journal of Applied Ichthyology*, 22 (4), 264-270.
- Torcu-Koç, H., Çakır, D., Başusta, N., 2008. A review of length-weight relationships of lessepsian fishes from Turkish Seas. *e-Journal of New World Sciences Academy Natural And Applied Sciences*, 31, 145-150.
- Turker-Cakir, D., Torcu-Koc, H., Basusta, A., Basusta, N., 2008. Length-weight relationships of 24 fish species from Edremit Bay Aegean Sea. *e- Journal of New World Scientific Academy National Applied Science* 3, 47-51.
- Wootton, R. J., 1990. *Ecology of teleost fishes*. Springer, 404 pp.
- Yapıcı, S., Karachle, P., Filiz, H., 2015. First length-weight relationships of 11 fish species in the Aegean Sea. *Journal of Applied Ichthyology*, 31(2), 398-402.
- Yazıcı, M., İşmen, A., Altınağaç, U., Ayaz, A., 2006. Marmara Denizi'nde Karides Algarnasının Av Kompozisyonu ve Hedeflenmeyen Av Üzerine Bir Çalışma. *E.Ü. Su Ürünleri Dergisi*, 233-4, 269-275.
- Yeldan, H., Avsar, D., 2007. Length-weight relationship for five elasmobranch species from the Cilician Basin shelf waters northeastern Mediterranean. *Journal of Applied Ichthyology*, 23 (6), 713-714.
- Yığın, C., Ismen, A., 2009. Length-weight relationships for seven rays from Saros Bay North Aegean Sea. *Journal of Applied Ichthyology*, 25 (S1), 106-108.
- Zar, J.H., 1999. *Biostatistical analysis*. Pearson Publishing, Cloth, 929 pp.