

Review

Alien Species Threat across Marine Protected Areas of Turkey—An Updated Inventory

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Abstract: This study presents the first comprehensive assessment of alien species occurrences within the selected 11 Marine Protected Areas (MPAs) located on the Aegean and Levantine coasts of Turkey. The inventory includes a total of 289 species belonging to 15 phyla, in which lowest and highest diversities were observed in Saros Bay MPA (27 species, northern Aegean Sea) and Fethiye-Göcek Bay MPA (150 species, northwest Levantine Sea), respectively. Alien species distributions that were revealed in protected areas located in the southern Aegean and Levantine Seas were 56.9% similar (based on presence vs. absence data), while northern Aegean sites formed another distinct group. According to the breakdown of major phyla through the entire study areas, Mollusca had the highest alien diversity (22.1% of alien species), followed by Actinopterygii (19.0%), Arthropoda (15.2%) and Annelida (13.5%). Casual aliens were represented by very low proportions in each MPA, proving that most species were already established in the region, with a significant proportion of invasive species. Regardless of the localities, the majority of the species originated from the Red Sea, whose primary pathway of introduction is the corridor, the Suez Canal. In the absence of effective management actions against bioinvasions, MPAs located along the Turkish coastline do not currently seem to provide any protection, revealing a large conservation gap to be filled.

Keywords: invasive alien species; marine protected areas; eastern Mediterranean Sea



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1. Introduction

In the Mediterranean Sea, Marine Protected Areas (MPAs) are described as clearly defined marine geographical spaces (including subtidal, intertidal and supratidal ecosystems, together with coastal lakes/lagoons connected permanently or temporarily to the sea), which are recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature with its associated ecosystem services and cultural values [1]. As clearly implied by this broad generic term, MPAs are the most effective conservation tool in the key management of marine ecosystem alterations around the world [2], by maintaining natural ecological processes, increasing ecosystem resilience, preserving genetic diversity, ensuring the sustainable utilization of species and ecosystems, restoring the biomass and structure of species assemblages, and providing socio-economic benefits [3–5]. These advantages, however, can only be noticeable in appropriately sited, strongly protected and effectively managed MPAs [3], which prominently protect natural habitats and species from multiple local human stressors, e.g., overexploitation of living resources and habitat destruction [6]. The recent assessments of the development of MPAs in the Mediterranean Sea during the last decade show progress towards the increased protection of marine and coastal areas; however, results are not encouraging and effectiveness of management measures are still a matter of concern [7]. Currently, 9.7% of the Mediterranean Sea is designated as MPAs, but only a small portion are associated with a properly implemented management plan and few countries have fulfilled the designated

target of 10% by 2020, pointed out both in the UN Sustainable Development Goal 14 and Aichi target 11 (Convention on Biological Diversity) [8].

MPAs appear to be quite vulnerable when the enormous impacts of global-scale stressors such as climate change, pollution and biological invasions are taken into consideration [9]. The latter phenomenon is of special importance throughout the Mediterranean Sea, since the basin is among the most ecologically altered marine regions globally, representing a hotspot of biological invasions [10,11]. Human-mediated alien species introductions are regarded as one of the main causes of drastic biodiversity changes in the region, causing a troublesome problem because of the unprecedented rate of their invasion, and the irreversible impacts they pose on local ecosystems, human health and the socio-economy [12,13], and so their impact on protected areas could thus be much more severe [14,15]. Despite the widespread theory that MPAs are resistant to invasion owing to their high species diversity and putative abundance of predators, competitors and parasites of alien species, this hypothesis is not fully supported and marine reserves may even promote the introduction of alien species [10,16]. Through the wealth of research carried out so far, very few attempts have been made to clarify the status of alien species within coastal protected areas, in which the available information denotes that majority of Mediterranean MPAs are at a high risk of invasion [17] and their boundaries offer almost no protection from many high-impact invasive species [18].

Biodiversity and ecosystem conservation in Turkey is ensured by protected areas dispersed in 15 different categories (National Parks, Special Environment Protection Areas, Strict Nature Reserves, etc.), managed officially by two governmental bodies (Ministry of Agriculture and Forestry and Ministry of Environment and Urbanization). Currently, about 6.8% of Turkey's marine areas are nominally protected, which is significantly lower than the reported regional and global figures [8,19]. As with most parts of the Mediterranean Sea, alien and invasive species inventories specifically concentrated on MPAs are scarce in Turkey, where existing information is provided by a series of government-funded projects in the early 2000s [20–22], clearly outdated and seeking critical revisions. In order to promote the development of coordinated efforts and management measures throughout the Mediterranean Sea, a basin-specific action plan concerning species introductions and invasive species was recently published [23]. Considering the knowledge gaps to be filled on various issues, contracting countries are recommended to give national priority to take all necessary actions (scientific research and monitoring, national impact assessments, etc.) for improving the available knowledge, and conducting baseline and monitoring studies to obtain reliable data on the distribution of marine alien species. Conforming to the existing international commitments, Turkey has recently set its first national objective through the National Biodiversity Action Plan 2018–2028 [24] to determine the pressures and threats to biodiversity and ecosystems, including mitigating the impacts of alien species.

The success of the regulation of the prevention and management of invasive species relies heavily on the compilation of alien species inventories [25], which provide early warning of potentially invasive species, both within a country and for neighboring countries, and constitute an important tool for the implementation of relevant policies [26,27]. It is imperative that such inventories remain current and updated regularly by accurate scientific information, since the alien status of several species is constantly changing based on genetic studies, taxonomic revisions and biogeographic reviews [28]. Owing to the large knowledge gap regarding alien species occurrences through the MPAs in Turkey, we carried out a critical revision of their distribution, origin and modes of introduction, which are policy-relevant attributes of the utmost importance. No marine area in the world is immune to invasions and no action can be taken without such core biodiversity data. This is the first comprehensive treatment of alien taxa inhabiting MPAs in Turkey, which provides a scientific basis for further management actions and the effective allocation of resources.

2. Materials and Methods

Selection of the study sites was made according to their marine terrain coverage. Among the existing coastal and marine protected areas in Turkey, only those with over 40 km² of marine space were considered, including 7 MPAs in the Aegean Sea and 4 in the Levantine Sea (Table 1, Figure 1). Despite its huge area of nearly 11,000 km², the Finike Seamounts special environment protection area (northwest Levant) was omitted from the analyses, since the area was characterized by unique habitats (i.e., mud volcanoes) hosting deep sea species and currently no data on the existence of any alien species were available.

Table 1. General information on studied MPAs of Turkey (NP: national park, SEPA: special environmental protection area).

MPA Name	Protection Status	Year Founded	Surface Area (km ²)	Marine Coverage (km ²)	Coastal Length (km)
<i>Aegean Sea</i>					
1. Saros Bay	SEPA	2010	730	538	62
2. Ayvalik Islands	NP	1995	180	142	110
3. Foça	SEPA	1990	71	52	28
4. Karaburun-Ildır Bay	SEPA	2019	947	502	127
5. Gökova Bay	SEPA	1988	1093	820	193
6. Datça-Bozburun Peninsula	SEPA	1990	1444	737	417
7. Köyceğiz-Dalyan	SEPA	1988	461	41	26
<i>Levantine Sea</i>					
8. Fethiye-Göcek Bay	SEPA	1988	805	339	196
9. Patara	SEPA	1990	197	45	23
10. Kaş-Kekova	SEPA	1990	258	158	81
11. Gökso Delta	SEPA	1990	229	98	35

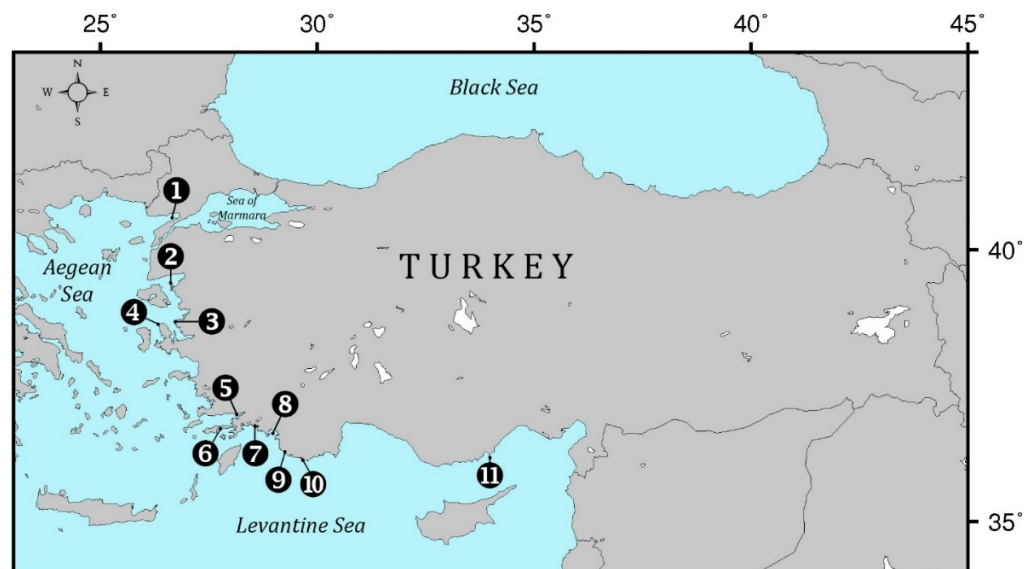


Figure 1. Geographical location of the studied MPAs (description of numerals as in Table 1).

In order to determine marine faunal hotspots in Turkey, species occurrence records (comprising all extant taxa) associated with accurate locality information and/or exact coordinates were plotted on a map where the Turkish coasts were divided into equivalent squares of 15 × 15 km², which were then entered into an Excel file for further analysis (for full account see [29]). Initial entries were based on governmental marine biodiversity studies conducted at 8 MPAs [20–22,30–33], with a number of alien taxa as follows: Saros Bay (5 sp.), Ayvalık Islands (5 sp.), Foça (1 sp.), Gökova Bay (26 sp.), Datça-Bozburun Peninsula (33 sp.), Köyceğiz-Dalyan (10 sp.), Fethiye-Göcek Bay (93 sp.), Kaş-Kekova (71 sp.); no baseline inventory was available for Karaburun-Ildır, Patara and Gökso Delta.

An updated version of this file (including floral elements) focusing solely on alien taxa was used in a recent comprehensive inventory [12], which formed the core data of the present study. For better presenting the distributional patterns of alien species, we also included previously unpublished observations (not new for the country or the region but overlooked occurrences in corresponding MPAs). The presence vs. absence matrix was used to reveal similarities within the MPAs, using cluster analysis with a group average sorting performed with the PRIMER 5.2 software [34].

The terminology of alien species followed [10], referring to species introduced by human activities, while species undergoing climate-shifted range expansions, without human-assisted spread, were not considered to be alien. Species that formed self-maintaining populations with at least two records in the area (three records for fish) spread over time and space, were classified as established species, while those having been recorded only once (no more than twice for fish) with no evidence of self-sustaining populations were classified as casual species [12]. Established aliens whose populations had proliferated and rapidly expanded their distributional range by overcoming biotic and abiotic barriers in the region were treated as invasive species [35]. Only primary pathways were considered in the classification of the pathways for the alien species introductions to Turkey (corridor via the Suez Canal, ships and aquaculture). Cryptogenic (species with no definite evidence of their native or introduced status) and questionable species were all left out of the inventory. Origins of each species were examined under 12 categories (IP: Indo-Pacific, RS: Red Sea, AT: Atlantic, NA: North Atlantic, WA: Western Atlantic, ST: Subtropical Atlantic/Pacific, IO: Indian Ocean, PG: Persian Gulf, PO: Pacific Ocean, TA: Tropical Atlantic, CT: Circumtropical, Unk: Unknown).

3. Results

The alien species inventory of Turkish MPAs included a total of 289 species belonging to 15 phyla, the majority of which had established successfully breeding populations throughout the study sites (61.6%) and a significant portion displayed an invasive character (29.4%) (Appendix A). Mollusca ranked first in terms of the number of alien species (64 sp.), followed by Chordata (55 sp.), Arthropoda (44 sp.) and Annelida (39 sp.). Percentage distribution of alien species phyla in each MPA is presented in Table 2.

Table 2. Percentage distribution of alien species phyla in Turkish MPAs.

Phyla	Saros	Ayvalık	Foça	Karaburun	Gökova	Dağça	Köyceğiz	Fethiye	Patara	Kaş	Göксу
Ochrophyta	11.1	20.0	3.1	8.2	2.3	2.8		2.0	3.2	2.1	2.2
Chlorophyta	7.4	8.6	6.3	4.1	2.3	1.9	1.4	2.0	4.3	2.1	1.4
Rhodophyta	14.8	11.4	6.3	12.3	5.8	4.7		5.3	8.6	5.6	5.1
Tracheophyta		2.9	3.1	1.4	1.2	0.9	1.4	0.7	1.1	0.7	
Foraminifera	18.5	17.1		19.2	1.2	12.3		1.3	14.0	15.3	
Cnidaria					2.3	4.7	4.3	2.0		0.7	0.7
Ctenophora	3.7				1.2			0.7		0.7	
Sipuncula			3.1	1.4	1.2	0.9		0.7			
Annelida	7.4	20.0	34.4	19.2	14.0	12.3	14.5	18.0	8.6	13.2	12.3
Arthropoda	18.5	5.7	3.1	12.3	17.4	10.4	10.1	16.7	10.8	13.9	12.3
Mollusca	7.4		3.1	6.8	9.3	12.3	13.0	16.7	8.6	16.0	30.4
Bryozoa				2.7				1.3			
Echinodermata					2.3	1.9	2.9	2.0	1.1	1.4	0.7
Tunicata			6.3			2.8	1.4	5.3	2.2	1.4	0.7
Chordata	11.1	14.3	31.3	12.3	39.5	32.1	50.7	25.3	37.6	27.1	34.1

There were significant differences in local alien biodiversity, with a clear decreasing pattern in a clockwise direction from Levantine towards the northern Aegean Sea coasts. The cluster analysis showed that MPAs were clearly separated into two groups (northern Aegean Sea areas vs. southern Aegean Sea and Levant Sea combined) at 30.0% similarity, which split further at 46.0% and 56.9% similarities (Figure 2). The numbers of taxa were typically higher in Levantine localities (ranging from 93 to 150 sp.), gradually decreasing to

69–106 sp. in the southern Aegean Sea and the minimum values were observed northwards, at values between 27 to 73 sp.

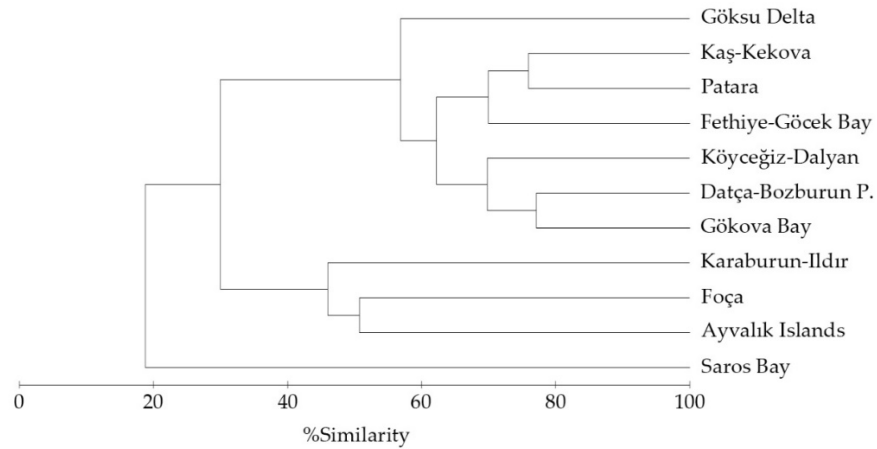


Figure 2. Group average sorting dendrogram of Turkish MPAs based on binary data (presence and absence) of alien taxa.

It is striking that the number of casual aliens is quite low throughout the entire study area (none in Foça and Köyceğiz-Dalyan, ranging from 1.2% to 6.9% elsewhere), where the great majority of the species are either characterized by successfully breeding established populations or possess an invasive character (Figure 3). The proportion of invasive taxa ranged from 37.0% (Göksu Delta) to 62.3% (Köyceğiz-Dalyan), displaying a large-scale impact regardless of their occurrence localities. The two invasive fish, *Lagocephalus sceleratus* (Gmelin, 1789) and *Siganus rivulatus* (Forsskål, 1775) were present in each of the MPAs, while some other noxious species, such as *Caulerpa cylindracea* (Sonder, 1845) (Chlorophyta), *Asparagopsis armata* (Harvey, 1855) (Rhodophyta), *Leodice antennata* (Savigny, 1820) (Annelida), etc., were absent in just a few sites.

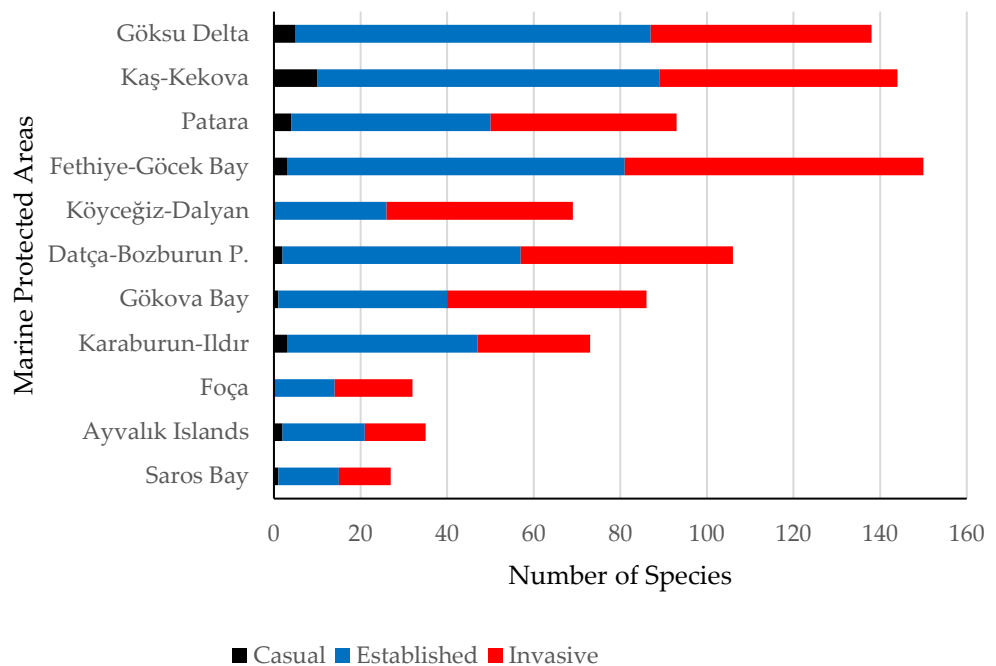


Figure 3. Establishment success of alien taxa in MPAs.

According to their origins, there was a very pronounced dominance of Red Sea originated species (201 sp., out of 289 sp.), while the contribution of rest of the categories was set at low levels (Figure 4). This was an expected result, since Turkey was geographically located close to the Red Sea, which explained why corridors (Suez Canal) were the main vector of the species introductions (Figure 5). Ship-transferred species were higher in proportion at the north Aegean MPAs (Saros Bay, Ayvalık Islands, Foça and Karaburun-Ildır, ranging between 28.1–48.1%), significantly reducing to levels of 8.7–18.0% in the rest of the coastal areas. Saros Bay was the only locality that shipping-oriented introductions outnumbered Suez Canal introductions (13 sp. vs. 9 sp., respectively); the latter vector was dominant elsewhere. Aquaculture was the least impacting vector and only four such species were present in MPAs (for example, the Pacific Ocean originated invasive bivalve *Ruditapes philippinarum* (Adams & Reeve, 1850)).

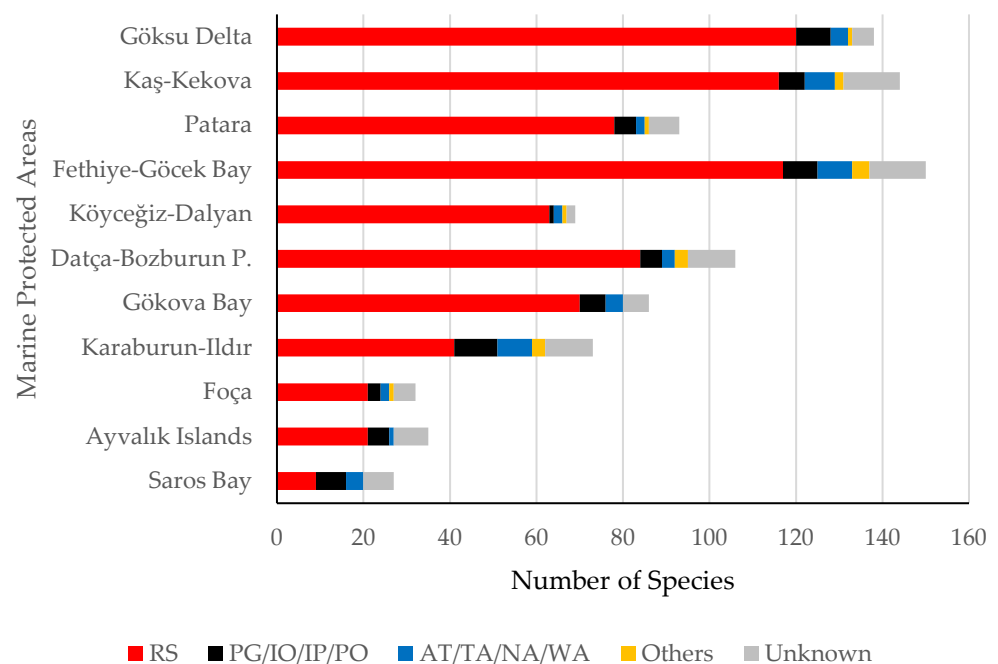


Figure 4. Origins of alien taxa in MPAs. For ease of interpretation, low contributing origins were grouped: red group, RS: Red Sea; black group, PG: Persian Gulf, IO: Indian Ocean, IP: Indo-Pacific, PO: Pacific Ocean; blue group, AT: Atlantic, TA: Tropical Atlantic, NA: North Atlantic, WA: Western Atlantic; yellow group (others), ST: Subtropical Atlantic/Pacific, CT: Circumtropical; grey group, species with currently unknown origin).

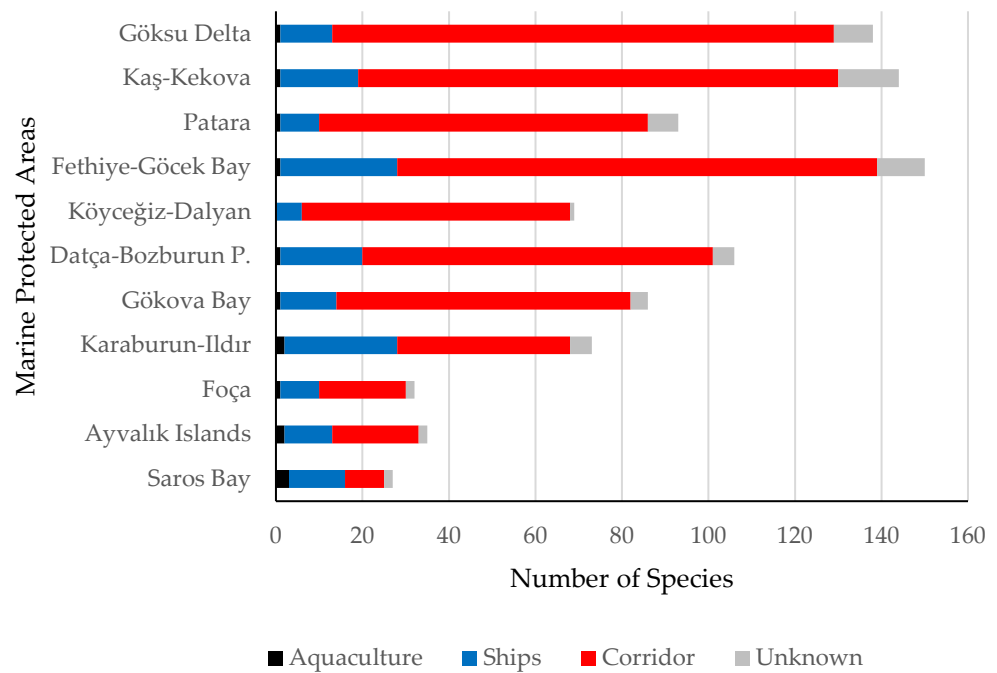


Figure 5. Pathways of the introduction of alien taxa in MPAs.

4. Discussion

The present inventory revealed that (i) existing MPAs were exposed to different levels of alien biota impact, with a clear decreasing trend from the Levantine coasts to the northernmost regions of the Aegean Sea; (ii) the Suez Canal was the most important vector for species introductions, and was also responsible for the existence of the huge proportion of Red Sea-originated biota; and (iii) the high rates of established aliens and invasive species were obvious in every MPA. These results were in accordance with the general trends observed for the alien biota of the entire coast of Turkey during the last decade [12,35]. The low number of species determined in the northern Aegean protected areas should be carefully monitored, since they may be related to lower research efforts, in comparison to the northern Levantine coasts. The significant taxonomic similarity we found between the southern Aegean and Levantine MPAs was an issue to be taken seriously and may have indicated an ongoing biotic homogenization event, although concrete data for proving this phenomenon are currently lacking. It is a known fact that species invasions and extinctions lead to a decrease in β -diversity, by increasing the genetic, taxonomic or functional similarity of two or more locations over time [36].

When Mediterranean Sea coastal countries were taken into consideration, more alien taxa were recorded along the Turkish coastline than anywhere else. For example, the reported diversity was 452 sp. in Israel [37], 265 sp. in Italy [38], 214 sp. in Greece [39], 136 sp. in Tunisia [40] and 73 sp. in Libya [41]. Receiving 185 new alien species introductions just during the last decade, the immense impact of bioinvasions to the Turkish marine realm reflected the diversity estimates, now reaching to 539 species, 404 of which were established in the region [12]. Thus, it was not surprising that there was a high number of alien species (289 sp.) throughout Turkish MPAs, which we believe was merely an underestimation and could certainly be increased by further research. The relevant data are currently incomparable to any other regional datasets, due to the lack of country-based comprehensive alien species checklists, which focus on their presence in protected areas of the Mediterranean Sea. As previously outlined, Mediterranean MPAs face common challenges including a lack of baseline information and the inefficient reporting of biological invasions [10,18,42], constituting crucial data to draw robust conclusions in the effective management of protected sites [14,43].

No control of alien species is feasible that would not also harm other components of the biota once an invasion process is underway [10,44], thus the objective highlighted in the Convention on Biological Diversity (CBD) at art. 8(h), calling for contracting parties “as far as possible and as appropriate, (to) prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species” can only be partially fulfilled, especially by the eastern Mediterranean countries where the existing invasion process is unique. By ratifying and signing the “International Convention for the Control and Management of Ship’s Ballast Water and Sediments” in 2014, Turkey took an important step that could considerably decrease risks of ship-borne introductions, but the troublesome vector, the Suez Canal, remains wide open, unquestioningly destroying the strength of the proposed eradication measures. The first ever government-supported incentive notification on the bounty hunting of the noxious *Lagocephalus sceleratus* along Turkish coasts (for a price of EUR 0.5 per each captured individual) ended with little success, where only 46,000 individuals were eradicated out of the targeted 1 million fish [12]. Although *L. sceleratus* fishery was also conducted within the existing MPAs, the captured quantities in each site have not been announced yet. The above-mentioned notification has been updated recently (official gazette no. 31524, dated 27 June 2021), now encouraging the capture of all Tetraodontids inhabiting Turkey (native pufferfish were incomprehensibly included as well) from now until the end of 2023. There are also efforts to cull and create consumption demand to decrease the population trend of *Pterois miles* in the Kaş-Kekova region [45], though currently no official announcement has been made.

MPAs alone are unlikely to be sufficient in preventing biological invasions in the Mediterranean Sea, as evidenced from results of several recent studies [46–49]. On the contrary, the Red Sea invaders, which came from a highly competitive environment, find a suitable feeding and shelter ground in the Mediterranean MPAs, whereby they increase their population sizes enormously and utilize the areas as stepping stones in their distribution expansions [16]. Therefore, alien species’ harvesting should be promoted in MPAs where they benefit from fishing bans and restrictions that apply within the MPAs. Considering the highly connected nature of the Mediterranean Sea, a basin-wide ecosystem-based policy on bioinvasions is required [10]. The effective management of the Suez Canal is of utmost importance, and an issue which all Mediterranean countries have failed to put on their conservation agendas so far, highlighting the urgent need of international cooperation in the management of alien species [12].

In terms of their resilience to invasive species, an unmanaged MPA is no different from an unprotected coastal area, reflecting the current situation we are experiencing in Turkey. The drastic impact of invaders are therefore the expected and inevitable result of numerous “lacks”, including a lack of legal background, lack of marine management plans (available only for Foça, Gökova Bay and Kaş-Kekova with no measures defined against the struggle with aliens), the lack of public/governmental awareness and understanding of the impacts of invasive species, the lack of trained staff devoted to monitor the impacts of alien taxa, the lack of funds to regularly carry out monitoring research (at least for selected invasive species), and the lack of fishery regulations in favor of apex predators, etc.

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Appendix A

Table A1. Alien species inventory of Turkish MPAs. The sorting of the sites follows a counterclockwise direction, from the north Aegean to the northern Levantine Sea. Establishment Success (ES)—C: casual aliens, E: established aliens, Inv: invasive species; Origin (O)—IP: Indo-Pacific, RS: Red Sea, AT: Atlantic, NA: North Atlantic, WA: Western Atlantic, ST: Subtropical Atlantic/Pacific, IO: Indian Ocean, PG: Persian Gulf, PO: Pacific Ocean, TA: Tropical Atlantic, CT: Circumtropical, Unk: Unknown; Pathways (PW)—Aq: aquaculture, S: ships, Su: Suez Canal (corridor).

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Dağça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
Ochrophyta														
<i>Botrytella parva</i> (Takamatsu) H.-S.Kim, 1996		1										C	IP	S
<i>Cladosiphon zosterae</i> (J.Agardh) Kylin, 1940		1		1							1	E	AT	S
<i>Cutleria multifida</i> (Turner) Greville, 1830	1	1		1	1	1		1	1	1	1	E	IP	Aq
<i>Dictyota cyanoloma</i> Tronholm, De Clerck, Gomez Garreta & Rull Lluh, 2010				1								E	ST	S
<i>Halothrix lumbricalis</i> (Kützing) Reinke, 1888	1	1		1				1	1	1		E	Unk	S
<i>Pylaiella littoralis</i> (Linnaeus) Kjellman, 1872	1	1		1								E	Unk	S
<i>Sphaerotrichia firma</i> (Gepp) A.D.Zinova, 1940		1					1					E	Unk	S
<i>Styopodium schimperi</i> (Buchinger ex Kützing) Verlaque & Boudouresque, 1991		1	1	1	1	1		1	1	1	1	Inv	RS	?Su
Chlorophyta														
<i>Caulerpa cylindracea</i> Sonder, 1845	1	1	1	1	1	1	1	1	1	1		Inv	RS	Su
<i>Caulerpa racemosa</i> var. <i>lamourouxii</i> f. <i>requienii</i> (Montagne) Weber-van Bosse, 1898								1	1	1	1	E	RS	Su
<i>Caulerpa scalpelliformis</i> (R.Brown ex Turner) C. Agardh, 1817								1	1	1		E	RS	Su
<i>Caulerpa taxifolia</i> var. <i>distichophylla</i> (Sonder) Verlaque, Huisman&Procacin, 2013											1	Inv	PO	S
<i>Codium fragile</i> subsp. <i>fragile</i> (Suringar) Hariot, 1889	1	1	1	1	1	1						Inv	Unk	S
<i>Codium parvulum</i> (Bory ex Audouin) P.C.Silva, 2003		1										E	RS	Su
<i>Codium taylorii</i> P.C. Silva, 1960				1								E	IP	S
<i>Pseudocodium okinawense</i> E.J.Faye, M.Uchimura & S.Smimada, 2008									1			C	PO	S

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
Rhodophyta														
<i>Acanthophora nayadiformis</i> (Delile) Papenfuss, 1968	1			1				1	1	1	1	E	RS	Su
<i>Asparagopsis armata</i> Harvey, 1855	1	1	1	1	1	1		1	1	1	1	Inv	Unk	S
<i>Asparagopsis taxiformis</i> (Delile) Trevisan de Saint-Léon, 1845				1								Inv	RS	Su
<i>Bonnemaisonia hamifera</i> Hariot, 1891				1				1	1	1	1	Inv	IP	?S
<i>Botryocladia madagascariensis</i> G. Feldmann, 1945		1						1	1	1		E	Unk	S
<i>Colaconema codicola</i> (Børgesen) H. Stegenga, J.J. Bolton, & R.J. Anderson, 1997	1				1	1		1	1	1	1	E	Unk	S
<i>Ganonema farinosum</i> (Lamouroux) Fan & Wang, 1974		1		1	1	1		1	1	1	1	E	RS	Su
<i>Hypnea spinella</i> (C. Agardh) Kützing, 1847				1				1	1	1	1	E	CT	S
<i>Lophocladia lallemandii</i> (Montagne) Schmitz, 1893		1	1	1	1	1		1	1	1	1	E	RS	Su
<i>Polysiphonia morrowii</i> Harvey, 1857	1											Inv	PO	S
<i>Polysiphonia paniculata</i> Montagne, 1842				1								E	Unk	S
<i>Vertebrata fucooides</i> (Hudson) Kuntze 1891				1	1	1						E	Unk	S
Tracheophyta														
<i>Halophila stipulacea</i> (Forsskål) Ascherson, 1867		1	1	1	1	1	1	1	1	1		Inv	RS	Su
Foraminifera														
<i>Adelosina longirostra</i> (d'Orbigny, 1826)						1						C	Unk	S
<i>Amphisorus hemprichii</i> Ehrenberg, 1840								1	1	1		Inv	Unk	?
<i>Amphistegina lobifera</i> Larsen, 1976		1		1		1		1	1	1		Inv	RS	Su
<i>Articulina alticostata</i> Cushman, 1944						1						E	PO	S
<i>Astacolus insolitus</i> (Schwager, 1866)					1							E	PO	S
<i>Bolivina striatula</i> Cushman, 1922	1											E	Unk	?
<i>Clavulina cf. multicamerata</i> Chapman, 1907						1				1		E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Cornuspiroides striolata</i> (Brady)				1								E	Unk	S
<i>Cyclorbiculina compressa</i> (d'Orbigny, 1839)										1		C	Unk	?
<i>Cymbaloporeta plana</i> (Cushman, 1915)				1		1				1		E	RS	Su
<i>Cymbaloporeta squammosa</i> (d'Orbigny, 1839)				1		1				1		E	Unk	?
<i>Entosigmomorphina</i> sp.										1		C	PO	S
<i>Euthymonacha polita</i> (Chapman, 1904)				1								E	Unk	S
<i>Haddonina</i> sp.									1	1		E	RS	Su
<i>Hauerina diversa</i> Cushman, 1946									1	1		E	RS	Su
<i>Heterostegina depressa</i> d'Orbigny, 1826									1	1		E	RS	Su
<i>Iridia diaphana</i> Heron-Allen and Earland, 1914		1		1								E	PO	S
<i>Miliolinella</i> cf. <i>hybrida</i> (Terquem, 1878)										1		C	RS	Su
<i>Nodophthalmidium antillarum</i> (Cushman, 1922)				1								E	RS	Su
<i>Peneroplis arietinus</i> (Batsch, 1791)				1					1	1		E	RS	Su
<i>Peneroplis pertusus</i> (Forsskål in Niebuhr, 1775)		1		1		1			1	1		E	RS	Su
<i>Peneroplis planatus</i> (Fichtel & Moll, 1798)		1		1		1			1	1		C	RS	Su
<i>Planogypsina acervalis</i> (Brady, 1884)	1											E	RS	Su
<i>Planogypsina squamiformis</i> (Chapman, 1901)	1					1				1		E	RS	Su
<i>Pseudomassilina reticulata</i> (Heron-Allen and Earland, 1915)									1			C	RS	Su
<i>Pseudonodosaria brevis</i> (d'Orbigny, 1846)				1								C	PO	S
<i>Pulleniatina obliquiloculata</i> (Parker & Jones, 1862)	1											C	PO	S
<i>Pyrgo denticulata</i> (Brady, 1917)										1		E	Unk	?
<i>Quinqueloculina</i> cf. <i>mosharrafai</i> Said, 1949										1		C	RS	Su
<i>Schlumbergerina alveoliniformis</i> (Brady, 1879)	1								1	1		E	RS	Su
<i>Sorites orbiculus</i> Ehrenberg, 1839		1		1		1			1	1		E	Unk	?
<i>Sorites variabilis</i> Lacroix, 1941				1					1	1		E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Dağça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Spiroloculina angulata</i> Cushman, 1917						1			1	1		E	RS	Su
<i>Triloculina</i> cf. <i>fichteliana</i> d'Orbigny, 1839				1		1				1		E	RS	Su
<i>Vaginulinopsis sublegumen</i> Parr, 1950		1				1						E	PO	S
Hydrozoa														
<i>Clytia linearis</i> (Thorneley, 1900)						1						E	RS	Su
<i>Filellum serratum</i> (Clarke, 1879)						1						E	CT	S
<i>Macrorhynchia philippina</i> Kirchenpauer, 1872								1				Inv	RS	Su
<i>Sertularia marginata</i> (Kirchenpauer, 1864)						1						E	CT	S
Scyphozoa														
<i>Cassiopea andromeda</i> (Forsskål, 1775)					1	1	1	1				Inv	RS	Su
<i>Phyllorhiza punctata</i> von Lendenfeld, 1884							1					E	RS	Su
<i>Rhopilema nomadica</i> Galil, Spanier & Ferguson, 1990					1	1	1	1		1	1	Inv	RS	Su
Ctenophora														
<i>Mnemiopsis leidyi</i> (Agassiz, 1865)	1				1			1		1		Inv	NA	S
Sipuncula														
<i>Aspidosiphon</i> (<i>A.</i>) <i>elegans</i> (Chamisso & Eysenhardt, 1821)			1	1	1	1		1				E	RS	Su
Annelida														
<i>Aricidea bulbosa</i> Hartley, 1984		1				1						E	RS	Su
<i>Branchiomma bairdi</i> (McIntosh, 1885)								1		1		Inv	Unk	?S
<i>Branchiomma luctuosum</i> Grube, 1869								1				Inv	RS	Su
<i>Ceratonereis mirabilis</i> Kinberg, 1866		1	1	1	1	1	1	1		1	1	E	RS	Su
<i>Chaetozone corona</i> Berkeley & Berkeley, 1941	1	1	1	1	1	1	1	1		1		E	?PO	S
<i>Dorvillea similis</i> (Crossland, 1924)				1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Eurythoe complanata</i> (Pallas, 1766)					1	1	1	1	1	1	1	Inv	?RS	?Su
<i>Eusyllis kupfferi</i> Langerhans, 1879								1		1	1	E	?AT	S
<i>Exogone africana</i> (Hartmann-Schröder, 1974)											1	E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Exogone brevi antennata</i> Hartmann-Schröder, 1959								1		1		E	RS	Su
<i>Ficopomatus enigmaticus</i> (Fauvel, 1923)							1					Inv	ST	S
<i>Glycinde bonhourei</i> Gravier, 1904											1	E	RS	Su
<i>Hydroides dirampha</i> Mörch, 1863								1				Inv	CT	S
<i>Hydroides elegans</i> (Haswell, 1883)			1	1		1		1		1		Inv	CT	S
<i>Laonice norgensis</i> Sikorski, 2003					1							C	AT	S
<i>Leodice antennata</i> (Savigny, 1820)		1	1	1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Leonnates indicus</i> Kinberg, 1866								1		1		Inv	RS	Su
<i>Leonnates persicus</i> Wesenberg-Lund, 1949		1	1	1	1	1		1		1	1	E	RS	Su
<i>Linopherus canariensis</i> Langerhans, 1881								1		1	1	E	AT	S
<i>Loimia medusa</i> (Savigny, 1818)								1				E	RS	?Su
<i>Lumbrineris perkinsi</i> Carrera-Parra, 2001								1	1	1	1	E	RS	?Su
<i>Lysidice collaris</i> Grube, 1870		1	1	1				1				E	RS	Su
<i>Metasychis gotoi</i> (Izuka, 1902)								1				E	RS	Su
<i>Notomastus aberans</i> Day, 1957			1	1	1	1	1	1	1	1	1	E	RS	Su
<i>Notomastus mossambicus</i> (Thomassin, 1970)											1	Inv	RS	Su
<i>Palola valida</i> (Gravier, 1900)				1				1	1	1	1	E	RS	Su
<i>Phyllodoce longifrons</i> Ben-Eliahu, 1972								1				E	RS	Su
<i>Pista unibranchia</i> Day, 1963		1	1	1	1	1		1		1		E	RS	Su
<i>Polycirrus twisti</i> Potts, 1928								1		1	1	E	RS	Su
<i>Polydora cornuta</i> Bosc, 1802				1								Inv	WA	S
<i>Prionospio (Minuspio) pulchra</i> Imajima 1990			1					1				Inv	IP	S
<i>Prionospio (Prionospio) depauperata</i> Imajima, 1990	1										1	Inv	PO	S
<i>Prionospio (Prionospio) paucipinnulata</i> Blake & Kudenov, 1978					1							E	PO	S
<i>Prionospio (Prionospio) saccifera</i> Mackie & Hartley, 1990						1	1	1				E	RS	Su
<i>Pseudonereis anomala</i> Gravier, 1900				1	1	1	1	1	1	1	1	Inv	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Pseudopolydora paucibranchiata</i> Okuda, 1937				1								Inv	IP	S
<i>Spirorbis marioni</i> Caullery & Mesnil, 1897			1									E	PO	S
<i>Streblospio gynobranchiata</i> Rice & Levin, 1998			1	1								Inv	WA	S
<i>Syllis ergeni</i> Çinar, 2005					1	1	1	1	1	1	1	Inv	RS	Su
Cladocera														
<i>Pleopis schmackeri</i> (Poppe, 1889)	1			1	1							E	IP	Su/S
Copepoda														
<i>Oithona davisae</i> Ferrari and Orsi, 1984				1								Inv	PO	S
<i>Paracartia grani</i> Sars G.O., 1904				1								E	AT	S
Stomatopoda														
<i>Clorida albolitura</i> Ah Yong & Naiyanetr, 2000											1	E	RS	Su
<i>Erugosquilla massavensis</i> (Kossmann, 1880)		1			1			1	1	1	1	Inv	RS	Su
Amphipoda														
<i>Ampithoe bizseli</i> Özyaydınlı and Coleman, 2012				1								E	IP	S
<i>Latigammaropsis togoensis</i> (Schellenberg, 1925)											1	E	Unk	?S
Isopoda														
<i>Paracerceis sculpta</i> Holmes, 1904								1				C	IP	S
<i>Paradella diana</i> Menzies, 1962								1				E	Unk	?S
<i>Sphaeroma walkeri</i> (Stebbing, 1905)						1		1				E	RS	Su
Tanaidacea														
<i>Paradoxapseudes intermedius</i> (Hansen, 1895)			1									E	AT	?S
Cumacea														
<i>Eocuma sarsii</i> (Kossmann, 1880)				1								E	RS	Su
Decapoda														
<i>Alpheus rapacida</i> de Man, 1908										1	1	E	RS	Su
<i>Atergatis roseus</i> (Rüppell, 1830)					1	1		1	1	1	1	E	RS	Su
<i>Callinectes sapidus</i> Rathbun, 1896	1				1	1	1	1	1	1	1	Inv	WA	S

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Dağça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Carupa tenuipes</i> Dana, 1851						1	1	1	1	1	1	E	RS	Su
<i>Charybdis hellerii</i> (Milne Edwards, 1867)					1	1		1		1		Inv	RS	Su
<i>Charybdis longicollis</i> Leene, 1938						1		1				Inv	RS	Su
<i>Coleusia signata</i> (Paulson, 1875)								1	1	1	1	E	RS	Su
<i>Eucrate crenata</i> de Haan, 1835											1	E	RS	Su
<i>Gonioinfradens giardi</i> (Nobili, 1905)										1		C	IP	S
<i>Ixa monodi</i> Holthuis & Gottlieb, 1956					1						1	E	RS	Su
<i>Leptochela pugnax</i> de Man, 1916					1			1				E	RS	Su
<i>Macrophthalmus indicus</i> Davie, 2012					1							E	RS	Su
<i>Matuta victor</i> (Fabricius, 1781)							1					E	RS	Su
<i>Metapenaeopsis aegyptia</i> Galil & Golani, 1990								1		1		E	RS	Su
<i>Metapenaeopsis mogiensis consobrina</i> (Nobili, 1904)										1		E	RS	Su
<i>Metapenaeus affinis</i> (H. Milne Edwards, 1837)				1								E	RS	Su
<i>Metapenaeus monoceros</i> (Fabricius, 1798)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Metapenaeus stebbingi</i> (Nobili, 1904)								1				Inv	RS	Su
<i>Micippa thalia</i> (Herbst, 1803)					1			1		1		E	RS	Su
<i>Myra subgranulata</i> Kossmann, 1877								1	1	1	1	E	RS	Su
<i>Palaemonella rotumana</i> (Borradaile, 1898)								1				E	RS	Su
<i>Penaeus aztecus</i> Ives, 1891	1			1								E	WA	S
<i>Penaeus hathor</i> (Burkenroad, 1959)					1			1		1		Inv	RS	Su
<i>Penaeus pulchricaudatus</i> Stebbing, 1914 (=P. japonicus)		1			1	1	1	1	1	1	1	Inv	RS	Su
<i>Penaeus semisulcatus</i> de Haan, 1844								1	1	1	1	Inv	RS	Su
<i>Percnon gibbesi</i> (H. Milne Edwards, 1853)					1	1	1	1		1		Inv	TA	S
<i>Pilumnus minutus</i> De Haan, 1835	1			1								E	RS	Su
<i>Portunus segnis</i> (Forskål, 1775)					1	1	1	1			1	Inv	RS	Su
<i>Processa macrodactyla</i> Holthuis, 1952	1			1								E	TA	S
<i>Thalamita poissonii</i> (Audouin, 1826)					1	1		1		1	1	E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Trachysalambria palaestinensis</i> Steinitz, 1932								1	1	1	1	E	RS	Su
<i>Urocaridella pulchella</i> Yokes & Galil, 2006								1		1		E	RS	Su
Gastropoda														
<i>Diodora ruppellii</i> (Sowerby I, G.B., 1835)											1	E	RS	Su
<i>Pseudominolia nedyma</i> (Melville, 1897)											1	E	RS	Su
<i>Smaragdia souverbiana</i> (Montrouzier in Souverbie & Montrouzier, 1863)								1			1	E	RS	Su
<i>Cerithidium perparvulum</i> (Watson, R.B., 1886)											1	E	PO	S
<i>Cerithium scabridum</i> Philippi, 1848	1					1		1		1	1	Inv	RS	Su
<i>Rhinoclavis kochi</i> (Philippi, 1848)											1	E	RS	Su
<i>Varicopeza pauxilla</i> (A. Adams, 1855)											1	E	RS	Su
<i>Finella pupoides</i> Adams, A., 1860						1	1	1			1	Inv	RS	Su
<i>Metaxia bacillum</i> (Issel, 1869)											1	E	RS	Su
<i>Viriola bayani</i> Jousseaume, 1884							1					E	RS	Su
<i>Cerithiopsis pulvis</i> (Issel, 1869)								1		1	1	E	RS	Su
<i>Cerithiopsis tenthrenois</i> (Melvill, 1896)											1	E	RS	Su
<i>Sticteulima lentiginosa</i> (Adams, A., 1861)										1	1	E	RS	Su
<i>Rissoina ambigua</i> (Gould, 1849)										1		C	RS	Su
<i>Rissoina bertholleti</i> Issel, 1869				1							1	E	RS	Su
<i>Conomurex persicus</i> (Swainson, 1821)					1	1	1	1	1	1	1	Inv	PG	S
<i>Purpuradusta gracilis notata</i> (Gill, 1858)											1	E	RS	Su
<i>Ergalatax junionae</i> Houart, 2008					1	1	1	1		1	1	E	RS	S
<i>Zafra savignyi</i> (Moazzo, 1939)								1			1	E	RS	Su
<i>Zafra selasphora</i> (Melvill & Standen, 1901)								1			1	E	RS	Su
<i>Pyrgulina fischeri</i> Hornung & Mermod, 1925											1	E	RS	Su
<i>Pyrgulina pupaeformis</i> (Souverbie, 1865)							1	1	1	1	1	E	RS	Su
<i>Pyrgulina nana</i> Hornung & Mermod, 1924											1	C	RS	?S
<i>Pyrgulina pirinthella</i> Melvill, 1910											1	E	RS	Su
<i>Cingulina isseli</i> (Tryon, 1886)											1	E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Monotygmia fulva</i> (Adams, A., 1853)											1	E	RS	Su
<i>Monotygmia lauta</i> (Adams, A., 1853)											1	E	RS	Su
<i>Odostomia lorioli</i> (Hornung & Mermod, 1924)											1	E	RS	Su
<i>Oscilla galilae</i> Bogi, Karhan & Yokeş, 2012											1	C	IP	?S
<i>Syrnola fasciata</i> Jickeli, 1882							1		1		1	Inv	RS	Su
<i>Syrnola lendix</i> (Adams, A., 1853)											1	E	IO	Su
<i>Turbonilla edgarii</i> (Melvill, 1896)											1	E	RS	Su
<i>Leucotina natalensis</i> Smith, E.A., 1910											1	E	RS	Su
<i>Bulla arabica</i> Malaquias & Reid, 2008										1	1	E	RS	?Su
<i>Pyrrunculus fourierii</i> (Audouin, 1826)								1		1	1	Inv	RS	Su
<i>Retusa desgenettii</i> (Audouin, 1826)						1						E	RS	Su
<i>Lamprohaminoea cyanomarginata</i> (Heller & Thompson, T.E., 1983)			1	1	1	1		1	1	1		E	RS	Su
<i>Biuve fulvipunctata</i> (Baba, 1938)					1	1						E	RS	Su
<i>Acteocina mucronata</i> (Philippi, 1849)											1	E	RS	Su
<i>Mnestia girardi</i> (Audouin, 1826)											1	E	RS	Su
<i>Oxynoe viridis</i> (Pease, 1861)								1	1	1		E	IP	S
<i>Elysia tomentosa</i> Jensen, 1997								1				E	?IP	S
<i>Bursatella leachii</i> Blainville, 1817								1		1		E	RS	?Su
<i>Syphonota geographica</i> (Adams, A. & Reeve, 1850)								1		1		E	RS	Su
<i>Goniobranchus annulatus</i> (Eliot, 1904)										1		E	RS	Su
<i>Hypselodoris infucata</i> Rueppel & Leuckart, 1828								1		1	1	E	RS	Su
<i>Plocamopherus ocellatus</i> Rüppell & Leuckart, 1828										1		E	RS	Su
<i>Baeolidia moebii</i> Bergh, 1888									1	1		C	RS	Su
<i>Coryphellina rubrolineata</i> O'Donoghue, 1929					1	1		1	1	1		E	RS	Su
<i>Siphonaria crenata</i> Blainville 1827											1	E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
Bivalvia														
<i>Brachidontes pharaonis</i> (Fischer, P., 1870)				1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Clementia papyracea</i> (Gmelin, 1791)											1	E	RS	Su
<i>Dendostrea folium</i> (Linnaeus, 1758)					1	1		1				E	IP	?S
<i>Ervilia scaliola</i> Issel, 1869											1	C	RS	Su
<i>Fulvia fragilis</i> (Forsskål in Niebuhr, 1775)								1			1	Inv	RS	Su
<i>Isognomon legumen</i> (Gmelin, 1791)							1					E	RS	Su
<i>Magallana gigas</i> (Thunberg, 1793)				1								E	PO	Aq
<i>Malleus regula</i> (Forsskål in Niebuhr, 1775)						1		1		1		E	RS	Su
<i>Pinctada imbricata radiata</i> (Leach, 1814)				1	1	1	1	1		1	1	Inv	RS	Su
<i>Ruditapes philippinarum</i> (Adams & Reeve, 1850)	1											Inv	PO	Aq
<i>Saccostrea cucullata</i> (Born, 1778)								1				E	IP	S
<i>Septifer cumingii</i> Récluz, 1849						1		1				E	RS	S
<i>Teredothyra dominicensis</i> (Bartsch, 1921)										1		E	WA	S
Cephalopoda														
<i>Sepioteuthis lessoniana</i> d'Orbigny, 1826								1		1		Inv	RS	Su
Bryozoa														
<i>Amathia verticillata</i> (delle Chiaje, 1822)				1				1				Inv	AT	S
<i>Celleporaria brunnea</i> (Hincks, 1884)				1				1				Inv	AT	S
Echinodermata														
<i>Ophiactis savignyi</i> (Müller & Troschel, 1842)								1				E	RS	Su
<i>Diadema setosum</i> (Leske, 1778)					1	1	1	1		1		Inv	RS	Su
<i>Synaptula reciprocans</i> (Forsskål, 1775)					1	1	1	1	1	1	1	Inv	RS	Su
Tunicata														
<i>Ascidella aspersa</i> (Müller, 1776)								1				E	NA	S
<i>Clavelina oblonga</i> Herdman, 1880						1						E	WA	S
<i>Diplosoma listerianum</i> (Milne Edwards, 1841)			1					1				E	?AT	S
<i>Microcosmus exasperatus</i> Heller, 1878						1		1				E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Phallusia nigra</i> Savigny, 1816								1	1	1	1	Inv	WA	?S
<i>Pyura (=Herdmania) momus</i> (Savigny, 1816)							1	1	1	1		E	RS	Su
<i>Rhodosoma turcicum</i> (Savigny, 1816)								1				E	CT	S
<i>Styela plicata</i> (Lesueur, 1823)			1			1		1				Inv	?AT	S
<i>Symplegma brakenhielmi</i> (Michaelsen, 1904)								1				Inv	RS	Su
Actinopterygii														
<i>Acanthopagrus bifasciatus</i> (Forsskål, 1775)				1								C	RS	Su
<i>Alepes djedaba</i> (Forsskål, 1775)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Apogonichthyoides pharaonis</i> (Bellotti, 1874)					1	1	1	1	1	1	1	E	RS	Su
<i>Atherinomorus forskalii</i> (Rüppell, 1838)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Bregmaceros nectabanus</i> Whitley, 1941			1	1	1	1	1	1	1	1	1	E	RS	Su
<i>Callionymus filamentosus</i> Valenciennes, 1837							1	1	1	1	1	E	RS	Su
<i>Champsodon nudivittis</i> (Ogilby, 1895)		1	1		1	1	1	1	1	1	1	Inv	RS	Su
<i>Cheilodipterus novemstriatus</i> (Rüppell, 1838)										1	1	E	RS	Su
<i>Cynoglossus sinusarabici</i> (Chabanaud, 1913)								1			1	E	RS	Su
<i>Diplogrammus randalli</i> Fricke, 1983								1				C	RS	Su
<i>Dussumieria elopsoides</i> Bleeker, 1849											1	Inv	RS	Su
<i>Equulites klunzingeri</i> (Steindachner, 1898)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Equulites popei</i> (Whitley, 1932)											1	Inv	RS	Su
<i>Etrumeus golanii</i> DiBatista, Randall and Bowen, 2012			1		1	1	1	1	1	1	1	Inv	RS	Su
<i>Fistularia commersonii</i> (Rüppell, 1835)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Fistularia petimba</i> Lacepède, 1803					1	1	1	1	1	1	1	Inv	RS	Su
<i>Hazeus ingressus</i> Engin, Larson, Irmak, 2018								1				C	RS	Su
<i>Hemiramphus far</i> (Forsskål, 1775)			1	1	1	1	1	1	1	1	1	E	RS	Su
<i>Herklotsichthys punctatus</i> (Rüppell, 1837)											1	E	RS	Su
<i>Jaydia queketti</i> (Gilchrist, 1903)					1	1	1	1	1	1	1	E	RS	Su
<i>Jaydia smithi</i> Kotthaus, 1970											1	E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Lagocephalus guentheri</i> (Richardson, 1844)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Lagocephalus sceleratus</i> (Gmelin, 1789)	1	1	1	1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Lagocephalus suezensis</i> Clark & Gohar, 1953					1	1	1	1	1	1	1	Inv	RS	Su
<i>Liza carinata</i> (Valenciennes, 1836)											1	E	RS	Su
<i>Nemipterus randalli</i> Russell, 1986					1	1	1	1	1	1	1	Inv	RS	Su
<i>Ostorhinchus fasciatus</i> (White, 1790)					1	1	1	1	1	1	1	E	RS	Su
<i>Oxyurichthys petersi</i> (Klunzinger, 1871)					1	1	1	1	1	1	1	E	RS	Su
<i>Paranthias furcifer</i> (Valenciennes, 1828)										1		C	AT	?
<i>Parexocoetus mento</i> (Valenciennes, 1846)					1	1	1	1	1	1	1	E	RS	Su
<i>Parupeneus forskalli</i> (Fourmanoir & Guézé, 1976)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Pelates quadrilineatus</i> (Bloch, 1790)											1	E	RS	Su
<i>Pempheris rhomboidea</i> Kossmann & Räuber, 1877					1	1	1	1	1	1	1	E	RS	Su
<i>Petroscirtes ancyllodon</i> Rüppell, 1838					1							E	RS	Su
<i>Planiliza haematocheilus</i> (Temminck & Schlegel, 1845)	1	1	1									Inv	PO	Aq
<i>Pomadasystris stridens</i> (Forsskål, 1775)											1	E	RS	Su
<i>Priacanthus sagittarius</i> Starnes, 1988											1	C	RS	Su
<i>Pteragogus trispilus</i> Randall, 2013					1	1	1	1	1	1	1	E	RS	Su
<i>Pterois miles</i> (Bennett, 1828)				1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Sargocentron rubrum</i> (Forsskål, 1775)					1	1	1	1	1	1	1	E	RS	Su
<i>Saurida lessepsianus</i> (Russell, Golani and Tikochinski, 2015)					1	1	1	1	1	1	1	Inv	RS	Su
<i>Scarus ghobban</i> Forsskål, 1775										1		C	RS	Su
<i>Scomberomorus commerson</i> Lacepède, 1800					1	1	1	1	1	1	1	E	RS	Su
<i>Siganus luridus</i> (Rüppell, 1829)		1	1	1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Siganus rivulatus</i> Forsskål, 1775	1	1	1	1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Sillago suezensis</i> Golani, Fricke and Tikochinski, 2014						1					1	E	RS	Su

Table A1. Cont.

Species List	Saros Bay	Ayvalık	Foça	Karaburun	Gökova Bay	Datça	Köyceğiz	Fethiye	Patara	Kaş-Kekova	Göksu	ES	O	PW
<i>Sphyræna chrysotaenia</i> Klunzinger, 1884			1	1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Sphyræna flavicauda</i> Rüppell, 1838							1	1	1	1	1	Inv	RS	Su
<i>Stephanolepis diaspros</i> Fraser-Brunner, 1940					1	1	1	1	1	1	1	E	RS	Su
<i>Synchiropus sechellensis</i> Regan, 1908										1		E	RS	Su
<i>Torquigener flavimaculosus</i> Hardy & Randall, 1983					1	1	1	1	1	1	1	Inv	RS	Su
<i>Tylerius spinosissimus</i> (Regan, 1908)											1	C	RS	Su
<i>Upeneus moluccensis</i> (Bleeker, 1855)			1	1	1	1	1	1	1	1	1	Inv	RS	Su
<i>Upeneus pori</i> Ben-Tuvia & Golani, 1989					1	1	1	1	1	1	1	Inv	RS	Su
<i>Vanderhorstia mertensi</i> Klausewitz, 1974					1	1	1	1	1	1	1	E	RS	Su

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