Documentation of the Sparidae fish species in the Syrian marine waters

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□ ABSTRACT □

This research was conducted from November 2018 to December 2020, to survey the Sparidae fish species in the Syrian marine waters. Fish samples were collected from catch landing ports along the Syrian coast (Raas Al-Bassit, Lattakia, Jableh, and Tartus), which were fished by fishermen within the Syrian territorial waters exclusively, using different fishing methods (Traps, gill nets, trammel net, trawl, long line,fishing rod, spearfishing ..)
The samples were transferred to the laboratory of Marine Sciences and Fish Lab, Faculty of Agriculture at Tishreen University, to take morphometric measurements and meristic data. All species have been classified, briefly described and documented.
The results showed that 25 fish species belonging to 11 genera were found, in which two immigrants fish species was recorded for the first time in the Syrian marine waters, *Pagellus bogaraveo* as an immigrant species from the Atlantic Ocean and *Pagrus major* indo-pacefic species, introducd to the Eastern Basin of Mediterranean Sea. Additionnaly 5 species recorded previously in the Syrian marine waters were not found in this study.

Key words: Documentation, Sparidae, Biodiversity, Syrian Marine waters.

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توثيق الأنواع السمكية التابعة لفصيلة الأسبورات الموجودة في المياه البحرية السورية

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□ ملخّص □

أُجري هذا البحث خلال الفترة الممتدة من شهر تشرين الثاني 2018 وحتى شهر كانون الأول 2020، بهدف رصد الأنواع التابعة لفصيلة الأسبورات (Sparidae) في المياه البحرية السورية.

جُمعت العينات السمكية من مواقع إنزال المصيد الممتدة على طول الساحل السوري (رأس البسيط، اللاذقية، جبلة، طرطوس) والمصطادة من قبل الصيادين ضمن المياه الأقليمية السورية حصراً، باستخدام وسائل الصيد المختلفة (أقفاص، الشباك الغلصمية، الشباك المبطنة، شباك جرف قاعي، الخيوط الطويلة، الصيد بالقصبة، الصيد بالرمح ..) ونُقلت العينات إلى مخبر علوم البحار ومخبر الأسماك في كلية الزراعة جامعة تشرين لأخذ القياسات المورفولوجية (الشكلية) و المورفومترية (القياسية). تم تصنيف الأنواع السمكية وفقاً للمفاتيح التصنيفية العالمية.

أظهرت نتائج الدراسة وجود (25) نوعاً سمكياً تابعاً لـ (11) جنس من فصيلة Sparidae. وسجل لأول مرة النوعان السمكيان المهاجران في المياه البحرية السورية: *Pagellus bogaraveo* مهاجر من المحيط الأطلسي وغرب البحر المتوسط إلى الحوض الشرقي للبحر المتوسط، و *Pagrus major* أصله من المحيطين الهندي والهادي ومُدخَل إلى البحر المتوسط، ووصل مؤخراً إلى الشواطئ السورية.

ومن جهة أخرى هناك 5 أنواع مسجلة في المياه البحرية السورية سابقاً لم يتم رصدها خلال هذه الدراسة.

الكلمات المفتاحية: توثيق، فصيلة Sparidae، التنوع الحيوي، المياه البحرية السورية.

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Introduction:

The Sparidae family includes 148 species worldwide belonging to 37 genus (Nelson, 2016). According to Parenti, (2019) the family Sparidae includes 426 available names representing 166 valid species in 39 genera and 260 synonyms. The family Centracanthidae is presently regarded as a junior synonym of the Sparidae family. Preparation of typology study conducted on Sparidae species are relatively little compared to the economic importance of the species of this family.

Sparidae is one of the most abundant and occurred family in the commercial catch in the Syrian coast (Saad, 2005; Ulman *et al*., 2015) most of which are of high nutritional value.

The Sparidae family are marine fish, rarely found in brackish or fresh waters, found in oceans (Atlantic, Indian and Pacific) at tropical and temperate latitudes, and rarely in cold waters. It is widespread in the Mediterranean and it is interesting that more than a third of the species live along the coast of South Africa, including many endemic species (Whitehead, 1986; Carpenter and De Angelis, 2016).They are benthic depths of up to 250 meters, but are more abundant in shallow waters to some extent in small clusters, around coral reefs, on rubble, sand, or in the seagrass beds. Aggregation occurs for small species or young individuals where adults are solitary (Parenti, 2019). Many species are hermaphroditic although hermaphroditism is never simultaneous and at the sexual maturity, the majority of individuals are males (protandric hermaphroditism) or females (protogynic hermaphroditism). The sparid fishes are omnivorous, feeding on invertebrates and seaweeds. Sparids are important food fishes and fisheries have been very intensive in several areas causing a drop in the catches.

Based on the phylogenetic analysis of Orrell *et al.*, (2002) the family Sparidae Rafinesque, 1818 (Van der Laan *et al*., 2014) is monophyletic only with the inclusion of Spicara, once included in the family Centracanthidae.

The mission of Korean experts, have conducted a study on marine fish from August 1975 to August 1976, identified only (96) species of bony fish and (9) spices of cartilaginous fish (Anonym, 1976), this was followed by an ecological and taxonomic study of the Sparidae fish found in some areas of the Syrian coast (Abo- gallyon and Qassem, 1991), through it, 20 species of the Sparidae family were documented, including those of the Centracanthidae family, in addition to a single species, *Pagellus* spp, Whose identity the researchers were unable to determine.

While Sbaihi, (1994) conducted an extensive classification study of bony marine fish in the Syrian marine waters, during which he documented the presence of 25 species belonging to the Sparidae's family and Centracanthidae family in the Syrian marine water, and documented the existence of the *Pagellus bellottii* (Steindcner, 1882) as a migratory species from the Atlantic Ocean, in addition to documenting the existence of each species: *Spicara maena* (Linnaeus 1758), *Dentex gibbosus* (Rafinesque, 1810) and *Centracanthus cirrus* (Rafinesque 1810).

Biological study of two fish species; *Diplodus sargus* and *Diplodus vulgaris* was by Hammoud, (2005), also recorded the existence of a lessepsion species: *Crenidens crenidens* (Forsskal, 1775).

This was followed by several biological studies of some economic species of the Sparidae family (Baloch, 2016; Al-shawy, 2017).

The last published list of the Sparid family indicates the presence of 28 species belonging to this family in the Syrian marine waters (Ali, 2018). However, this later work only included a review of previous publications, some dating back to several centuries, and

therefore the results were not based on field study and classification of fish samples representative of the species. Our current work is based on field monitoring and follow-up of the presence of representatives of the sparid species, with the preservation of a sample of each species in the laboratory, as well as the determination of the extent of the spread of each species and its abundance within the catch, based on an dopted scale in such research. As well as documenting those speices.

The importance and goals of research :

The process of determining the specific composition of fish and identifying the environment in which they live is an important study for developing measures for the protection of the local fish biodiversity, the development of fish wealth and the scientific investment of marine resources. Therefore, it was necessary to conduct a scientific, biological, environmental and taxonomic study to draw a biological map of the distribution of fish species in general and the Sparidae family in particular in the Syrian marine waters.

The research aims to :

Determination the fish species of the Sparidae family in the Syrian marine waters.

Materials and methods :

Samples were collected during the period from 1/11/2018 to 31/12/2020 from (Raas Al-Bassit) in the north to Tartus in the south, Fig (1) (research stations: Raas Al-Bassit, Lattakia, Jableh, Tartus). Fish samples were collected from the landing sites of artisanal fisheries (Traps, gill nets, trammel net, long line, fishing rod, spearfishing) which are fished exclusively within the territorial waters, usually no more than 3 miles from the shore; and from the bottom trawl fishing outcome of one of that were fishing 6 miles from the shore and at depths between 250 and 400 meters during the years 2018 and 2019.The samples were transferred to the Laboratory of Marine Sciences and fish lab, faculty of Agriculture, for morphological measurements (formal: number of thorns for each of the dorsal, ventral and anal fins, number the shape of the teeth and how they are placed within the mouth, the number of scales on the lateral line, and everything related to the taxonomic characteristics of the species) and morphometric measures (standard length, total length, body depth, distance between the sockets, eye diameter ...) and body weight, and comparing these results according to classifications keys.

One sample of each species was preserved in Formaldehyde10% and information (scientific name, date, area and depth of fishing) for each specimen were included.

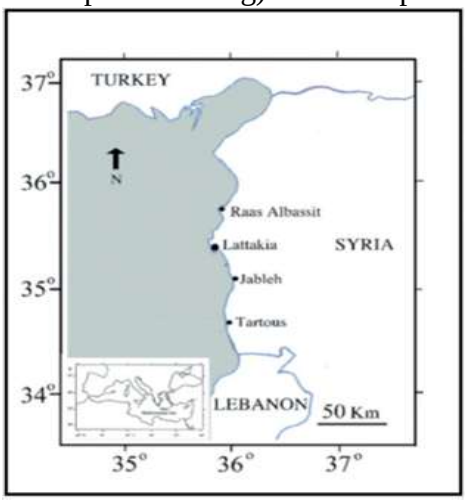

Fig (1) . Map of the Syrian coast showing the locations of fish landing and collect of Sparidae speices.

Results and discussion:

The results showed that (25) fish species belonging to (11) Sparidae genera were found.

For the first time in the Syrian marine waters, *Pagellus bogaraveo* has been documented as an immigrant species from the Atlantic Ocean and the Western Mediterranean to the Eastern Basin of Mediterranean Sea. *Pagrus major* has also been recorded as an immigrant (indo-pacefic) species, introduced to the Eastern Basin of Mediterranean Sea (Saad *et al*., 2020).

An explanatory description of the species of the genus Spicara was created to easily distinguish between them, as several international studies were conducted to distinguish between these species (Minos *et al*., 2013).

By comparing these results with previous studies, we find that there are 5 species were not monitored during the current study (Table 1), and this could be a cause of the climatic changes that have occurred in the Eastern basin of the Mediterranean in recent decades, in addition, the Syrian coast is considered poor in the special food and because of the spread of migratory species that invade and dominate the aquatic medium, thus affecting the spread of local fish, and possibily of their sparid outside the permitted fishing areas in the Syrian territorial waters during the current study period.

Table (1): Comparison between the fish species found in the current study with previous studies (Sbaihi, 1994; Saad, 2005, Ali 2018):

	Genus	Species	Sbaihi, 1994	Saad, 2005	Ali, 2018	This study
1	*Boops*	*boops* (Linneaus, 1758)	+	+	+	+
2	*Centracanthus*	*cirrus* (Rafinesque, 1810)	+	+	+	
3	*Crenidens*	*creidens* (Forsskal, 1775)		+	+	
4	*Dentex*	*dentex* (Linneaus, 1758)	+	+	+	+
5		*gibbosus* (Rafinesque, 1810)	+	+	+	
6		*macrophthalmus* (Block, 1971)	+	+	+	+
7		*marocanus* (Valenciennes, 1830)	+	+	+	+
8	*Diplodus*	*annularis* (Linneaus, 1758)	+	+	+	+
9		*cervinus* (Lowe, 1838)	+	+	+	+
10		*puntazzo* (Walbaum, 1792)	+	+	+	+
11		*sargus* (Linneaus, 1758)	+	+	+	+
12		*vulgaris* (Geoffroy saint-Hilaire, 1817)	+	+	+	+
13	*Evynnis*	*ehrenbergii* (Valenciennes, 1830)		+	+	
14	*Lithognathus*	*mormyrus* (Linneaus, 1758)	+	+	+	+
15	*Oblada*	*melanura* (Linneaus, 1758)	+	+	+	+
16	*Pagellus*	*acarne* (Risso, 1827)	+	+	+	+
17		*bellottii* (Steindachner, 1882)	+	+	+	+
18		*erythinus* (Linneaus, 1758)	+	+	+	+
19		*bogaraveo* (Brünnich, 1768)				+
20	*Pagrus*	*auriga* (Valenciennes, 1830)	+		+	+
21		*Caeruleostictus* (Valenciennes, 1830)	+	+	+	+
22		*pagrus* (Linneaus, 1758)	+	+	+	+
23		*major* (Temminck&Schlegel,1843)				+
24	*Rhabdosargus*	*haffara* (Forsskal, 1775)		+	+	
25	*Sarpa*	*salpa* (Linneaus, 1758)	+	+	+	+
26	*Sparus*	*aurata* (Linneaus, 1758)	+	+	+	+
27	*Spicara*	*maena* (Linneaus, 1758)	+	+	+	+
28		*smaris* (Linneaus, 1758)	+	+	+	+
29		*flexousa* (Rafinesque, 1810)	+	+		+
30	*Spondyliosoma*	*cantharus* (Linneaus, 1758)	+	+	+	+

All the species mentioned in this article are fished from the Syrian territorial waters. The table (2) shows the rate of abundance of each species within the catch.
Abundance categories of bony fishes in the Syrian coast as follows as Sparidae (Table 2): First record = 1 finding during or before this study. Very rare = 2-10 annual occurrence. Rare corresponds to 3-700 annual finding. Frequent corresponds to 701- 3000 annual finding. Common corresponds to more than 3000 annual findings.

Table (2). Updated list of recorded Sparidae species in the Syrian marine waters. The status, Habitat, Fishing gear, frequency, the first record. (N= native; AL= alien).

	Species	Status	Habitat	Fishing gear	Frequency	First record
1	*Boops boops* (Linneaus, 1758)	N	Demersal _ semi-pelagic to depth of 250 m	Trammel net _ trawls_ long line	Frequent	Gruvel, 1931
2	*Dentex dentex* (Linneaus, 1758)	N	demersal (rocky bottoms) to depth of 200 m	Trawls_ long line_ trammel nets	Frequent	Anon, 1976
3	*Dentex macrophthalmus* (Bloch, 1791)	N	rocky or sandy bottoms from 30 to 300 m	Trawls_ bottom long line_ Traps	Common	Gruvel, 1931
4	*Dentex maroccanus* Valenciennes, 1830	N	various types of bottom from a depth of 20 to 500 m	Trawl_ trammel nets	Frequent	Gruvel, 1931
5	*Diplodus annularis* (Linneaus, 1758)	N	seagrass beds and rocky bottoms from 20 to 80 m	fishing rod & long line	Very rare	Gruvel, 1931
6	*Diplodus cervinus* (Lowe, 1838)	N	rocky bottoms from a depth of 30 to 80 m	Long line _ trammel nets_ trawls	Frequent	Gruvel, 1931
7	*Diplodus puntazzo* (Walbaum, 1792)	N	rocky bottoms down to a depth of about 150 m	Gill net_ trammel nets _trawls	Frequent	Sbaihi, 1994
8	*Diplodus sargus* (Linnaeus, 1758)	N	rocky bottoms down to depths of 150 m	trammel nets_ Long line _trawls- long line	Common	Gruvel, 1931
9	*Diplodus vulgaris* (Geoffroy Saint-Hilaire, 1817)	N	rocky and sandy bottoms to depths of 160 m	trammel nets_ gill net _trawls	Common	Gruvel, 1931
10	*Lithognathus mormyrus* (Linnaeus, 1758)	N	sandy or muddy-sand bottoms to a depth of 150 m	Fishing rod - trammel nets_ Traps	Common	Gruvel, 1931
11	*Oblada melanura* (Linnaeus, 1758)	N	rocky bottoms or seagrass beds to depths of 30 m	Trammel nets _trawls	Common	Gruvel, 1931
12	*Pagellus acarne* (Risso, 1827)	N	Demersal (various types of bottom) to depths of 500 m	Gill net _trawls	Common	Gruvel, 1931
13	*Pagellus bellottii* Steindachner, 1882	AL	demersal (sandy bottoms) to depths of 250 m	trawl	Rare	Sbaihi and Saad, 1992
14	*Pagellus erythrinus* (Linnaeus, 1758)	N	demersal (various types of bottom) to depths of 220 m	Trawls-trammel nets_ Traps	Common	Gruvel, 1931
15	*Pagellus bogaraveo*	AL	demersal (various	Trawls _long	First	This study

	(Brünnich, 1768)		types of bottom) to depths of 700 m	line	record	
16	*Pagrus auriga* Valenciennes, 1843	N	Demersal (rocky bottoms) to a depth of 170 m	Gill net _trawls	Common	Gruvel, 1931
17	*Pagrus caeruleostictus* (Valenciennes, 1830)	N	Demersal (rocky bottoms) to a depth of 150 m	Gill net _trawls	Common	Gruvel, 1931
18	*Pagrus pagrus* (Linnaeus, 1758)	N	demersal (various types of bottom) to depths of 250 m	Trawls	Common	Gruvel, 1931
19	*Pagrus major* (Temminck & Schlegel, 1843)	AL	Demersal to depths of 50 m	Trawls	First record	This study
20	*Sarpa salpa* (Linnaeus, 1758)	N	rocky or sandy bottoms to depths of about 70 m	Trawls _gill nets	Frequent	Gruvel, 1931
21	*Sparus aurata* Linnaeus, 1758	N	sandy bottoms to depths of 30- 150 m	Trammel nets_ trawls_ long line- fishing rod	Common	Gruvel, 1931
22	*Spicara flexousa* (Rafinesque, 1810)	N	Neritic over soft bottoms to depths 100 m	Trawl	Common	Sbaihi, 1994
23	*Spicara maena* (Linnaeus, 1758)	N	Neritic over soft bottoms to depths 100 m	Trawl – gill net	Very rare	Sbaihi, 1994
24	*Spicara smaris* (Linnaeus, 1758)	N	over muddy bottoms to depths 15 _ 170 m	Trawl _ trammel nets	Frequent	Gruvel, 1931
25	*Spondyliosoma cantharus* (Linnaeus, 1758)	N	demersal (various types of bottom) to depths of 300 m	Trawls _long line	Frequent	Gruvel, 1931

we take here an explanation of the most important taxonomic characteristics and morphological characteristics of each of the species recorded in this study:

1. Subfamily Boopsinae Fowler 1936

Teeth in the outermost row incisor-like. They are typically herbivorous, feeding sometimes on small invertebrates; 25 species in the world represented by 2 genus and 2 species in the Syrian marine water.

1.1. Genus Boops Cuvier

1.1.1. *Boops boops* (Linnaeus, 1758)

Common names: Bogue**.**

Diagnostic characters: Body elongately fusiform, moderately compressed. Mouth small, oblique; lips very thin; all teeth incisor-like, set in a single row in both jaws; cutting edges of upper teeth with 4 points, lower teeth with 5 points (the central point largest). **Fin formula:** D: XIII- XV + 12 - 16; A: III+ 12-16; pectoral fins short, not reaching to anus; caudal fin forked. Scales along lateral line 69 to 80. **Size:** common to 20 cm. Fig (2).

Fig (2). *Boops boops*, 190 mm (TL), 62.04 g (T.W) captured off Ras Al-Basiit coast.

1.2. Genus *Oblada* Cuvier, 1829.

Eastern Atlantic and Mediterranean in coastal and open water, near rocky bottoms; monotypic. Represented by 1 species in the Syrian water.

1.2.1. *Oblada melanura* (Linnaeus, 1758)

Common names: Saddled bream**.**

Diagnostic characters: Body oblong, slightly compressed. Mouth small; in each jaw an outer series of 8 to 10 median incisor-like teeth (each slightly notched), followed by small, slightly inward-curving, conical teeth; anteriorly, the external row of incisors is followed by 2 or more rows of small granular teeth. **Fin formula:** D XI + 13- 14; A III + 12-14. Scales along lateral line 64 to 67. **Size:** common to 20 cm. Fig (3).

Fig (3). *Oblada melanura*, 201 mm (TL), 99.5 g (T.W) captured off Jableh coast.

1.3. Genus *Sarpa* Bonaparte

1.3.1. *Sarpa salpa* (Linnaeus, 1758)

Common name: salema

Diagnostic characters: Body oblong. Mouth terminal, small; a single row of incisor-like teeth in each jaw. **Fin formula:** D XI- XII + 14-17; A III+ 13-15; pectoral fins short, not reaching to anus. Scales along lateral line 70 to 80. **Size:** common to 30 cm. Fig (4).

Fig (4). *Sarpa salpa*, 210 mm (TL), 132.28 g (T.W) captured off Jableh coast.

1.4. Genus *Spicara* Rafinesque, 1810

1.4.1. *Spicara flexuosa* Rafinesque 1810

Diagnostic characters: Head about as long as depth of body; vomerine teeth few or absent. D XI + 10- 12, edge more or less convex in spiny part; A III + 9-10. Lateral line scales 68- 73. **Size:** common to 18 cm. Fig (5)

Fig (5). *Spicara flexuosa*, 156 mm (TL), 45.76 g (T.W) captured off Lattakia coast.

1.4.2. *Spicara maena* (Linnaeus, 1758)

Diagnostic characters: Body oblong, somewhat compressed, its depth 2.9 to 3.5 times In standard length. Upper jaw very protrusible; jaws with bands of villiform teeth, the outer series larger, with a few small canines at front of jaws; vomerine teeth small or absent. Dorsal fin unnotched, D XI + 10+12; A III + 9+10. Lateral-line scales 68 to 73. Swimbladder bifurcate posteriorly. **Size:** common to 15 cm. Fig (6).

Fig (6). *Spicara meana*, 128 mm (TL), 28.89 g (T.W) captured off Jableh coast.

1.4.3. *Spicara smaris* (Linnaeus, 1758)

Diagnostic characters: Body slender and elongate, its depth contained 3.7 to 4.7 times in standard length. Upper jaw very protrusible; jaws with bands of villiform teeth; vomerine teeth small or absent. D XI + 10-12; A III + 10-12. Lateral-line scales 75 -81. Swimbladder bifurcate posteriorly. **Size:** common to about 15 cm. Fig (7).

Fig (7). *Spicara smaris*, 128 mm (TL), 22.86 g (T.W) captured off Tartus coast.

1.5. Genus *Spondyliosoma* Cantor, 1849

1.5.1. *Spondyliosoma cantharus* (Linnaeus 1758)

Common name: Black sea bream.

Diagnostic characters: Body oval, compressed. Mouth oblique; 4 to 6 rows of pointed teeth in each jaw, those in outer row largest, especially in front. **Fin formula:** D XI + 11-13; A III + 9-11. Scales along lateral line 66-75. **Size:** common to 25 cm. Fig (8).

Fig (8). *Spondyliosoma cantharus*, 230 mm (TL), 243.15 g (T.W) captured off Jableh coast.

2. Subfamily Denticinae Bonaparte 1831

2.1. Genus *Dentex* Cuvier, 1814.

Diagnostic characters: Body oblong, rather deep; scales on cheeks and preopercle (except on posterior margin) and opercle; mouth terminal, little inclined; caniniform teeth in both jaws, in several rows, the outer the strongest, with 4-6 antrrior strong canines (in *D. macrophthalmus* fangs present only on upper jaw).

2.1.1. *Dentex dentex* (Linnaeus, 1758)

Common name: Common dentex.

Fin formula: D XI + 11-12; the spines increasing in length from the first to the fourth or fifth and subequal thereafter; A III + 7-9. Scales along lateral line 62 to 68. **Size:** common to 45 cm. Fig (9).

Fig (9). *Dentex dentex*, 236 mm (TL), 206.49 g (T.W) captured off Raas Al-Bassit coast.

2.1.2. *Dentex macrophthalmus* (Bloch, 1791)

Common name: Large-eye dentex.

Fin formula: D XI- XII + 10-11, the spines increasing in length from the first to the fourth or fifth and subequal thereafter; A III+ 8. Scales along lateral line 49 to 55. **Size:** common to 16-24 cm. Fig (10).

Fig (10). *Dentex macrophthalmus*, 236 mm (TL), 167.49 g (T.W) captured off Raas Al-Bassit coast.

2.1.3. *Dentex maroccanus* (Valenciennes, 1830)

Common name: Morocco dentex.

Fin formula: D XII+ 10-11; the spines increasing in length up to the fourth or fifth and subequal thereafter (longest spine 44 to 51% of head length); A III + 8-9. Scales along lateral line 46 to 51. **Size:** common to 16_ 20 cm. Fig (11).

Fig (11). *Dentex maroccanus*, 162 mm (TL), 243.15 g (T.W) captured off Jableh coast.

3. Subfamily Pagellinae Smith 1938

3.1. Genus *Lithognathus* Swainson, 1839

3.1.1. *Lithognathus mormyrus* (Linnaeus, 1758)

Common name: Striped sea bream**.**

Diagnostic characters: Body oblong and compressed. Mouth low and nearly horizontal, lips thick; anterior teeth small, set in bands, followed by 3 to 6 rows of molars in upper, and 2 to 4 rows in lower jaw. **Fin formula:** D XI-XII + 11- 12; A III + 10- 11; pectoral fins short, not reaching beyond anus. Scales along lateral line 59 to 65. **Size:** common to 25 cm. Fig (12).

Fig (12). *Lithognathus mormyrus*, 163 mm (TL), 61.33 g (T.W) captured off Jableh coast.

3.2. Genus Pagellus Valencienne

Diagnostic characters: Body elongately ovate or fusiform, more or less compressed; scales on cheeks and opercle; preopercle scaleless; mouth terminal; in both jaws, aband of conical and slender teeth in front and at least 2 rows of molars at back; the outer series of conical teeth little enlarged and the inner (second) row of molars the largest.

3.2.1. *Pagellus acarne* (Risso, 1827)

Common name: Axillary sea bream.

Fin formula: D XII- XIII + 10-12; A III + 9- 10; last dorsal and anal-fin rays clearly stronger then the preceding ones. Scales along lateral line 65 to 72. **Size:** common to 25 cm. Fig (13).

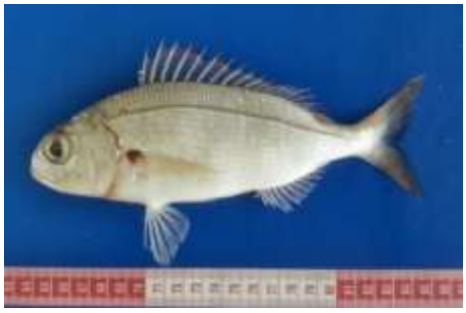

Fig (13). *Pagellus acarne*, 175 mm (TL), 165.4 g (T.W) captured off Lattakia coast.

3.2.2. *Pagellus bellottii* (Steindachner, 1882)

Common name: Red Pandora**.**

Fin formula: D XII+ 11-12 ; A III + 10; base of anal fin longer than distance from snout to posterior eye margin. Scales along lateral line 54 to 60. **Size:** common to 25 cm. Fig (14).

Fig (14). *Pagellus bellottii*, 240 mm (TL), 179.07 g (T.W) captured off Jableh coast.

3.2.3. *Pagellus bogaraveo* (Brünnich, 1768)

Common name: Red sea bream**.**

Fin formula: D XII- XIII + 11- 13; A III + 11- 12; last dorsal and anal-fin rays stronger than the preceding ones. Scales along lateral line 68 to 74. **Colour:** a more or less reddish grey, darker on head, lighter on belly; a dark spot at pectoral-fin axils and a large black blotch at origin of lateral line (sometimes absent in young). Size**:** common to 25 cm. Fig (15).

Fig (15). *Pagellus bogaraveo* 194 mm (TL), 74.61 g (T.W) captured off Lattakia coast.

3.2.4. *Pagellus erythrinus* (Linnaeus 1758)

Common name: Common pandora**.**

Fin formula: D XII+ 10- 11; A III + 8-9; anal-fin base shorter than distance from snout to posterior eye margin. Lateral-line scales 55 to 65. **Size:** common to 25 cm. Fig (16).

Fig (16). *Pagellus erythrinus* 171 mm (TL), 60.62 g (T.W) captured off Tartus coast.

4. Subfamily Sparinae Rafinesque

4.1. Genus Diplodus Rafinesque, 1810

Body oblong or ovate, more or less compressed, back elevated; mouth terminal; scales on checks and opercle; in front of both jaws incisiform teeth (8_12); at back of jaws molariform teeth in several series.

4.1.1. *Diplodus annularis* (Linnaeus 1758)

Common name: Annular sea bream.

Fin formula: D XI+ 11-13; A III – 11-12. Scales along lateral line 48 to 56. **Size:** common to 20 cm. Fig (17).

Fig (17). The specimen of *D. annularis* 175mm (TL), 103.15g (T.W) captured off Jableh coast.

4.1.2. *Diplodus cervinus* (Lowe, 1838)

Common name: Zebra sea bream**.**

Fin formula: D XI- XII + 11-14; A III+ 10-12; caudal fin forked. Scales along lateral line 51 to 62. **Size:** common to 35 cm. Fig (18).

Fig (18). *Diplodus cervinus*, 165 mm (TL), 96.17 g (T.W) captured off Jableh coast.

4.1.3. *Diplodus puntazzo* Gmelin 1789

Common name: Sharpsnout sea bearm**.**

Fin formula: D XI + 12-15 (first spine short); A III + 11-13; caudal fin forked. Scales along lateral line 53 to 64 (scales on caudal-fin base excluded). **Size:** common to 30 cm. Fig (19).

Fig (19). *Diplodus puntazzo*, 213 mm (TL), 167.31 g (T.W) captured off Raas Al-Bassit coast.

4.1.4. *Diplodus sargus* (Linnaeus 1758)

Common name: White sea bream.

Fin formula: D XI-XII (rarely XIII) +12 -15; AIII + 12-14; caudal fin forked. Scales along lateral line 58 to 67. **Size:** common 20- 25 cm. Fig (20).

Fig (20). *Diplodus sargus* 180 mm (TL), 111.02 g (T.W) captured off Tartus coast.

4.1.5. *Diplodus vulgaris* (Geoffroy Saint Hilaire, 1817)

Common name: Common two-banded sea bream.

Fin formula: D XI- XII+ 13-16; A III + 12-15; caudal fin forked. Scales along lateral line 51 to 61. **Size:** common to 25 cm. Fig (21).

Fig (21). *Diplodus vulgaris* 173 mm (TL), 93.6 g (T.W) captured off Tartus coast.

4.2. Genus Pagrus Cuvier

Diagnostic characters: Body oblong, more or less deep, compressed; upper profile of head convex with a very slight gibbosity in front of eyes which are small to moderate; scales on check and opercle; lips rather thick; in front of jaws, 4_6 canine- like teeth; behind them more obtuse and shorter teeth, becoming more or less gradually molariform in 2_3 rows.

4.2.1. *Pagrus auriga* (Valenciennes, 1843)

Common name: Red-banded sea bream.

Fin formula: D XI + 10-12; the first 2 spines always very short, the third to fifth very long and filamentous, particularly in the young; A III + 8-9. Scales along lateral line 50 to 52. **Size:** common to 30 cm. Fig (22).

Fig (22). *Pagrus auriga*, 207 mm (TL), 155 g (T.W) captured off Raas Al-Bassit coast.

4.2.2. *Pagrus caeruleostictus* (Valenciennes 1830)

Common name: Blue-spotted sea bream.

Fin formula: D XI- XII + 9-11; the first 2 spines always very short, the third to fifth longest, filamentous in the young; A III+ 8-9; first soft ray of pelvic fins filamentous. Scales along lateral line 51 to 54. **Size:** common to 45 cm. Fig (23).

Fig (23). *Pagrus caeruleostictus*, 168 mm (TL), 77.18 g (T.W) captured off Lattakia coast.

4.2.3. *Pagrus major* (Temminck & Schlegel 1843)

Common name: red seabream

Fin formula: D XII+10; Anal fin: A III+8. Scales along lateral line 56. **Colour:** Dorsal surface brown-red becoming pinkish-silvery on the belly. Body covered with numerous bright blue spots. **Size:** common to 25 cm. Fig (24).

Fig (24). *Pagrus major* , 214 mm (TL), 169.1 g (T.W) captured off Tartus coast.

4.2.4. *Pagrus pagrus* (Linnaeus, 1758)

Common name: sea bream.

Fin formula: D XII + 9-12; A III + 8-9. Scales along lateral line 52 to 60. **Size:** common to 35 cm. Fig (25).

Fig (25). ***Pagrus pagrus*****, 255 mm (TL), 273.6 g (T.W) captured off Tartus coast.**

4.3. Genus *Sparus* Linnaeus 1758.

4.3.1. *Sparus aurata* (Linnaeus, 1758)

Common name: Gilt-head sea bream

Diagnostic characters: Body oval, moderately deep and compressed. Mouth low; 4 to 6 canine-like teeth anteriorly in each jaw, followed posteriorly by blunter teeth which become progressively molar-like and are arranged in 2 to 4 rows (teeth in the 2 outer rows stronger). **Fin formula:** D XI + 13-14; A III + 11-12. Scales along lateral line 73 to 85. **Size:** common to 35 cm. Fig (26).

Fig (26). ***Sparus aurata*****, 28 mm (TL), 258.3 g (T.W) captured off Tartus coast.**

The species recorded previously, and were not found during this study in the Syrian marine waters are:

1. *Crenidens crenidens* (Forsskål 1775)

Common names: Karenteen sea bream**.**

Fin formula: D XI +11; A III + 10; caudal fin forked. Scales moderate, 52 to 60 in lateral line. **Size:** From 10 to 16 cm TL (20 cm TL).

Distribution: Red Sea to Durban and Mediterranean Sea as Red Sea immigrant. The first documented record of *C. crenidens* in the Syrian marine waters was by Saad *et al*., (2002).

2. *Dentex gibbosus* (Rafinesque 1810)

Common name: Pink dentex.

Fin formula: D XII+10-11; first 2 dorsal-fin spines very short and decreasing in length from the third backward; A III + 7-9; first soft ray of pelvic fin filamentous. Scales along lateral line 52 to 62. **Size:** Maximum: 100 cm; common to 60 cm.

Distribution: Mediterranean and Portugal to Angola, arounds Canary Islands. The first documented record of *Dentex gibbosus* in the Syrian marine waters was by Sbaihi, (1994).

3. *Centracanthus cirrus* Rafinesque 1810

Fin formula: D XIII + 9-10; A III + 10. Lateral-line scales 86 to 89 to base of caudal fin. Swimbladder not bifurcate. **Colour**: brownish dorsally, silvery below. **Size:** Maximum to 20 cm; common to 15 cm. **Distribution:** Eastern Atlantic and Mediterranean. The first documented record of *Centracanthus cirrus* in the Syrian marine waters was by Sbaihi, (1994).

4. *Rhabdosargus haffara* (Forsskål 1775)

Common name: Haffara seabream

Fin formula: D XI- XII + 11-14; A III + 10-11, 2nd and 3rd spines subequal; pectoral fins long, reaching almost to level of first anal spines, caudal fin forked. Lateral-line scales 58 to 66. **Distribution:** Red Sea to western Indian Ocean: East Africa and Madagascar to Persian Gulf; Mediterranean Sea (Red Sea immigrant). The first documented record of *Rhabdosargus haffara* in the Syrian marine waters was by Saad, (2005).

5. *Evynnis ehrenbergii* (Valenciennes 1830)

Fin formula: D XI- XII + 9-14; A III + 8-9; the first 2 spines always very short, the third to fifth longest. **Size:** Maximum: 43 cm; common to 20 cm. **Distribution:** Mediterranean Sea and West African coast. The first documented record of ***Evynnis ehrenbergii*** in the Syria marine waters was by Saad, (2005).

Conclusions:

1. The existence of (25) species belong to (11) genera of the family Sparidae in the Syrian marine waters, has been documented.
2. For the first time on the Syrian marine waters, *Pagellus bogaraveo* and *Pagrus major* have been recorded in this study.

Recommendations:

1. Follow-up taxonomic studies on fish fauna to survey the exotic fish species in the Syrian marine waters, and note the ability of these migratory species to adapt to the environmental conditions prevailing in our region.
2. Completion of the database on the biological studies of this economic species in the Syrian marine waters to form a scientific and knowledge base that helps us developing mariculture on the Syrian coast.

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