

**IDENTIFICATION OF FISHES BELONGING TO FAMILY  
CENTRACANTHIDAE IN THE EGYPTIAN MEDITERRANEAN  
WATERS**

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**Key Words: Taxonomy, Family Centracanthidae.**

**ABSTRACT**

Three species belonging to family : Centracanthidae are recorded in the catch of the Egyptian Mediterranean waters. These are: *Spicara flexuosa* (Rafinesque, 1810), *Spicara smaris* (Linnaeus, 1758) and *Spicara maena* (Linnaeus, 1758). Body depth, pre-ventral length, pre-pectoral length, standard length and body colour are reliable for identification of these species. Body depth, pre-ventral length and pre-pectoral length for *S. flexuosa* and *S. maena* are relatively greater than in the corresponding lengths for *S. smaris* while the reverse is shown with respect to standard length which has slight shorter dimension. Body colour is quite different in fresh *S. flexuosa* as compared with *S. maena* since the first has grey brownish colour with three yellow longitudinal bands situated below the lateral line while in *S. maena* its body has blue-olive colour.

**INTRODUCTION**

Picarels (Family: Centracanthidae) are represented in the Mediterranean basin by only one genus with four species namely: *S. flexuosa*, *S. smaris*, *S. maena* and *S. cirrus* (Hureau and Monod, 1979; Whitehead et al., 1986. and Fisher et al., 1987). In spite of the low economic value of picarels as compared to the other fishes obtained from the Egyptian Mediterranean waters, they constitute a remarkable percentage in the catch of the bottom trawlers (Rizkalla, 1992 and Faltas, 1993). Only the first three species of picarels are found in the catch of the Egyptian Mediterranean waters. The local names of these fishes are Mozat garr or Moza mabrouma.

The present work is considered to be the first on this family in Egypt and is directed to know the diagnostic features of the three species (S. flexuosa, S. smaris and S. maena).

## ***MATERIAL AND METHODS***

Picarels used in the study were obtained from bottom trawlers operating in the Egyptian Mediterranean waters during the period from January to December 1993. A total of 320 specimens of S. flexuosa, 212 of S. smaris and 105 of S. maena were examined. Morphometric measurements were made on specimens and were measured to the nearest millimeter as illustrated in fig. (1). These measurements are: total length (T. L.), forked length(F. L.), standard length(S. L.), head length (H. L.), pre-dorsal length (Pr. D.), dorsal fin base (D. F. B.), pre-pectoral length (Pr. P), pre-ventral length (Pr. V.), pre-anal length (Pr. A.), anal fin length (A. F. L.), body depth (B. D.), pre-orbital distance (Pr. O.), post - orbital length (P. O.), eye diameter (E.D.) and inter-orbital width (I.O.). The morphometric index of each character was calculated as percentage to total body length or head length by using the following formula:

$$\text{Morphometric measurements} / \text{Total length or head length} \times 100$$

Meristic characters including number of spines, rays and vertebrae were recorded. Statistical analyses (standard deviation and t-test) in the present study were made according to Snedecor and Cochran (1982).

## ***RESULTS***

### **Diagnostic features of the species:**

1- Spicara flexuosa (Rafinesque, 1810).

Synonyms:

Smaris chryselis Valenciennes, 1830,

Smaris gagarella Valenciennes, 1830.

This species is one of the most common picarels in Egypt. Collected samples varied in length from 8.0 cm. to 21.0 cm. . Body shape is oblong with an edge more or less convex in its spiny part. Mouth is protractile. Teeth of villiform type are present on both jaws. Dorsal fin comprises 11 spines and 11 rays.

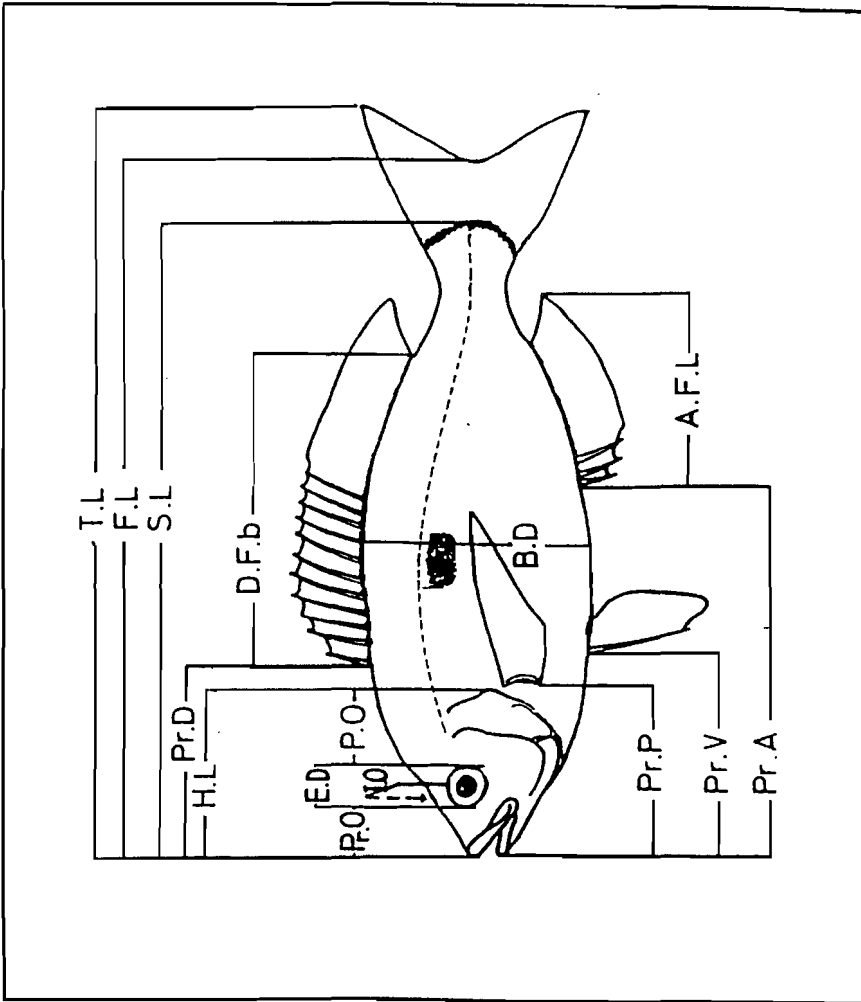


Figure 1: The different morphometric measurements in *Spicara* Species.

Pectoral fin with 14 rays. Ventral fin with one spine and 5 rays. Anal fin with 3 spines and 9 rays. Caudal fin is forked and its upper lobe is slightly longer than its lower one. Eye is covered by a transparent membrane (eye lid). Colour of the body is grey brownish. A brown quadrilateral patch is found on each body side with three narrow longitudinal yellow bands below the lateral line. Number of vertebrae is 22 including an urostyle. (Fig.2)

2- Spicara smaris (Linnaeus, 1758).

Synonyms:

Sparus alcedo Risso, 1810,

Smaris vulgaris Valenciennes, 1830,

Smaris gracilis Bonaparte, 1836,

Smaris maurii Bonaparte, 1836.

This species is considered to be as another most important type of picarels. It appears in the catch with varying lengths from 9.0 cm. to 18.0 cm.. The body is elongated with a protractile mouth. Villiform teeth are present on both jaws. Dorsal fin contains 11 spines and 11 rays. Pectoral fin with 14 rays. Ventral fin with one spine and 5 rays. Anal fin has 3 spines and 9 rays. Eye is covered by an eye lid. Number of vertebrae is 21 with one urostyle. Colour of the body is grey brown above and silvery below. A rectangular black spot is present below the lateral line. During the spawning period from March to May, males show certain characteristic colours. Irregular blue lines are found on both body sides. A black spot is present on the upper part of the membrane connecting the first three dorsal spines. White small circular spots are found on the membrane connecting the dorsal spines and rays. Tail has irregular blue spots. (Fig.3)

3- Spicara maena (Linnaeus, 1758).

Synonyms:

Maena vulgaris Valenciennes, 1830,

Maena jusculum Valenciennes, 1830.

This species is rarely found in the Spicara catch. Samples obtained ranged from 9.0 cm. to 16.0 cm. . Head is elevated posteriorly in large specimens. Mouth is protractile with villiform teeth on both jaws. Dorsal fin has 11 spines and 11 rays. The last two rays originate from one base. Pectoral fin rays range from 12 to 15 with a modal value 14 rays. Ventral fin with one spine and 5 rays. Anal fin with 3 spines and 9 rays. The last 8th and 9th rays are united basically. Number of vertebrae 22. Colour of the body is blue-olive above and silvery with scattered blue spots below. A black spot is present on both body sides. Pectoral fin with light red margin. (Fig.4)

The index range, mean value and standard deviation of each morphometric character of the three species of picarels are given in Table (1).

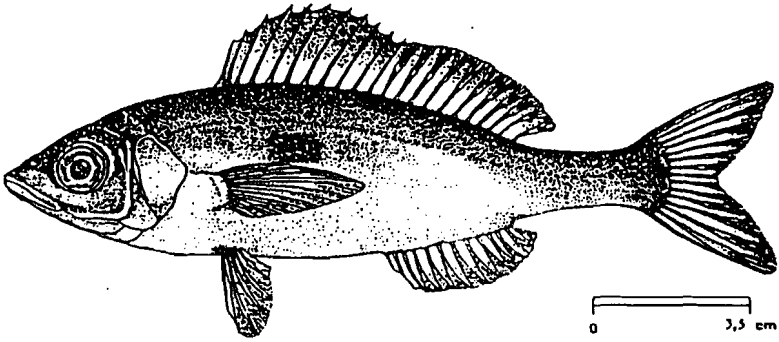


Figure 2: Spicara flexuosa

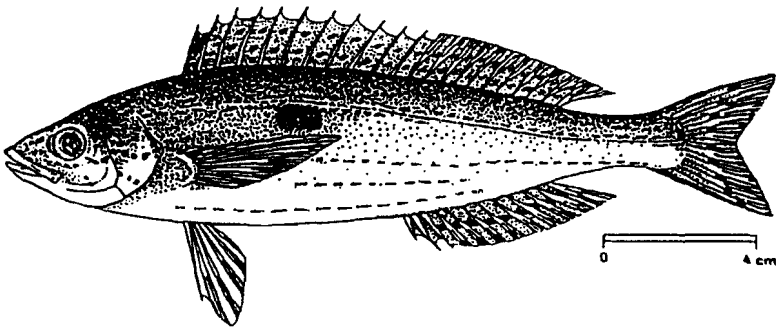


Figure 3: Spicara smaris

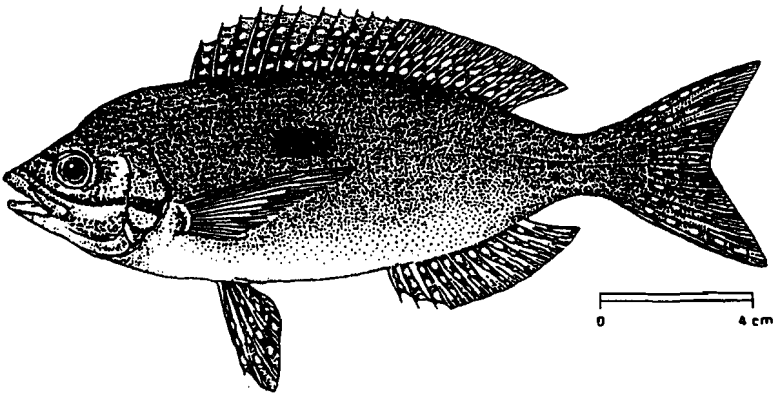


Figure 4: Spicara maena

Table (1): Ranges and mean values of different percentages of body proportions of *S. flexuosa*, *S. maena* obtained from the Egyptian Mediterranean waters (January-December 1993).

Morphometric characters	<i>Spicara flexuosa</i>		<i>Spicara smaris</i>		<i>Spicara maena</i>	
	Index range	Mean±s.d.	Index range	Mean±s.d.	Index range	Mean±s.d.
F.L.	87.86-92.00	89.85±1.0700	89.00-92.11	90.58±0.9471	89.46-92.22	90.70±1.0376
S.L.	26.25-80.00	78.71±1.1045	79.71-82.42	80.98±0.7742	77.93-80.82	79.39±0.9893
H.L.	20.71-23.50	21.65±0.6670	19.71-22.11	20.78±0.7676	20.94-22.27	21.49±0.4488
Pr.D.	22.71-26.00	24.50±0.8217	23.33-25.25	24.54±0.6479	24.38-25.75	25.08±0.4786
D.F.B	38.75-43.56	42.40±1.1818	39.00-42.78	41.39±1.2376	40.00-42.27	41.59±0.7573
Pr-P.	22.38-25.56	23.58±0.8024	21.67-23.44	22.59±0.5243	23.20-24.44	23.58±0.3885
Pr-V.	25.82-28.13	27.24±0.5769	25.30-27.44	25.86±0.6104	26.60-27.50	27.18±0.4588
Pr-A.	48.48-52.50	49.75±1.2584	48.59-51.08	50.28±0.7552	48.00-50.00	48.94±0.6445
A.F.L	14.00-16.35	15.56±0.6082	14.25-15.83	15.01±0.5272	15.21-16.75	15.91±0.5751
B.D.	16.50-22.26	19.76±1.6907	12.70-15.86	14.19±1.0030	16.67-20.67	18.98±1.2113
Pr-O.	25.00-35.29	29.06±2.2045	26.39-28.7	27.88±0.7305	26.26-31.58	28.13±1.6933
P.O.	27.66-39.34	33.56±3.3851	32.16-38.89	34.87±1.9769	31.58-37.37	35.91±2.5900
E.D.	25.53-32.35	30.07±1.8611	27.78-33.17	30.38±1.7682	27.69-31.58	29.36±1.4691
I.O.	20.00-31.72	27.37±3.085	23.12-28.96	25.70±2.0833	25.87-29.22	27.24±1.2062

s.d.± = standard deviation

On comparing the morphometric indices of S. smaris, S. flexuosa, and S. maena the following results were obtained:

**A- For S. smaris and S. flexuosa :**

The mean value of four morphometric indices for S. flexuosa are significantly higher at 1% level than those for S. smaris. These are: Body depth, pre-ventral length, pre-pectoral length and head length indicating that the fish of the former has slightly longer dimensions than those of the second. But the reverse is observed with respect to standard length which has significantly slight shorter dimension at 1% level.

**B- For S. flexuosa and S. maena :**

Comparisons between the morphometric indices for the two species show non significant differences for all the characters at 1% level. Confusion may occur in the differentiation between S. flexuosa and S. maena as both have identical morphometric characters.

**C- For S. smaris and S. maena :**

It is observed that only 6 morphometric indices out of 14 are reliable for the differentiation between the two species as S. maena has slightly longer dimensions for body depth, pre-ventral length, pre-pectoral length and anal fin length than those of S. smaris while the reverse is shown with respect to standard length and pre-anal length which have significantly slight shorter dimensions.

## ***DISCUSSION***

Studying the biometric characters of any fish including its morphometric and meristic characters are very essential in identifying its species (Barlow, 1961; Ezzat et al., 1979 and Wadie et al., 1987). Very little is known about the morphometric characters of the different species of picarels in the Mediterranean waters. Hattour et al. (1985) studied the morphometric characters of S. flexuosa in the Tunisian waters. Ragab (1992) mentioned the presence of four species of picarels in the Egyptian Mediterranean waters but the present study recorded only three species during the period of investigation (January - December 1993). These are S. flexuosa, S. smaris and S. maena. The first two species are more common in the catch while the third one is rarely found. Differentiation between the three species cannot be dependent on

their meristic characters as all of them have nearly the same number of spines, rays and vertebrae. Differentiation can be performed on the basis of the following items: Body colour, body depth, pre-ventral length, pre-pectoral length and standard length. Fresh S. flexuosa is found to have grey brown colour with three yellow longitudinal bands along the body side situated below the lateral line while for S. maena the body has blue-olive colour. Such finding coincides with John and Lythgoe (1975) who showed that identification of most sea breams can be done from their markings, head profile and colour of the body. On the other hand, body depth, pre-ventral length and pre-pectoral length for S. flexuosa and S. maena are slightly longer than those of S. smaris while the reverse is shown with respect to standard length which have shorter dimensions.

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