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(RESEARCH ARTICLE)

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The occurrences and reclassification of eagle ray *Aetobatus flagellum* (Bloch & Schneider,1801) in Iraqi Marine waters

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Abstract

The species *Aetobatus flagyllem* was caught and reclassified in the Iraqi marine waters on board the boat Anwar 2, and from its specifications, 17 morphometric traits were calculated. The species contains three thorns to defend against prey. It is noted that some morphometric traits are close to each other after using the PCA analysis for some traits of the species from different environments.

Keywords: *A flagyllum*; Iraqi marine waters; Morphometric; PCA

1. Introduction

Over the last decade, the scientific community has paid considerable attention to the conservation of elasmobranchs. The combined effects of increased fishing pressures, habitat degradation, and climate change have caused the decline of many shark and ray species [1] Aetobatus, Aetomylaeus, Manta, Mobula, Myliobatis, Pteromylaeus, and Rhinoptera are the seven genera and 37 species that make up the family Myliobatidae (eagle rays). [2]. At least four nominal species of the genus *Aetobatus Blainville,* 1816 exist: *A. flagellum, Aetobatus laticeps* Duméril, 1865, *Aetobatus narinari* (Euphrasen, 1790), and *Aetobatus ocellatus* (Kuhl, 1823), The IUCN Red List of Threatened Species classified *A. flagellum* as "Endangered" due to its apparent scarcity, preference for coastal waters with high and growing levels of fishing effort, and assumed restricting life history characteristics, As mentioned [3] Previously known as A. flagellum, it has been reported. *Aetobatus flagellum*, a medium-sized eagle ray, matures at around 500 mm DW for males and 900 mm DW for females. Females appeared to live longer and expanded to bigger sizes than men. For ladies, the maximum age limit was 19 year, while for men, it was nine year. Both sexes grew similarly up to the age of two year, but after that point, females became bigger. Eagle rays only ate bivalves. [4]. Among the previous studies on *Aetobatus flagellum* in Iraq, including the study of [5].while attending studding in southern Iraq's Shatt Al-Basra. The aim of study Knowing the existence *Aetobatus flagellum* of the three-pronged snail and reclassifying it in the Iraqi marine waters.

2. Material and Methods

long, 4.5 The fishing survey boat (Anwar 2), which is 16 meters meters broad, has a 2-meter draft, and has a horsepower of 150 horses, was used to catch fish. Each boat has a trawl net with a mesh size of 5x5 cm and a bag mesh of 3x3 cm, as well as a net pull line that is between 75 and 100 meters long. In November, two specimens were procured from Iraqi maritime waters after three hours of net pulling.2021. Using a trawl net, the marine waters specified by the coordinates (29 ° 43'33.41 "N; 48 ° 43'43.46" E), (figure. 1) based on the commercial fishing industry. The specimens are stored at the Department of Marine Vertebrates in Iraq's Marine Science Centre. An electronic caliper and a fish measuring board were used to measure 17 morphometric features to the nearest millimeter. [6,7,8]. The percentage of standard length was used for all morphometric measurements.

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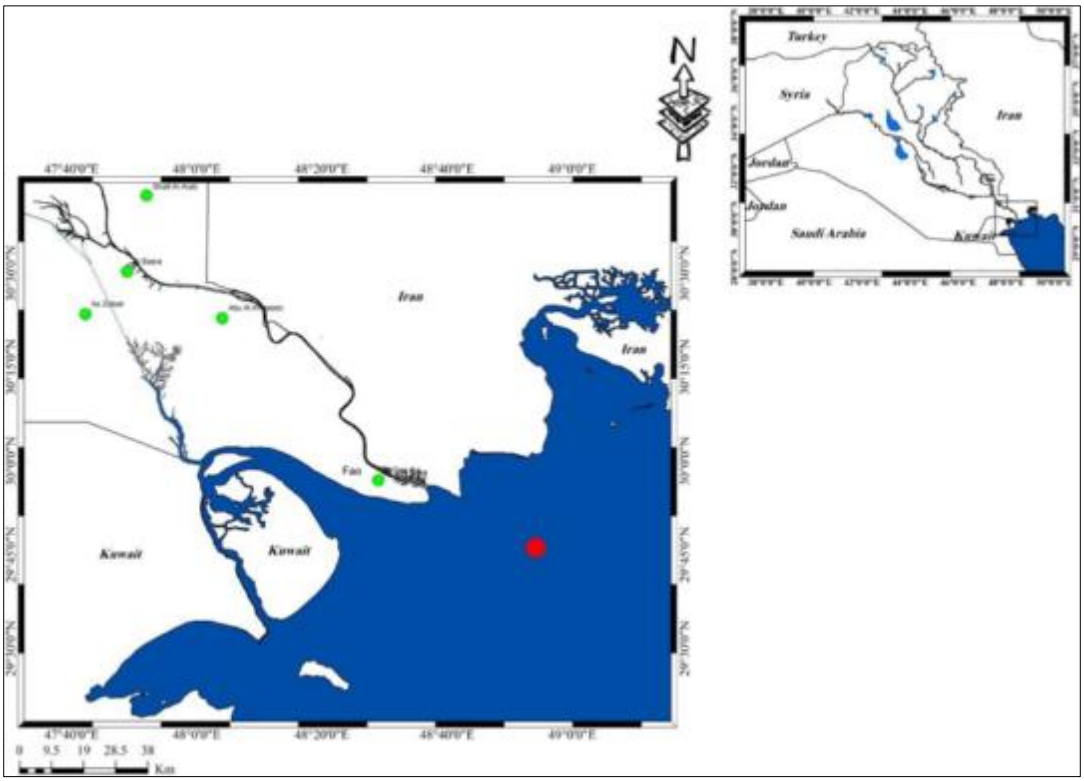

Figure 1 Explain present study area in marine waters

2.1. Description of spacemen

Figure 2 Dorsal view of *A. flagellum* from Iraqi marine water

The color is black and the cache is long and there are five respiratory holes, the mouth is solid and contains large teeth and lips and are always "relatively large models" and thus they are large clasper and the disk is wide and thicker and

the tail is long and thick and sometimes these types are characterized by an appearance and category that have thorns at the beginning of the strong and toxic tail that defends it Its themselves while being at risk from other prey, and the models are sometimes with one, two or three thorns, and they are spread in marine waters, and sometimes fresh water enters.(Figure,2).

3. Result and Discussion

A. flagellum belong to the following classification section:

Class: Elasmobranchii
Order: Myliobatiformes
Family: Myliobatidae
Genus: *Aetobatus Blainvilla*, 1816
Species: *A. flagellum* (Bloch & Schneider, 1801)
Raja flagellum Bloch & Schneider, 1801

Table (1) shows a measurement of 22 morphometric characteristics of the species, and it is noted that it is measured in percentage of disc width. It is noted in Table (1) that the width of the disc is 770, and this does not agree with [5]. as he recorded 280 during his study on the Shatt Al-Basra and [3]. as he recorded 353.25 during his study on the coasts of Kuwait. It is also noted that the rest of the morphometric traits are not similar to some trait measurements in most of the previous studies, While it is noted that the strong association of *A. flagellum* with tropical and non-tropical estuaries and its presence in marine waters[9].

Table 1 Demonstrates for the *A. flagellum*'s morphometric. measurements that are given as a % of disc width

Morphometric characters	**(mm)**	**% in Disc width**
Disc width	770.0	
Disc length	510	66.23
Disc thickness	60	7.79
Preorbital length	90	11.6
Preoral length	85.0	11.03
Tail length	980	127.2
Head length (ventral)	253.0	32.8
Head width at mid-eye	102	13.2
Head height at mid-eye	82	10.6
Interorbital width	81	6.23
Spiracle length (longest)	78.0	10.12
Spiracle width (narrowest)	20	2.59
Orbit diameter	80.1	10.3
Eye diameter	10	1.29
First gill slit width	3	0.38
Third gill slits width	2	0.25
Fifth gill slit width	1	0.12
Dorsal fin length	50	6.49
Dorsal fin height	24	3.11
Pelvic fin length	118	15.32

Pelvic fin base	63	8.18
Clasper outer length	53.0	6.88

When comparing the morphometric characteristics of previous studies and the present study, it is noted that there are differences for the species in different environments, as well as between sex (Table. 2).

Table 2 Explain It shows the morphology characteristics of previous studies and the present study for species *A. flagellum*

Morphometric characters	**[5] (mm)**	**[3] (mm)**	**Present study**
Disc width	280.0	353.35	770.0
Disc length	185.0	62.1	510.0
Disc thickness	36.27	11.2	60
Preorbital length	35.1	10.8	90
Preoral length	40.07	11.5	85.0
Tail length	565.0	274.3	980
Head length (ventral)	60.32	29.9	253.0
Head width at mid-eye	42.99	16.5	102
Head height at mid-eye	27.89	9.7	82
Interorbital width	30.48	10.2	81
Spiracle length (longest)	9.56	5.6	78.0
Spiracle width (narrowest)	3.38	2.3	20
Orbit diameter	11.16	5.2	80.1
Eye diameter	6.51	2.2	10
First gill slit width	4.12	2.2	3
Third gill slits width	4.77	2.1	2
Fifth gill slit width	4.03	1.7	1
Dorsal fin length	11.77	6.3	50
Dorsal fin height	17.90	3.3	24
Pelvic fin length	42.37	16.6	118
Pelvic fin base	15.53	7.1	63
Clasper outer length	7.88	6.4	53.0

It is also noted that ray from the ventral side contains 5 nostrils and two large eyes and contains a large clasper and three strong thorns for defense figure (3.A,B ,C ,D).

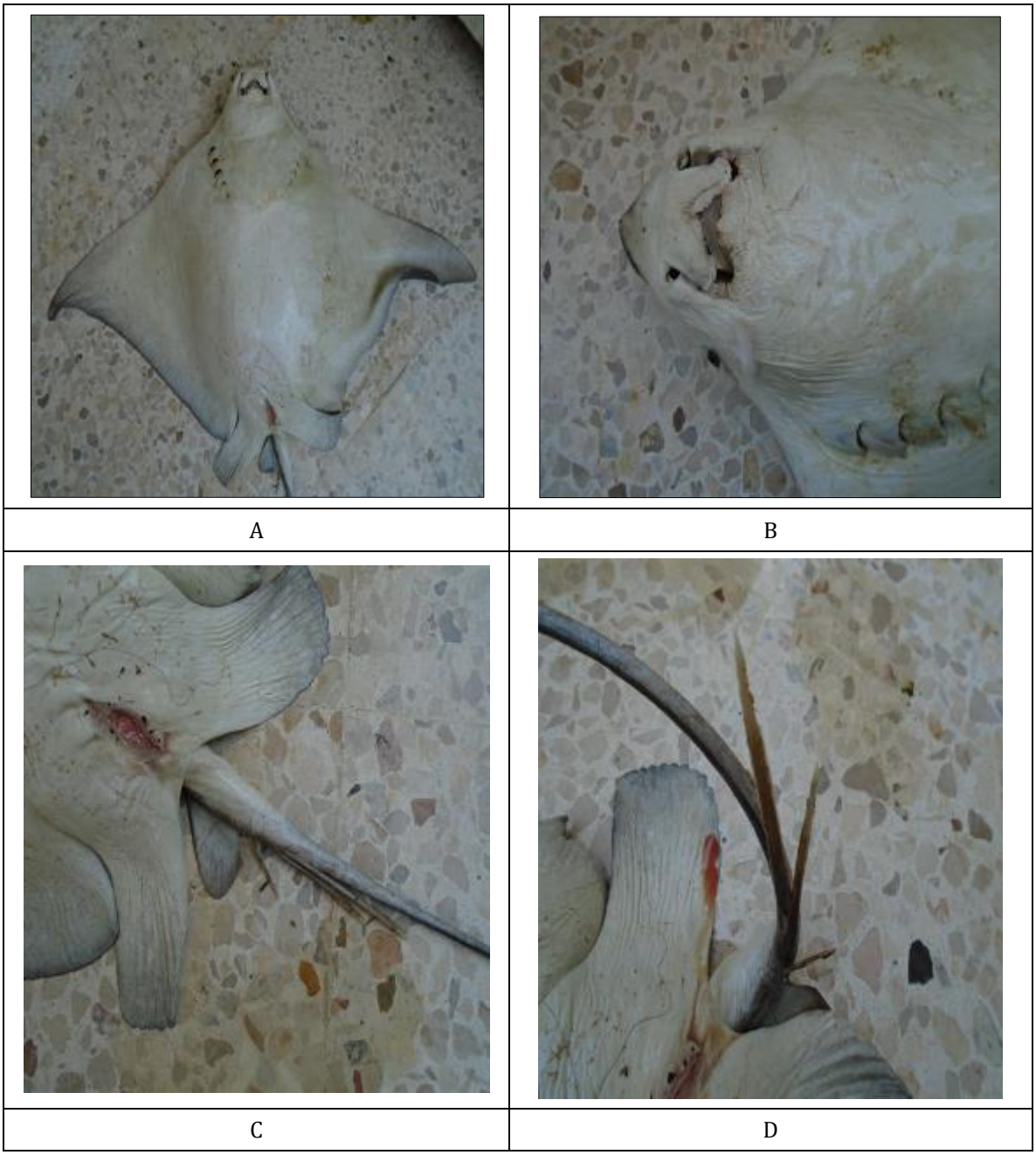

Figure 3(A,B,C,D) The ventral part, clasper and hard spines of the species *Aetobatus flagellum*

The presence of elasmobranch species, including the *A*. *flagellum*, which was recorded in the Arabian Gulf [3]. While occurrence *A. flagellum* the species was present in the Iraqi marine waters, even in small quantities, which claimed it to be on the red list threatened with extinction, according to the IUCN [10]. This species is considered a dangerous species for fishermen, as most of *A. flagellum* its contain one, two or three thorns. The animal defends itself from the danger of enemies. A recipe has been restored in the Arabian Gulf, represented by Kuwait and some countries such as Indonesia and Malaysia. It seems that it is particularly vulnerable to the effects of fisheries 3].

While it was previously recorded in large quantities in the Arabian Gulf, especially the State of Kuwait, where [11].recorded 36 individuals in the Gulf, males and females, whose weights ranged between (277-580) and (330-746) mm dry weight, respectively. Before the Kuwait Institute for Scientific Research and also: It was previously recorded" from [12]. with two samples of individuals near Visakhapatnam off Northeast India . It is noted recently that the number of the species has begun to dwindle a lot because it has become one of the endangered species due to the large number of by-catch with fish and as a result of the change in the great environmental conditions to which the world is exposed

to by climatic changes, which led to changing the stable environments of the species and this confirmed [5]. during A hunted in the Shatt al-Basra canal, which they attributed to entering the canal in search of food.

It was used in PCA's analysis of the three studies and different environments. The analysis of the morphology traits of the species shows that the adjective pelvic fin length(PFL) and orbit dimeter (OD)are far from the species and according to the environment of the species from which they are caught, while the rest of the traits converge to the species and the great similarity between them and close to the point of origin(Figure,4).

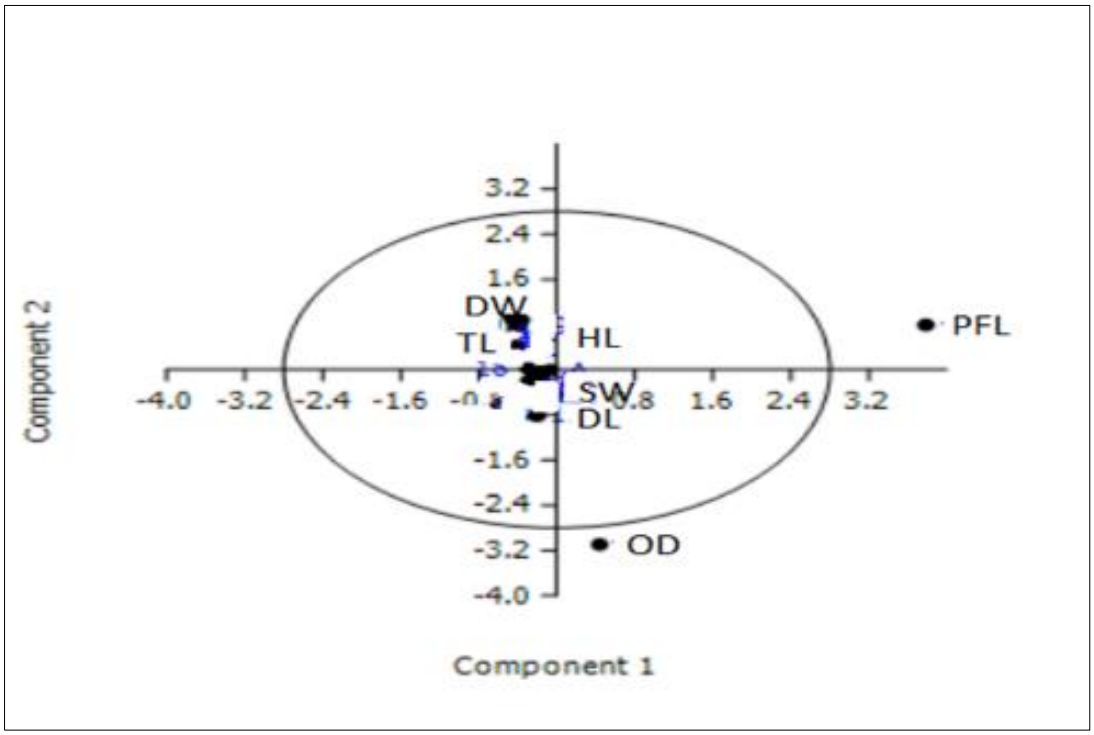

Figure 4 PCA analysis shows the Morphometric characteristics of the species

4. Conclusion

The present study concluded to reclassify the species *A flagyllem* in Iraqi marine waters and included the presence of the species threatened with extinction, which is caught as an accidental product with fish and not returned to the sea by fishermen, which reduced its quality in marine waters and was included in the red list. Morphological characteristics, divergence and convergence were studied with respect to species in different environments.

Compliance with ethical standards

Acknowledgments

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