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## FIRST SUBSTANTIATED RECORD OF *GADELLA MARALDI* (MORIDAE) FROM THE ALGERIAN COAST (SOUTHERN MEDITERRANEAN SEA)

### SUMMARY

Four specimens of *Gadella maraldi* (Risso, 1810) were collected from the Algerian coast, they ranged from 104 to 145 mm in total length, and their total body weight from 5.6 to 17.9 g. These captures constitute rare records of the species from the Algerian coast and confirm its occurrence in the area, where it was previously considered as doubtful. A single specimen is described including morphological measurements, meristic counts and colour. However, due to a lack of records, the real status of the species in the Algerian waters still remains questionable.

### INTRODUCTION

*Gadella maraldi* (Risso, 1810) is known in the eastern Atlantic from the western coast of Ireland to the northern continental shelf of Spain and the southern coast of Portugal (RUIZ-PICO *et al.*, 2012). South of the Strait of Gibraltar, the species has been reported from Madeira, Josephine Bank, Azores, Great Meteor Bank and Canary Islands (BAÑON *et al.*, 2010).

*Gadella maraldi* occurs in the western Mediterranean Basin and the Adriatic Sea (Cohen, 1986). To the east, the species has been found in the Turkish waters (KABASAKAL, 1998) and the Levant Basin (GOLANI, 2005). COHEN *et al.* (1990) noted the occurrence of the species from the Maghreb shore probably based on previous records reported by MAURIN (1962).

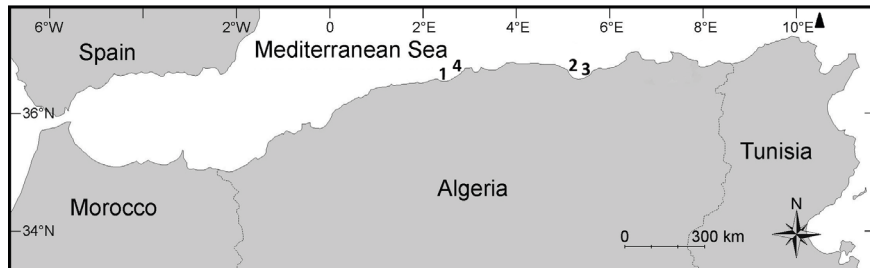
On 30 September 2019, RAFRAFI-NOUIRA *et al.* (2020) noted the capture of a specimen of *G. maraldi*, from the northern Tunisian coast where a first specimen has been already recorded, confirming its presence in an area where it was first recorded by MAURIN (1962) near the Resgui Bank."

*Gadella maraldi* was first recorded in the Algerian marine waters by DIEUZEIDE *et al.* (1954) in the Bay of Bou Ismail (formerly Castiglione) and then by MAURIN (1962) in the Bay of Béjaïa (formerly Bougie) where an additional record of the species was later noted by REFES (2011).

The captures of some specimens of *G. maraldi* are reported in the present study with a description of the species and comments about the distribution and the status of the species in the area and the Mediterranean Sea

## MATERIAL AND METHODS

On 07 May 2024, four specimens of *Gadella maraldi* were collected by a shrimp boat off Bouharoun, city located in the Bay of Bou-Ismaïl, central Algerian coast (Fig. 1), at depths between 183 and 457 m by 36° 38' 60." N and 2° 42" 0.0" E, on soft bottoms together with velvet belly *Etmopterus spinax* (Linnaeus, 1758), blackspot grenadier *Coelorinchus caelorhincus* (Risso, 1810), silver scabbard fish *Lepidopus caudatus* (Euphrasen, 1788), *Epigonus denticulatus* (Risso, 1810) and snipe fish *Macroramphosus scolopax* (Linnaeus, 1758). *Gadella maraldi* and the other species were identified through papers and field guides (see *infra*).



**Fig. 1** - Map of the Maghreb shore indicating the capture sites of *Gadella maraldi*: black triangle, Resgui Bank (MAURIN, 1962), and northern Tunisia (RAFARAFI *et al.*, 2019). Bay of Béjaïa: **2.** MAURIN (1962). **3.** REFES (2010). Bay of Bou-Ismaïl: **1.** DIEUZEIDE *et al.* (1954). **4.** This study.

The four available specimens were measured for total length (TL) and total body weight (TBW). However, a single specimen was conserved and delivered to the laboratory of the «Ecole Nationale Supérieure des Sciences de la Mer et de l'Aménagement du Littoral (ENSSMAL)» of Algiers. The specimen was frozen at -18° C and then preserved in 10% buffered formaldehyde in the ichthy-

ological collection of ENSSMAL. It received the catalogue number ENSSMAL-Gad.mar-1/4-Bh.24. Morphometric measurements to the nearest millimeter and percentages of standard length (SL), were recorded on this specimen (Tab. 1) following RUIZ-PICO *et al.* (2012) and RAFRAFI-NOUIRA *et al.* (2019). In addition meristic counts and total body weight in grams were also noted.

**Tab. 1.** - Morphometric measurements, in mm and percent of standard length (% SL), meristic counts and mass recorded in the specimen of *Gadella maraldi* (ref. ENSSMAL-Gad.mar-1/4-Bh.24) captured in the Bay of Bou-Ismaïl.

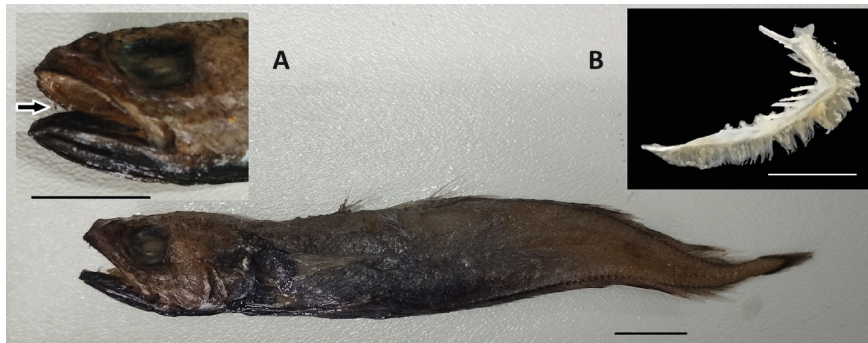
| References                 | ENSSMAL<br>Gad mar-1/4-Bh.24 |        | ISPAB Gad-mar-01                |        | IEOST 11001                 |      |
|----------------------------|------------------------------|--------|---------------------------------|--------|-----------------------------|------|
| Authors                    | This study                   |        | RAFRAFI-NOUIRA<br>et al. (2019) |        | RUIZ-PICO et al.<br>(2012). |      |
| Capture sites              | Central Algerian<br>coast    |        | Northern Tunisian<br>coast      |        | Northeastern Atlantic       |      |
| Morphometric measurements  | mm                           | %SL    | mm                              | %SL    | mm                          | %SL  |
| Total length               | 104                          | 105.05 | 215                             | 111.98 | 157                         | -    |
| Standard length (SL)       | 99                           | 100.00 | 192                             | 100.00 | 141                         | -    |
| Pre-anal length            | 34                           | 34.34  | 62                              | 32.29  | 48                          | 34   |
| Predorsal fin length       | 27                           | 27.27  | 60                              | 31.25  | 46                          | 32.6 |
| Prepectoral fin length     | 26.5                         | 26.77  | 57                              | 29.69  | -                           | -    |
| First dorsal fin length    | 11                           | 11.11  | 14                              | 7.07   | 12                          | 8.5  |
| Second dorsal fin length   | 39                           | 39.39  | 103                             | 53.68  | 78                          | 55.3 |
| Anal fin length            | 53                           | 53.54  | 120                             | 62.55  | 89                          | 63.1 |
| Pectoral fin length        | 4                            | 4.04   | 7                               | 3.64   | 28                          | 19.9 |
| Pelvic fin length          | 2                            | 2.02   | 2                               | 1.00   | 22                          | 15.6 |
| Head length                | 23                           | 23.23  | 45                              | 23.51  | 35                          | 24.8 |
| Eye diameter               | 6.5                          | 6.57   | 13.                             | 6.79   | 9                           | 6.4  |
| Body depth                 | 14                           | 14.14  | 37                              | 19.46  | 32                          | 22.7 |
| Preorbitary length         | 5.5                          | 5.56   | 13                              | 6.52   | -                           | -    |
| Interorbital length        | 5.2                          | 5.25   | 12                              | 5.96   | 9                           | 6.4  |
| Length of upper jaw        | 9                            | 9.09   | 27                              | 13.98  | -                           | -    |
| Length of lower jaw        | 8                            | 8.08   | 24                              | 12.71  | -                           | -    |
| Length of right pelvic fin | 12                           | 12.12  | 18                              | 9.30   | -                           | -    |
| Length of left pelvic fin  | 11.5                         | 11.62  | 28                              | 14.33  | -                           | -    |
| Meristic counts            |                              |        |                                 |        |                             |      |
| First dorsal fin rays      | 10                           | 11     |                                 |        | 10                          |      |
| Second dorsal fin rays     | 56                           | 55     |                                 |        | 54                          |      |
| Anal fin rays              | 60                           | 60     |                                 |        | 60                          |      |
| Pectoral soft fin rays     | 24                           | 24     |                                 |        | 24                          |      |

|                           |     |      |   |  |      |
|---------------------------|-----|------|---|--|------|
| Pelvic fin soft rays      | 7   | 7    |   |  | 7    |
| Scales in lateral line    | -   | 96   | - |  |      |
| Number of gill rakers     | 5+7 | 12   |   |  | 12   |
| Number of vertebrae       | -   | 54   | - |  |      |
| Total body weight in gram | 5.6 | 97.6 |   |  | 19.7 |

## RESULTS AND DISCUSSION

The TL of the 4 examined specimens ranged from 104 to 145 mm, and their TBW from 5.6 to 17.9 g. *Gadella maraldi* reaches 150 mm TL as maximum size and the first sexual maturity occurs at 150 mm TL (COHEN, 1986). Among the collected specimens, a single male of 145 mm TL has been observed, conversely the sex was not determined in the 3 other specimens. *Gadella maraldi* is a carnivorous species which feeds on small benthic invertebrates and teleost species. The stomach of the referenced specimen was empty.

The specimens were identified as *G. maraldi* via the combination of main morphological characters as follows: body elongated and slightly compressed exhibiting a large head (4.3 times in SL) and tapering posteriorly, chin absent, oblique mouth, jaw in a narrow row 2-3 teeth, some teeth larger, pointed and strongly curved at distal end, no on vomer and palatines, large eye, two dorsal fins with the first slightly higher than the second, anal fin not indented originated behind the origin of first dorsal fin., caudal fin rounded at distal end, pectoral fins extending beyond the origin of pelvic fin, filamentous ray of pelvic fin extending slightly beyond anal fin origin, entire body covered with small cycloid scales, including the head except on chick and lips, light organ present as a small naked patch on the belly, colour brownish-black, pectoral bluish-black, oral cavity pale (Fig. 2).



**Fig. 2** - Specimen of *Gadella maraldi* (ref. ENSSMAL-Gad.mar-1/4-Bh.24) captured in the Bay of Bou-Ismaïl, scale bar = 10 mm. **Insert A.** Head of the same specimen, with arrow showing the teeth, scale bar = 10 mm. **Insert B.** Gillraker of the first branchial arc removed from the same specimen, scale bar = 5 mm.

General morphology, morphometric measurements, meristic counts and colour are consistent with previous descriptions of *G. maraldi* such as MAUL (1953), AGUIAR and PEREIRA (1982), COHEN (1986), COHEN *et al.* (1990), KABASAKAL (1998), RUIZ-PICO *et al.* (2012) and RAFRAFI-NOUIRA *et al.* (2019). The present specimen of *G. maraldi* referenced ENSSMAL-Gad.mar-1/4-Bh.24 constitutes the first substantiated record of the species from the Algerian coast, due to the fact that no specimen was preserved from the previous records reported in the area. The concept of substantiated record follows SALAMEH *et al.* (2012) who noted that the occurrence of the yellowbar angelfish *Pomacanthus maculosus* (Forsskal, 1775) in the Levant Basin where the species was first recorded from Lebanon based on a photographed but not preserved specimen to enable further examination (BARICHE, 2010). The captures of *G. maraldi* from the Algerian coast and confirms the occurrence of the species which should be included at present in the local ichthyofauna. and extend to the west the range of the species along the Maghreb shore.

AGUIAR and PEREIRA (1982) noted that *G. maraldi* was locally abundant in the areas where it was reported, however the records of the species were generally based on few specimens, 2-4 maximum.

The captures of *G. maraldi* carried out from the Algerian coast indicate that the species appears to be very rare in the area. Similar patterns were described from other marine regions such as around Madeira (MAUL, 1952), the northwestern Spain (BAÑON *et al.*, 2010), the north-eastern Atlantic (RUIZ-PICO *et al.*, 2012), the Greek seas (PAPACONSTANTINO, 1990), the Turkish seas (KABASAKAL, 1998) and the Tunisian shore (RAFRAFI-NOUIRA *et al.*, 2019)

The causes of the scarcity of *G. maraldi* are probably since the species inhabits deep waters generally poorly exploited by commercial fishing gears. *Gadella maraldi* displays a low economical value according to information provided by fishermen and fishmongers. The captured specimens are probably discarded at sea. COHEN *et al.* (1990) noted that no separated statistics concerning the species maybe included among by-catch in fisheries. It could explain why only two records were reported from the Algerian and Tunisian waters in a seventy years research period. Therefore, as noted by RAFRAFI-NOUIRA *et al.* (2019) and through the present observations the real status and the occurrence of a viable population along the Maghreb shore remain questionable However, this fact that it cannot be totally ruled out due to the scarcity of captures.

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