

Summer aggregation of common eagle ray, *Myliobatis aquila* (Chondrichthyes: Myliobatidae), in the Marine Protected Area of the Egadi Islands (southwestern Tyrrhenian Sea)

DESIRÉE GRANCAGNOLO*, MARCO ARCULEO

Dipartimento STEBICEF, Università di Palermo, Via Archirafi 18, 90123 Palermo (Italia)

* corresponding author, email: desiree.grancagnolo@gmail.com

Keywords: Marettimo Island, Mediterranean Sea, visual census.

SUMMARY

We report for the first time in Italian waters a periodic and frequent presence of a summer aggregation of common eagle ray *Myliobatis aquila* in the island of Marettimo (southwestern Tyrrhenian Sea), which is part of the Marine Protected Area of the Egadi Islands. These aggregation could be related to different phenomena such as reproduction, feeding or simply as a transit zone.

INTRODUCTION

The common eagle ray *Myliobatis aquila* (Linnaeus, 1758), reported in all Italian seas (Vacchi & Serena, 2010), is a benthopelagic species with an Atlanto-Mediterranean distribution that lives in small groups swimming on sandy–muddy substrates between 10–600 meters of depth (McEachran & Capapé, 1984). In particular, in the Atlantic Ocean, the species has been reported from off Scandinavia and British isles to Portugal, further south to Mauritania and Senegal (La Mesa et al., 2016) and it is known throughout the Mediterranean Sea. In the Mediterranean Sea there is only one species of the genus *Myliobatis* that differs from the other genera *Pteromylaeus* and

Rhinoptera; in particular, *M. aquila* has a rhombic shape of the disk more developed in the horizontal axis than in the vertical one, the head is raised from the plane of the back and with a semicircular shape in the frontal part, the eyes are lateral followed by spiracles, the length of the tail is twice that of the vertical axis of the disk, with a whip shaped with a side plug, and can reach a disc width of 140 cm (Capapé et al., 2007).

Myliobatis aquila is a species with gregarious tendencies during the reproductive period, which takes place between September and February (Notarbartolo & Bianchi, 1998), when it is possible to observe groups composed by a few dozens of individuals (La Mesa et al.,

2016). Although these aggregations have been reported by other authors mainly in other areas outside the Mediterranean Sea, the significance of these aggregations is still poorly understood (see Alfonso & Rodrigues (2015) and references therein). The only observation in the Mediterranean Sea (Strait of Sicily) was made by Consoli et al. (2016) through the use of a Remotely-Operated Vehicle (ROV). Unfortunately, the paper of Consoli et al. (2016) does not provide information on the number of observations, number and size of individuals forming the aggregations, the period in which they were made and the environmental conditions. All these aspects make the observation of Consoli et al. (2016) hardly usable.

Myliobatis aquila has no commercial value within the Mediterranean Sea, except in sporadic and localized cases and it is often accidentally caught with trawl nets, trammel nets, and longlines. According to La Mesa et al. (2016), during the last 40 years the common eagle ray *M. aquila* has undergone a drastic decline in the Mediterranean Sea; such decline could be even greater than estimated due to the scarce information on catches available from the Maghreb countries. In fact, it is well known that, due to the constant increase of fishing exploitation, some sharks and rays appear to be globally endangered (Ferretti et al., 2005; Giovos et al., 2020). Moreover, since most of these species are also caught accidentally (bycatch) and official catch data are thus largely underestimated, that their actual level of exploitation is surely misrepresented (Giovos et al., 2020).

The International Union for Conservation of Nature (IUCN) lists the common eagle ray *M. aquila* as “Vulnerable” in European and Mediterranean waters, whereas globally its conservation status is considered “Data Deficient” (Holtzhausen et al., 2009; Malak et al., 2011).

The present note deals with the observations of some aggregations of *M. aquila*

made in Marettimo Island (north–western coast of Sicily) during some summer scuba diving.

MATERIALS AND METHODS

The observations of *M. aquila* were made during summer scuba diving in Cala Martina shoal (Fig. 1), on the southern side of Marettimo island, within the Marine Protected Area (MPA) of the Egadi archipelago. The MPA, located in front of the north–western coast of Sicily, is the largest in Europe (surface of about 54,000 ha) (Fig. 1).

Our study area, part of Cala Martina shoal, is located about 200 m off the South-Eastern coast of Marettimo (37°56'42" N - 12°05'04" E) and consists of a gently declining plateau covered with a dense *Posidonia oceanica* ((Linnaeus) Delile, 1813) bed with its deepest part at 19 m. The edge of the shoal falls from 20 to 40 m of depth on a sandy bottom that slopes towards the open sea with isolated rocks. The prevailing currents come from the third quadrant of the compass and, during summer, the most frequent ones are driven by a marked thermal difference between warm waters that flow on colder layers (D. Grancagnolo, personal observations).

In the frame of dives carried out on September 2020, an aggregation of *M. aquila* was recorded. In particular, on 10th September 2020 at 10.00 A.M., 30 *M. aquila* individuals of different sizes were sighted along the edge of the shoal below the thermocline, with a water temperature of 18°C and between 30 and 36 meters of depth. We returned to the same site on 12th and 13th September, in the morning and in the afternoon, and observed again 27–30 individuals swimming on the edge between the shoal and the sandy bottom. On 16th and 17th September, the *M. aquila* group no longer appeared in the same area, but moved to the sandy bottom at a greater depth, in smaller numbers (5 individuals of larger size between 1,60–1,80 cm disc length and one of small size 60–50 cm disc length).

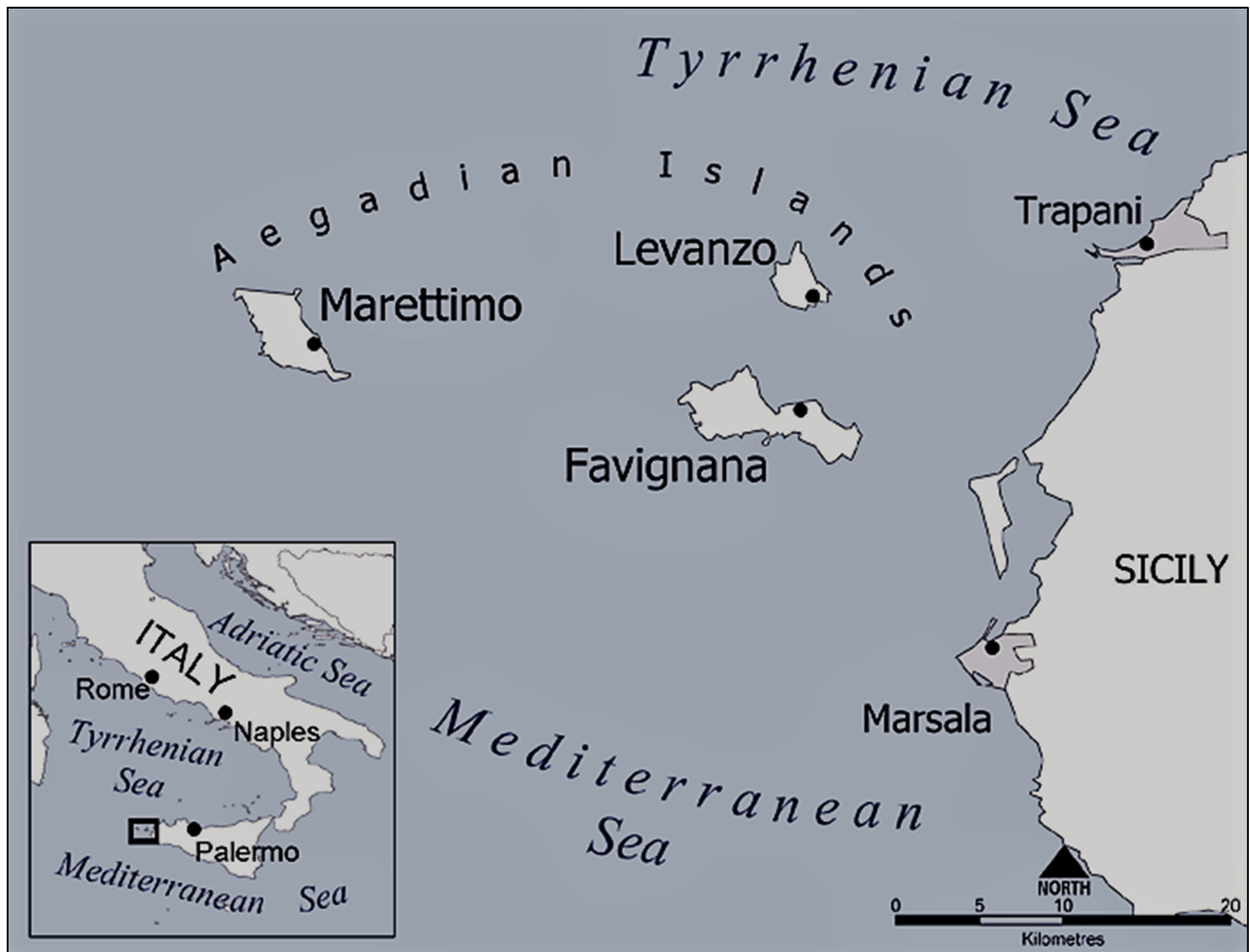


Figure 1. Map of the Western side of Sicily with Egadi Islands position. For more details on the Marine Protected Area (MPA) visit <http://www.ampisoleegadi.it/>.

RESULTS AND DISCUSSION

During the first three dives the size of the individuals was variable, larger specimens were more frequent but small individuals were also seen among them (Fig. 2). In particular, the first three observed aggregations consisted of both large (25 individuals of about 150 cm disc length) and small individuals (5 individuals of 40 - 50 cm disc length). According to Capapè et al. (2008) the disk width of juvenile males ranged between 21 and 49 cm and all the males above 54 cm were considered adults. The individuals did not seem disturbed by the scuba divers' presence, which is possibly due to the fact that the area is interested by a low anthropogenic impact. Finally, it is noteworthy

to stress that on 9th September 2019 a similar aggregation was documented on the same spot and reported on a social network (<https://www.facebook.com/giuseppe.zambrano.7/videos/10217891682356427>).

The reported *M. aquila* aggregations in the Marettimo island should have different meanings such as a reproductive and nursery site for the species or feeding or transit area (Alfonso & Rodrigues, 2015). Barreiros & Gadig (2011) refer that the species can be observed in reproductive aggregations in summer, in one specific cave, in Ilhéu das Cabras, Terceira Island (Azores islands) but provide no information to ascertain the function of the aggregation. Considering that no other

observations have been reported in the Mediterranean Sea with which we can compare and that we have not observed particular behaviors, it is difficult to explain the nature of this aggregation. These periodic and frequent aggregations, not yet reported for Italian waters, suggest that a constant monitoring of the site should be implemented by the staff of the local MPA in order to monitor the aggregation and provide more information about the ecology

and behavior of the species. The presence of threatened species such as *M. aquila* or species at risk of extinction such as the monk seal implies a greater effort of the MPA Egadi Islands in implementing specific conservation strategies (Caro, 2010). In fact, in the last decade, the island of Marettimo has been at the center of the attention of the international scientific community for the return of the monk seal, a species considered extinct in this area.



Figure 2. Group of *M. aquila* individuals observed during the first three sightings and made up of large and small individuals.

ACKNOWLEDGEMENTS

This paper would not have been possible without the support of Marettimo Diving Center.

REFERENCES

- Afonso, P. & Rodrigues, N.V. (2015) Summer aggregations of the common eagle ray, *Myliobatis aquila*. *Arquipélago-Life and Marine Sciences*, 32, 1–4.
- Barreiros, J.P. & Gadig, O.B. (2011) Catálogo ilustrado dos tubarões e raias dos Açores. *Catálogo ilustrado dos Tubarões, e Raias dos Açores= Sharks and Rays from the Azores: an illustrated catalogue*.
- Capapé, C., Guélorget, O., Vergne, Y., & Quignard, J.P. (2007) Reproductive biology of the common eagle ray *Myliobatis aquila* (Chondrichthyes: Myliobatidae) from the coast of Languedoc (Southern France, Northern Mediterranean). *Vie et Milieu*, 57(3), 125.
- Capapé, C., Guélorget, O., Vergne, Y., & Reunaud, C. (2008) New biological data on the eagle ray,

- Myliobatis aquila* (Chondrichthyes: Myliobatidae), off the Languedocian coast (Southern France, northern Mediterranean). *Annals for Istrian and Mediterranean Studies*. (Hist. Nat.), 18, 167–172.
- Caro, T. (2010) Conservation by proxy: indicator, umbrella, keystone, flagship, and other surrogate species. Island Press. 365 pp.
- Consoli, P., Esposito, V., Battaglia, B., Altobelli, C., Perzia, P., Romeo, T., Canese, S. & Andaloro, F. (2016) Fish Distribution and Habitat Complexity on Banks of the Strait of Sicily (Central Mediterranean Sea) from Remotely-Operated Vehicle (ROV) Explorations. *Plos One*, 11(12), e0167809. DOI: 10.1371/journal.pone.0167809.
- Ferretti, F., Myers, R. A., Sartor, P., & Serena, F. (2005). Long-term dynamics of the chondrichthyan fish community in the upper Tyrrhenian Sea. *International Council for the Exploration of the Sea*, C.M. 2005/N:25, Copenhagen.
- Giovos, I., Arculeo, M., Doumpas, N., et al. (2020) Assessing multiple sources of data to detect illegal fishing, trade and mislabelling of elasmobranchs in Greek markets. *Marine Policy*, 112, 103730. DOI: 10.1016/j.marpol.2019.103730
- Holtzhausen, J.A., Ebert, D.A., Serena, F. & Mancusi, F. (2009) *Myliobatis aquila*. International Union for Conservation of Nature, IUCN Red List of Threatened Species, version 2014.3. Available: www.iucnredlist.org. (January 2015).
- La Mesa, G., Annunziatellis, A., Filidei Jr, E., & Fortuna, C.M. (2016) Bycatch of myliobatid rays in the central mediterranean sea: the influence of spatiotemporal, environmental, and operational factors as determined by generalized additive modeling. *Marine and coastal fisheries*, 8(1), 382–394. DOI: 10.1080/19425120.2016.1167795
- Malak, D.A., Livingstone, S.R., Pollard, D., et al. (2011) Overview of the conservation status of the marine fishes of the Mediterranean Sea. International Union for Conservation of Nature, Gland, Switzerland
- McEachran, J.D. & Capapé, C. (1984) Myliobatidae. In: Whitehead, P.J.P., M.L. Bauchot, J.-C. Hureau, J. Niel-sen & Tortonese, E. (eds.): *Fishes of the North - eastern Atlantic and the Mediterranean*, Vol.1. UNESCO, Paris, pp. 205–209.
- Notarbartolo di Sciara, G., & Bianchi, I. (1998) Guida degli squali e delle razze del Mediterraneo. [Guide to the sharks and rays of the Mediterranean Sea.] Muzzio Editore, Padova, Italy.
- Vacchi, M. & Serena, F. (2010) Chondrichthyes. In Relini G. (Ed.) Checklist of the flora and fauna dei mari italiani. *Biologia Marina Mediterranea*, 17 suppl 1, 642–648.

Submitted: 17 December 2020

First decision: 2 January 2021

Accepted: 7 March 2021

Edited by Loris Galli