

FIRST RECORD OF AN ENTIRELY WHITE HARBOUR PORPOISE (*Phocoena phocoena relicta* Abel 1905) IN ROMANIAN BLACK SEA WATERS AFTER 27 YEARS

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Abstract. The harbour porpoise together with the common dolphin and the bottlenose dolphin are the only cetacean species within the Black Sea. Cases of completely white animals are rare in nature and even more in case of cetaceans (whales, dolphins and porpoises). When it comes to porpoises, the world-wide spread of such cases is low, and even more within the Black Sea. Thus, only 9 previous cases were recorded, two of which in the Strait of Istanbul. There are several reasons or explanation for skin depigmentation such as albinism, piebaldism, vitiligo and poliosis. Albinism is widespread in the animal kingdom, and the expression is used to refer to a genetic disorder, which is manifested by the lack of body pigments. Genetic studies showed that albinism is caused by a mutation of a gene that regulates the production of melanin, the pigment protein in skin, hair and eyes. The gene inheritance is conditioned by the presence in both genitors. In 1993 an albino harbour porpoise was found stranded on the Eforie Sud beach. The present article brings another sighting, after 27 years, of an anomalously white harbour porpoise in Romanian Black Sea waters.

Keywords: Black Sea, Romania, harbour porpoise, albino, anomalously white.

Rezumat. Prima înregistrare a unui marsuin complet alb (*Phocoena phocoena relicta* Abel 1905) în apele românești ale Mării Negre după 27 de ani. Marsuinul alături de delfinul comun și afaalinul reprezintă singurele specii de cetacee din Marea Neagră. Cazurile de animale complet albe, în natură, sunt rare și cu atât mai mult când vine vorba de cetacee (balene, delfini și marsuini). Când vine vorba de marsuini, numărul acestora este redus la nivel mondial și cu atât mai mult la nivelul Mării Negre. Astfel, au fost consemnate doar 9 cazuri anterioare, dintre care două în strâmtoarea Istanbul. Există mai multe motive sau explicații pentru depigmentarea pielii, cum ar fi albinismul, piebaldismul, vitiligo și polioza. Albinismul este răspândit în regnul animal, iar sintagma se folosește pentru a se referi la o anumită tulburare genetică, care se manifestă prin lipsa pigmentilor corporali. Studiile genetice au arătat că albinismul este cauzat de o mutație a unei gene care reglează producția de melanină, proteina pigmentară din piele, păr și ochi. Moștenirea genei este condiționată de prezența în ambii genitori. În 1993, un marsuin alb a fost observat eșuat pe plaja din Eforie Sud. Prezentul articol aduce o nouă observație, după 27 de ani, a unei focene albe în apele românești ale Mării Negre.

Cuvinte cheie: Marea Neagră, România, marsuin, albinos, anormal de alb.

INTRODUCTION

The harbour porpoise (*Phocoena phocoena relicta* Abel, 1905) is one of the three species of cetaceans present in the Black Sea (ANTONESCU, 1966; BORCEA, 1928; CĂLINESCU, 1936; ELLIS, 1989; MURARIU, 2004, 2005; 2012; NICOLAE et al. 2015; NICOLAEV et al. 2014; O'BRIEN, 2020; VIAUD-MARTINEZ, 2007). The species belongs to the Phocoenidae family and it is recognised as a subspecies (PERRIN, 2020). It is classified in both IUCN and Romanian protected species list as endangered (BIRKUN & FRANTZIS, 2008; Order No. 448/MEWF/2020). It usually occurs in coastal waters, feeding on a variety of organisms (MURARIU, 2005, 2012; BIRKUN, 2008). The most extensive study on the diet of Black Sea harbour porpoise was performed by ZALKIN in 1940 (quoted in TOMILIN, 1957) on 4000 stomachs. The main captured species were: turbot (*Scophthalmus maeoticus*), common sole (*Solea solea*), Black seabream (*Spondylusoma cantharus*), whiting (*Merlangius merlangus*), goby species (*Gobius niger*, *Neogobius melanostomus*), european sprat (*Sprattus sprattus*), big-scale sand smelt (*Atherina boyeri*), Black Sea anchovy (*Engraulis encrasicolus*), sea pikeperch (*Sander lucioperca*), Black Sea shad (*Alosa maeotica*), mullets (*Mugil* genus) (SANTOS & PIERCE, 2003). The harbour porpoise can be found in shallow waters of the continental shelf, venturing in bays, harbours, inlets and brackish lagoons, estuaries and even rivers (DI SCIARA, 2001; BIRKUN, 2007/8; MURARIU, 2005). During our 2017 assessment (PAIU et al., 2019), spring and summer, between 359 and 5697 individuals can be found within the 12NM area from Constanta to Vama Veche. Not rarely are found offshore, far from the coastal water (BIRKUN et al., 2014), even in the middle of the Black Sea (KRIVOKHIZIN et al., 2006). The total population size for the species in the Black Sea basin is unknown; several studies, in the 1980s, proposed estimates of several hundred thousands of all the three species (ZAITSEV & MAMAEV, 1997). For Romanian waters and the exclusive economic zone the number was estimated at 8059 individuals in 2013 (BIRKUN et al., 2014), with less than 800 individuals in offshore waters.

The body pigmentation of porpoise is dark grey/black on the back and tail fluke with white belly. The flanks are paler grey patched, lips are dark, with a grey/dark line from the jaw to flippers (TONAY et al., 2012; CÂNDEA et al., 2011; RADU et al., 2013; NICOLAE et al., 2017). The colour of the skin is produced by the different chromatophores such as melanophores (black), chromatophores (blueish and grey-blueish), iridescent chromatophores (blue-green colour), lipidophores (from black to dark blue) (BEHRMANN, 1998). Melanocytes produce melanosomes mainly in the dark areas over the body although exists in all regions of the epidermis (BEHRMANN, 1998). The albinism cases are resulting due to lack of melanine in the absence of thirosinase (TONAY et al., 2012).

The sighting presented discriminates from other pigmentation disorders due to the all-body-white status of the animal in comparison with piebaldism (GLADILINA et al., 2019) which presents body pigmentation in some areas and leucism which present dark eyes on white animals (OWEN & SKIMMINGS, 2008).

MATERIAL AND METHODS

Our field investigations dates back to 2010 within the Cetacean Stranding Monitoring Network coordinated by the first author within the Mare Nostrum NGO across the Romanian coastline between Sulina (in North) and Vama Veche (in South). In parallel with cetacean stranding monitoring, sea surveys were performed in order to collect *in situ* data of cetacean biology and ecology. Throughout the vessel surveys two main methods were applied, used world-wide: line transect distance sampling (BUCKLAND et al., 2001; BIRKUN et al. 2014) and photo-identification (WILSON et al., 1999; INGRAM & ROGAN, 2002; PAIU, 2011). If in the case of first method the survey was performed based on a well-established survey plan, with predetermined transects, for the second method the trip is random, and only the area to cover was established. Opportunity platforms and data shared by observers represents the third source of *in situ* information collected within the monitoring program within which we identified the all-white porpoise presented here, the so-called citizen science concept. The animal was recorded using a mobile telephone using Android system.

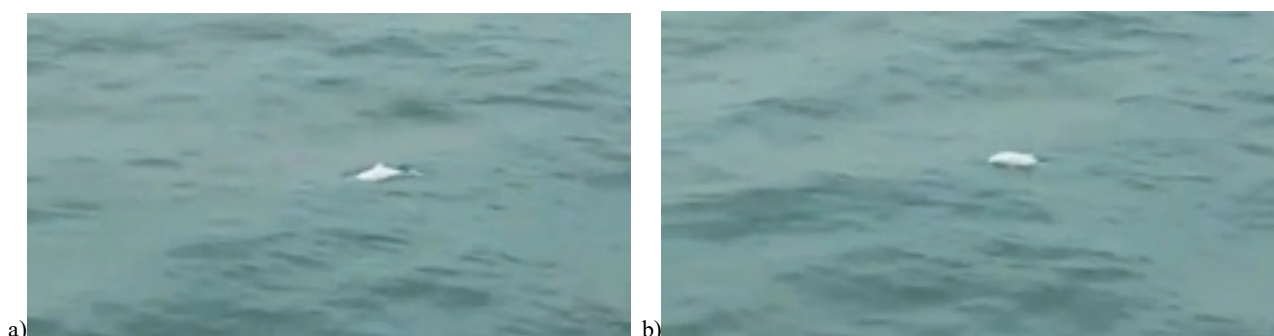
A bibliographic research activity was performed, both in private libraries and online (due to Sars-CoV-2 restriction), to identify other cases of white porpoises within the limits of Black Sea. Discussions with specialists from the riparian countries were initiated. The species names were searched and updated in accordance with Worms (PERRIN, 2020) and Fish Base (FROESE & PAULY, 2019) databases and FAO report from 2018 “The state of Mediterranean and Black Sea fisheries”.

QGIS software (QGIS, 2020) was used to prepare the map with the anomalously white porpoises sighted in 1993 respective 2020.

RESULTS AND DISCUSSIONS

The cases of anomalously white cetaceans are rare in Black Sea and even more when it comes to harbour porpoise. The first record dates from 1928, 28 of April (KLEINENBERG, 1956). In the next years other 5 cases were mentioned: near Yalta in 1937 by ZALKIN (1938) which was possibly a form of piebaldism (KEENER et al., 2011); 2 sightings near Novorossiysk in 1948 (KLEINENBERG, 1956); 1 animal sighted in both Trabzon (Turkey) and Rioni (Georgia) on 24 April 2010 respectively 23 June 2012 communicated to Dr. Arda Tonay by the A. Gök and Z. Gurielidze, which shared with us the information. The last sighting within the Black Sea was recorded on June 19, 2011 (TONAY et al., 2012). Beside these cases, the same authors presented two sightings occurred within the strait (Istanbul) on 7 of May 2012 (with several re-sightings between 18 of May and 12 of June, 2012) and on 7 July, the same year, a stranded harbour porpoise, which died and is presently preserved in neutral buffered formalin solution (10%) in the Istanbul University, Faculty of Biology (TONAY et al., 2012).

9 years after the last recorded case of a white harbour porpoise within the Black Sea region, and 8 after the last case recorded in Bosphorus strait we record the second anomalously white porpoise within the Romanian waters (Figs. 1 a, b).



Figures. 1 a, b. Anomalously white harbour porpoise (*Phocoena phocoena* ssp. *relicta* Abel 1905), a) breaching at the surface behaviour and b) diving under the surface behaviour (original).

The sighting recorded by us on 24.05.2020 (Fig. 2), within the Romanian Black Sea waters, near the oil&gas extraction platforms, at the GPS position 44°33'43.2"N 29°58'40.6"E, was documented with the help of a mobile phone video-camera. The film clearly indicates the presence of a totally white harbour porpoise, adult and healthy animal. The porpoise spent up to 5 minutes in the area after disappearing, surfacing several times. The pictures below are extracted from the video-camera and indicate a foraging behaviour. No other porpoise or dolphin species were seen in the proximity of the animal.

The map presented in figure 2 indicates the position of the two cases recorded so far of a white harbour porpoise within the Romanian boundaries.

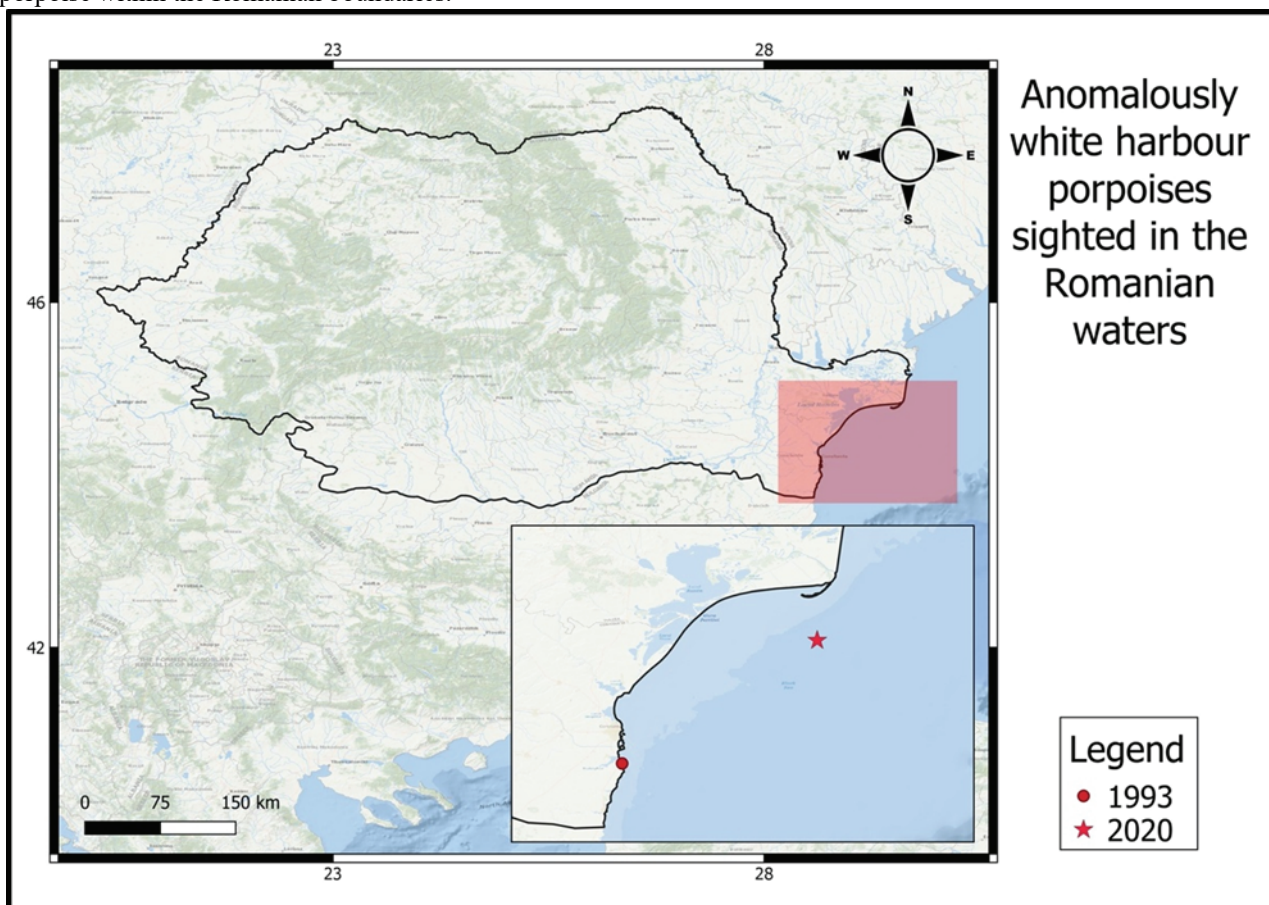


Figure 2. Anomalously white harbour porpoises sighted in the Romanian waters of Black Sea (original).

The first case of an anomalously white porpoise, at the Romanian coast, that we were able to identify, was mentioned by DIMA (1996) (Fig. 3) as being found stranded on a beach in Eforie Sud area, in 1993. As it can be observed in the picture, the animal presents remains of black patches of epiderma on the tip of the rostrum and dorsal fin and also black eyes. No other study identified a similar porpoise afterwards (PAIU et al., 2011, 2013, 2016; POPESCU-MIRCENI et al., 2015)



Figure 3. First recording of an anomalously white harbour porpoise in the Romanian Black Sea waters, in 1993 (DIMA, 1996).

CONCLUSIONS

1. Despite being the single sighting, alive, of an entirely white harbour porpoise in Romanian Black Sea waters this could be the first entirely albino.
2. Comparing the image of the *P. phocoena* case, reported by DIMA (1996) it can be seen that both the tip of the dorsal fin and the rostrum have what seem to be the remains of black coloured epiderma; this is suggesting that those specimen could have been an example of piebaldism.
3. Even if the images used in the present notice are not of the best quality, they are still valid to report an anomalously white harbour porpoise which could suffer of one of the above-mentioned genetical disorders.

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