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Cetacean mortality along the Bulgarian Black Sea Coast during 2017

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Abstract. The present study provides information on the stranding of cetaceans along the Bulgarian Black Sea Coast during 2017. Observations were made trough covering transects along the Bulgarian Black Sea Coast. A total of 198 cetaceans of three species were found - Harbor Porpoise (*Phocoena phocoena*), Bottlenose Dolphin (*Tursiops truncatus*), and Common Dolphin (*Delphinus delphis*). The most numerous were the harbor porpoise - 48% followed by the bottlenose dolphin - 15% and common dolphin - 8%. The most significant number of strandings was observed during July and August (54% of all cases). Cetacean strandings events were relatively highly concentrated in the area of Shabla, Varna and Pomorie.

Key words: Cetaceans, mortality, Black Sea.

Introduction

There are currently only three species of cetaceans found in the Black Sea - the Harbor Porpoise (*Phocoena phocoena relicta* Linnaeus, 1758), the Short-Beaked Common Dolphin (*Delphinus delphis ponticus* Linnaeus, 1758) and the Bottlenose Dolphin (*Tursiops truncatus ponticus* Montagu, 1821). The cetaceans in the Black Sea are recognized as a subspecies possessing morphological differences from Atlantic and Pacific populations (Viaud-Martinez *et al.* 2008). The Black Sea population is also differentiated genetically from other populations in the Mediterranean Sea (Natoli *et al.* 2005). Studies on the distribution of cetaceans in the Black Sea revealed that short beaked common dolphins are mainly distributed in the offshore areas (Panayotova *et al.* 2015), while harbor porpoise and bottlenose dolphins are widely distributed in coastal areas (Raykov *et al.* 2012; Panayotova *et al.* 2017). Other studies were focused on specific aspects such as pingers effects on cetacean bycatch in the Black Sea (Zaharieva *et al.* 2016). However, research on cetacean strandings in this area is still in progress (Evtimova *et al.* 2015, Evtimova *et al.* 2016).

The aim of this study was to assess the cetacean stranding mortality along the Bulgarian Black Sea Coast during 2017.

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Material and Methods

The study was conducted by examining dead bodies of cetaceans found on the sea shore during covering of transect. The selected transects were located along the whole Bulgarian coastline which has a total length of 378 km from Durankulak in the north to the mouth of the river Rezovska in the south. The present research method for monitoring of stranded marine mammals is used in Bulgaria and approved by ACCOBAMS. The condition of the marine mammals was determined by using a five point classification scale: (1) alive, (2) fresh corpse, (3) decayed, but the organs are mostly preserved, (4) the organs could not be identified and (5) mummified animal parts/a skeleton and its parts. For temporal analysis, stranding events were categorized by month and seasons.

Results and Discussion

A total of 198 cetaceans of three species were found along the Bulgarian Black Sea Coast during 2017. We observed a prevalence of strandings of Phocoena phocoena (almost 70%), followed by a considerably smaller percentage of strandings of *Tursiops truncatus* (12%) and the *Delphinus delphis* (7%) (Fig.1.a). During the three successive years (2015, 2016 and 2017) this proportion among the three cetacean species was similar (Evtimova *et al.* 2015, Evtimova *et al.* 2016), so we can conclude that it describes stable picture of cetacean mortality.

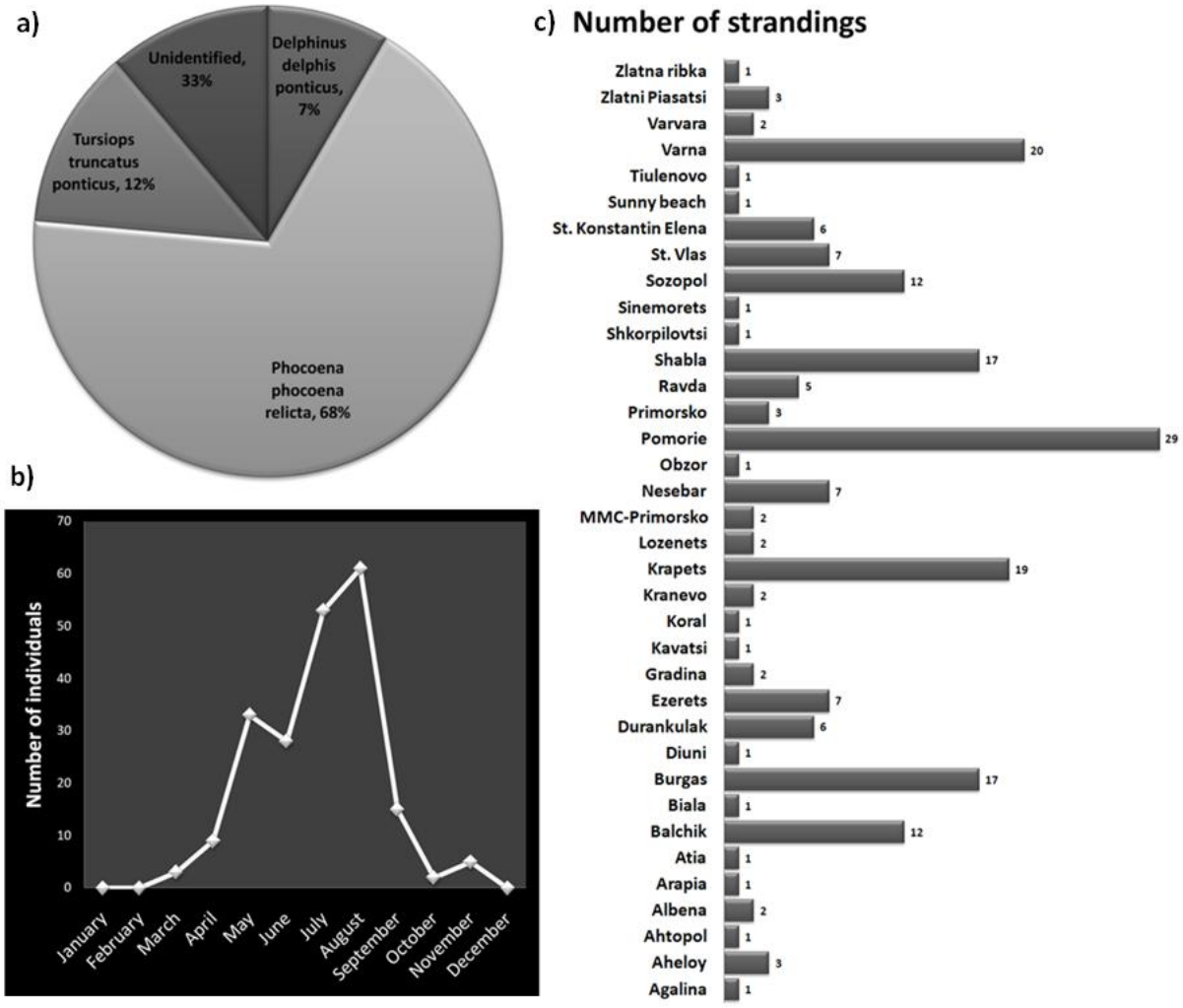

Fig. 1. Percentage distribution (a), timing (b) and location (c) of the stranded cetaceans along Bulgarian Black Sea Coast during 2017.

In 2017 the first dead cetaceans were thrown to shore during the last decade of March (Fig. 1b). The most significant number of strandings was observed in the late summer – July (53 cases) and August (67 cases). In September there was a sharp decline in the number of dead cetaceans (only 15 cases) and the lowest number of strandings was observed at the end of autumn and in winter.

The most significant concentrations of cetacean strandings in the Bulgarian coast was recorded along the beach line between the Romanian border and the town of Shabla, Pomorie and Varna (Fig. 2). In Shabla there are large, poorly used beaches whose sand areas are very suitable to kept carcasses for a long time. The highest percentage of cetacean strandings is registered along the coast of Pomorie - 29%, followed by Varna - 20%, Krapets - 19%, Shabla and Burgas - 17% (Fif.1c).

The distribution of cetacean carcasses depends on a number of factors. One of the major determinants is the availability of large unguarded sandy beaches. The bodies stay long on the sand, as at the rocky beaches they are easily washed away by the waves. Larger sandy beaches are situated in the area from Krapets camping to the Romanian border, in the regions of Pomorie, Varna and Burgas. However, the number of carcasses discharged is not directly dependent on the length and width of the beach, but depends mainly on the number of cetacean populations in the particular area and their distance from the coastline. Marine currents in different parts of coastal waters are also of great importance.

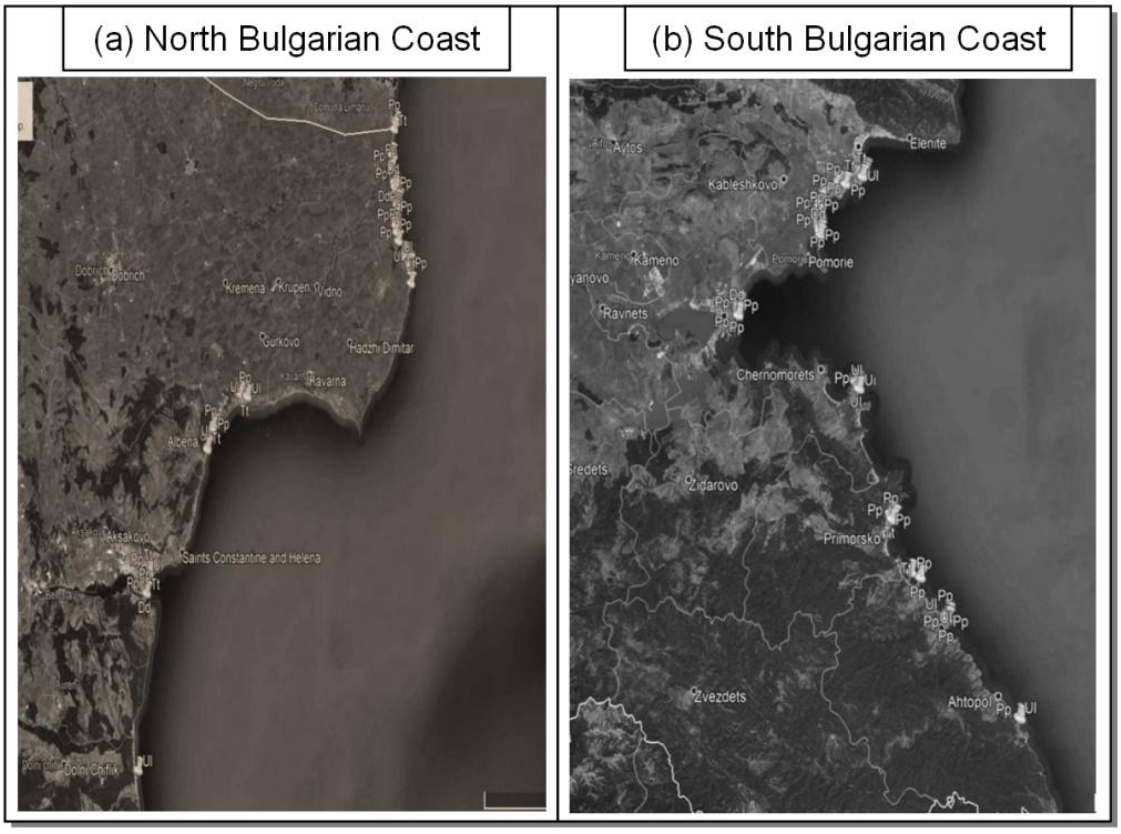

Fig. 2. Distribution of recorded cetacean strandings along the (a) North Bulgarian coast and (b) South Bulgarian coast.

All three species have the highest frequencies at the third stage of decomposition (Fig. 3), so it can be suggested that most of the cetacean corpses reach the coast in this condition. In the Harbor Porpoise (Pp), which had the largest mortality, we observed also a high frequency of the fifth stage of decomposition (Fig. 3).

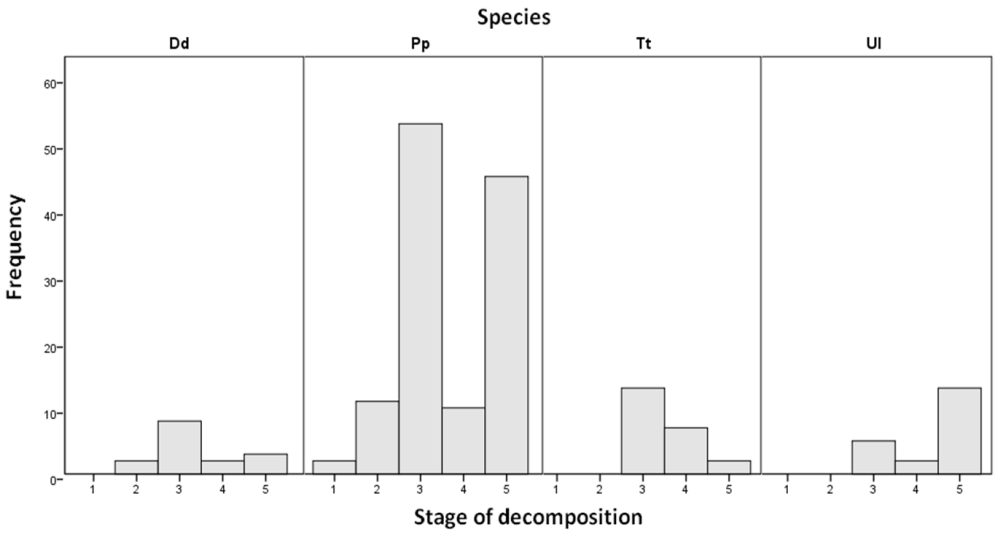

Fig. 3. Distribution frequency of different stages of decomposition of the stranded cetaceans by species (Tt - *Tursiops truncatus ponticus*, Pp - *Phocoena phocoena relicta*, Dd - *Delphinus delphis ponticus*, UI – Unidentified). Stage 1 – alive; stage 2 - fresh corpse; stage 3 - decayed, but the organs are mostly preserved; stage 4 - the organs could not be identified; stage 5 - mummified animal parts/a skeleton and its parts.

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