



## THE FIRST RECORD OF A PIEBALD COMMON BOTTLENOSE DOLPHIN (*TURSIOPS TRUNCATUS*) IN OFFSHORE WATERS OF THE NORTH-WESTERN BLACK SEA

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### Abstract

Piebaldism is one of three types of hypopigmentation of animals, when some areas on the skin have no pigments. Anomalous white cetaceans are rare, although they have been reported in more than 20 different cetacean species, including the common bottlenose dolphin, which in the Black Sea is recognized as an endangered endemic subspecies — the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus* Barabash-Nikiforov, 1940). Its main habitat in the north-western Black Sea region is the coastal waters, however, these dolphins also occur offshore. Thirty cases of anomalously white bottlenose dolphins have been reported from the Black Sea, which were unevenly distributed, and only a few sightings have been reported from the north-western Black Sea. Cetacean observations were conducted in the Ukrainian part of the north-western Black Sea waters in April 2017, onboard the research vessel "Auguste Piccard". All encountered cetaceans were photographed, and individual distinctiveness of dorsal fin images was used for their photo-identification. On 13 April 2017, four groups of up to four individuals of bottlenose dolphins were encountered in the same area at a distance of 61 km south of Odesa (34 km from the nearest coast). The depth at the observation site was about 20 m. The initially observed type of dolphins' behavior was feeding. However, two groups changed their behavior and followed the vessel by 5–6 individuals for approximately 18 minutes. The joint group consisted of adults and one juvenile individual. Among the adults, there was one piebald specimen with white patches on its dorsal fin, peduncle, and tail fluke. The piebald dolphin was photographed and photo-identified. Our research has shown that piebald Black sea bottlenose dolphins occur not only in the coastal waters, but also in offshore waters of the north-western Black Sea. However, the frequency of such hypopigmentation in local populations remains unknown. Further intensive photo-identification and genetic sampling of local stocks of the Black Sea bottlenose dolphins are necessary for the assessment of their population genetic structure and its divergence.

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## THE FIRST RECORD OF A PIEBALD COMMON BOTTLENOSE DOLPHIN (*TURSIOPS TRUNCATUS*) IN OFFSHORE WATERS OF THE NORTH-WESTERN BLACK SEA

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**The first record of a piebald common bottlenose dolphin (*Tursiops truncatus*) in offshore waters of the north-western Black Sea.** — O. Savenko. — Piebaldism is one of three types of hypopigmentation of animals, when some areas on the skin have no pigments. Anomalously white cetaceans are rare, although they have been reported in more than 20 different cetacean species, including the common bottlenose dolphin, which in the Black Sea is recognized as an endangered endemic subspecies — the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus* Barabash-Nikiforov, 1940). Its main habitat in the north-western Black Sea region is the coastal waters, however, these dolphins also occur offshore. Thirty cases of anomalously white bottlenose dolphins have been reported from the Black Sea, which were unevenly distributed, and only a few sightings have been reported from the north-western Black Sea. Cetacean observations were conducted in the Ukrainian part of the north-western Black Sea waters in April 2017, onboard the research vessel "Auguste Piccard". All encountered cetaceans were photographed, and individual distinctiveness of dorsal fin images was used for their photo-identification. On 13 April 2017, four groups of up to four individuals of bottlenose dolphins were encountered in the same area at a distance of 61 km south of Odesa (34 km from the nearest coast). The depth at the observation site was about 20 m. The initially observed type of dolphins' behavior was feeding. However, two groups changed their behavior and followed the vessel by 5–6 individuals for approximately 18 minutes. The joint group consisted of adults and one juvenile individual. Among the adults, there was one piebald specimen with white patches on its dorsal fin, peduncle, and tail fluke. The piebald dolphin was photographed and photo-identified. Our research has shown that piebald Black sea bottlenose dolphins occur not only in the coastal waters, but also in offshore waters of the north-western Black Sea. However, the frequency of such hypopigmentation in local populations remains unknown. Further intensive photo-identification and genetic sampling of local stocks of the Black Sea bottlenose dolphins are necessary for the assessment of their population genetic structure and its divergence.

Key words: *Tursiops truncatus ponticus*, piebaldism, hypopigmentation, Cetacea, north-western Black Sea.

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### Introduction

Pigmentation of animals is important for protection from exposure to sunlight, communication, and camouflage from predators. Rare atypical pigmentation may affect survival of the specimen. Pigmentation is controlled by a number of genes. In mammals, it is almost entirely dependent on melanin pigment synthesis and distribution in the skin, hair, and eyes (Hearing & Tsukamoto 1991).

Piebaldism is a type of hypopigmentation of animals when some areas on the skin have no pigments; usually this autosomal dominantly inherited pigment anomaly is caused by a loss of function mutation in the *KIT* gene (Oiso *et al.* 2012). Piebaldism is different from two other types of anomalously white pigmentation, resulting from the inheritance of mutations in pigment-related genes, such as albinism — complete absence of pigmentation, a lack of melanin in the eyes, hair, and skin, and leucism — reduced pigmentation that causes white or patchy coloration of the skin, with normally colored eyes (Acevedo *et al.* 2009).

Anomalously white cetaceans are rare, although they have been reported in a more than 20 different cetacean species (Fertl *et al.* 1999, 2004).

For all three Black Sea cetacean endemic subspecies: the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus* Barabash-Nikiforov, 1940), the Black Sea harbor porpoise (*Phocoena phocoena relicta* Abel, 1905), and the Black Sea common dolphin (*Delphinus delphis ponticus* Barabash-Nikiforov 1935), cases of piebaldism are reported (Tonay *et al.* 2012; Kopaliani *et al.* 2017; Gladilina 2018; Gladilina *et al.* 2019).

The Black Sea subspecies of the cosmopolitan common bottlenose dolphin is listed as Endangered by the IUCN (Birkun 2012). Coastal waters of the north-western Black Sea are considered as an important habitat for bottlenose dolphins (Raykov & Panayotova 2012; Birkun *et al.* 2014; Savenko *et al.* 2017; Gol'din *et al.* 2017; Popov *et al.* 2020). In the northern Black Sea, bottlenose dolphins are known for site fidelity patterns, they may live in resident or locally migrating coastal communities with a high level of social connections (Gladilina *et al.* 2018; Gladilina 2018; Gol'din *et al.* 2017). However, they also occur offshore (Kleinenberg 1956; Mikhalev 2005; Birkun 2006; Birkun *et al.* 2014; Savenko *et al.* 2017), and they can possibly have some connection with Mediterranean populations (Moura *et al.* 2013; Gladilina *et al.* 2018; Gladilina 2018).

There are 30 reported cases of anomalously white bottlenose dolphins from the Black Sea, most of them are piebald, however a fully white dolphin has also been observed in the north-eastern Black Sea between 2007 and 2013 (Gladilina 2018; Gladilina *et al.* 2019).

Piebald Black Sea bottlenose dolphins have been recorded in most of the coastal areas of the Black Sea and the Bosphorus Strait, but their distribution was uneven: cases of piebaldism were not recorded in the southern Black Sea, the greatest concentration of piebald dolphins was found in the north-eastern areas (9–13 %), which is significantly more than in the other areas, and only a few sightings have been reported from the north-western and eastern Black Sea (Gladilina *et al.* 2019). In the north-western Black Sea, one piebald specimen is known from coastal waters of Romania (Paiu 2013), another one from the area of Dzharylhach Island (Gladilina 2018), and a third individual was observed in waters of the Danube Delta region with some white patches on its tail fluke, but unfortunately it could not be included in the photo-identification catalog of dorsal fins (Gladilina 2018).

Since no cases of anomalously white bottlenose dolphins have been previously known from offshore waters of the north-western Black Sea, the aim of this study was to detect such individuals and to photograph them qualitatively for further photo-identification.

## Material and Methods

Vessel-based cetacean observations were conducted in the Ukrainian part of the north-western Black Sea waters in April 2017, onboard the expedition vessel "Auguste Piccard". Visual observations were conducted under good or moderate weather conditions (Beaufort Sea state  $\leq 3$ ). Cetaceans were detected with naked eye, and 10 $\times$  binoculars were also used for observations. The following data were collected: observational effort, weather conditions, bearing angle and distance to the group, species identification, group size, composition, and behavior.

The Canon EOS 70D digital cameras with Canon EF 100–300 f/4.5–5.6 USM and EF 100–400 f/4.5–5.6 IS II USM lenses were used to photograph the cetaceans.

Individual distinctiveness of dorsal fin images was traditionally used for the photo-identification (Würsig & Jefferson 1990; Gladilina *et al.* 2018).

## Results and Discussion

On 13 April 2017, four groups of bottlenose dolphins were encountered in the same area (Fig. 1). The encounter occurred 61 km south of Odesa and 34 km off the nearest coast (coordinates: 45°49.846'N; 030°45.387'E). The depth at the observation site was about 20 meters.

Group sizes of the bottlenose dolphins reached up to four individuals. The initially observed type of dolphins' behavior was feeding. However, two groups changed their behavior and followed the vessel by 5–6 individuals for approximately 18 minutes. The joint group consisted of adults and one juvenile individual. Among the adults, there was one piebald specimen with the several white

patterns (Fig. 2–5). No other members of the encountered bottlenose dolphin groups had hypopigmentation.

The white patch was located on the upper front part of the dorsal fin, occupying most of the upper part of the fin on the left and right sides, nearly symmetrical on both sides (Fig. 2–4).



Fig. 1. Location of the piebald Black Sea bottlenose dolphin sighting in offshore waters of the north-western Black Sea (red pentagon).

Рис. 1. Місце спостереження частково білої чорноморської афаліни у відкритих водах північно-західної частини Чорного моря (зображене червоним п'ятикутником).



Fig. 2. Photo-identification images of both sides of a piebald Black Sea bottlenose dolphin (left photo by O. Savenko; right photo by Yu. Bataev).

Рис. 2. Фото-ідентифікаційні зображення частково білої чорноморської афаліни (автор фото ліворуч О. Савенко, праворуч — Ю. Батаєв).



Fig. 3. Distribution of white patches on the dorsal side and peduncle of a piebald bottlenose dolphin (photos by O. Savenko).

Рис. 3. Розподіл білих плям по верхній частині тіла частково білої афаліни (фотографії О. Савенко).



Fig. 4. Photo-identification images: left and right sides of the dorsal fin of a piebald bottlenose dolphin (photos by O. Savenko).

Рис. 4. Фото-ідентифікаційні зображення: лівий і правий боки спинного плавця частково білої афаліни (фотографії О. Савенко).



Fig. 5. Images of the partially white dorsal side of the tail fluke of a piebald bottlenose dolphin (photos by Yu. Bataev).

Рис. 5. Зображення верхньої сторони хвостового плавця частково білої афаліни з характерними білими плямами (фотографії Ю. Батаєва).

Two other main patches of irregular shape were located on the peduncle of the dolphin (Fig. 2–3). In addition, there were white patches on the dorsal side of the tail fluke (Fig. 5), on its both outer edges, but quality pictures of the tail fluke were not taken — only its underwater blurred images taken from above the surface. According to the visual observations, there were no white patches on the head and upper front part of the dolphin's body (Fig. 3; left), however there were no images taken of the dolphins' head.

The top of the dorsal fin had a pink shade (Fig. 2 and 4), which is sufficiently typical for cetaceans with piebaldism — the pink color of the skin is caused by the blood seen through the colorless tissue.

All these coloration patterns are the most typical for the known piebald Black Sea bottlenose dolphins (Gladilina 2018; Gladilina *et al.* 2019).

A large number of traces of the teeth of other dolphins (parallel scratches; Fig. 2–3) indicates active social interactions of this individual. Its behavior was similar to the other adult members of the group, and the body condition seemed to be normal.

Our research has shown that piebald Black sea bottlenose dolphins occur not only in coastal but also in offshore waters of the north-western Black Sea, however the frequency of such genetic variants of anomalously white patterns in local populations remains unknown. Further intensive photo-identification and genetic sampling of local stocks of the Black Sea bottlenose dolphin are necessary for the assessment of their population genetic structure and its divergence.

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