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SIGHTINGS OF CETACEANS IN THE WATERS OF YUZHNY SEA PORT (HRYHORIVSKY ESTUARY, BLACK SEA) IN 2015–2016

Oksana Savenko¹, Julia Ivanchikova², Bohdan Hulak^{1,3}, Tatyana Derkacheva³

¹Ukrainian Scientific Center of Ecology of the Sea (Odesa)

²National University of Kyiv-Mohyla Academy (Kyiv)

³Odesa National Mechnikov University (Odesa)

e-mail: o.v.savenko@gmail.com

Sightings of Cetaceans in the Waters of Yuzhny Sea Port (Hryhorivsky Estuary, Black Sea) in 2015–2016. — Savenko, O., Ivanchikova, J., Hulak, B., Derkacheva, T. — The use of transformed coastal ecosystems by the Black Sea cetaceans is an important, but little studied issue. In 2015–2016, coastal visual observations of cetaceans were conducted in the waters of Yuzhny Sea Port. The area was regularly used by common dolphins (they were sighted in 24 days of 64) and also by harbour porpoises (7 sightings). Group sizes of the common dolphins reached up to 25 individuals (Median = 7), and of the harbour porpoises — up to 5 (Median = 4); calves and juveniles were present in most groups. The primary behaviour of cetaceans was feeding. Because of significant concentrations of fish in Hryhorivsky Estuary, the area of Yuzhny Sea Port is an important habitat for the Black Sea cetaceans.

Key words: *Delphinus delphis*, *Phocoena phocoena*, distribution, ecology, northwestern Black Sea.

Зустрічі китоподібних в акваторії Морського порту «Южний» (Григорівський лиман, Чорне море) у 2015–2016 роках. — Савенко, О., Іванчикова, Ю., Гулак, Б., Деркачева, Т. — Характер використання чорноморськими китоподібними трансформованих людиною прибережних екосистем є важливим та майже не дослідженим питанням. За допомогою візуальних спостережень з берега, виконаних у 2015–2016 рр., було досліджено особливості перебування китоподібних в акваторіях Морського порту «Южний». Встановлено, що Григорівський лиман регулярно відвідують дельфіни білобокі (їх спостерігали протягом 24 із 64 днів досліджень), а також фочени звичайні (7 спостережень). Розміри груп дельфінів білобоких — до 25 особин (медіана = 7), фочен звичайних — до 5 (медіана = 4), у складі більшості груп відмічені молоді особини та дитинчата. Основним типом поведінки китоподібних є харчування. Акваторія порту «Южний» є важливим місцем перебування чорноморських китоподібних через значні концентрації риби в Григорівському лимані.

Ключові слова: *Delphinus delphis*, *Phocoena phocoena*, розповсюдження, екологія, північно-західна частина Чорного моря.

Introduction

Coastal northwestern Black Sea waters are known for their shallow depths and intensive human activities. Hryhorivsky Estuary, or Malyi Adzhalyk Estuary (liman), is an estuary which has been artificially transformed into a bay in the early 1970s. Now the Yuzhny Merchant Sea Port and Odesa Port Plant are operating in the area. Hryhorivsky Estuary is an important spawning and feeding fish habitat (Екосистема..., 2008).

The cetacean fauna of the Black Sea includes three species, which are recognized as endemic subspecies: the Black Sea harbour porpoise (*Phocoena phocoena relicta* Abel, 1905), the Black Sea common dolphin (*Delphinus delphis ponticus* Barabash-Nikiforov, 1935), and the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus* Barabash, 1940). The Black Sea harbor porpoise and the Black Sea bottlenose dolphin are now listed as Endangered by the IUCN (Birkun and Frantzis, 2008; Birkun, 2012), and the Black Sea common dolphin is listed as Vulnerable (Birkun, 2008). Coastal waters are considered to be the primary habitat for harbour porpoises and bottlenose dolphins in the Black Sea (Клейненберг, 1956; Михалёв, 2005; Raykov, Panayotova, 2012; Birkun

et al., 2014; Gladilina et al., 2016), whereas open waters are the primary source for common dolphins (Клейненберг, 1956; Михалёв, 2008; Birkun et al., 2014).

During previous years, unidentified cetacean species were noticed visiting the waters of Hryhorivsky Estuary in the summer period (Экосистема..., 2008). In 2015, the common dolphins were detected as its regular summer visitors. Moreover, photo-identification results showed that this had been mainly the same group of individuals (Savenko, Ivanchikova, 2016), which is highly unusual for this species: the first evidence of a resident common dolphin community has been recently shown for a shallow, urbanised embayment in southeastern Australia (Mason et al., 2016).

The aim of the present study was to investigate the use of the waters of Yuzhny Sea Port and Hryhorivsky Estuary by cetaceans in 2015–2016.

Materials and methods

Hryhorivsky Estuary is located in the northwestern part of the Black Sea (fig. 1), its total length is about 12 km, its width is 0.3–1.3 km; the area is 5.8 square km, and the depths are up to 18 meters. Yuzhny Port is situated on the east and west banks of Hryhorivsky Estuary. The port waters include inland waters, outer roads with anchorage; the water area is bounded by a 2-mile radius arc centered at the shore maritime radar station building. The port is open to navigation year round.

Coast-based visual observations were conducted in the area of Hryhorivsky Estuary in 2015–2016, during 64 days of observations at two stationary observation sites (fig. 1) at a distance of 0.1 and 5 km from the sea. The main observation point was located in the area of Hryhorivka village, and additional observations were performed from the bridge deck of the RV “Vladimir Parshin” which was anchored near Novi Bilyari village. Visual observations were conducted under good or moderate weather conditions (Beaufort Sea state ≤ 3).

Most of the cetaceans were detected by naked eye; however, 10× binoculars were also used. The following data were collected: observational effort, weather conditions, bearing angle and distance to the group, species identification, group size, its composition, and behaviour. The Canon EOS 40D and 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.

We also performed visual observations of fishes in the coastal zone and interviewed local fishermen and crews of vessels on the movement of cetaceans and fishes in the area.

The R software (R Core Team..., 2016) was used for the analysis and graphics.



Fig. 1. Geographical location of Hryhorivsky Estuary.

Black rectangles show the observation sites in Hryhorivka and Novi Bilyari villages.

Рис. 1. Географічне положення Григорівського лиману.

Чорними прямокутниками відмічено місця спостережень в селах Григорівка та Нові Біляри.

Results and discussion

Our research have showed that common dolphins regularly visit the waters of Yuzhny Sea Port during the warm period of the year, and harbour porpoises are its usual but rare visitors (fig. 2 & 3). Although during last years, bottlenose dolphins tend to dominate in some coastal areas of the Black Sea (Raykov, Panayotova, 2012; Gladilina et al., 2016), we have not encounter this species during our studies.

Common dolphins come into the estuary up to 6.5 km from the sea, which is highly unusual (Клейненберг, 1956; Северо-западная..., 2006; Михалёв, 2008; Birkun et al., 2014). They also actively use areas of high intensity port operations. During 11 successful days of observations in June–September 2015, groups of common dolphins entered the Hryhorivsky Estuary out of the sea or returned back 52 times. Fishermen and crews of the vessels also confirmed the summer presence of both species in the estuary (mostly common dolphins), including its inner areas.

Group sizes of common dolphins reached up to 25 individuals (Median = 7) and of harbour porpoises — up to 5 (Median = 4), which is larger than the usual group sizes in inshore areas of the northwestern Black Sea (Северо-западная..., 2006; Birkun et al., 2014). Most of the groups of common dolphins primarily consisted of females with calves and juveniles. They possibly come to the estuary from somewhere offshore and it could be similar to the Mediterranean Sea, where the most critical areas for this predominantly pelagic species are the waters around the shelf edge, where they concentrate to feed and where the large majority of calves are encountered (Cañadas, Hammond, 2008). Calves were also observed in the groups of harbour porpoises (fig. 2).

The primary type of cetaceans' behaviour in the waters of the estuary was feeding. In some cases we managed to detect that the feeding behaviour of cetaceans was associated with movements of large aggregations of fish: big-scale sand smelt (*Atherina boyeri* Risso, 1810), representatives of a small species of the Mulletts family (*Liza* sp.), whiting (*Merlangius merlangus* Linnaeus, 1758), garfish (*Belone belone euxini* Günther, 1866), and others. All the peak numbers of common dolphins (groups of 20–25 individuals observed in August 2015) coincided with the observed big aggregations of small sized mullet species such as golden grey mullet (*Liza aurata* Russo, 1810) and leaping mullet (*Mugil saliens* Risso, 1810); the sand smelt was also present in the area. Likewise, reports of local fishermen showed that the large groups of dolphins are encountered in the estuary during the seasonal migrations of mullets to the sea and back.



Fig. 2. Groups of harbour porpoises (female with calf; on the left) and common dolphins (adults with calf; on the right) in the navigation channel of Yuzhny Sea Port, near Hryhorivka village.

Рис. 2. Групи фоцен звичайних (самиця з дитинчам; ліворуч) та дельфінів білобоких (дорослі з дитинчам; праворуч) у навігаційному каналі Морського порту «Южний», біля села Григорівка.

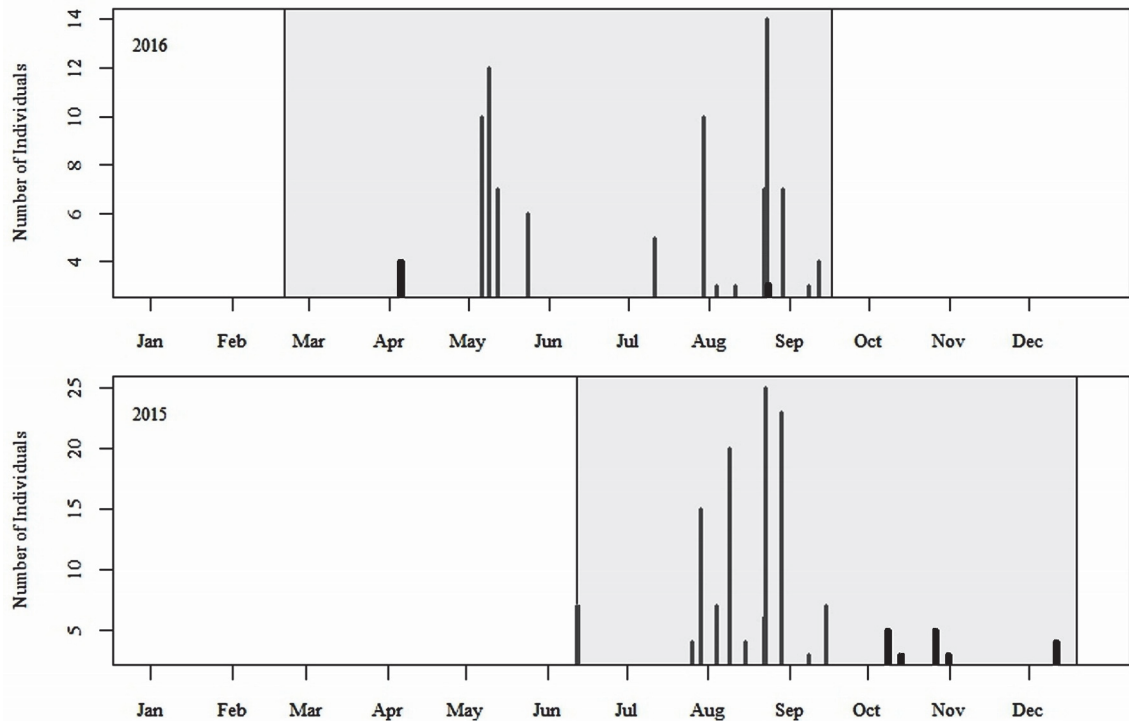


Fig. 3. The sightings and group sizes of the common dolphin (grey lines) and the harbour porpoise (black bold lines) in the waters of Yuzhny Sea Port (Hryhorivsky Estuary, Black Sea) in 2015–2016 (observation periods are indicated by grey background). Observations of harbour porpoises performed on April 4th, 2016, were conducted not in the waters of Yuzhny Sea Port, but in adjacent area.

Рис. 3. Зустрічі дельфінів білобоких (сірі лінії) і фоцен звичайних (чорні напівжирні лінії) та розміри їх груп у водах Морського порту «Южний» (Григорівський лиман, Чорне море) у 2015–2016 рр. (періоди їх спостережень зображені на сірому тлі). Спостереження за фоценами 4 квітня 2016 р. проведено не в акваторії Морського порту «Южний», а в районі, прилеглому до нього.

Fishermen also regularly reported about the feeding of cetaceans in the estuary on small pelagic fish such as the Black Sea sprat (*Clupeonella cultriventris* Nordmann, 1840) and the sand smelt. We believe that these fish species could be an important food source for both cetacean species in Hryhorivsky Estuary because their primary food objects are small pelagic fish (Клейненберг, 1956). Common dolphins use the waters of the estuary during the whole warm period, but harbour porpoises were encountered there mostly during seasonal migrations or in winter.

Conclusions

Favourable feeding conditions for cetaceans in Hryhorivsky Estuary make the transformed coastal ecosystem of Yuzhny Sea Port an important habitat for common dolphins and for harbour porpoises in the northwestern Black Sea. Regular monitoring and dedicated photo-identification studies should be performed to discover philopatry patterns and social structure of this unusual community of common dolphins. Hryhorivsky Estuary is a favourable location to study the feeding ecology, habitat partition and other aspects of ecology of the vulnerable and endangered Black Sea cetacean species.

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