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SHORT COMMUNICATIONS

Results of Transect Observations of Marine Mammals in the Tatar Strait and During Passages within Adjacent Water Areas in the Fall of 2018

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Abstract—A vessel-based survey of marine mammals was carried out at transects in the southern part of the Tatar Strait and during passages within the Sea of Japan and the La Perouse Strait in October 2018. Such surveys had not been previously conducted in these areas during the fall. A total of five species of cetaceans (including the Dall's porpoise, harbour porpoise, common dolphin, killer whale, and minke whale) and two species of pinnipeds (the Steller sea lion and northern fur seal) were sighted. The study showed a low occurrence of marine mammals in the area during the fall season.

Keywords: marine mammals, fall distribution, Tatar Strait, La Perouse Strait

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INTRODUCTION

The composition of the mammal fauna of the Tatar Strait and adjacent waters is generally known [1, 2], but the seasonal distribution of marine mammals in this area is poorly studied. This is explained by the fact that studies of mammals in waters of the Soviet Far East were initially conducted to be applied in sealing and whaling and were often timed to coincide with the pupping or molting seasons of animals [7, 14, 20, 23]. During most of the last century, mammal studies in the Tatar Strait were carried out as opportunistic vessel-based observations [3, 5, 19, 23] or aerial visual surveys [4, 12, 19]. The area was quite quickly recognized as unpromising for regular harvesting [8, 15]. Therefore, little attention was paid to the study of marine mammals in the fall in the Soviet period. The situation did not improve in the 1990s, as the commercial harvesting of pinnipeds nearly stopped (the harvesting of cetaceans stopped even earlier under the decisions of the International Whaling Commission). In the current century, some data on the mammal fauna of the northeastern Sea of Japan were obtained through vessel-based [10, 11] and aerial observations [16, 21, 22], as well as through finding dead animals onshore [13]. Additionally, data from satellite telemetry were reported for some species [17, 25, 26]. The existing data, with rare exceptions, did not cover the fall/winter season and were limited to certain species or groups of species. However, the effective management of marine mammal resources is impossible without understanding the species distribution throughout the year. In order to study the species composition and occurrence of marine mammals in the fall season, vessel-based surveys were conducted at transects in the southern part of the Tatar Strait, as well as during passages in the Sea of Japan and the La Perouse Strait.

MATERIALS AND METHODS

The observations were conducted aboard the R/V *Akademik Oparin* from October 3 to 16, 2018 during the 55th integrated expedition [6]. The water area was viewed from the observation platform located above the wheelhouse at a height of 9.8 m (sight line height of approximately 11.5 m) above sea level. The distance to the visible horizon under no-fog/no-precipitation conditions was 12.1 km. The water area was observed during daylight hours by two periodically alternating observers. The 7 × 50 Pentax Marine binoculars with a reticle (rangefinder and horizontal scale) were used to make approximate angular measurements. The position of the vessel at certain time points was recorded using a portable GPS/GLONAS navigator Garmin eTrex 30×; the angle to the sighted animals was indicated in degrees relative to the vessel's course. Most of the observations were conducted at transects crossing the Tatar Strait in the central (site 1) and southern (site 2) parts of the water area (Fig. 1a). The area of the first and second transect sites, with visibility conditions taken into account, was 30917 km^2 (48.5 h of working effort) and 27578 km^2 (35.8 h), respectively. At the transect sites, the marine mammal

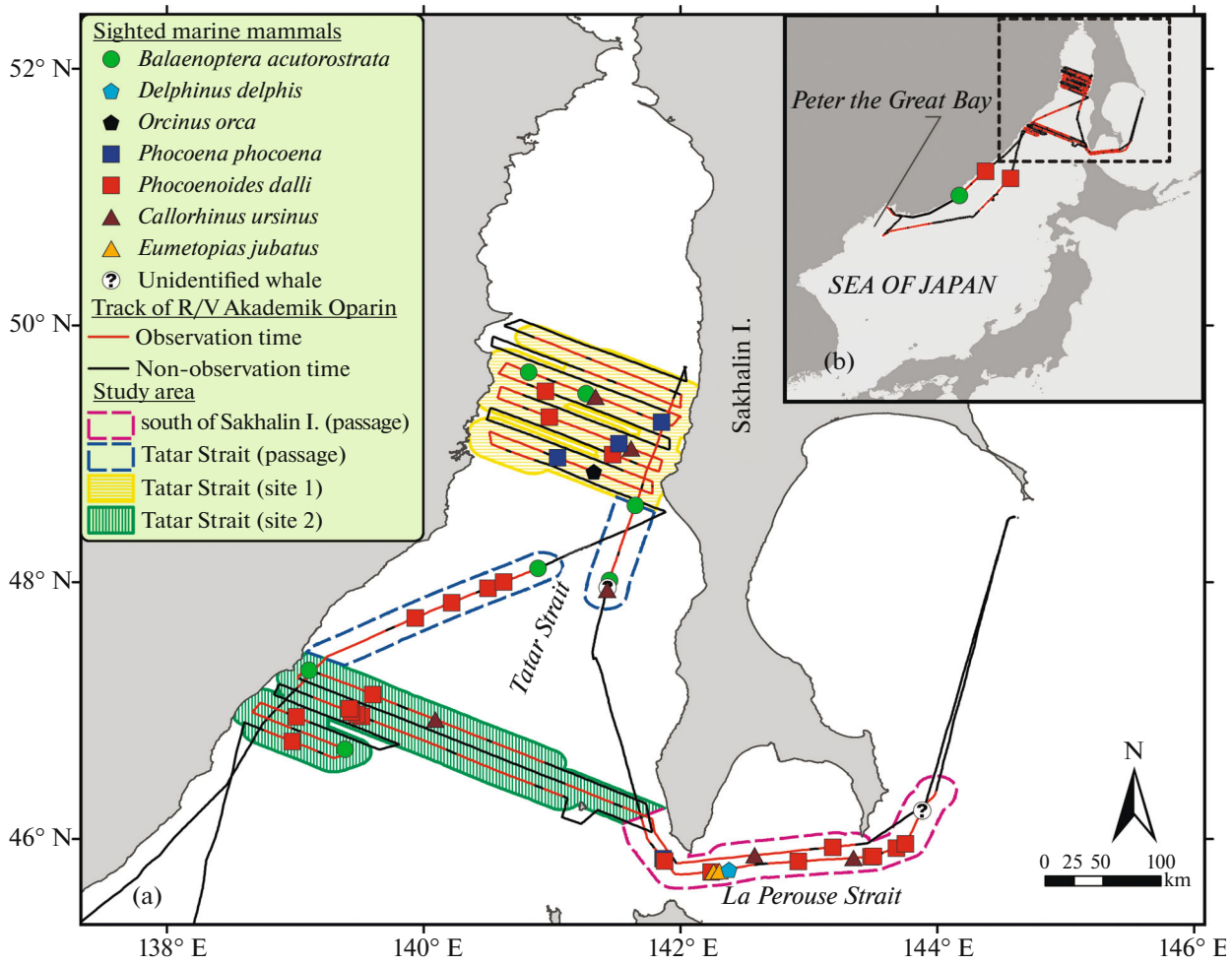

Fig. 1. Map of marine mammal observations during the 55th integrated expedition aboard the R/V *Akademik Oparin*: (a) in the Tatar Strait and the La Perouse Strait; (b) during passages in the Sea of Japan.

occurrence was estimated as the number of individuals per 1000 km^2. During passages in the Sea of Japan, 40460 km^2 (45.3 h) were surveyed (Fig. 1b); in the Tatar Strait, 13424 km^2 (16.6 h); and south of Sakhalin Island, 15281 km^2 (18.5 h) were surveyed (Fig. 1a). Thus, the total surveyed water area, including passages, was 127660 km^2, and the total duration of working effort was 164.7 h. Geographic coordinates of marine mammal groups were determined during the processing of the data in the laboratory with respect to the track recorded by the ship's navigation system. In addition to coordinates and time stamps, the track log contained information on the speed and heading of the vessel. Data processing was performed using the ArcMap and MS Excel software packages.

RESULTS AND DISCUSSION

Marine mammal groups were sighted 49 times (Table 1). The most frequently sighted species was Dall's porpoise *Phocoenoides dalli* (True, 1885) (99 individuals). These animals were most frequently recorded from the southern part of the Tatar Strait (0.26 ind./1000 km^2 at site 1 and 0.69 ind./1000 km^2 at site 2) and in the waters of southern Sakhalin (Fig. 1a). Other species were sighted markedly less frequently. The harbor porpoise *Phocoena phocoena* (Linnaeus, 1758) (11 individuals) was recorded from the central part of the Tatar Strait (0.29 ind./1000 km^2 at site 1) and much less frequently south of Sakhalin Island. Mukhametova et al. [13] noted that *P. dalli* was more frequently found in strandings than *P. phocoena*, but the ratio was not as pronounced as in our study. The study areas were not the same, which may have contributed to difference: we recorded most of the *P. dalli* in the western part of the strait, whereas Mukhametova et al. [13] analyzed the strandings along the coast of Sakhalin Island. It should be noted that harbor porpoises are less visible than Dall's porpoises when moving in the sea, which makes them less likely to be sighted, especially in a rougher state of the sea. A group of nine common dolphins (*Delphinus delphis*

Table 1. Marine mammal sightings from the R/V *Akademik Oparin* in the fall of 2018

Marine mammal species	Study area					
	Sea of Japan (passage)	south of Sakhalin (passage)	Tatar Strait (passage)	Tatar Strait (site 1)	Tatar Strait (site 2)	Total
Balaenoptera acutorostrata	1 (1)	0 (0)	3 (3)	2 (2)	3 (2)	9 (8)
Orcinus orca	0 (0)	0 (0)	0 (0)	2 (1)	0 (0)	2 (1)
Delphinus delphis	0 (0)	9 (1)	0 (0)	0 (0)	0 (0)	9 (1)
Phocoena phocoena	0 (0)	2 (1)	0 (0)	9 (3)	0 (0)	11 (4)
Phocoenoides dalli	8 (2)	35 (9)	29 (4)	8 (3)	19 (7)	99 (25)
Callorhinus ursinus	0 (0)	3 (2)	1 (1)	2 (2)	1 (1)	7 (6)
Eumetopias jubatus	0 (0)	5 (2)	0 (0)	0 (0)	0 (0)	5 (2)
Unidentified whale	0 (0)	3 (1)	1 (1)	0 (0)	0 (0)	4 (2)

The total number of sighted marine mammal groups of each species is given in parentheses.

Linnaeus, 1758) was observed in the La Perouse Strait. Killer whales (*Orcinus orca* (Linnaeus, 1758)) were sighted only once in the Tatar Strait (0.06 ind./1000 km^2 at site 1). We did not manage to identify a particular ecotype of orcas.

Baleen whales were represented only by minke whales *Balaenoptera acutorostrata* Lacépède, 1804 (nine individuals) in the Tatar Strait (0.06 ind./1000 km^2 at site 1 and 0.11 ind./1000 km^2 at site 2) and along the Sea of Japan coast (Fig. 1b). It was previously noted that off the coast of Asia, minke whales migrate to northern areas (including the Tatar Strait) for feeding in spring and return to the south in the fall [18]. The relatively high number of sightings in our study suggests that minke whales stay in the area until at least mid-October.

Among pinnipeds, the Steller sea lion *Eumetopias jubatus* (Schreber, 1776) (five individuals) and the northern fur seal *Callorhinus ursinus* (Linnaeus, 1758) (7 individuals) were recorded (Table 1). Both species were found east of the La Perouse Strait. Moreover, northern fur seals were sighted several times in the Tatar Strait (0.06 ind./1000 km^2 at site 1 and 0.04 ind./1000 km^2 at site 2). The records of the Steller sea lion in southern Sakhalin waters were not unexpected as there are several permanent rookeries and haulouts of this species in the La Perouse Strait and its vicinity [24]. The sightings of northern fur seals in the Tatar Strait agree well with the previous data [10]. It should be noted that, unlike the study by Kuzin and Maminov [10], which was conducted during the spring/summer season (i.e., before the beginning of the breeding season of northern fur seals), we covered the fall season of the species' annual cycle, which is the time of completion of the breeding season. It was previously known that northern fur seals use the waters of the northeastern Sea of Japan for feeding in summer and fall [9, 25].

No spotted seals were observed during this survey. However, our previous studies indicate the presence of spotted seals from Peter the Great Bay in the Tatar Strait [26], including the area covered in the present survey, in October.

This study extends the data on the mammal fauna of the southern part of the Tatar Strait and demonstrates that this area is poorly populated by marine mammals in the fall. During the fall, porpoises of both species are predominant in the sightings.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All applicable international, national and/or institutional guidelines for the care and use of animals have been followed. No experiments on animals have been performed in this study, only visual examination from a long distance.

CONFLICT OF INTEREST

The authors of this work declare that they have no conflicts of interest.

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