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Remarks on the past and recent records of walrus, *Odobaenus rosmarus rosmarus* Linnaeus, 1758, from South Spitsbergen coasts

ABSTRACT: Archaeological investigations were carried out on Sörkappland, the results together with literature data permitted to draw the past distribution of walruses at South Spitsbergen.

Recent observations of walruses and marine biological survey indicate good perspectives for the recolonisation of investigated area by walrus population from East Svalbard region.

Key words: Arctic, South Spitsbergen, walrus

1. Introduction

The existence of Polish Polar Station in South Spitsbergen and development of new trends in its scientific activity towards environmental sciences, natural resources protection and other aspects of ecology draws attention to the animal life in Hornsund fiord.

New inspiration for ecological and protection studies gives an increasing danger of potential oil spills from planned oil drilling fields at South Spitsbergen coasts (Bergsager 1984).

Although numerous ornithological works were conducted in that area (Jakubiec 1974, Norderhaug, Brun and Møllen 1977, Stempniewicz 1978, 1979), still very few is known about the occurrence, population density and ecology of sea mammals inhabiting South Spitsbergen National Park. Some species were investigated more extensively like Polar bear

(Jezierski and Moskal 1984, Larsen 1985) aspects of seal ecology (Gjertz, Lydersen and Węsławski 1985, Gjertz and Lydersen 1986). Note on white whales from Van Keulen Fjord was published by Różycki (1978).

Atlantic walrus (*Odobaenus rosmarus rosmarus* Linnaeus, 1758) was almost not observed at South Spitsbergen since the end of last century (Born 1984), whereas the recent observations gave us the inspiration to search for past records of this species. The aim of present study is to review past and present occurrence records of walrus on Sörkappland and to indicate potentaially convenient areas for recolonisation of that area by these animals.

2. Material and methods

All archaeological data were collected by the first author during Jagiellonian University Expeditions to South Spitsbergen in 1980, 1982, 1983 and 1985. Data on marine biology were collected by the second author during expeditions of the University of Gdańsk and Polish Academy of Sciences in 1977, 1979, 1981/82 and 1984/85. The survey of coasts and walruses observations were performed by both authors in 1982 and 1985.

3. Results and discussion

South Spitsbergen was famous of abundant walrus populations at its West Coasts in the begining of Arctic exploration (Edge 1625 after Perry 1967, Lønø 1979, 1984). The remains of intense hunting can be found in some places on that area. Small island Stjernoya (Fig. 1) is a good example of such a place; in July 1982 we have found there the remnants of more than 100 walruses. Skeletons and single bones of walrus were found abundantly along the whole investigated coast (Fig. 1).

These findings correspond mostly with remains of small traper huts and settlements from XVII and XVIII centuries, where hunting gear was found (Fig. 1, Tab. 1).

Reports cited by Perry (1967) and Lønø (1984) show that thousands of walruses were hunted on South Spitsbergen during XVII and XVIII centuries. In effect walruses were completely exterminated there and were not observed along the whole Spitsbergen island until 1973, when North Spitsbergen island Moffen was recolonized (Born 1984).

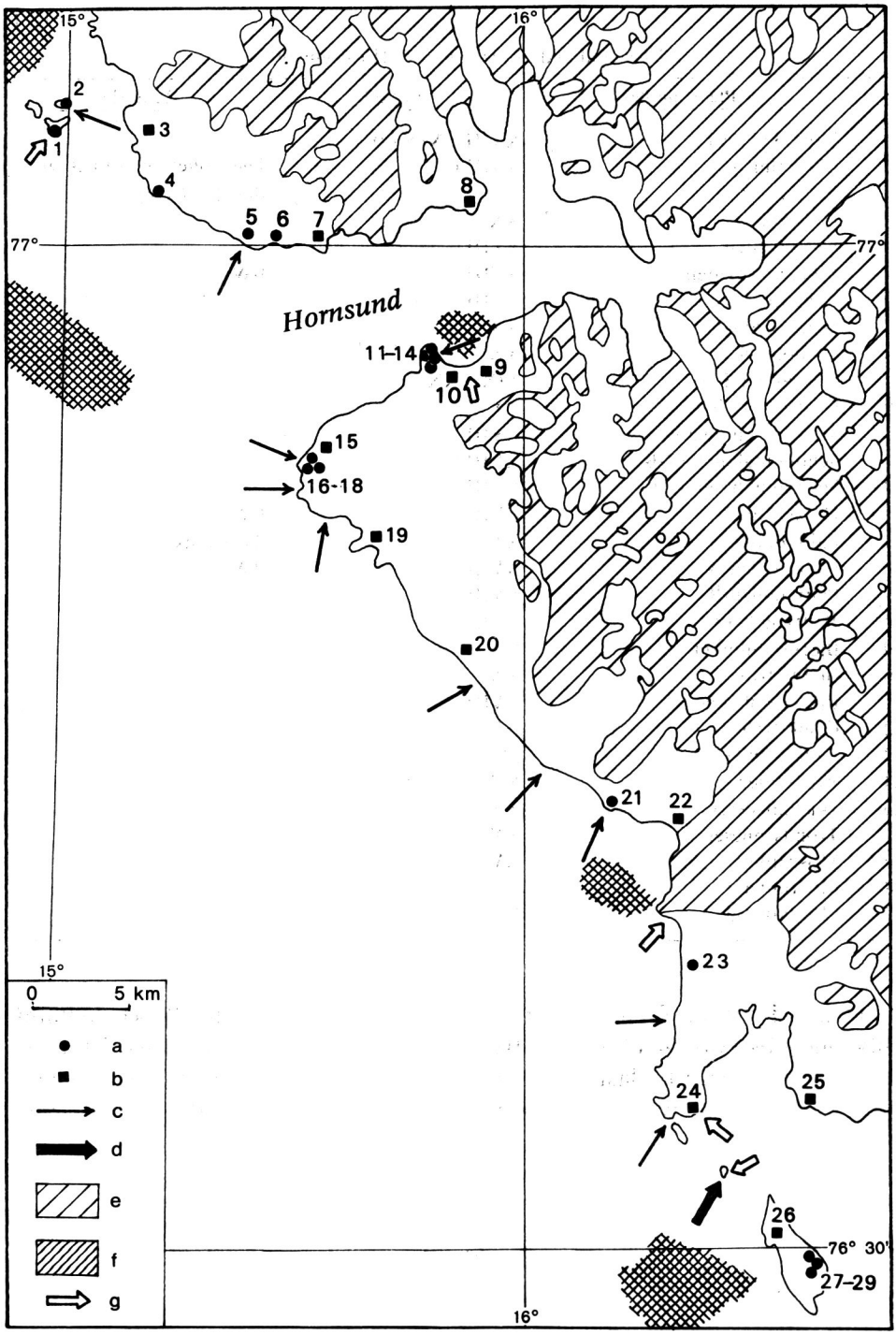

Fig. 1. Remains of hunting stations and walrus bones with indication of areas rich in benthic fauna and suitable haul-out grounds a — remains of old settlements, b — remains of XIX—XX century settlements, c — walrus bones, d — numerous walrus skeletons on Stjernøya, e — glaciers, f — rich bottom macrofauna, g — suitable haul-out grounds

Table 1

New and old settlements in Hornsund area

No	Place names	Period	Remarks
1	Store Dunöya	XVIII—XIX (?)	
2	Fjørhølmen	XVIII (?)	The bones of walrus in the hut (BW)
3	Hyttevika	XX	
4	Russepynten	XVIII	
5	Worcesterpynten	XVIII (?)	BW
6	Revelva	XVIII	
7	Wilczekodden	XX	
8	Gnalodden	XX	
9	Gashamna East	XIX—XX	
10	Gashamna West	XX	
11	Schönningholmane-A	XVIII	
12	Schönningholmane-B	XVIII (?)	
13	Schönningholmane-C	XVIII (?)	
14	Höferpynten	XVII	BW
15	Palffyodden	XX	Two huts
16	Palffyodden-A	XVIII	BW
17	Palffyodden-B	XVIII	BW
18	Palffyodden-C	XVIII	BW
19	Björnskaubukta	XX	
20	Breinesflya	XX	
21	Björnbeinflyene	XVIII	BW
22	Olsokflyene	XX	
23	Langstranda	(?)	
24	Skjerodden	XX	
25	Skjemmeneset	XX	
26	Trondsenneset	XX	
27	Mosvatnet-1	XVIII (?)	
28	Mosvatnet-2	XVIII (?)	
29	Mosvatnet-3	XVIII (?)	

Detailed list of faunal observations collected by Born (1984) contains only one observation of walrus from South Spitsbergen over last 30 years (Tab. 2). Apparently last years brought some new data to this record list, when as many as 7 single walruses were observed in Hornsund in 1984/85.

From where come Svalbard walruses? The biggest population of the Atlantic walrus in European Arctic lives at the border between Barents and Kara Seas at Novaja Zemlja; that population is supposed to support Franz Josef Land colony (Ivašin, Popov and Capko 1972, Byčkov 1985). Little is known about possible contact between Franz Josef Land and Svalbard walrus populations, however the ice pack drift suggests such a connection (Fig. 2).

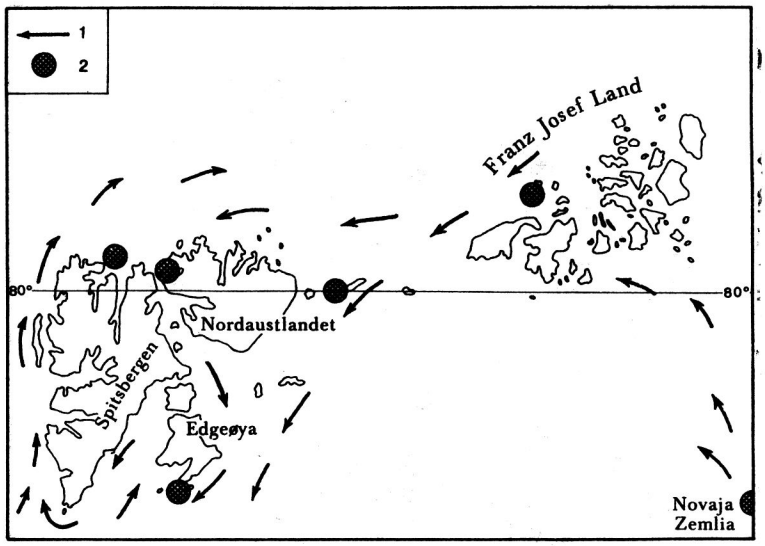

Fig. 2. Schematic outline of ice pack drift and surface currents in Barents Sea (data compiled from Tantsura 1959 and Vinje 1984); walrus colonies marked according to Born (1984) and Ivašin et al. (1972). 1 — Sea Currents. 2 — Walrus colony

North and East Spitsbergen were recolonised probably by walruses from Franz Josef Land in early 70-ties (Larsen and Norderhaug 1974, Born 1984).

Walruses recolonised at first North Spitsbergen and Nordaustlandet, afterwards Edgeoya and islands south of (Figs. 1 and 3). That movement from North to South along Svalbard coasts is also correlated with direction of ice pack drift which may help in spreading of the population (Figs. 2 and 3). The whole stock of walruses on Svalbard increased over last years and amounts to about 700 specimens at the whole archipelago (P. Prestrud, pers. comm., in 1984).

The sea currents system and ice pack drift (Tantsura 1959, Vinje 1984) should support Sörkappland with walruses from their colonies situated south of Edgeoya (Fig. 3).

What kind of limitation meet walruses colonising Sörkappland area? Since international protection was introduced walrus has had no natural enemies in practice. Three factors seem to be most important: food, local climatic conditions and the accessibility of haul-out grounds.

Food is not a limiting factor for the occurrence of walruses. Their wide food pattern (bivalves, polychaetes, crustaceans, echinoderms, seals) permits to accommodate to different food conditions (Perry 1967, Ivašin, Popov and Capko 1972, Born 1984, Byčkov 1985). Benthic fauna is not very abundant in the coastal shallow waters off South Spitsbergen

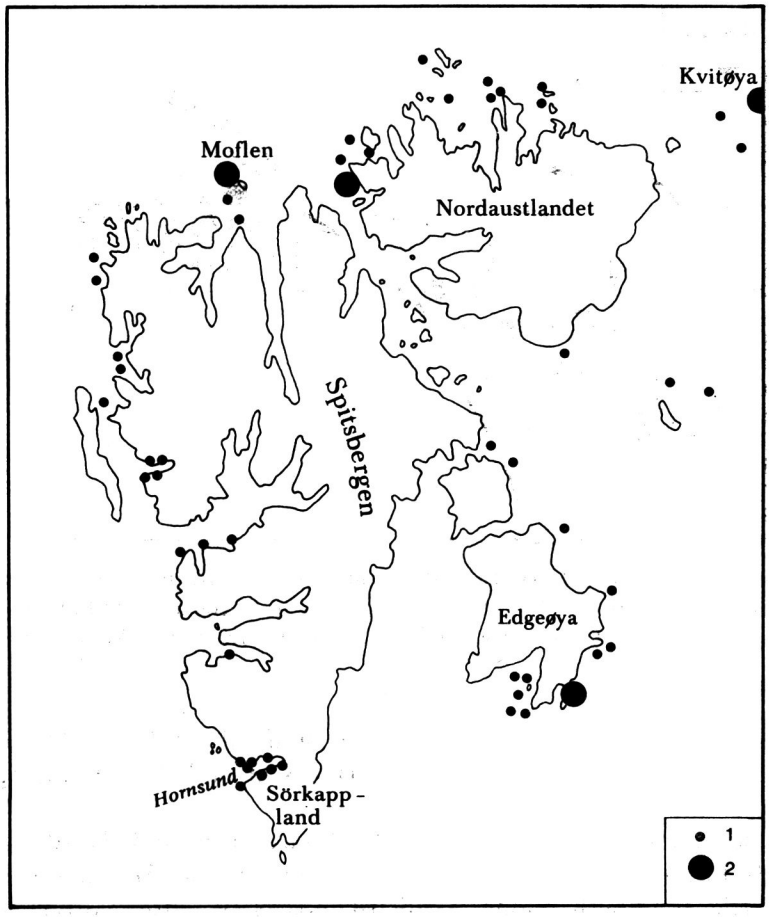

Fig. 3. Occurrence of walruses in Svalbard area compiled from Lonø (1974), Born (1984) and own observations 1 — single observations, 2 — colonies

(Węsławski, unpubl. data); only few parts of the coast seem to be accessible as walrus feeding grounds (Fig. 1).

Climatic conditions — especially variable in Svalbard area (Blacker 1957) may be considered as very important factor limiting animal life in the area. Vibe (1967) and Perry (1967) recorded low frequency of walruses during severe ice periods at Greenland. However Ivašin, Popov and Capko (1972), Lukin (1978) and Byčkov (1985) noted that due to the human activity walruses in Soviet Arctic left their breeding places along the coast and in escape to more protected places started to breed on the ice pack in Barents Sea. European Arctic is coming into rather mild climatic period after small climatic minimum in 70-ties (Łomniewski, Zaleski and Żmudziński 1979); that fact as well is favorable for walruses in the area.

Haul-out grounds are low gravel or sandy beaches around sheltered bays accompanied by the shelf of the depth of 10—90 m with rich bottom fauna (Perry 1967, Ivašin, Popov and Capko 1972). Such areas off South Spitsbergen are marked in Fig. 1.

In conclusion we can tate that sea currents system, available food

Table 2

Records of walruses from South Spitsbergen in XX century

Date	Place	Remarks	Author
28 August 1967	Gashamna	single male?	Born (1984)
14 June 1984	Brepollen	adult male on ice	S. Siedlecki pers. comm.
11 April 1985	Isbjornhamna	adult female on ice	own observ.
29 April 1985	Burgerbukta	immature male in water	own observ.
17 May 1985	Hornsund	young of ice	own observ.
17 May 1985	Isbjornhamna	young with short tusks on ice	own observ.
17 May 1985	Isbjornhamna	adult male? on ice	own observ.
28 May 1985	Palffyodden	in water	own observ.

base, presence of haul-out grounds as well as recent mild climatic conditions would support further spreading of walrus colonies in South Spitsbergen.

An important factor, but not considered in the present work, is the human activity, especially that connected with industrial works. Animals, even protected from direct killing, will be seriously stressed in such circumstances.

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4. References

Bergsager E. 1984. Letting etter olie og gass. — In: Det Beste (ed.), Nordligste Norge. Oslo. 260—266.

Blacker R. W. 1957. Benthic animals as indicators of hydrological conditions and climatic changes in Svalbard waters. — Fish. Invest. London, ser. 2, 20: 1—49.

Born E. W. 1984. Status of the Atlantic walrus *Odobaenus rosmarus rosmarus* in the Svalbard area. — Polar Res., 2: 27—45.

Byčkov V. A. 1985. Atlantičeskij morž. — In: Krasnaja Kniga SSSR. Lesn. Promyšl., Moskva, 49—50.

Gjertz I. and C. Lydersen. 1986. Polar bear predation on Ringed Seals in Hornsund. — Polar Res., 7:

Gjertz I., C. Lydersen and J. M. Węsławski. 1985. Aspects of vertebrates feeding in Hornsund fiord. — Rapportserie Norsk Polarinst., 21:

Ivašin M. B., L. A. Popov and A. S. Capko. 1972. Morskije mlekopitajuščije. — Piščevaja promyslennost. Moskva, 300 pp.

Jakubiec Z. 1975. Badania ilościowe nad awifauną tundry w rejonie Hornsundu. — In: S. Baranowski (ed.). Pol. Wyprawy Spits. Uniw. Wrocł., Wrocław, 70—76.

Jezierski J. and W. Moskal. (in press). Polar Bear observations from Polish Polar Station in Hornsund. — In: R. Z. Klekowski (ed.). Man, animal life and landscape in High Arctic. Ossolineum, Wrocław.

Larsen T. 1984. Population biology of Polar Bear (*Ursus maritimus*) in Svalbard area. — Norsk Polarinst. Skr., 184: 1—129.

Larsen T. 1985. Polar Bear biology, population density and ecology in Svalbard area. — Ph. D. thesis, Univ. Oslo.

Larsen T. and M. Norderhaud. 1974. Hvalrossen kommer tilbak til Svalbard. — Norsk Natur, 2: 44—47.

Lønø O. 1970. The catch of walrus Odobaenus rosmarus in the areas of Svalbard, Novaja Zemlja and Franz Josef Land. — Norsk Polarinst. Arb., 1972, 199—212.

Lønø O. 1984. Den første spekkalder. — In: Det Beste (ed.). Svalbard vart Nordligste Norge, Oslo, 23—53.

Lukin L. R. 1978. O srokah i rajonah ščenki atlantičeskogo morža. — Ekologija, 5: 100—101.

Łomniewski K., J. Zaleski and L. Żmudziński. 1979. Morze Arktyczne. — PWN, Gdańsk.

Norderhaug M. I., E. Brun and G. U. Møllen. 1977. Barentshavet sjofuglre surser. Medd. Norsk Polarinst., 104:

Perry R. 1967. The world of the walrus. — London, 111 pp.

Perry R. 1976. Mir Morža. — Gidrometeoizdat, Leningrad, 112 pp.

Różycki O. 1978. Analiza kości biełuch poławianych w fiordzie Van Keulen. — Mat. V Symp. Pol. PTG, Gdańsk-Gdynia, 2: 113—123.

Stempniewicz L. 1978. Rola traczyka lodowego w wysokoarktycznym ekosystemie Spitsbergenu. — Mat. V Symp. Pol. PTG, Gdańsk-Gdynia, 2: 159—169.

Stempniewicz L. 1979. Niektóre konsekwencje życia ptaków w strefie wysokoarktycznej. — Kosmos, 2: 159—164.

Tantsura A. J. 1959. O tečenijah Barentsogo Morja. — Trudy PINRO, 9: 35—54.

Vibe C. 1967. Arctic animals in relation to climatic fluctuations. — Medd. Grønl., 170: 227—000

Vinje T. E. 1984. Sea ice in Barents Sea. — Norsk Polarinst., Oslo.

Vinje T. E. 1985. Drift, composition, morphology and distribution of the ice fields in the Barents Sea. — Norsk Polarinst., 1—26.

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5. Streszczenie

W pracy przedstawiono dane o dawnym występowaniu morsa (*Odobaenus rosmarus rosmarus*) na wybrzeżach południowego Spitsbergenu na podstawie znalezisk szczątków kostnych tego zwierzęcia w pobliżu resztek traperskich szałasów (Rys. 1), a następnie zestawiono ostatnie obserwacje żywych morsów na wybrzeżach południowego Spitsbergenu (Tab. 1) na tle literaturowych informacji o występowaniu tego gatunku w rejonie Spitsbergenu i pobliskich rejonach (Rys. 2 i 3).

Przedyskutowano szanse rozwoju populacji morsa na wybrzeżach Spitsbergenu, biorąc pod uwagę czynniki klimatyczne, troficzne i topograficzne.