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# Russian Fishery of Shrimp (*Pandalus borealis*) on Flemish Cap Bank (NAFO Division 3M) in 1999 and in March-September 2000

by

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## Abstract

The paper gives brief preliminary review of Russian fishery for shrimp on Flemish Cap Bank during March-November 1999 and March-September 2000. Maximum catches per effort were taken in June-August 1999 and in March-July 2000. Length and sex compositions of catch by month are reported. Redfish were the most frequent in by-catch (up to 430 indiv./1 t of shrimp in June 2000), as well as common wolffish (up to 188 indiv./1 t in May 2000). Besides, spotted wolffish, roughhead grenadier and Greenland halibut were taken as by-catch.

## Introduction

Russian fishery for shrimp on Flemish Cap Bank commenced in March 1999 by two vessels and continued until November. In the year 2000, it was started again in January. The number of vessels varied from 2 to 5. Most of the vessels were 54.8 m and above with a main engine power being above 1000 h.p. Observers were onboard all the vessels.

## Materials and Methods

The material was gathered by the observers trained in PINRO. The Canadian trawl "Crocodile" with 40 mm minimum mesh size and sorting grid (22 mm distance between bars) were used as a fishing gear. Hauls were done at a speed 2.5-3.0 knots. Trawling duration was 4-6 hours.

Shrimps were measured and staged by the methods suggested by Rasmussen (1953) and modified by McCrary (1971). Size and species composition of by-catch were daily analyzed. In this case, by-catch of one of the hauls performed was completely analyzed.

## Results

In 1999, shrimp fishery was carried out by the Russian vessels on the bank northwestern slope in the sites with 250-350 m depth during March-May and in June-July - on the northeastern slope - within the range of 280-310 m depth. Maximum catches per effort were taken in June and August (Table 1). In January-March 2000, the fishery was continued along the northwestern slope and along the eastern and northeastern slopes at 210-280 m depths - during April-May. In June, hauls were done along the western and southwestern slopes at 270-310 m depths. During that period maximum fishing efficiency was observed. In July-August, the southeastern and southern slopes at 260-310 m

depths were covered. Since July fishing efficiency has gradually decreased and attained minimum values in September-October (Table 2).

Length of carapace in shrimp from catches varied from 7.5 to 32 mm (Fig. 1-2). In this case, males attained 24 mm. Length of females with sternal spines varied from 15.5 to 27.5 mm and from 16 to 32 mm - in those without them. In 1999, proportion of males in catches increased (58.8-77.7) from March to August. In 2000, the highest proportion of males in catches was registered in March-May (up to 94%). No clearly pronounced fluctuations were noted in sex ratio during the year.

In late March - early April 1999, the females with eggs on pleopods made up on the average 23% of the amount of shrimps in a sample and no such females were virtually found on 9 April. Therefore, one could suggest that the shrimp larval hatch occurred during ten days of the first half of April. Females with new eggs on pleopods began to occur in samples in mid-July. In late-July about 50% of females free of sternal spines were with eggs on pleopods.

During the Russian fishery for shrimp on Flemish Cap Bank the young redfish were most frequent in by-catch (Table 3). Maximum catch of this species was registered on the bank western slope (430 indiv./1 t of shrimp) in June 2000. Redfish length was 8-23 cm. Redfish occurred in catches taken during operations in the areas at 220-440 m; however, its large quantities were noted at 250-300 m. Redfish by-catch decreased with an increase in depth of trawling. Besides redfish, common wolffish (9-30 cm), roughhead grenadier (11-27 cm) and Greenland halibut (9-28 cm) constantly occurred in by-catch.

## References

McCRARY, J.A. 1971. Sternal spines as a characteristic for differentiating between females of some Pandalidae. *J. Fish. Res. Board Can.*, **28**: 98-100.

RASMUSSEN, B. 1953. On the geographical variation in growth and sexual development of the deepsea prawn (*Pandalus borealis* Kr.). *Fisk. Dir. Skr. ser. Havunders*, **10**(3): 160 p.

Table 1. Preliminary data on catch (t), fishing efforts (fishing day) during Russian fishery for shrimp on Flemish Cap Bank (NAFO Div. 3M), 1999-2000

| | 1999 | | | 2000 | |
|---|---|---|---|---|---|
| Months | Catch, t | Fishing days | Trawling hours | Catch, t | Fishing days |
| January | - | - | - | 88 | - |
| February | - | - | - | 59 | - |
| March | 3.5 | 3 | 39 | 653 | 42 |
| April | 119.4 | 53 | 828 | 739 | 68 |
| May | 127.6 | 54 | 870 | 847 | 94 |
| June | 123.2 | 32 | 540 | 1174 | 95 |
| July | 183.5 | 61 | 973 | 1044 | 85 |
| August | 94.7 | 25 | 436 | 430 | 41 |
| September | - | - | - | 551 | 102 |
| October | 91 | 23 | | | |
| November | 133 | 29 | | | |
| December | - | - | | | |

Table 2. Preliminary data on catch (t), fishing efforts (fishing day and trawling hours) during fishery for shrimp on Flemish Cap Bank (NAFO Div. 3M) by Murmansk vessels, 2000.

| Months | Catch, t | Fishing days | Trawling hours |
|---|---|---|---|
| January | - | - | - |
| February | - | - | - |
| March | 132.6 | 12.0 | 228 |
| April | 234.2 | 34.8 | 676 |
| May | 209.2 | 25.0 | 520 |
| June | 277.0 | 27.0 | 559 |
| July | 233.7 | 25.0 | 484 |
| August | - | - | - |
| September | 86.8 | 30.3 | 541 |
| October | 69.1 | 26.5 | 462 |

Table 3. By-catch taken during Russian fishery for shrimp on Flemish Cap Bank (NAFO Div. 3M), March-August 1999, April-May 2000, indiv./1 t of shrimp

| | 1999 | | | | | | 2000 | | |
|---|---|---|---|---|---|---|---|---|---|
| Fish species | March | April | May | June | July | August | April | May | June |
| Redfish | 262 | 147 | 137 | 55 | 104 | 314 | 16 | 324 | 430 |
| Common wolffish | 45 | 19 | 19 | 4 | 20 | 31 | 138 | 188 | 13 |
| Roughhead grenadier | 10 | 3 | 6 | 12 | 36 | 8 | 3 | 16 | 2 |
| Greenland halibut | 12 | 6 | 5 | 0.4 | 0.8 | - | 31 | 33 | 8 |
| Flounder | 5 | 2 | 0.6 | - | 0.1 | - | - | 0.3 | - |
| Capelin | 2 | 1 | 0.3 | - | - | - | - | - | - |
| Spotted wolffish | - | 0.1 | - | 0.2 | 0.8 | 0.1 | 292 | - | - |
| Red hake | - | 0.2 | - | - | - | - | - | 0.2 | - |
| Haddock | - | 0.1 | - | - | - | - | - | 6 | - |
| American plaice | - | 0.1 | - | - | - | - | - | - | - |

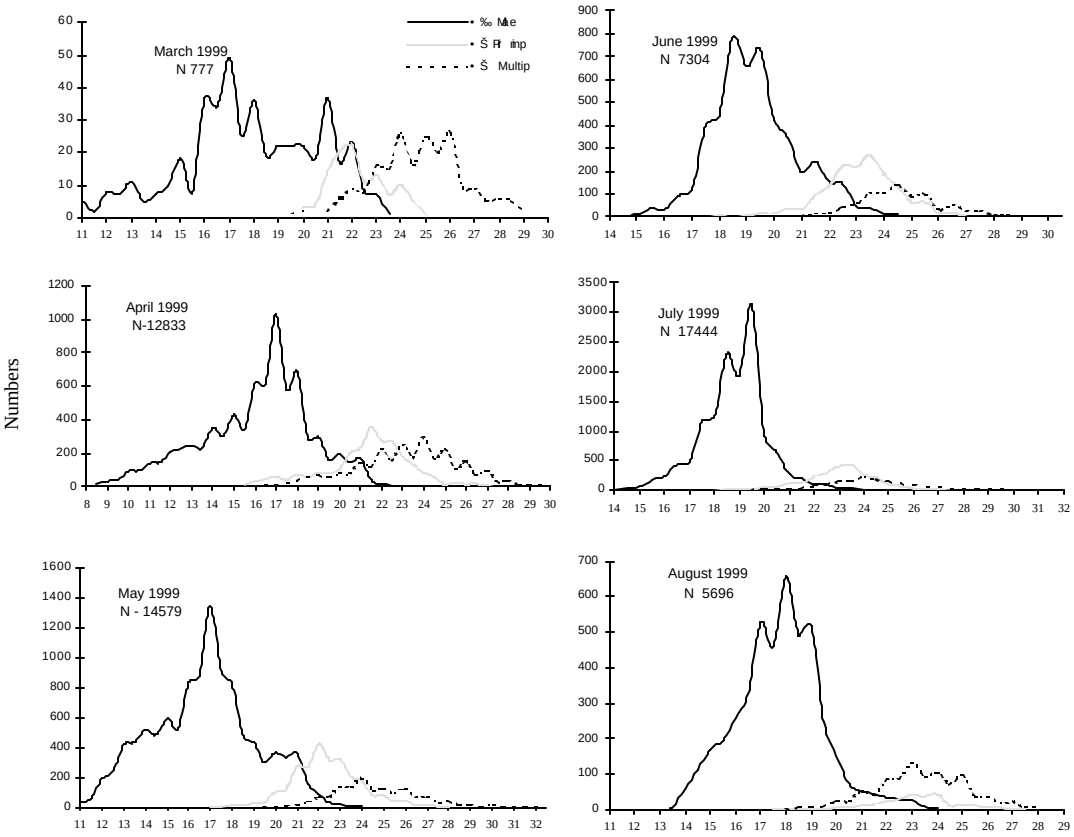


Fig.1. The length frequency distribution from Russian catches of northen shrimp at Flemish Cap by months in 1999.

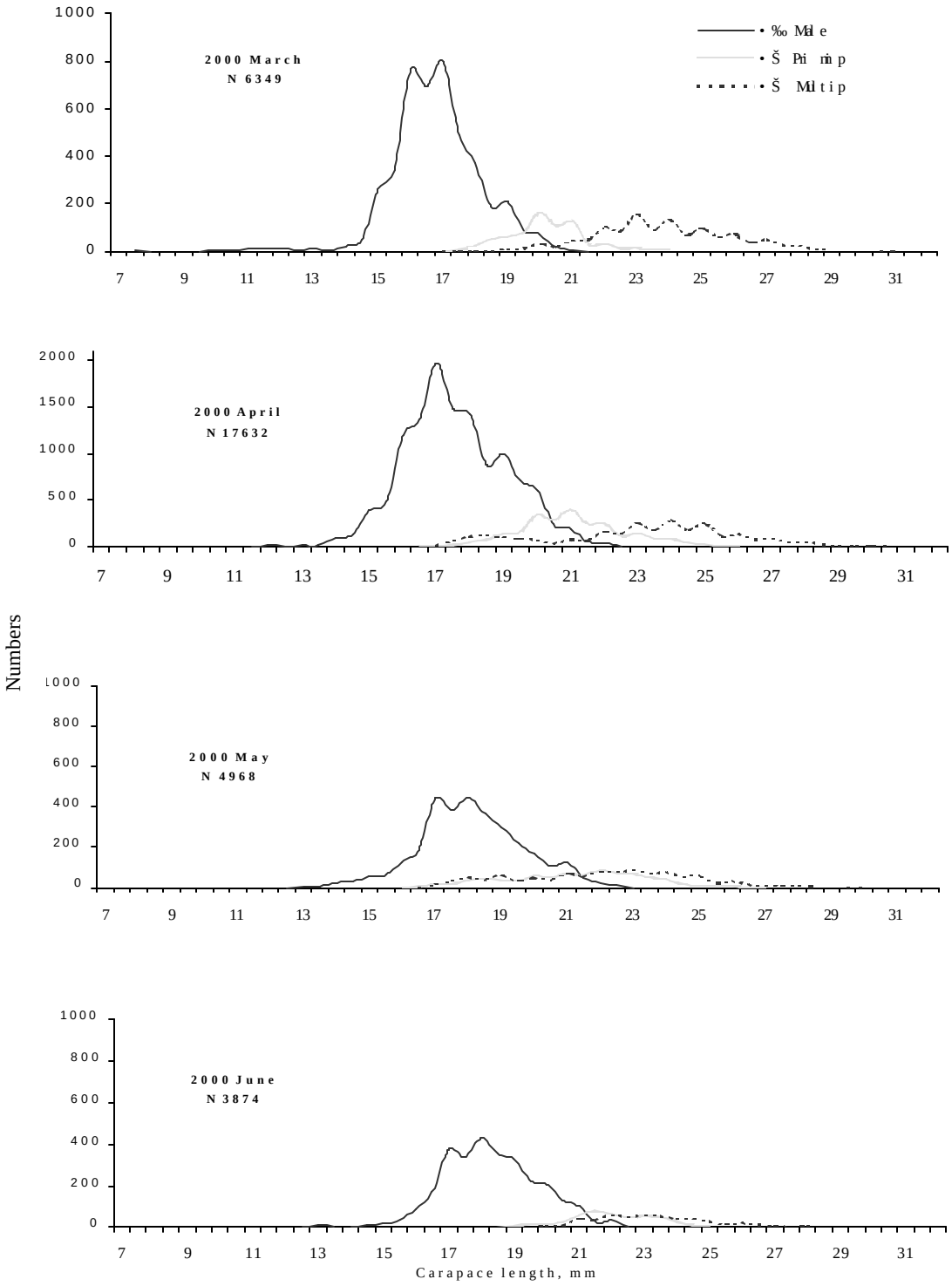


Fig.2. The length frequency distribution from Russian catches of northen shrimp at Flemish Cap by months in 2000.