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SPAWNING OF BLUE WHITING (MICROMESISTIUS POUTASSOU)
IN NORWEGIAN WATERS

by

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ABSTRACT

From two permanent oceanographic stations 56 eggs of blue whiting were recorded in the period March-July. Half of these were recorded in May indicating a peak in spawning this month. During a survey covering the area Stad-Bear Island (62-74°N) in June/July eggs and newly hatched larvae were found as far north as to Træna (66°N), indicating spawning south of this area. Surveys in April from Stad to Lofoten (68°N) in the period 1976-1982 and in June/July from Træna to Bear Island in the period 1977-1982 confirm this. Spawning seems to take place in the fjords and over the deeper parts of the continental shelf. A maximum of 30 eggs and 50 larvae per m² surface was recorded. Most of the recordings were from the Møre area.

INTRODUCTION

The main spawning area of blue whiting is west of the British Isles, and the spawning lasts from March to late April with a peak in April (Anon. 1979). The existence of subsidiary spawning areas outside this area is suggested by Coombs and Pipe (1980) referring to findings of eggs and larvae in the fjords on the west coast of Norway, of young blue whiting found to the

north of Norway and in the Barents Sea, and of spawning adults taken in the Norwegian Sea. The evidence indicates that spawning in the Norwegian Sea is from late May through June, and the location of the spawning grounds in the Norwegian Sea appears to be mostly adjacent to the edge of the continental shelf as they do to the west of the British Isles (Coombs and Pike, 1980).

In Norwegian waters larvae of blue whiting are recorded in Nordfjord and off Svinø, 8-13 mm long, (Anon. 1976) and off Røst, 5-33 mm long (Zilanov 1968). Monstad and Tangen (pers. comm.) found 64 larvae in some fjords in the area from 59°N to 62°N. The length of the larvae varied from 11 to 31 mm and they were sampled with a pelagic trawl in June. Eggs and/or larvae are recorded in Masfjorden and Fensfjorden (Lopes 1979) and from Stad to Træna (Bjørke 1983).

MATERIALS AND METHODS

Parts of this material were derived from herring larvae surveys made in April from Stad to Lofoten in the period 1976-1982. The area was covered twice and samples taken with a Gulf III-samples. (Zijlstra 1970). The samples are taken as double oblique hauls from 60 m to the surface and the station grid is nearly the same each year. The station grid for 1980 is indicated in Fig. 1.

Another part of the material was derived from a postlarvae survey in June/July 1982 (Fig. 2). Vertical hauls were taken with a 0.1m² Juday net from 20-0 m and from 200 m, or bottom if shallower, to surface. Mesh size was 180 micron.

The rest of this material was derived from permanent oceanographic stations at the entrance of Sognefjorden (Sognesjøen) and off Bud (Fig. 2). Vertical hauls from 300 to 0 m and from 250 to 0 m, from Sognesjøen and Bud respectively, were taken with a 0.1m² Juday net at intervals from one week to one month (Wiborg 1978). The samples included are from the period 1976-1979 and from 1976-1981 from Sognesjøen and Bud respectively. Seaton and

Bailey (1971) and Russel (1976) were used for identification purposes.

RESULTS AND DISCUSSION

Seasonal distribution

Table 1 shows the recordings of eggs and larvae of blue whiting at Sognesjøen. Eggs and/or larvae are recorded from March to July with a small maximum in May. The length of the larvae varied from 2.0 to 5.3 mm. Off Bud five eggs were recorded from April to July in the period 1976-1981; three of these in May in different years. (Bjørke 1983). Spawning of blue whiting in Norwegian waters have thus been recorded from March to July with an indication of a peak in May.

Vertical distribution

During the postlarvae survey most of the eggs were found in the deepest hauls, while the larvae were more evenly distributed (Table 2). The length of the larvae varied from 2.0 to 6.4 mm.

Highest recordings of eggs in deeper hauls is in correspondence with findings by Coombs, Pipe and Mitchell (1981) West of the British Isles they found the highest number of eggs between 250 and 450 m. They also found larvae most frequently in the upper 100 and 40 m, depending on length. This might explain the relatively high number of larvae (40) compared to eggs (14) recorded during the postlarvae survey.

Horizontal distribution

In the present material, eggs of blue whiting were found from Sognefjorden (61°10'N) to Træna (66°20'N) (Fig. 1). Findings of egg and larvae are also reported from Fensfjorden and Masfjorden (60°50'N) (Lopes 1979). Monstad and Tangen (pers. comm.) found larvae from 11 to 31 mm in length in Botnafjord, Osterfjord, Sognefjord, Sunnfjord and Nordfjord.

Although vertical zooplankton hauls were taken off the coast and in the fjords from 67°N and 5°E north to 74°N and 27°E during postlarvae surveys in the period 1977-1982, no findings of eggs or newly hatched larvae were recorded north of Træna. The northern limits of spawning seems thus to be found in this area (66°N). The distribution of eggs and small larvae seems to indicate spawning in Norwegian fjords and over the deeper parts of the continental shelf. It should be noted that the edge of the continental shelf suggested as spawning grounds by Coombs and Pipe (1980), was not investigated in the area south of Træna during the surveys in April and June. Most of the recordings were from the Møre area.

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Table 1. Numbers of eggs and larvae in vertical hauls with 0.1 m² Juday net from Sognesjøen.

Year	Eggs					Larvae				
	March	April	May	June	July	March	April	May	June	July
1976		1	8		2		3	9		
1977		6	5	2			4			7
1978		1	9	1					2	1
1979		3	5	8		1	2	11		4
1976-										
1979		11	27	11	2	1	9	22		12

Table 2. Numbers of eggs and larvae in different hauls with 0.1 m² Juday net sampled during the postlarvae survey in June/July 1982. Depths are rounded off to the nearest hundred meter when the depths were less than 200 m.

Depth in m	Eggs	Larvae
20-0	3	12
100-0	1	11
200-0	10	17

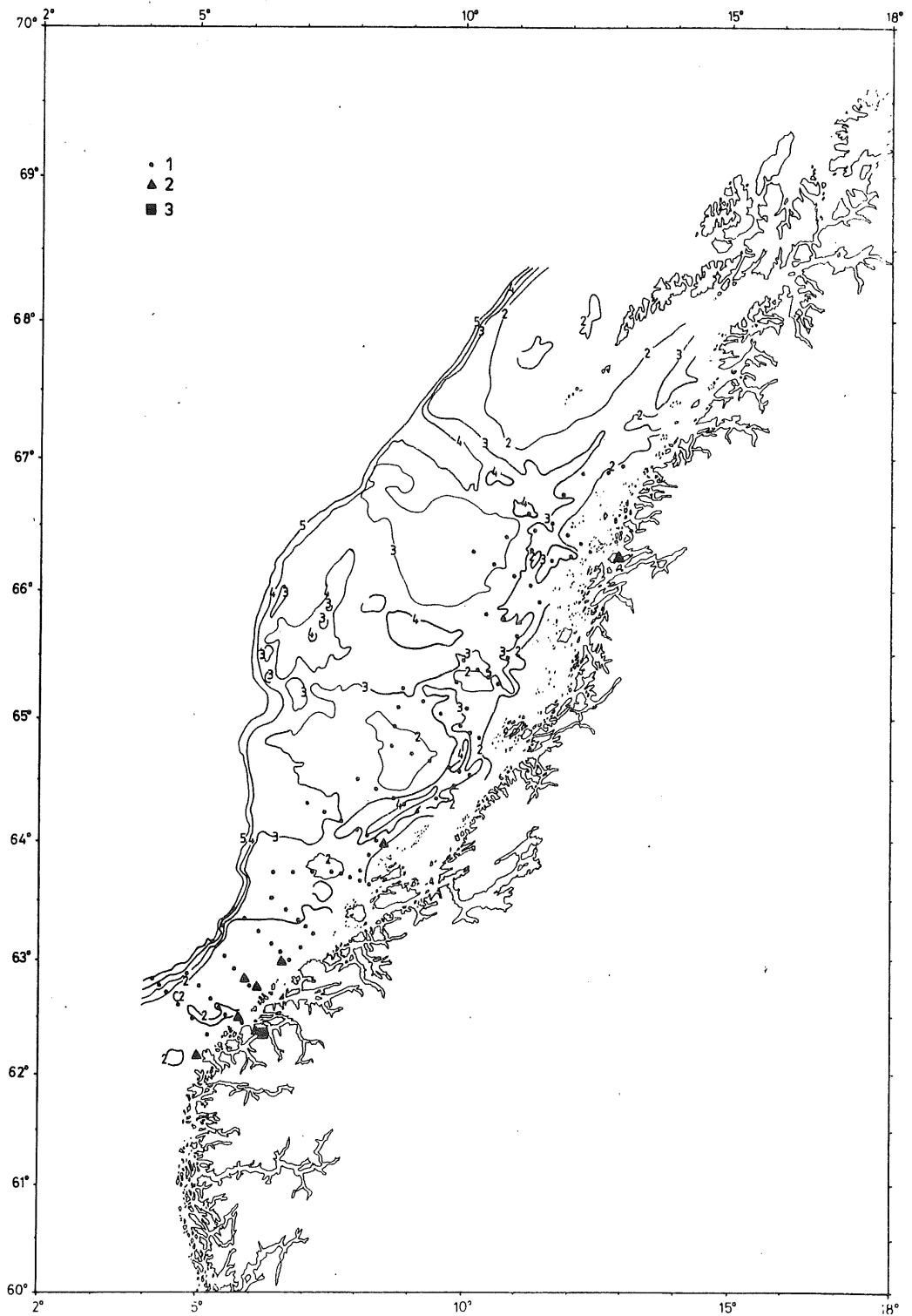


Fig. 1. Station grid for 1980 and recordings of eggs and larvae of blue whiting in April 1976-1982.
1. Stations without recordings. 2. Eggs. 3. Larvae.
Depth contours in hundred meters.

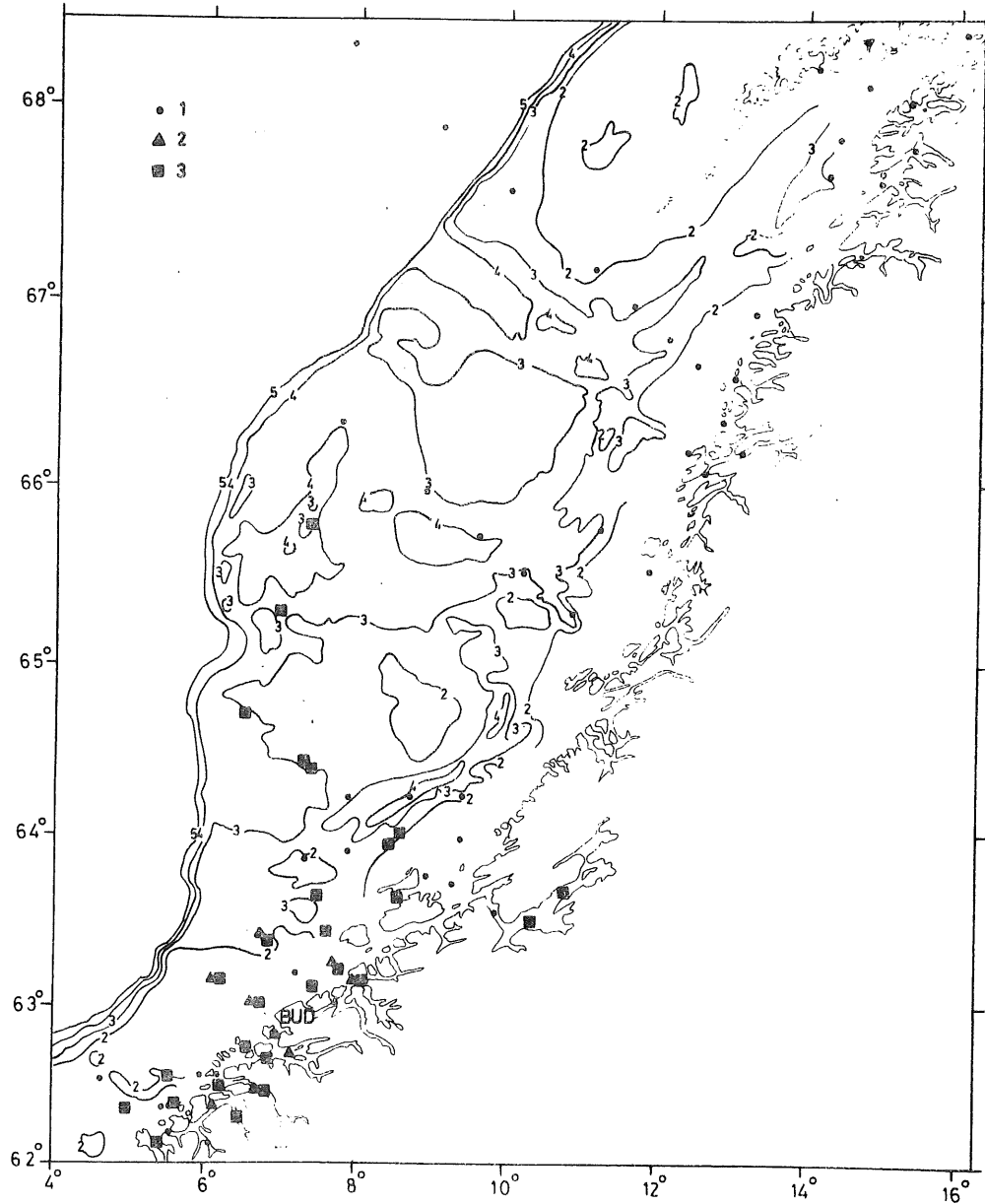


Fig. 2. Station grid from the postlarvae survey in June/July 1982 and recordings of eggs and larvae of blue whiting. 1. Stations without recordings. 2. Eggs 3. Larvae. Depth contours in hundred meters.