Biological Data of Brama rayi (Bloch 1791) in North Atlantic Waters

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Brama rayi (Bloch 1971) is known as an accidental guest in northern Atlantic waters.

Joensen and Tåning (1970) list the findings at the Faroes. In all cases only single specimens have been found or caught.

Brandes (1952) gives a summary of occurrences in North European waters.

In most cases these, too, are single findings or a few. The biological data from these findings are comparatively sparse.

In a more complete list from 1965, landings up to 8 cwts. are reported from the water around the British Isles, in September and October, but without biological data. From July the list only contains single findings (*Mead and Haedrich* 1965).

It is known from the fishery statistics and the literature (*Mead and Headrich 1965*) that there is a center of fishery of this species off the west-coast of Spain. »Each vessel sets and hauls about six miles of longline daily, a line similar to that universally used for tuna, but of lighter construction and with more numerous and smaller hooks« (*Mead and Haedrich* 1965).

This species contributes about 2 % to the total Spanish fishery landings.

Material and methods.

In a research gill-net fishery for mackerel south of the Faroe Islands, the Faroese research ship J. C. Svabo July 21, 1972 caught 37 specimens of Brama rayi. The position was west of St. Kilda about 200 m depth (59° 10' N—07° 10' W). (fig. 1).

The fishes were standing in the gill nets meshes the protruding maxilla holding back. The mesh size was 39 mm. The crew saw several specimens escape from the gill net. 25 of the specimens were brought ashore.

Another instance with several specimens involved is reported from hand-line fishery west of the Faroes. Two specimens were captured. Length and stomach-contents are at hand. The date was 17—18 September 1969 and the catch-position 61° 40' N—07° 45' W. (fig. 1).

With the sparseness of biological data from northern findings in mind, the authors felt it would be of interest to communicate some biological data.

The sample was treated according to routine procedure of the Fisheries Laboratory of Tórshavn.

1. Total length.

Length from the tip of the lower jaw, (mandibular symphysis) to the tip of the longest lobe of the caudal fin.

2. Fork length.

From the tip of the lower jaw to the cartilaginous tip of the median caudal fin rays.

Length measurements were to half centimeters below.

3. Total weight.

The fishes were weighed to 10 g below. e. g. a fish weighing between 2140 g. 2149.9 g is recorded as 2140 g. Calculating the mean, the true mean is derived by adding half the group interval, 5 g. The fact that the sample was preserved 1 month frozen, might be a possible source of bias on weight data.

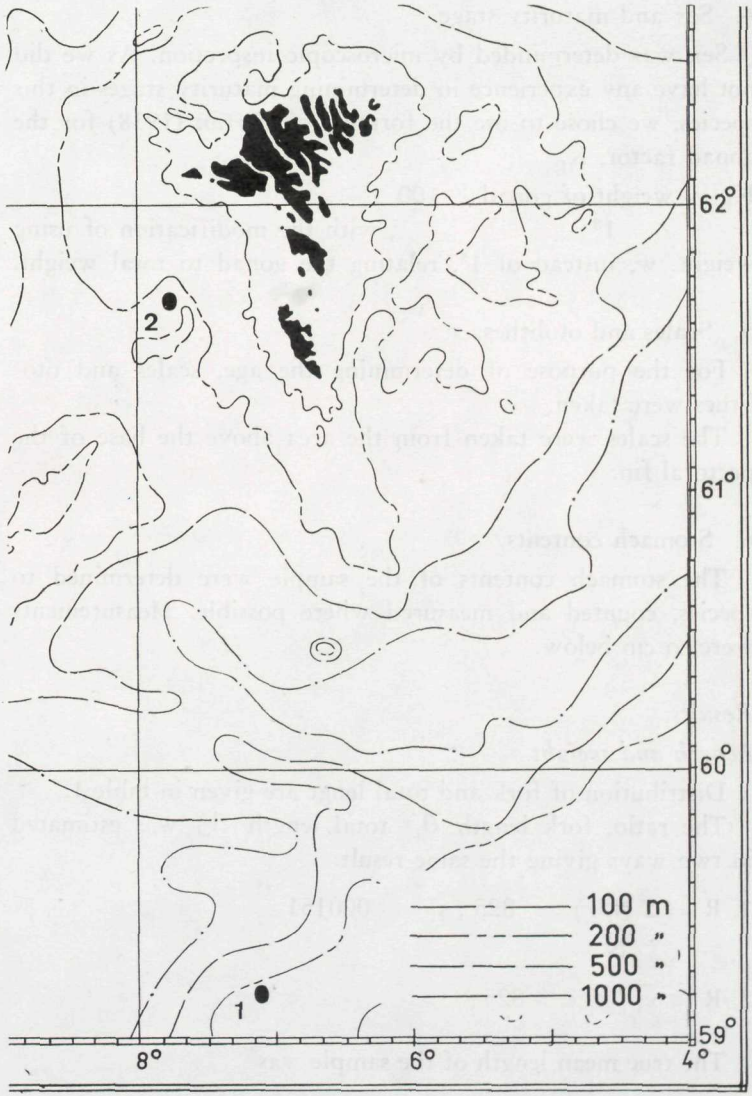

Fig. 1. *Brama rayi (Bloch 1791).*
Station 1. July 21. 1972. 37 specimens.
Station 2. September 17.—18. 1969. 2 specimens.

1. mynd. *Brama rayi (Bloch 1791).*
1. støð, 21. juli 1972. 37 fiskar.
2. støð. 17.—18. september 1969. 2 fiskar.

4. Sex and maturity stage.

Sex was determinded by microscopic inspection. As we did not have any experience in determining maturity stages in this species, we chose to use the formula of *Farran* (1938) for the gonad factor, K_g

$K_g = \frac{\text{weight of gonad}}{1^3} \times 100$, with the modification of using weight, w, instead of 1^3, relating the gonad to total weight.

5. Scales and otolithes.

For the purpose of determining the age, scales and otolithes were taken.

The scales were taken from the area above the base of the pectoral fin.

6. Stomach contents.

The stomach contents of the sample were determined to species, counted and measured where possible. Measurements were to cm below.

Results.

Length and weight.

Distribution of fork and total lengt are given in table 1.

The ratio, fork length (l_f) total length (l_t) was estimated in two ways giving the same result.

1. $R = \frac{\Sigma\,(l_f/l_t)}{N} = \cdot 825\ ;\ s^2 = \cdot 000151$

2. $R = \bar{x}_{l_f} / \bar{x}_{l_t} = \cdot 825$

The true mean length of the sample was

Fork length	47.34 cm	;	(s^2 = 3.87, N = 25)
Tot. length	57.30 cm	;	(s^2 = 5.08, N = 25)

Weight distribution is given in table 1.

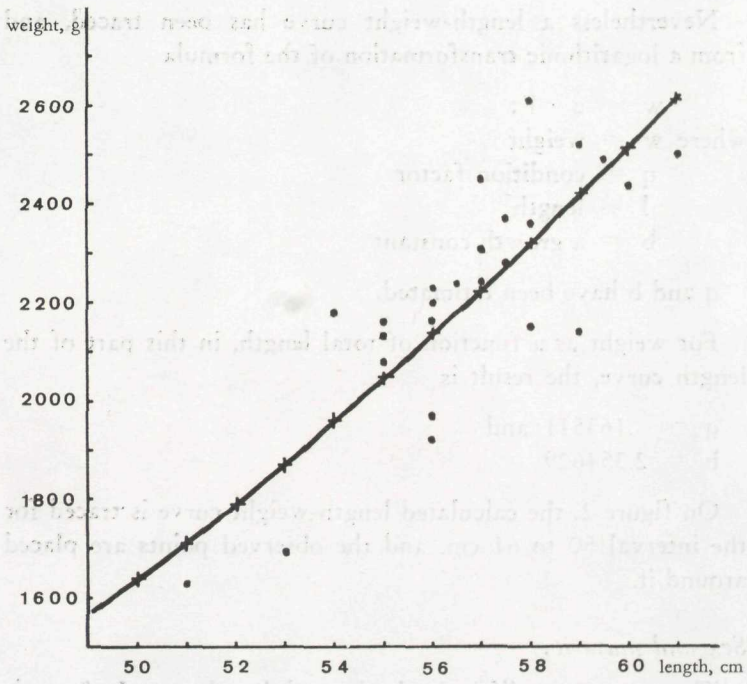

Fig. 2. *Brama rayi (Bloch 1791).*
July 21. 1972. Station 1.
Weight as a function of total length.
Calculated weight: $w = .163511 \cdot 1^{2.354629}$.

2. mynd. *Bramafiskur. 21. juli 1972. 1. stöð.*
Vekt móti longd. Roknað vekt: $w = .163511 \cdot 1^{2.354629}$.

The true mean weight of the sample was 2224 g (s^2 = 57399, N = 25)

Weight as a function of length.

The sample only covers a small part of the length range of Brama rayi, as a matter of fact 51 to 61 cm. A maximal length of 70 cm is given in the literature, so all the lower and the upper end of the length — weight curve is missing.

Nevertheless a length-weight curve has been traced, and from a logarithmic transformation of the formula

$$w = q \cdot l^b;$$

where w = weight
q = condition factor
l = length
b = a growth constant

q and b have been estimated.

For weight as a function of total length, in this part of the length curve, the result is

$q = .163511$ and
$b = 2.354629$

On figure 2. the calculated length-weight curve is traced for the interval 50 to 61 cm, and the observed points are placed around it.

Sex and maturity.

There was some difficulty in determining the sex. In 9 specimens the gonads had the appearance of empty bags, and it could not be seen if the contents had been eggs or sperm.

Of the remaining 16 specimens were 9 females and 7 males.

In table 2. the gonad-factor is given.

Age-determination.

Both scales and otolithes were examined for age-determinations.

It was not possible in the scales to find any structure that could be related to rings or periodic phenomena.

The scales were difficult to get because they were fixed to dermal bones. They were covered with pigment layers, and when these pigment layers were removed the rest was quite hyaline, and without readable macrostructures.

The otolithes clearly had a shift between hyaline and opaque

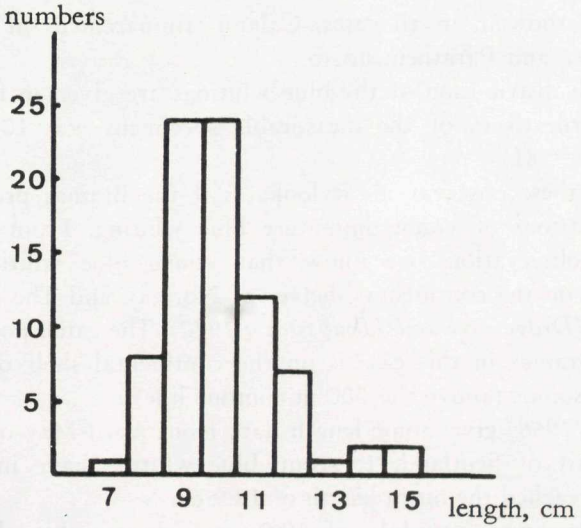

Fig. 3. *Length distribution of blue whiting (Micromesistius poutassou) from stomach contents of Brama rayi, July 21. 1972. Station 1.*

3. mynd. *Longdarbýti, svartkjaftur (Micromesistius poutassou) úr maganum á Brama rayi, 21. juli 1972. 1. stöð.*

zones. They were relatively difficult to read, in many features having the characteristics of old otoliths. The hyaline rings were counted by an experienced otolith reader and the results are given in table 3.

A control reading by another experienced otolith reader showed that there was agreement within $\pm$ 1 ring.

Stomach contents.

The stomach contents were almost exclusively specimens of Micromesistius poutassou. (Table 4).

From the two specimens west of the Faroes squids and fish remains were reported.

No empty stomachs were found and the mean number of specimens in each stomach was 9.1 (s^2 = 22.1, N = 23). An examination of the stomach contents of some of the blue

whitings showed, in all cases, Calanus finmarchicus in great quantities, and Parathemisto sp.

Length distribution of the blue whitings are given in fig. 3.

The true mean of the measurable specimens was 10.0 (s^2 2.45, N = 81).

From these observations it looks as if the Bramas prey on concentrations of young immature blue whiting. From Norwegian observations we know that young blue whiting is common on the continental shelves of Norway and The Faroe Islands. (*Dragesund and Jákupsstovu 1970*). The catch position of the Bramas in this case is on the continental shelf of the British Islands (above the 200 m contour line).

Raitt (1968) gives some length data from April-May on the west coast of Scotland. 1. group blue whiting have in this months reached the mean length of 18.9 cm.

The true mean of July of 10.0 cm indicates that this is O-group blue whiting from the spawning in the spring of 1972.

Table 1. Total length, fork length and weight of Brama rayi, stat. 1.
1. talva. Heildarlongd, stertlongd og vekt hjá Brama rayi, 1. støð.

no.	total length	fork length	weight
	cm.	cm.	g
1.	59.0	47.5	2140
2.	56.5	46.5	2170
3.	56.0	46.5	1920
4.	59.5	50.0	2490
5.	57.0	47.0	2310
6.	58.0	48.0	2610
7.	58.0	47.5	2150
8.	58.0	48.5	2360
9.	53.0	43.0	1690
10.	57.0	45.5	2240
11.	55.0	46.5	2080
12.	59.5	49.5	2530
13.	56.5	47.0	2240
14.	55.0	45.5	2160
15.	57.5	47.0	2370
16.	57.5	46.5	2280
17.	51.0	41.5	1630
18.	61.0	50.5	2500
19.	55.0	46.0	2130
20.	56.0	46.0	2220
21.	56.0	46.5	2230
22.	60.5	49.0	2440
23.	56.0	47.0	1970
24.	54.5	45.0	2180
25.	57.0	47.5	2450

Total length of Brama rayi, stat. 2.
Heildarlongd hjá Brama rayi, 2. støð.

	cm.
1.	59.5
2.	56.5

Table 2. Gonad factor of Brama rayi, stat. 1.
2. talva. Búningarfaktorur hjá Brama rayi, 1. støð.

♀	.61	♂	.65
♀	.71	♂	.16
♀	1.04	♂	.65
♀	.76	♂	.68
♀	.84	♂	.94
♀	.89	♂	.77
♀	.74	♂	.69
♀	.66		
♀	.82		
mean	.786	mean	.648
s^2	.0168	s^2	.0568

Table 3. Number of hyaline rings in otoliths of Brama rayi, stat. 1.
3. talva. Tal av klárum ringum í nytrum hjá Brama rayi, 1. støð.

no. nr.	number of rings tal av ringum	no. nr.	number of rings tal av ringum
1.	5	14.	6
2.	5	15.	6
3.	5	16.	6
4.	7	17.	6 ?
5.	6 ?	18.	8 ?
6.	?	19.	7
7.	?	20.	5
8.	5	21.	?
9.	6	22.	6
10.	5	23.	5
11.	8	24.	5
12.	6	25.	5
13.	6		

Table 4. Stomach contents of Brama rayi, stat. 1.
4. talva. Magainnihald hjá Brama rayi, 1. stød.

No. Nr.		
1.	11	Micromesistius poutassou 5/9, 5/10, 1/14 cm + remains of 2 spec.
	1	Boreogadus esmarki 8 cm
2.	2	Micromesistius poutassou 1/12, 1/15 cm + remains of 4 spec.
3.		Remains of 4 M. poutassou + otoliths of the same species
4.		Remains of 3 M. poutassou
5.		Remains of 1 M. poutassou
6.	8	M. poutassou 8 to 12 cm
7.	8	M. poutassou 1/8, 1/9, 3/11, 2/12, 1/15 + remains of 4 spec.
8.	13	M. poutassou 2/8, 6/9, 2/10, 2/11, 1/13 cm
9.	9	M. poutassou 2/8, 4/10, 2/11, 1/12 cm + remains of spec.
	1	Melanogrammus aeglefinus 9 cm
10.		Remains of 4 M. poutassou
11.	8	M. poutassou 1/7, 3/8, 4/9 cm + remains of 2 spec.
12.	10	M. poutassou 2/9, 4/10, 2/11, 1/12, 1/14 cm + remains of 3 spec.
13.	7	M. poutassou 2/9, 5/10 cm + remains of 2 indet. gadoids
14.	10	M. poutassou 4/9, 3/10, 1/11, 2/12 cm + remains of 5 spec.
15.	3	M. poutassou 1/10, 2/11 cm + remains of 4 spec.
	1	Melanogrammus aeglefinus 11 cm
16.	11	M. poutassou
	1	M. aeglefinus
17.	5	M. poutassou
18.	14	M. poutassou
19.	2	M. poutassou
20.		Indeterminable remains of fishes
21.	17	M. poutassou
	1	M. aeglefinus
22.	7	M. poutassou
23.	9	M. poutassou
24.		Indeterminable remains of fishes
25.		Indeterminable remains of fishes

ÚRTAK

Lívfrøðiligir upplýsingar um bramafiskin. (Brama rayi (Bloch 1971) í Norðuratlantshavi.

Bramafiskurin er í bókmentum umrøddur sum ein tilvildarligur gestur úr Miðnorðuratlantshavinum, um okkara leiðir.

Í bókini hjá *Joensen og Tåning* (1970) er ein listi við teimum fundum, sum gjørdir eru í Føroyum. *Mead og Haedrich* (1965) hava gjørt ein fullfíggjaðan lista fyri alt Norðuratlantsøkið.

Burtur úr hesum sæst, at landingar upp til 8 cwt. hava verið t. d. í Bretsku oyggjunum, og eisini er hann landaður í størri tali á Suðurlandinum í Íslandi. Men ógvuliga lítið verður sagt um hann, okkurt longdarmát, annars einki, í hesum stóru fundum.

Á royndarveiðu eftir makreli vestan fyri Bretsku oyggjarnar í juli 1972 fekk »Jens Chr. Svabo« í gørnini eitt rættiliga stórt tal av bramafiskum. Teir stóðu í gørnunum, og kjaftbeinið helt eftir í meskunum. Vegna góð veðurlíkindi eydnaðist tað at fáa 37 fiskar á dekkið.

Í 1969 var onkur snellubátur eisini komin í bramafisk á landgrunninum, og frá hesum vóru tveir fiskar landaðir.

Av tí at so fáar upplýsingar vóru um henda fisk í Norðuratlantshavi, hildu høvundarnir, at vert var at gera eitt sindur meira burturúr, og var tí henda kanning gjørd.

Bramafiskur er annars ikki óvanligur út fyri sponsku strondini. Spaniólar fiska rættiliga stórar nøgdir við línu. Hetta fiskaslag er 2 % av heildarveiðu Spaniu.

Úrslitini síggjast av myndum og talvum. Kannaður vøkstur í longd og vekt, kyn og búningarstig, aldur og magainnihald. Roknað varð út ein longdar- vekt- farstrika eftir líkningini $w = q \cdot l^b$. q varð funnin at vera .163511 og b = 2.354629. Búningarfaktorur varð roknaður út sum eitt lutfall millum vektina av sili og rogni í mun til heildarvekt fyri hvønn fiskin. Roynt varð at finna aldurin á fiskunum eftir roðsluni, men eingi vakstrarlop vóru at síggja. Í nytrunum vóru ringar, og vóru teir taldir. Um hetta samsvarar við aldur í árum er óvist. Í maganum vóru í sýnislutinum vestan fyri bretsku oyggjarnar funnir fiskar í ymiskum tali. Nærri kanningar sýndu at hetta var svartkjaftur (Micromesistius poutassou). Samanberingar við vakstrarfarstriku fyri hetta fiskaslag sýndi, at hetta var ungur óbúgvin svartkjaftur, gýttur sama árið.

Eisini magarnir í svartkjaftinum vóru kannaðir. Í teimum funnu vit vatnloppuna Calanus finmarchicus og eina marflugu, sum livir uppi í sjónum, Parathemisto sp. Í teimum báðum bramafiskunum, sum fingnir vóru undir Føroyum, funnu vit høgguslokk og leivdir av fiski.

Leggjast kann aftrat, at bramafiskurin sýndist góður matfiskur.

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