

OBSERVATIONS ON THE ORMER POPULATION OF GUERNSEY

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At the invitation of the States Committee for Agriculture and Fisheries I was able to carry out underwater studies on the ormer, *Haliotis tuberculata* L., from 5 to 26 October 1961. Quantitative measurements of the ormer population were made at twenty-three different positions by diving, and also at a few places on the shore. I am very grateful to Dr Le Pelley and Mr Le Feuvre for making the visit possible; and to Dick Tostevin for much practical assistance and freely given help from his knowledge of ormers.

The Survey

Narrow strips of the sea bottom were surveyed for ormers by the following method. A terylene rope marked at intervals of 5 m was first stretched out over the rock surface either by the diver himself or by attaching one end of the rope to the anchor when working from a boat. The diver then worked his way along the rope with a measuring rod, collecting all the ormers within 1 m of the rope. When necessary stones and boulders were turned over. Normally progress was very slow as the diver was having to work his way through dense *Laminaria* (kelp) 2 or 3 ft. high. In one dive it was usually possible to cover a strip of rock surface of either 5 or 10 m². After collection the ormers were measured and returned to the sea.

The results are shown in Table 1.

Ormer distribution

It is common knowledge to any ormer hunter that these molluscs are usually restricted to rock crevices in the side of a reef or to the under side of stones and boulders. This tendency to hide away is still shown by the sublittoral ormers, though in some of the richest grounds, notably Rocquaine Bay, they were plentiful on the open rock surface. Ormers appear to prefer a rock surface covered by the pink encrusting alga *Lithothamnion*. This surface would allow much more powerful adhesion by the ormers than surfaces covered by sponges and ascidians. On many reefs surrounded by sand, the ormers were found only on a thin strip of *Lithothamnion*-covered rock immediately above the sand level.

The overall average of 2.4 ormers per m² (i.e. one ormer to 4½ sq.ft.) may seem remarkably high. However, this figure cannot be used to assess the

TABLE 1

Station no.	Locality	No. of ormers	Area m ²	No. m ²	Depth (ft.)		Type of bottom
					During dive	Below LWS	
I	S. side of Fermain Bay	9	16	0.6	30	22	Boulders and small sand patches close to large area of sand
II		17	5	3.6	25	21	Stones. Farther from sand
III	S. side of breakwater near Castle Cornet	15	5	3.0	30	12	Boulders
IV	Nr. Bec du Nez	29	5	5.8	29	17	Stones, some rock
V	Barbées	5	5	1.0	28	21	Rock and boulders
VI	Grosse Ferriere	6	10	0.6	28	20	Rock and boulders
VII	Fort Doyle	50	5	10.0	15	14	Stones
VIII B	Nr. Bordeaux Harbour	8	5	1.6	14	7	Stones
VIII A	Vivian Rock	2	12	0.2	20	13	Rock, few stones
IX	Between Lihou and L'Eree	12	0.5	2.4	10	10	2 boulders only
X	N.E. from watch tower on Grande Roque Pt.	22	15	1.5	14	10	Rock wall
XI		3	5	0.6	14	11	Rock wall
XII	N. side of Grosse Rock	49	0.3	163	14	14	3 boulders only
XIII		27	5	5.4	24	4	Stones and boulders
XIV	S. side of Grand Saut Rocher	7	10.5	0.7	18	16	Rock
XV		18	8	2.2	18	18	Boulders and rock
XVIA	Extremity of Grosse Rock	22	5	4.4	30	24	Boulders and rock
XVIB	Extremity of Grosse Rock, slightly closer to shore	16	5	0.7	18	16	Rock wall
XVII	Near Fort Hommet	22	7	3.1	40	18	Rock wall
XVIII A	Rocquaine Bay, unnamed rocks nr. centre of bay	13	12.5	1.0	20	14	Rock, top of low reef
XVIII B	30 yards farther W.	28	5	5.6	20	16	Edge of reef
XIX	Nr. Fort Pembroke	17	5	3.4	15	7	Rock and boulders
XX A	Nr. harbour Saints Bay	7	5	1.4	15	6	Boulders and rock
XX B	Edge of reef	18	5	3.6	38	26	Large boulders and stones
XXI	Pt. S. end of Saints Bay	8	5	1.6	50	32	Large boulders, rock and few stones
XXII	N.E. corner Moulin Houet Rock	20	12	1.7	30	25	Rock
XXIII	S. of Les Trois Peres Rocquaine Bay	6	10	0.6	10	12	Rock
		456	188.8	2.43	.	.	
SHORE COLLECTING							
A	Between Lihou and L'Eree	35	80	2.3	.	.	Stones and boulders
B	Grande Roque nr. Watch Tower	7	40	0.2	.	.	Boulders
C	Rock shore S. of St Peter's Port swimming pools	7	90	0.1	.	.	Rock shore, few stones
D	N. of Saumarez Fort	5	25	0.2	.	.	Rock—stones and boulders
		54	235	0.2	.	.	

population of all submerged rocks, but represents an average figure for normal ormer grounds, i.e. boulders or reef edges. With such a limited time available it did not seem worthwhile attempting dives in areas where ormers were not expected. Nevertheless, the total area of ormer-bearing rocks around the island must be extremely large. Two estimates of the amount of rock suitable for ormers have been made from large-scale charts. It is likely that a half mile of the coast near Fort Doyle would have 166,000 sq.yd. of ormer-bearing rock whereas in Rocquaine Bay it would be 620,000 sq.yd. Using the lower figure as a basis the ormer population around the whole of Guernsey, but not including Herm, would be of the order of 20 million.

TABLE 1 (cont.)

DIVING

Station no.	No. counted but not measured	No. measured, in ½cm. groups												Total measured												
		1	2	3	4	5	6	7	8	9	10	11	12													
I	.	.	.	.	.	.	.	.	1	1	.	.	2	4	.	1	.	.	.	.	.	9	
II	.	.	.	.	.	1	.	1	1	3	1	2	.	3	2	.	3	.	.	.	.	17	
III	.	.	.	.	.	1	.	2	.	2	.	1	1	1	4	2	.	.	.	.	.	15	
IV	.	.	.	.	.	1	2	.	4	1	2	3	1	5	6	3	.	.	.	.	1	29	
V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	5
VI	(1)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	5
VII	.	.	.	.	.	2	1	2	3	3	1	1	1	5	11	5	5	4	4	1	.	.	50
VIIIA	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	2	1	.	1	1	.	.	8
VIIIB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
IX	.	.	.	.	.	2	1	1	1	3	.	.	.	.	.	1	.	.	2	1	.	.	12
X	(2)	.	.	.	.	1	1	1	4	2	2	.	.	.	.	1	1	3	2	2	.	.	20
XI	(1)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	2
XII	.	3	5	2	4	4	9	6	6	3	.	.	2	1	.	1	1	1	.	1	.	.	49			
XIII	.	.	1	3	6	6	4	3	.	.	1	1	.	.	.	.	.	.	.	.	.	.	27
XIV	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	1	3	.	7
XV	.	.	.	.	.	2	.	3	.	2	3	1	.	1	1	2	.	2	1	.	.	18	
XVIA	.	.	.	.	.	.	.	2	1	3	.	.	.	1	2	2	4	2	2	2	.	1	22
XVIB	.	.	.	.	.	1	.	1	2	4	1	.	1	1	.	2	1	1	.	.	1	.	16
XVII	.	.	.	.	.	.	.	.	.	1	2	2	2	1	1	5	3	1	2	2	.	.	22
XVIIIA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3	3	3	2	2	.	.	13
XVIIIB	.	.	.	.	.	1	.	1	.	1	2	2	3	2	2	6	2	3	2	1	.	.	28
XIX	(17)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
XXA	(7)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
XXB	(18)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
XXI	.	.	.	.	.	.	.	1	1	1	.	1	.	.	.	2	.	2	.	.	.	.	8
XXII	(20)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
XXIII	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	.	6
Totals	66	3	6	5	11	14	19	15	22	19	25	16	16	10	18	27	40	37	20	24	22	9	9	1	2	390

SHORE COLLECTING

A	.	.	6	3	2	.	.	2	10	3	1	.	2	1	3	.	.	1	.	.	.	.	35	
B	.	.	1	.	.	.	.	.	3	1	.	.	.	.	1	.	.	.	.	.	1	.	.	7
C	(7)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
D	(5)	.	.	.	.	.	.	.	.	.	.	.	1	.	2	1	1	.	.	.	.	.	.	5
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	47

The lower limit of the ormers has not yet been completely determined. Certainly at 30 ft. below low spring-tide level there are still considerable numbers, but according to Mr Tostevin below 40 ft. they become scarce. It would be well worthwhile if further information could be obtained on this point.

Size-groups

As many as possible of the ormers counted on the sea bed were collected and measured. At first the measurements were made underwater to avoid undue disturbance of the ormers but this was found to be a much slower

process than collecting the ormers into a bag and measuring them on completion of the dive. Sexing was also attempted with a few samples, but since most of the gonads were in a spent condition, it was not always possible to be certain of the sex. A preponderance of males was found which confirms Stephenson's (1924) results. The results of the measurements are included in Table 1, and summarized in Table 2.

TABLE 2. FREQUENCY OF SIZE-GROUPS (AS PERCENTAGES)
POPULATION

Length (cm)	POPULATION				
	Total catch	East coast	West coast	Stones	Rock
0.5	0.7	.	1.3	1.1	.
1.0	3.0	.	2.5	2.3	.
1.5	1.8	.	2.1	1.9	.
2.0	3.0	.	4.6	3.8	0.8
2.5	3.2	.	5.9	4.5	1.6
3.0	4.4	3.6	5.9	6.8	0.8
3.5	3.9	2.2	5.1	5.3	0.8
4.0	8.1	3.6	7.2	6.5	4.0
4.5	5.3	5.8	4.2	5.3	4.0
5.0	6.0	7.3	5.9	6.8	5.5
5.5	3.7	2.9	4.6	4.5	3.2
6.0	4.6	6.6	3.0	4.2	4.0
6.5	2.5	2.2	2.5	1.9	4.0
7.0	5.5	8.0	3.0	4.9	4.0
7.5	6.5	10.9	5.1	8.0	4.8
8.0	9.5	16.8	7.2	10.6	9.5
8.5	8.3	10.9	8.5	8.3	11.9
9.0	4.6	3.6	6.3	3.4	8.7
9.5	4.8	3.6	6.3	4.9	8.7
10.0	5.1	3.6	5.9	3.4	10.3
10.5	2.1	1.5	2.1	0.8	5.5
11.0	2.1	4.4	0.4	0.8	5.5
11.5	0.2	0.7	.	.	0.8
12.0	0.5	1.5	.	.	1.6
12.5	.	.	.	.	.
Total (no.)	437	137	237	264	126

Juvenile ormers

Although a special look-out was kept, very few tiny ormers were encountered. The group of mean length 1.25 cm (1-1.5 cm in Table 2) forms only 3% of the whole sample. It is this group which I would assume to be the result of 1961 summer spawning, since Crofts (1937) found that a length of 2 mm was reached after 2 months. It might be suggested that many of these tiny ormers would get overlooked, but as those which were taken were quite reasonably

conspicuous, I think that the sampling has been reasonably accurate. Recruitment is therefore probably slow and may also vary considerably from year to year. Captain F. Noyon has informed me that he has observed the presence of a particularly abundant year group, increasing in size over a period of several years, though no measurements were taken.

Age and growth

There is no really satisfactory information about the age and growth of *Haliotis tuberculata*. Stephenson (1924) suggested that after one year ormers grew to a length of 1.5–3.5 cm (i.e. roughly 1 in.). Crofts (1937) estimated the age and size at maturity as 3 years and 5 cm, whereas Tanner (1926) also gave 5 cm as the length at maturity but thought the age would be only two years. It is clear that tagging a large number of ormers should be undertaken to obtain more reliable information as to the rate of growth. Cox (1960) claims that for Californian species of *Haliotis* growth is irregular and varies from area to area.

In Table 2 the numbers of each size-group are given as percentages of the total. Considering the total catch, the results have been plotted both in histogram form and on probability paper, but no separate year-groups were evident. This situation is to be expected since the breeding season lasts at least from June till September (Crofts, 1926, 1937).

The ormer catches from the east and west coasts of the island are also compared in Table 2, together with catches from solid rock as opposed to those from loose stones or boulders. The smallest size-groups (1–3 cm) were much more abundant on the west coast and underneath stones. Medium sizes (4–7 cm) were evenly distributed, but the largest ormers (10–12 cm), though slightly more common on the west coast, showed a distinct preference for the solid rock surfaces.

Starfish predators

In the course of the diving work large-sized *Marthasterias glacialis* were often observed. Whenever possible these voracious animals were destroyed. Proof that these starfish feed on ormers was obtained while diving with Mr Tostevin at Moulin Huet Rock, when one was found with a large partially digested ormer pressed against its everted stomach. Wherever these starfish are at all common one may assume that they will take substantial numbers of ormers.

DISCUSSION

The sublittoral rock fauna around the Channel Islands is mainly similar to that of the coast of Devon and Cornwall, and it therefore seems remarkable that there should be no herbivorous counterpart to *Haliotis* on the north side of the Channel. In fact the species might well flourish in the Scilly Isles if

introduced, though growth would probably be slow. The short larval life of 2 days (Crofts, 1937) presumably prevents *Haliotis* from extending its range naturally.

Tanner (1926) considers that the ormers which live under stones feed on the fine growths *in situ*, but as these growths are animal—usually branched bryozoa, or hydroids, and rarely made up of algae, it seems more probable that the ormer normally lives in a retreat from which nightly feeding excursions are made, though the ormer may not invariably return to the same retreat. Stevenson (1924) refers to Sinel's belief that *Haliotis* is nocturnal. Brehant (1958) describes an ormer-tagging experiment using aqualung gear and concludes that ormers do not move about very much, at least in June.

It is unfortunate that the shell of *H. tuberculata* does not appear to provide satisfactory clues as to the age and growth. Although some shells show a number of bands, no sign of a general pattern was observed. Without any information of the growth of tagged specimens it would be rash at present to attempt an assessment of growth-rate.

SUMMARY

The results of a short investigation of the population of ormers (*Haliotis tuberculata*) are described and discussed. The average number of ormers found by diving between 0–5 fm. below low tide was 2.4 per m². The catches were measured, but no separation of year-groups was found.

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