

BALANUS BALANOIDES (L.) ON THE ATLANTIC COAST
OF FRANCE: FURTHER OBSERVATIONS ON THE
SMALL ISOLATED POPULATION AT THE SOUTHERN
LIMIT OF ITS DISTRIBUTION AT ARCACHON

By

HAROLD BARNES and MARGARET BARNES

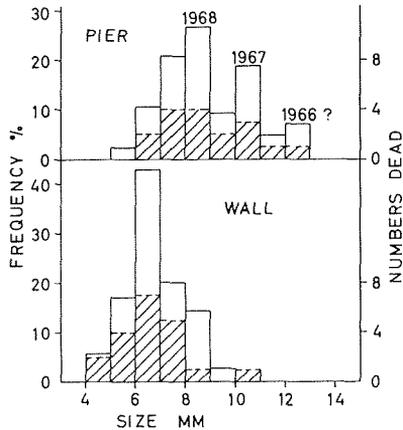
The Dunstaffnage Marine Research Laboratory, Oban, Scotland and
L'Institut de Biologie Marine, Arcachon, France

The behaviour of an animal near the limits of its distribution is always of considerable ecological interest. On western European coasts *Balanus balanoides* (L.) is one of the most common components of the littoral fauna of rocky and relatively open coasts (for a summary of the literature see BARNES 1957a, 1958, BARNES and BARNES 1962). In its distribution and behaviour it may be regarded as a typical boreo-arctic species, characteristics typical of a northern species accompanying it to the southern limits of its distribution (BARNES 1957b). It is present in quantity on the eastern Channel coast of France although much less abundant in the western channel; there seems, however, to have been an increase in population density in the western region during the past ten years (BARNES and BARNES 1966). On the French Atlantic coast it is fairly common, although somewhat unevenly distributed, with the southern limit in quantity at La Rochelle. There is then a complete break in the distribution with a reappearance in moderate quantity in north-western Spain, in the Asturias and Galicia. Some details of competition at Pornic, near to the southern limit, with the warm-temperate littoral *Chthamalus stellatus* have recently been given and an account of the effect of abnormal temperatures (BARNES and BARNES 1968).

BARNES and POWELL (1966, *q.v.* for a discussion of the validity of some older records) have drawn attention to a small "isolated" population south of La Rochelle at Arcachon. Very small numbers were originally (in 1963) recorded on a concrete wall—one of the very few suitable areas

Contribution given in honour of Gunnar Rollefsen at his 70th birthday.

Fig. 1. *Balanus balanoides* at Arcachon; size (basal diameter)- frequency (%) distribution of animals in two localities, with estimated year classes on the pier; hatched area, size frequency (actual numbers) of empty shells.



in this locality—between the Jetée Anglais and the Jetée de la Chapelle; subsequently (in 1964) a few individuals were found on stakes from the Bassin itself. The animals on the wall were recorded as too far apart to breed and were estimated to be one year old; all were present under well-developed *Fucus vesiculosus* at about M.T.L.; by 1967 this population had markedly increased (BARNES and BARNES 1968). Those on the stakes appeared to represent two year classes and consisted of a small group of animals, all of which had well-developed egg masses.

Further observations on the “wall” population—the total lateral extent of which is about 1.0 km—are now recorded. The basal diameters of all the animals, living and dead (empty shells), found during a thirty-minute survey of both the wall and the piles of the Jetée Legallais were recorded. On the wall 35% of the population was dead, on the piles only 17%. The size distribution of each population is shown in Fig. 1. The wall population has a well-marked peak at a diameter of 6.0–7.0 mm which may be confidently assigned to the settlement of the spring of 1968; no further year classes can be recognized but a skewness to the right suggests the admixture of small numbers of an older year class; individuals larger than 10.0 mm were not found and all the evidence suggests that on the wall animals do not live beyond two years. On the piles the first year class is represented by the 8.0–9.0 mm size group; a peak at 10.0–11.0 (1967 spat) and possibly an earlier settlement can be recognized. Almost 30% of the pile population had a size greater than 10.0 mm and empty shells up to 14.0 mm were found. It seems clear that both survival and growth are better on the piles; this may be due to greater protection from high summer temperatures which would be inimical to an essentially boreo-arctic species.

The original records were for the wall; on that occasion the piles were

not examined carefully since at that time Mr. H. T. POWELL's interest centred largely on the occurrence of *Fucus serratus* which is restricted to the wall. It seems possible that the piles were first colonized. The density is now sufficient to give an expanding but still very local population some of which settles on the nearby wall annually, and there lives only for about one year. In view of the distance from La Rochelle it is very unlikely that planktonic larvae are brought into the Bassin each year—even though this (or a vector from the same place) was responsible for the original colonization.

SUMMARY

Balanus balanoides is present as a small, isolated and even locally restricted population on the west coast of France at Arcachon. Observations of the past few years indicate an increase in numbers. Growth and survival are best in shaded places—possibly due to these affording some protection from high summer temperatures.

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