STATUS OF THE LUNDY CABBAGE, RHYNCOSINAPIS WRIGHTII

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Observation of the Lundy Cabbage and host invertebrate fauna was carried out in the summer of 1979. Fears had been expressed that the cabbage (endemic to Lundy) was declining in numbers. The cabbage also acts as host to two beetle species, *Psylliodes luridipennis* and *Ceutorhyncus contractus* (*var. pallipes*) which are similarly thought to exist only on Lundy. The aim of the investigation was therefore twofold, firstly to determine the status of *Rhyncosinapis* on the island and secondly to investigate the possible insect/plant relation between the cabbage and its beetle hosts.

Rhyncosinapis wrightii was first described by Elliston Wright (1936) as a crucifer with strong, well branched stems, 1½ — 3 ft. in height, thickly clothed with deflexed hairs. Fruit are produced in green (turning straw) coloured pods (siliquae) which dehisce when mature scattering the seeds. Two basic leaf types are seen, larger "wet weather' leaves at the base and narrower upper leaves produced in the summer under conditions of high light intensity. The plant is a perennial producing a large bright yellow flower.

During the period of observation (late July — early August) mature cabbage plants had produced a vast array of long, thin siliquae with only one or two specimens in full flower. This time of year was also favourable for collecting insect larvae and imagines (adults), particularly the Coleoptera and Lepidoptera.

The Lundy Cabbage is a maritime plant and was found only on S.E. facing cliffs poessing little soil cover. Protected from the harsh Atlantic winds (which severely restrict vegetation on the west side of the island) the plant is found solely in the bottom (S.E.) quarter of Lundy Island in an area approximately one quarter square mile stretching from the Landing Beach to Knight Templar Rock.

Marren (1971) lists five main sites where *Rhyncosinapis* was recorded on Lundy. During the course of this investigation, a number of additional sites were discovered but all specimens were again located within the same narrow tract of land. The following major sites are presented:

SITE	DESCRIPTION	NO. SPECIMENS RECORDED
1 Seaward (East) facing slate cliffs below Marisco Castle.	Many plants on steep slopes. Few detailed records.	113
2 Beach road.	Plants on both sides of the track, obvious and accessible.	76
3 Inland slate cliffs east of Millcombe House gardens.	Plants occupying a variety of sites. Close to several footpaths.	16
4 The Ugly	A site not listed by Marren. On the crest of the hill, behind blackthorn bushes.	25
5 Slate and granite coves between Landing Beach and Quarter Wall Bay.	Specimens observed on steep S.E. facing cliffs of Miller's Cake, Ladies Beach and White Beach.	28
6 Group of six granite outcrops around Knight Templar Rock.	Individual plants recorded growing out of cracks in the rock faces.	66

The entire coastline of the island was searched for cabbage plants but were only found in the specified areas. The figures given above must of course remain an underestimate (some plants presumably lie undiscovered) and in addition to the above the numbers of the very many young cabbage plants must be noted.

The viability of the population was further assessed by examining plant damage. Two types of cabbage injury were recorded:

a. damage to aerial plant parts, particularly the leaves. This took the form of

leaf edge feeding (carried out mainly by *Pieris rapae* larvae) and leaf holeing (leaf punctuation effected through the action of flea beetles).

b. the destruction of seeds (inside the pod)by the feeding actions of small white beetle larvae.

PLANT DAMAGE IN RHYNCOSINAPIS WRIGHTII

	DAMAGE TO LEAVES	% PARASITISATION	PROPORTION OF SILIQUAE AFFECTED
Site 2.	12 : 1	1.1	18%
Site 3.	23 : 5	6.1	50%
Site 4.	27 : 8	5.8	41%
Site 6.	20 : 5	0.002	2%

Damage to leaves = a two figure score indicating % leaf damage by holeing (1st figure) and % leaf area consumed by edge feeding.

% Parasitisation = a figure calculated from the number of seeds in any sample and the % of the those seeds eaten by parasites.

Results indicate that plant damage is relatively slight. Up to 30% of some leaves may be eaten by invertebrate hosts and although most plants are attacked this does not seem to affect seed production (using a comparison of plants fed upon and those free from damage). Seed predation appears low when viewed in terms of numbers of seeds consumed; yet it must be remembered that the process is a dynamic one; figures of 40-50% of siliquae infested do given rise to concern. The effect of the beetle predators in the pod is not only to reduce seed number but also distort the shape of the pod. The curled, infected pods to dehisce and scatter seeds but the process must undoubtedly be less efficient. An important finding from this part of the study was that a difference in location appeared to influence plant damage; sites 3 and 4 suffered quite heavy leaf damage and seed parasitisation, sites 2 and 6 on the other hand escaped lightly.

Associated with the cabbage plants is a variety of fauna; *Meligethes viridescens* is a common beetle in the flowers, ants are also found there. Rabbits do not appear to consume cabbage. Attempts to induce grazing rabbits to feed on *Rhyncosinapis* outside their burrows was singularly unsuccessful. Many invertebrates were found resting on the stem and leaves; various grasshoppers, moths, flies, snails, apterygote insects. When placed in containers with cabbage leaves however these animals made no response.

One major element in the tangled food web of the Lundy Cabbage is the feeding activities of the two endemic beetles, *Psylliodes luridipennis and Ceutorhyncus contractus*. Adults of *Psylliodes* were positively identified feeding on the cabbage leaves (as were adults of the related *P. cuprea*). *Ceutorhyncus* was found feeding on leaves and the larvae were extracted from infected seed pods. In food choice experiments *P. rapae* and these two beetle species invariably fed upon Lundy Cabbage and not locally occurring plant types (bramble, ivy foxglove, wood sage, broom). Their preference for *Rhyncosinapis* was however lessened when given a choice of other crucifiers (from a local garden).

To conclude, the Lundy Cabbage appears to be maintaining a viable population and shows encouraging signs of regeneration (large numbers of young plants and mature plants over one and two years of age). Their distribution is limited by climatic factors, soil factors and competition from other plants. Plant damage is fairly severe, particularly at sites 3 and 4. This may perhaps be explained by the close proximity of gardens in this area where commercial crucifers are cultivated. A process akin to concentrating most major pests in one area.

Tourism appears not to present a problem, Sites 1, 4, 5 and 6 are well away from the main tourist paths. The weed — like appearance and their often inaccessible position also affords the cabbage a high degree of protection. Plants near the beach road suffered as a result of road rebuilding but as a rule remain unmolested. Only cabbages at site 3. (at the foot of Millcombe House gardens) are in immediate danger. The footpath in this area is very popular. and people scrambling up the loose slate cliff have already caused injury to a number of plants. Here it is suggested that visitors might be discouraged from straying too far from the path. Not only does this area possess a large and easily accessible population of *Rhyncosinapis*, a wide variety of insect habitats are also found.

Rhyncosinapis wrightii

Mature plant showing flowering and fruiting stem.

(drawing taken from Ross-Craig, 1948)

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I would like to thank Chris Baillie and Dr A. J. Richards for their "cabbage talk" and Peter Hammond for beetle identification. I would also like to thank the British Ecological Society and the Lundy Field Society for financial assistance.

VYNE SCHOOL BIOLOGY FIELD TRIP — JULY 1979

ANDREW J. CLEAVE

A party of 11 pupils from the Vyne School, Basingstoke, led by Andrew Cleave, Head of Biology, and accompanied by Margaret Bristow and Paul Sterry, visted Lundy in July 1979. The purpose of the visit was a general introduction to fieldwork and coastal ecology for pupils intending to study these subjects at a higher level. A week of superb weather and the excellent accommodation afforded by the Barn, greatly helped the party in their work. The main topics studied were the breeding birds, cliff flora and life between the tides. In addition a daily log of birds seen, weather conditions and other observations was kept.

Individual projects included night-time forays to search for shearwaters and an auk count for the whole island and a survey of dragonflies in Pondsbury.

1. Auk Count — Lundy, July 1979

Within the limits of the short time available and consideration of pupil safety on steep cliffs the auk count was as complete as possible. The results are summarised on the accompanying map: birds on ledges, or on the water immediately below cliffs were counted. On two days the unprecedented calm weather brought huge rafts of shearwaters (ca. 6000) in close to the island and many auks were also seen feeding offshore. The first guillemot chicks were noted on the 3rd July and could be heard calling at night (1 a.m.) whilst listening for shearwaters.

2. Dragonfly survey-Pondsbury.

During the week spent on Lundy, large numbers of newly emerged adult dragonflies and exuviae (nymphal remains) were observed at Pondsbury. These were obviously of the genus *Sympetrum* but we were uncertain whether the species was *S. striolatum* or the more unusual *S. sanguineum*, or both. Some adult characteristics suggested *S. sanguineum* whereas the larval characters were those of *S. striolatum.* It would have been foolish to dismiss the possibility of *S. sanguineum* simply because it is a less common species: Lundy has a habit of turning up rarities, especially in the bird world. Dragonflies are highly mobile, and either species could have flown from the mainland. It was decided to resolve the matter by sending sample exuviae to Cyril Hammond (author of 'Dragonflies of Great Britain and Ireland). He confirmed that distinguishing between the two species is difficult without a good key and binocular microscope, particularly with nymphs. He did however manage to identify the exuviae sent to him as *S. striolatum.*

Good numbers were seen emerging each day and so we attempted to estimate the numbers of nymphs remaining in Pondsbury. It is well known that nymphs ready for emergence congregate around the shallow margins of ponds from spring onwards. Thus, using hand nets we sampled 10 random 2 ft. lengths of the circumference of Pondsbury. These samples extended 2 ft. toward the centre of the pond, and to the depth of the mud below. In addition, the circumference of Pondsbury was measured and the proportion useful for emergence estimated.

Mean number nymphs/sample	= 6
Useful circumference	= 800 ft.
Number nymphs present	= 2,400