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A comparison of the toggle and sphyrion methods of tagging the lobster (Homarus vulgaris L.)

by

Kaare R. Gundersen[x)]

INTRODUCTION

Growth by moulting causes special problems in the use of external tags on lobster since all hard parts of the body are lost.

Appelløf (1909) punched holes through different parts of the tail fan on lobsters. By using a code for the different length groups, he was by this method able to study the growth by moulting. This method was later used by Dannevig (1936), Wilder (1953), Thomas (1958) and Simpson (1961).

Barbed plastic strips bearing numbers and instructions which were inserted between the second and third abdominal segments to the side of the mid-dorsal line in order to avoid the gut, were used by Smith (1948) and Lindberg (1955) on Panulirus sp.

Abrahamson (1964) developed a method of burning marks on the carapace and abdomen for the crayfish Astacus astacus Linné, and Dybern (1965) used this method on lobster.

Gundersen (1964) designed a double tag, "the toggle tag", and used it on crabs and lobsters. The tag used by this method consists of two oblong plastic tags with rounded ends joined by a double nylon thread. Both of the plastic pieces, one smaller than the other, bear a number. The dimentions are 14 x 3 x 0,5mm and 20 x 4 x 0,5mm. The smaller

x) Institute of Marine Research
Bergen, Norway

tag is inserted in the soft tissue between carapace and abdomen and to the side of the mid-dorsal line on the lobster.

Laboratory experiments with this type of tag started in 1961 at the Institute of Marine Research, Bergen, and the method was used in field experiments from 1964 in Norwegian waters.

Another design of a toggle tag was given by Scarrat and Elson (1965). The main difference between this tag and the above mentioned, is the anchor and the way of insertion. The anchor is made from a small piece of wire bent to form three loops wich provide an attachement point for a filament in the middle and give a toggle effect to the anchor. One of the end loops is closed and the other left open so that it could be held back in the hollow tip of a (no.20) hypodemic needle and by means of this, inserted in the lobster between the carapace and abdomen.

The anchor was designed to approximate the profile of the head of Sphyrion lumpi, a parasitic crustacean, and the tag is later named the "sphyrion tag".

This type of tag was demonstrated by Dr. Scarrat at the Institute of Marine Research, Bergen 1967, and as it seemed to have advantages of ease and speed of application, it was decided to use it in field experiment.

FIELD EXPERIMENTS

The first field experiment with this type of tag was made in July 1968, but only 10 lobsters were tagged. In October the same year 179 lobsters were tagged and released on two localities.

During earlier field experiments, from 1964 -68, tagged lobsters were kept in crates, overnight or longer, to study mortality by tagging and to avoid releasing of weak animals. The same procedure was applied in October 1968, when the crates were inspected the day after tagging. It was found that the tagged lobsters had lost the tag du-

ring night, and on many lobsters the tag was pulled out and was visible under the skin. A closer inspection seemed to indicate that the tags had been chewed by other lobsters.

For further experiments, it was decided to make crates with a series of chambers so that lobsters immediately after tagging were placed in individual rooms. This method was later used in all tagging experiments.

The year after, when recaptures started to come, it seemed that the percent of recaptures was lower than the years before when the toggle tag had been used. This was also the case when recaptures from the 1969 tagging experiments came during 1969 and 1970, in spite of the handling in separate chambers after tagging.

Table 1 and 2 give a summary of recaptures the same year and the years following both with the toggle and sphyrion tag. The toggle tag seems to give a higher percent of recaptures.

Table 1. Recaptures of toggle tagged lobsters in different years after releasing at Busepollen

Tagging		Recapture									
Date	No.	Year 0	1	2	3	4	5	6	7	Tot.	%
18.11-64	17		9	2						11	64,7
30.6 -65	108	14	15	1	2	1	2	1		36	33,3
8.6 -66	34	17	5	2		1	4			29	85,3
22.10-69	54	3	12	12	4					31	57,4
21.7 -70	8	1	2	2						5	62,5
14.1 -71	73	19	17							36	49,3
30.6 -71	54	22	12							34	63,0
Total:	348									182	52,3

A special experiment was made on 22 October 1969 when 54 lobsters were tagged with the toggle tag and 56 with the sphyrion tag under the same conditions and released in the same area. Up to this date the percent of recapture of toggle tagged lobsters is about the double of

the sphyrion tagged lobsters.

A similar experiment was made in the end of June 1971. Recaptures from this experiment also seem to be in favour of the toggle tag.

Table 2. Recapture of sphyrion tagged lobsters in different years after releasing at Busepollen

Tagging		Recapture									
Date	No.	Year 0	1	2	3	4	5	6	7	Tot.	%
28.7 -68	10			1	1					2	20,0
10.10-68	101	1	9	7	3					20	19,8
27.1 -69	36	5	2		1					8	22,2
16.7 -69	111	23	11	2						36	32,4
22.10-69	56	1	8	4	3					16	28,6
30.6 -71	62	19	6							25	40,3
Total:	376									107	28,5

In the first experiments with the toggle tag in the laboratory and in the field both the internal and external plastic pieces were numbered. Later only the external tag was numbered, and this disregard was later regrettable.

During the last years rather many lobsters have been caught with the external tag lost, but with the internal tag still embedded. The gut shows that it is a tagged lobster. In these cases the internal tag has been operated out, and if numbered, all data relating to the lobster have been available.

The last years have also included experiments with the "Burning method" (Abrahamson 1964). The lobsters tagged in Norway therefore has a toggle tag with numbered internal and external discs and burned spots according to the method of Abrahamson.

SUMMARY

Comparisons of the "toggle" and the "sphyrion" methods of tagging lobsters have been carried out in field experiments.

Both types of tags are in laboratory experiments found to remain attached through the moult, and the sphyrion tag has the advantages of ease and speed of application.

The sphyrion tag, however, resulted in lower rate of recaptures than the toggle tag, indicating that the loss of sphyrion tag is greater. The experiments suggest that the sphyrion anchor is easily torn out by pulling in the external part or in the nylon gut.

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