Annual Luminosity Cycle as a forecast factor in the Deep Prawn Fishery Aristaeus antennatus (Risso, 1816) from the Catalan Area

INTRODUCTION

In order to analyse the prawn school movements and the efficiency of their captures, the authors set up the possibility of considering a light factor (directly or indirectly) as the responsible variable of species activity in relation to its catchability. These aspects have been scarcely studied in crustaceans. Only few references on Norway lobster are available.

We present work tries to relate the CPUE with a specific brightness index in terms of which a seasonal model of capture-depth is established.

MATERIAL AND METHODS

The fishery data come from the daily captures of trawler that supplied haul situation, yield (kg/h), depth, starting- and finishing time of the haul. The brightness of the captures were always considered with respect to the official sunrise time (GPM) during the whole season. Hauls of captures, fixed to the set (as was proceeded, estimating it proportional to the light which theoretically reaches the bottom, by the following equation: I = 10 exp(-5.R) where R is the subsuperficial light factor obtained from the solar declination and the refraction index (1.33 for the Mediterranean). k, is the extinction coefficient of the light in water (0.024 for the Mediterranean) and m, is the depth in meters.

The brightness factor was calculated for each day of the year, and each depth of capture from an annual table which considers sunrise time and the latitude and longitude of the studied area. From this table different relationships were analyzed: season, maximum yield with haul time, depth, brightness intensity and effect of official time shift during the spring.

RESULTS

The existence of an optimum schedule for maximum yields can be deduced from the relationship between the mean CPUE and the difference between the sunrise time and the maximum catchability. These aspects have been scarcely studied in crustaceans. We can deduce that an optimum brightness threshold exists to maintain this threshold as the solar intensity varies between the haul time and the sunrise increase, the depth of the hauls take place with higher superficial light for the same brightness conditions change, a significant consequence when brightness conditions change, a significant difference between the mean captures fished before and after time shift is noticed.

The relationship between the haul depth and the time of first capture presents a seasonal pattern. As the difference between the haul time and the sunrise increase, the depth of the first haul decreases correspond to very low brightness values and take place during the first trawls of the day (captured bigger than 15 kg/h) do not exceed a difference of the haul time with respect to the sunrise and the seasonal inclination, a change of the haul depth is necessary.

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