

**Light attraction of benthoplanktonic assemblages in a shallow *Posidonia oceanica* prairie**

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Light is generally considered as one of the most important factors affecting the vertical distribution of zooplankton. Previous studies have analyzed the phototactic responses of zooplankton to an artificial light source in the laboratory (CHAMPALBERT, 1973; FORWARD, 1986). In contrast, the evidence concerning the influence of artificial light in natural habitats remains scarce (KAWAGUCHI *et al.*, 1986).

It is well established that certain benthic organisms can temporarily join the planktonic community under the influence of light. In fact, FORWARD (1988) has proved that light is an important external factor affecting diel vertical distribution, because the migration of these organisms usually corresponds to the underwater light intensity change that occurs at sunrise and sunset.

The goal of the present study was to determine the influence of artificial light on the superficial and nocturnal benthoplanktonic fauna by comparing samples collected in natural conditions (nights of new moon) and after switching on a white light.

The sampling device consisted of a centrifuge pump and a halogen lamp (100 w) placed at a constant depth of 0.5 m, generating a directional light cone into the water column. Two samples were obtained: one in the presence of white light and the other in darkness. In each sample, water was pumped during 4 minutes at a rate of 25 l per minute and filtered through 69 µm filters to collect organisms. The use of 69 µm filters results in a high diversity of organisms collected without discriminating those of smaller size. Sampling in the white light condition commenced 20 minutes after the lamp was turned on.

The collected organisms were fixed in a 4% formaldehyde solution buffered with borax. All the organisms in the samples were counted. Abundances are expressed in individuals/100 l.

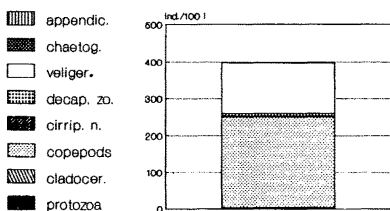
This study was carried out in July 1991, in a *Posidonia oceanica* prairie located in a shelter and shallow area (- 5 m) off Chafarinas Island (North Africa, Western Mediterranean). It is a dense prairie (600 shoots/m<sup>2</sup>) of uniform topography.

In darkness 398 ind./100 l were collected, belonging to the following groups (Fig. 1): protozoa (tintinnids and foraminifera), cladocerans, copepods (no Pontellidae), cirripede nauplii, veliger larvae, the chaetognath *Sagitta* sp. and appendicularians. In contrast, in the white light condition 1.053 ind./100 l were collected, which belong to the hyperbenthic fauna (polychaetes, isopods, cumaceans, amphipods, mysids and ostracods cypridiformes) and to the zooplankton (copepods Pontellidae, stomatopods and decapod larvae) (Fig. 2).

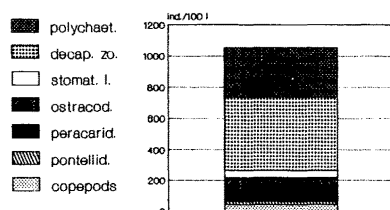
All organisms collected in darkness were typically planktonic, with a predominance of copepods closely followed by veliger larvae. This cluster of organisms represents the characteristic assemblage found under natural night conditions. On the other hand, under artificial illumination a positive reaction to the light was observed. This resulted in the collection of benthoplanktonic and planktonic organisms that are known to exhibit positive phototaxis (CHAMPALBERT, 1973; FORWARD, 1986). The most abundant fractions in this contingent were the heteronereid polychaetes and decapod larvae.

Some organisms were collected under both conditions (light and darkness) (Fig. 1 and 2): copepods (no Pontellidae) and decapod zoea. However, copepods (no Pontellidae) showed a preference for darkness (typically holoplanktonic) whereas decapod zoea were more abundant under white light (positive phototaxis).

**Fig. 1**  
Darkness



**Fig. 2**  
Light



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