

COMPARISON BETWEEN THE EFFECTS OF TWO DISPERSANTS AND THEIR
COMBINATIONS WITH MARINE DIESEL FUEL ON MONODONTA TURBINATA BORN

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RESUME : L'espèce Monodonta turbinata a été sélectionnée pour des études de toxicité au laboratoire sur les effets du Corexit-7664, et du Corexit-9527. Les expériences montrent que le Corexit-7664 diminue l'action toxique du Fuel tandis que le Corexit-9527 augmente cette action.

INTRODUCTION : Monodonta turbinata is an important species since its disappearance causes the whole ecosystem to change ; being a herbivore, the rocky substratum gets invaded with weeds and grass (Blackman, Franklin, Norton and K.W. Wilson, 1977).

Portman and Connor (1968), Dicks (1973), Axias and Saliba (1982) have done comparative investigations with petroleum hydrocarbons (HC) and dispersants on various organism groups.

MATERIALS AND METHODS : The organisms have been collected from the unpolluted shore or Urla (Izmir, TURKEY). The animals weighed 8.70 gr. and had an average length of 2.35 cm. Containers filled with 2 litres of aerated sea water and glass plates (20x30 cm) have been used. Glass plates have first been placed diagonally for 10 animals to attach on each. The animals have been acclimatized for 48 hours at 15°C. The sea water used had an approximate pH of 8, salinity of 36 per thousand. Two sets of experiments have been carried out consecutively using concentrate dispersant corexit 9527, corexit 9527+MDF and Marine Diesel Fuel alone. The second set has been done in the same way using the conventional dispersant corexit 7664. The glass plates were placed with 10 test animals on each and sprayed with 0.7 ml (standard) of MDF, MDF+ dispersant and dispersant alone from a distance of 10 cm. After leaving the plates six hours outside water they have been rinsed and placed diagonally in aerated water. The experiment has lasted 72 hours using 4 replicates .

The results at the end of 72 hours have been given as the mean percentage of animals affected as used in the method by BLACKMANN et al., 1977. The percentage of mortality of dispersants have been 20 % on the average for the conventional dispersant and 60% for corexit 9527, which is less than the average for MDF.

RESULTS AND DISCUSSION: It has been seen that corexit 9527, a concentrate dispersant has enhanced the toxicity of MDF from 70% to 90%, whereas the conventional dispersant corexit 7664 has decreased it from 70 % to 65%.

Some of the explanations for concentrates being more toxic are that toxic isomers formed may be more toxic with concentrates than conventionals and retention of PHC's may be greater, just as their intake in smaller droplets (1/10) by animals such as mussels and other filter feeders may be easier. BLACKMANN et al., 1977 have also found that concentrate dispersants seem to be more toxic although they have licences for use by the governments of U.S.A. and U.K.

Some explanations are that the total amount of HC increases with the addition of dispersants, another is the possibility of concentrates causing retention of PHC's by preventing evaporation of volatile substances. Thus it can be concluded that dispersants which enhance the toxicity of hydrocarbons when used alone should be used by experts. The dispersants that don't pass the sea test are not approved for usage in beach tests.

Thus it can be concluded that mechanical devices such as skimmers booms, etc., are preferable to chemical dispersants which cause further complications unless there is a case of emergency.

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