

US EPA ARCHIVE DOCUMENT

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MEMORANDUM

SUBJECT: Mode of Action of Margosan-O

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After reviewing the submission on Margosan-O, an extract of the seeds from the Neem tree, and other ancillary information from the published literature, it is my opinion that Margosan-O may be classified as a biochemical pest control agent. From the information available and from a discussion with Dr. Richard Ridgeway at the Natural Products Laboratory, USDA, Beltsville, Maryland, the major active ingredient in Margosan-O, azadriachtin, interferes with the normal molting process in a variety of insect orders. Insect mortality associated with the Margosan-O seems to be connected with the inability of insects to molt and is not due to a toxicant type effect.

Several studies (1, 2, 3, 4, 5, 6) have shown that when insects are treated topically with, or are fed azadriachtin or a variety of Neem extracts: 1) the period of time between molts is extended; 2) the adults show morphological abnormalities which, at times leads to death; 3) the adults exhibit lowered fecundity and; 4) there was an antifeedant effect. One study (4) investigating the mode of action of azadriachtin showed that the balance between juvenile hormones and exdysones in treated insects (Locusta migratoria) was shifted substantially, explaining the molting disruption and morphological abnormalities. It was also shown that the eggs did not develop properly in adult females.

Margosan-O is composed of a mixture of tetranortriterpenoids. In a telephone conversation, Dr. Richard Ridgeway stated he believed that azadriachtin was the major biologically active ingredient in Margosan-O and it is this compound, a naturally-occurring insect growth regulator, that is responsible for the activity of Margosan-O.

Although the mechanism of the mode of action is not fully elucidated, there appears to be enough evidence to classify Margosan-O as a biochemical pest control agent.

Copies of the journal articles are attached.

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cc: Tim Gardner
Willie Nelson

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