UNIVERSITY OF CALIFORNIA

SANTA CRUZ

DOMOIC ACID ANALYSES OF ZOOPLANKTON, FISH AND RHODOPHYTA IN MONTEREY BAY.

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of the requirements for the degree of

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by

Graeme John Haywood

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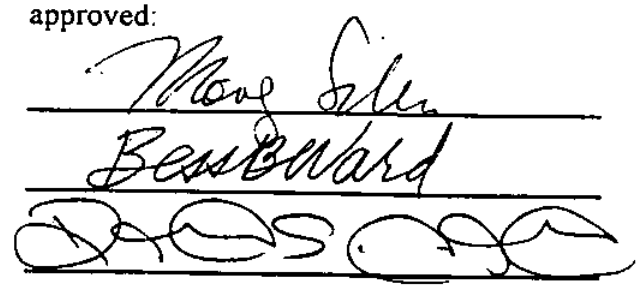
The thesis of Graeme John Haywood is approved:



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CHAPTER 1.

DOMOIC ACID IN ZOOPLANKTON AND FISH; MONTEREY BAY CALIFORNIA

ABSTRACT

In late summer 1991, seabird fatalities drew attention, for the first time, to the presence of domoic acid in Monterey Bay. The purpose of the present study was to discover whether the toxin has been present in earlier years, using samples of plankton collected at UCSC from as early ás 1979. Examination of the samples revealed that this was not a new phenomenon: domoic acid is detectable in zooplankton obtained during at least nine of the preceding thirteen years. Furthermore, domoic acid permeates the food web, entering all tested taxa of zooplankton and small fish. At each trophic level, there is an increase in the amount of domoic acid found in each animal. On a concentration basis, however, domoic acid is not bioaccumulated.

CHAPTER 2.

THE RESPONSE OF COPEPODS TO DIETARY DOMOIC ACID.

ABSTRACT.

Domoic acid is a naturally occurring neurotoxin produced by some *Pseudo-nitzschia* species. Copepods given a diet of this diatom fed heavily and toxin body burdens reached a steady state with bioaccumulation occurring during the first 10 min. of exposure. When switched to an alternate non toxic species, domoic acid was rapidly depurated, suggesting that it was only present in the alimentary canal. No domoic acid related mortality was observed in the copepod and the results from this study indicate that copepods provide only a short-term vector during plankton blooms for domoic acid in marine food chains.

CHAPTER 3

A survey of macroalgae for the presence of domoic acid. Santa Cruz, California.

ABSTRACT.

Domoic acid is a powerful neurotoxin that has been found in a few Rhodophytes and some species of *Pseudo-nitzschia*. The main toxin producing source of domoic acid in Monterey identified to date is *Pseudonitzschia australis*. In seeking another possible source of the toxin, a survey of the more common red macroalgae in the Santa Cruz area was made. Domoic acid was not detected in the specimens tested.