METHODOLOGY FOR ISOLATION AND ANALYSIS OF AGGREGATION PHEROMONES IN THE GENERA CRYPTOLESTES AND ORYZAEPHILUS (COLEOPTERA:CUCUJIDAE)

by
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Abstract

Methods utilizing Porapak-Q trapping techniques for preparative collection of aggregation pheromones of Cryptolestes and Oryzaephilus spp. are presented and discussed. Aeration of feeding beetles has been found to be the preferred method for collection of macrolide pheromones. For several Cryptolestes spp., however, frass from the rearing cultures is an alternate source of pheromones. The macrolide pheromones are produced by the male beetles. On the basis of the macrolides isolated, tentative schemes for their biosynthesis are presented.

Introduction

Our research program into the chemical ecology of cucujid beetles began in the mid-1970's with the rusty grain beetle, Cryptolestes ferrugineus (Stephens), a major pest in the storage and transportation of grain in Canada. The choice of the rusty grain beetle for our first pheromone isolation project was quite fortunate in retrospect. Firstly, much of the methodology developed for the isolation (Borden et al., 1979) and identification (Wong et al., 1983) of its aggregation pheromone proved applicable to other cucujid grain beetles. Secondly, and more importantly, we found that the male beetles produced a new class of aggregation pheromones, the macrolide lactones. Many of these and several similar compounds were later found to be produced by male C. pusillus (Schönherr), C. turcicus (Grouvelle), Oryzaephilus mercator (Fauvel), and O. surinamensis (L.). In this paper, we present a