RESEARCH PROPOSAL

"The Inheritance of Repression Systems in Xiphophorus (Pisces:Poeciliidae) : A Comparison between Radiation-Induced Mutations and Effects of Interspecific Hybridization".

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1. Introduction

Since the fundamental findings of KOSSWIG (1927), GORDON (1927), and HAUSSLER (1928) on the genetics of live-bearing tooth-carps of the genus Xiphophorus we know that interspecific hybrids between certain species are able to develop spontaneous neoplasms. The hybrids which do not develop tumors spontaneously exert a high genotypically determined susceptibility to the induction of neoplasms by carcinogens (ANDERS and ANDERS, 1978). In very case, the development of spontaneously arisen or induced neoplasms was found to depend on a tumor gene (Tu), sometimes interpreted as an oncogenic virus completely integrated in the host genome. In wild populations of the platyfish, Xiphophorus maculatus, and its laboratory stocks, the tumor gene is controlled by population-specific regulatory genes (R) which prevent the development of neoplasms even after application of N-methyl-N-nitros urea. This system of regulatory genes proved to be highly mutable after irradiation of different stages of germ cells of the platyfish x. maculatus (ANDERS, ANDERS and PURSGLOVE, 1971), thus causing the development of pre-melanomas not only in hybrids between platies and swordtails (Xiphophorus helleri) but even in pure-breeding platy-fish. Otherwise, functional XY-females of x.maculatus occurred with high frequencies after embryonic irradiation of platyfish with 1000-2000 R of X-rays (ANDERS et al., 1969) similar to the aberrant sex-ratios obtained after hybridization of x.helleri with x. maculatus, x. variatus, x. xiphidium and x. couchianus