CH-87-19 EFFECTS OF PRECOCENE AND AZADIRACHTIN ON THE DEVELOPMENT OF TRYPANOSOMA CRUZI IN RHODNIUS PROLIXUS.

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Chagas's disease is endemic mainly in parts of Brazil. Like any other trypanosomiasis, Trypanosoma cruzi utilizes insect for completing part of its life cycle. Usually, it is ingested by triatomine bugs and the trypomastigote transforms and differentiates into metacyclic tripomastigote as the blood moves through the midgut, eventually accumulating in the rectum, from where they are transmitted (Z. Brener, 1973, Ann. Rev. Microbiol., 27: 347-383). Not much is known about the interaction of the parasite with its invertebrate host, and on factors which could trigger the parasite development and differentiation (E. S. Garcia et al., 1984, Mem. Inst. Oswaldo Cruz, Suppl. 79: 33-37). One such factor might be insect hormone titers which are changing during the insect host's development and reproduction.

It has been known that precocene (W. S. Bowers, 1982, Entomol. Exp. Appl., 31: 3-15) and azadirachtin (H. Rembold et al., 1980, Z. PflKrankl. PflSchutz, 87: 290-297) is a powerful inhibitor of juvenile hormone and ecdysone secretion, respectively, in several species of insects.

In Rhodnius prolixus these compounds are very active. It has been demonstrated, for example, that the time of application is important and only application of these compounds early in the intermoulting cycle cause their physiological effects in nymphs (E. S. Garcia et al., 1986, Z. Naturforsch., 41c: 771-775; P. Azambuja & E. S. Garcia, 1987, Brazilian J. Med. Biol. Res., 20: 175-179). The inhibition of moulting is fully counteracted by ecdysone therapy (P. Azambuja et al., 1981, Gen. Comp. Endocrinol., 45: 100-104; E. S. Garcia et al., 1984, Arch. Insect Biochem. Physiol., 1: 367-373; E. S. Garcia & H. Rembold, 1984, J. Insect Physiol., 30: 939-941).

Ecdysteroid titers were significantly decreased in the hemolymph of 4th-instar nymphs by these treatments (E. S. Garcia et al., 1986, Z. Naturforsch., 41c: 771-775; E. S. Garcia et al., 1987, Arch. Insect Biochem. Physiol., in press). It was therefore clear that precocene and azadirachtin interfere in the endocrine system which control development of R. prolixus nymphs.

Having this biological system in hands, it was interesting to follow

growth and differentiation of T. cruzi in R. prolixus nymphs influenced experimentally by precocene (20 ug ethoxyprecocene II/ ml of bloodmeal) and azadirachtin (1 ug azadirachtin A/ml of bloodmeal). Fourth-instar nymphs treated with precocene presented a significant increase in the rate of development of Y and W strains of T. cruzi. By contrary, nymphs treated with azadirachtin had the rate of growth of these strains of parasites drastically decreased. The latter effect could be partially reversed by ecdysone therapy. Control studies showed that precocene and azadirachtin did not affect T. cruzi growth in axenic medium and therefore a direct effect of these compounds on its development could be excluded. Since ecdysone and juvenile hormone did not interfere directly on the development of T. cruzi in vitro, we suggest that precocene and azadirachtin indirectly affect the parasite growth in the gut of R. prolixus. More detailed studies on this respect are under investigation in our laboratory.

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