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 triptomastigote as the blood moves through the midgut, 
eventually accumulating in the rectum, from where they are transmitted 
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 titer 
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 prolizus 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 intermouling 
cycle cause their physiological effects in nymphs (E. S. Garcia et 
al., 1986, Z. Naturforsch., 41c: 771-775; P. Azambuja & E. S. Garcia, 
mouling 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. 

Ecdysteroid titer 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. prolizus nymphs.

Having this biological system in hands, it was interesting to follow
growth and differentiation of T. cruzi in R. prolixus nympha
influenced experimentally by precocene (20 ug ethoxyprecocene II/
m1 of bloodmeal) and azadirachtin (1 ug azadirachtin A/ml of blood-
meal). 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.

These studies were supported by grants from CNPq and FINEP.