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RESEARCH ARTICLE

Biochemical profile and histological effects of N-nitroso-N-Methylurea on fat bady of *Periplaneta americana*

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ABSTRACT - N-nitroso-N-methylurea, a chemical carcinogen was injected in the abdomen at an effective dose of 100 µg/g body weight on alternate days to *Periplaneta americana* and the insects were vivisected after 4, 8, 12, 16 and 20 days of treatment. Control insects received similar quantity of saline. Histological changes observed in fat body were: the cell boundaries of most of the fat cells had lost their identity and their cytoplasm was vacuolated. The peripheral and central globules had lost their architecture. Nuclei were small and pycnotic. Some of the nuclei were aggregated and were degenerated. The entire adipose tissue was seen to be degenerated and obliterated. Marked biochemical changes were also observed in the fatbody. A significant decline of protein, carbohydrate and lipid profile of the fat body was observed in 5, 10, 15 and 20 days of N-nitroso-N-methylurea treated insects.

KEY WORDS - *Periplaneta americana*, Fatbody, N-nitroso-N-methylurea, Protein, Carbohydrate, Lipid.

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INTRODUCTION.....

N-nitroso-N-methylurea is a potent direct acting carcinogen that has been shown to induce cancer of various organs, mainly of the forestomach, brain and the nervous system, in a wide variety of animal species (Magee *et al.*, 1976; Preussmann and Stewart, 1984).

The fatbody of insects serve as a storage organ. It is the principle tissue where the specific protein is synthesized. The histological and histopathological features of fat body have been investigated in some insects such as *Odontopus varicornis* (Peterle and Gillet, 1970; Premavathi, 1993, and Selvisabhanayakam, 1995) and *Gryllotalpa africana* (Sumathi *et al.*, 2001). However, the effect of phytopesticide and other known toxic substances on histological changes of fat body are not well documented as these studies appear to be limited to a few species of insects using, dimethoate (Jayakumar, 1988); endosulfan (Sumathi *et al.,* 2001); monocrotopha (Umapathi, 2007); neem gold (Niranjanadevi *et al.,* 2009) and zoopesticide pygidial secretion (Lousia and Selvisabhanayagam, 2009).

Carbohydrate, protein and lipid which are the major components of the body play an important role in the body construction and energy metabolism. These constituents are affected by many factors especially by pesticide (Jabakumar and Jayaraman, 1988). Investigations on the effects of pesticides have revealed their interference with carbohydrate metabolism in different species (Mansingh, 1972 and Babu *et al.*, 1988). In most, insects carbohydrates reserves are present as glycogen and trehalose which can readily be converted into glucose (Islam and Ray, 1981).

Lipids are the chief form in which energy is stored in insects. The ability to synthesize lipids for storage is widespread, but except for specific item as small amounts, they are not usually essential constituents of the diet. Insects utilize lipids and can also synthesize from protein and