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Uterotrophic Assays of Pyrethroid Insecticides in Immature Rats

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It is well known that many pesticides possess hormonal activity, and thus have been classified as endocrine disruptors. Currently, pyrethroid insecticides are in worldwide use to control in door pests, providing potential for environmental exposure. A few studies of hormonal activities of these pyrethroid insecticides, however, have been reported, and are controversial between studies. Therefore, we firstly examined the potential estrogenic activities of four pyrethroid insecticides (permethrin, cypermethrin, tetramethrin and sumithrin) by immature rat uterotrophic assay. Immature female rats (18-day old) were consecutively treated with the pyrethroid insecticides for 3 days by subcutaneous injection. E2 (3 μg/kg) used as a positive control caused about 3.7 and 3.8 fold increases in absolute and relative uterine wet weights compared to the control, respectively. Permethrin led to increases in uterine wet weights, and enhanced the E2-induced weight increases in this assay. In addition, the permethrin-induced uterine weights were inhibited by ICI 182780, a pure antiestrogen. On the other hand, tetramethrin caused statistically significant decreases in their weights, and also inhibited the E2-induced weight increases at all doses tested. No statistically significant effects on uterine wet weights were showed in sumithrin or cypermethrin-treated groups. In summary, our data indicate that permethrin seems to have estrogenic activity whereas tetramethrin has antiestrogenic activity, and thus these pyrethroids might affect the reproductive system in rat.

Keyword : Pyrethroid insecticide, Uterotrophic assay, Immature rat