

【P-1】**Assessment of Estrogenic and Androgenic Activities of Permethrin by Uterotrophic and Hershberger Assays**

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Permethrin, a synthetic pyrethroid insecticide, is used globally for agriculture and thus potential environmental exposure to permethrin is a concern. Environmental chemicals that are hormonally active (particularly, estrogen or androgen) may adversely affect the reproductive and endocrine systems. However, relatively few studies have reported on the estrogenic and androgenic activities of permethrin, and the results of these studies are in some respects contradictory. We conducted an immature rat uterotrophic assay for estrogenic activity assessment of permethrin, and Hershberger assay for androgenic activity. The rat uterotrophic and Hershberger assays are generally used as *in vivo* short-term screening assays for detecting the estrogenic and androgenic activities of chemicals, although these assays are still being validated by the Organization for Economic Cooperation and Development (OECD). In the uterotrophic assay using 18-day-old female rats, subcutaneous treatments with permethrin (10 to 800 mg/kg) for three days increased relative uterine wet weights, and E2-induced uterine weights. These effects were statistically significant at 800 and 200 mg/kg, respectively. Moreover, permethrin-induced uterine weights were inhibited by the co-administration of ICI 182,780, an antiestrogen. In the Hershberger assay, the administration of permethrin orally to testosterone propionate-treated castrated male rats produced statistically significant reductions in androgen-dependent sex accessory tissue (ventral prostate, seminal vesicles, levator ani and bulbocavernosus muscles, Cowper's gland and glans penis) weights at all doses tested (10, 50 and 100 mg/kg). Based on these uterophic and Hershberger assay results, permethrin is very likely to have estrogen-like effects on female rats, but antiandrogen-like effects on males.

Keyword: permethrin, immature rat uterotrophic assay, Hershberger assay, estrogenic activity, antiandrogenic activity