

Use of a Xanthine-Xanthine Oxidase System on *In Vitro* Maturation and Fertilization in Pig

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This study was undertaken to evaluate the effects of catalase using xanthine (X) - xanthine oxidase (XO) system on *in vitro* maturation and fertilization in pig. When follicular oocytes were cultured in maturation medium with X and/or XO, the maturation rates were not significantly different between in medium with and without catalase despite of different culture periods. However, significantly ($P < 0.05$) higher maturation rates were obtained in culture with X-XO system. The rates of degenerated oocytes were increased with culture periods prolonged, and were significantly ($P < 0.05$) higher in medium without than with catalase at 120 h of culture. On the other hand, the parthenogenetic oocytes were observed with high proportions at 72 h of culture, but were not different in medium with and without catalase at various times of culture. In another experiment, the frozen-thawed boar spermatozoa treated with X-XO system for *in vitro* fertilization. The penetration rates were higher in medium with that than without catalase during the *in vitro* fertilization with, none ($P < 0.05$), XO and X+XO. On the other hand, when sperm were treated with none, X, XO and X+XO, lipid peroxidation were higher in medium without that than with catalase. However, the changes in sperm penetration and lipid peroxidation showed opposite patterns. The sperm suspensions were also treated with X and/or XO for assay of sulfhydryl (-SH) group content. Under the above all conditions, sperm-SH group were higher detected in medium with that than without catalase. The activity of sperm binding to zona pellucida was also evaluated through binding to salt-stored porcine oocytes. In control group, sperm binding to zona pellucida were higher than in medium with X, XO and X+XO groups. No significant differences, however, were observed between medium with and without catalase. In conclusion, the exposure of follicular oocytes and spermatozoa to X-XO system may be caused stimulating *in vitro* maturation and fertilization in pig. This work was supported by grant No. 2000-1-22200-001-3 from the Basic Research Program of the Korea Science & Engineering Foundation.

(Key words) **catalase, IVM, IVF, pig, xanthine-xanthine oxidase**