

92. SEMEN-INDUCED LUTEAL PHASE IN THE KOALA

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The koala luteal phase is coitally induced (1; *J. Reprod. Fertil.* **120**: 57–64) but it is uncertain whether the mechanism is primarily a neural reflex caused by penile stimulation of the urogenital sinus or an ovulation-inducing factor present in the semen. To better understand the role of koala semen in induction of the luteal phase, sexually mature clinically healthy captive koalas were randomly allocated into one control and 3 treatment groups. The control group (–S/–GR; $n = 9$) was artificially inseminated (AI) (2; *Int. Zoo. Y.B.* **38**: 160–172) using 1 mL of sterile 0.9% saline. Treatment group 1 (+S/–GR; $n = 9$) was inseminated with approx 1 mL of koala semen. The urogenital sinus of the second treatment group (–S/+GR; $n = 9$) was manually stimulated with a purpose built glass rod that mimicked the koala penis. The glass rod was worked back and forth along the length of the urogenital sinus with a slight twisting motion to a depth of 40–60 mm; the stimulation protocol was based on previous descriptions of natural coitus (1). The final treatment group (+S/+GR; $n = 9$) received urogenital stimulation followed by AI of koala semen. All treatments were conducted during the breeding season on day 2 of the oestrous cycle. A luteal phase was confirmed by an elevated progesterone concentration on day 14 or day 28 greater than 0.67 ng/mL; this concentration represented the upper threshold progesterone concentration (99.99% confidence interval) from all 36 oestrous koalas on the day of treatment. Insemination of sterile saline without the glass rod (0/9) and glass rod stimulation without semen (0/9) failed to induce a luteal phase. Insemination of semen without rod stimulation resulted in a luteal phase occurring in 4/9 koalas, 3 of which produced pouch young. Insemination of semen in combination with rod stimulation induced a luteal phase in 7/9 koalas, 4 of which gave birth. Based on the 2×2 factorial design and using an exact logistic regression technique, semen was shown to have a significant effect on induction of the koala luteal phase ($P < 0.001$); glass rod stimulation has no such effect ($P = 0.335$). These results indicate that a component of semen must be involved in inducing ovulation in this species.