

# **Isocupressic acid blocks progesterone production from bovine luteal cells**

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## **Abstract**

The needles of ponderosa pine (*Pinus ponderosa* Laws.) were reported to induce abortions when fed to late-term pregnant beef cows in North America. An in vivo study of pregnant cows suggested that isocupressic acid (IA) was the main abortifacient isolated from needles and bark of the pine. However, the mechanism of abortifacient activity of IA is not clear yet. In a pregnant cow, the corpus luteum of the ovary helps the maintenance of pregnancy by its progesterone production. This study involved the IA extracted from the root of the Taiwan cypress (*Juniperus formosana*) and used a frozen-thawed bovine luteal cell culture system to investigate the action of IA on progesterone production. Thawed bovine luteal cells ( $1 \times 10^5$  cells/ml/well) in M199 medium were cultured in 24-well culture plates at 37 degrees C in a 5% CO<sub>2</sub> incubator. Ten ml of tested drugs, IA at 1 to 1000 ng/ml and/or ovine luteinizing hormone (oLH) at 1 to 100 ng/microl or 8-bromo-cyclic adenosine monophosphate (8-Br-cAMP) with 0.1-10 mM, were added into each well. After 4 hours of incubation, the media were harvested and assayed for progesterone by an enzyme immunoassay. Progesterone production from cells was the indicator used to evaluate the action of IA. All tested doses of IA significantly inhibited progesterone production in both basal and oLH stimulating conditions. Also those dosages inhibited cyclic adenosine-3',5'- monophosphate (cAMP) stimulation, suggesting a post-cAMP mechanism is involved in the IA action. We concluded that IA can induce pregnant cows to abort partly through blocking luteal function and may be identified as a new abortifacient chemical.