Sanguinarine and chelerythrine: assessment of safety on pigs in ninety days feeding experiment

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Abstract

Sanguinaria canadensis, Chelidonium majus and Macleya cordata have been used for centuries as alternative medicines. Currently the extracts from these medicinal plants are components of veterinary and human phytopreparations, and of oral-hygiene agents. Sanguinarine and chelerythrine (SA/CHE) are biologically active components of these extracts. They display distinct antibacterial and anti-inflammatory properties, but, on the other hand, they have been reported as having adverse effects — genotoxicity and hepatotoxicity. This paper is aimed at evaluation of the effects of daily administration of the extract from Macleya cordata (2 mg and 100 mg in 1 kg feed, sanguinarine:chelerythrine 3:1) in the diet on the health status of swine. After 90-day administration, alkaloids were retained to a different extent in tissues. The highest SA/CHE retention was detected in the gingiva (0.55 $\mu$g/g) and liver (0.15 $\mu$g/g), no SA/CHE were detected in muscles. Plasma SA levels attained 0.11 $\mu$g/ml. Treated animals did not display any results of hematological, biochemical or histological assay different from controls. A $^{32}$P-postlabeling assay proved that no DNA-adducts with SA/CHE were detected in pig livers. We did not observe any symptom linked to epidemic dropsy syndrome often attributed to sanguinarine. In conclusion, an average daily oral dose of alkaloids up to 5 mg per 1 kg animal body weight proved to be safe.

Keywords: Macleya cordata; Sanguinarine; Chelerythrine; Swine; Oral Administration; Absorption; Fecal elimination; Biochemical markers; Adverse effects; Epidemic dropsy syndrome