



Tropentag, September 18-20, 2019, Kassel

“Filling gaps and removing traps
for sustainable resource management”

***In vitro* Antiviral Activity of Mangosteen Peel (*Garcinia mangostana* Linn.) against PRRS Virus**

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Abstract

Modern systems for pig keeping in tropical countries face a variety of challenges to secure the animals' health and welfare. In Thailand, among others, the Porcine Reproductive and Respiratory Syndrome (PRRS) virus causes substantial losses in the swine industry. Up to now, no medical cure has been developed to control PRRSV. Therefore, the study of an alternative antiviral compound to prevent and control the virus has gained increasing attention among researchers. The aim of this study was to determine the *in vitro* antiviral activity of mangosteen (*Garcinia mangostana* Linn.) peel extract as a bio-agent against PRRSV.

Mangosteen peels were extracted by use of EtOH and the extract was analysed on total phenolic content using the Folin-Ciocalteu assay. For the determination of the *in vitro* antioxidant activity of different extracts three dose-dependent methods based on different analytical agents were used: (i) 2,2-diphenyl⁻¹-picrylhydrazyl (DPPH) (ii) 2,20 -azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt (ABTS) and (iii) ferric reducing antioxidant power (FRAP) assays. Further, a cytotoxicity test was performed using MARC-145 cells and finally, the antiviral activity against PRRSV was determined by immunoperoxidase monolayer assay (IPMA) to determine the viral titer.

The total phenolic content was determined as 106.356 mM GAE/g sample. Moreover, the antioxidant activity of mangosteen peel extract effective for scavenging free radicals in the DPPH and ABTS assays with IC₅₀ of 4.87 and 4.99 mg/ml, respectively and had FRAP values of 46.17 mM Fe (II) E/ g sample. The 50 % cytotoxic concentrations (CC₅₀) of the mangosteen peel extract for Marc-145 cells were 0.3125 mg/ml. Interestingly, the mangosteen peel extract at the concentration of 0.3125 mg/mL showed significant inhibition of PRRSV replication *in vitro*.

The results of this study show the potential of using mangosteen peel extract to control PRRSV in pig keeping. The availability of the raw material is abundant in Thailand, as mangosteen peels are considered an organic waste of the fruit processing industry. Further, the use of mangosteen peel potentially adds to the game of natural medicine for animal welfare. Based on the presented findings it is recommended to study the use of mangosteen extract *in vivo*.

Keywords: ABTS, DPPH, FRAP, IPMA, phenolic content, porcine reproductive and respiratory syndrome