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## The inhibitory effect of Thai black sticky rice extract on kidney stone formation

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Black sticky rice (*Oryza sativa* var. *glutinosa*) is a local colored-rice in the North and Northeast of Thailand. It contains high amount of antioxidants which can prevent chronic diseases such as cancer, diabetes, kidney stone and heart disease. However, the role of Thai black sticky rice in kidney stone disease remains not clarified. Renal stone is a common public health problem worldwide. The mechanism of stone formation is crystallization of calcium oxalate ions, growth, aggregation and adhesion to renal epithelial cells. Calcium Oxalate Monohydrate (COM) is the most common stone in patients. Thai black sticky rice was extracted with 75% ethanol and freeze dried. We examined the effects of crude extract on COM crystal growth and aggregation. COM crystals were prepared in 24-well plates by mixing calcium chloride and NaOx in artificial urine. COM crystals were generated in the absence (control) or presence of rice extract at various concentrations 10, 20, 50, 100 and 200 µg. The generated crystals were analyzed by phase contrast microscopy. Crystal adhesion was examined by adding COM crystals in condition with/without rice extract on Madin-Darby Canine kidney cells. All of the experiments were independently performed in triplicate. The number of crystals was compared by one-way ANOVA. The results showed that Thai black sticky rice extract were significantly decreased COM crystal growth, aggregation and adhesion in a dose-dependent manner comparing with control ( $p < 0.05$ ). The microscopic images showed that the rice extract decreased crystal size and aggregated configurations. Interestingly, the rice extract can decrease COM crystal adhesion to renal epithelial cells, which is a critical step of kidney stone formation. Our data provide the first evidence to demonstrate the effects of Thai black sticky rice extract on kidney stone formation, particularly, COM crystal growth, aggregation and adhesion. This extract contains substances that decrease COM crystal formation which might be beneficial in preventing kidney stone formation. Moreover, these findings may provide the information leading to the development of new therapeutic strategies.

### Biography

Tistaya Semangoen has completed her PhD in 2009 from the Department of Immunology, Faculty of Medicine Siriraj Hospital, Mahidol University and Post-doctoral studies from the Department of Microbiology, Faculty of Medicine Siriraj Hospital. She is a Lecturer in the Department of Medical Technology, Faculty of Allied Health Sciences, Burapha University, Thailand. She is an Assistant Dean of Student Affairs, Burapha University, Thailand. She has expertise in proteomic technology and kidney stone pathogenesis.

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