## Glucosinolates content of in vitro grown Nasturtium officinale (watercress)

## ABSTRACT

Watercress (Nasturtium officinale), a green vegetable belongs to Brassicaceae, is a rich source of phenyl ethyl glucosinolate (PEGSL) and benzyl glucosinolate (BGSL) i.e. the precursors of phenyl ethyl isothiocyanate (PEITC) and benzyl isothiocyanate (BITC), which are widely reported to restrain the growth of the cancer cells. The content of secondary metabolites and other compounds in plants are affected by different growth conditions such as pH, temperature, light intensity and nutrient supply. Thus, the aim of the current study is to evaluate the concentration of PEGSL and BGSL from in vitro grown watercress under nonelicited and elicited as well wild plant of watercress. The samples were collected from watercress wild growing in Kundasang area, Ranau, Sabah and subjected to sterilization to establish sterile in vitro culture. All plant cultures were kept inside growth chamber at 25°C under 16 hours photoperiod for thirty days before subcultured into fresh medium containing elicitors. Elicitors and natural additives tested in this study are chitosan, casein hydrolysate and coconut water at different concentration: chitosan (10, 20, 40, 60, 100 mg/L), casein hydrolysate (0.5, 1.0, 1.5, 2.0 g/L) and coconut water (5, 10, 15, 20, 25 % v/v). The results revealed that non-treated plant culture accumulated high content of PEGLS and benzyl glucosinolate (BGSL) which are 2.31 µmol/g FW and 1.08 µmol/g FW, respectively. PEGSL and BGSL increased over fivefold and three-fold, respectively, in non-treated plant culture compared to wild matured plant. Meanwhile the maximum concentration of the PEGSL and BGSL in treated plant were 1.60 µmol/g FW and 0.82 µmol/g FW, respectively. Interestingly, all in vitro plant culture (non-treated and treated) in this study shows higher concentration of PEGSL and BGSL compared to wild plant of watercress. Thus, tissue culture could be a valuable alternative for higher production of glucosinolates in watercress with short period of plant development. Besides, the plant is not exposed to the common environmental pollutants such as heavy metal and agrochemicals.