

PEMETAAN SENYAWA DAN KANDUNGAN TOTAL TANIN,  
FLAVONOID DAN ALKALOID SERTA AKTIVITAS ANTIOKSIDAN PADA  
BUAH SALAK (*Salacca zalacca* (Gaertn.) Voss)

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INTISARI

Salak (*Salacca zalacca*) (Gaertn.) Voss) adalah buah tropis yang memiliki penampilan dan rasa unik, kultivar lokal buah salak telah diteliti dan memiliki potensi farmakologis yang tinggi. Penelitian ini bertujuan untuk mengetahui golongan metabolit sekunder pada kultivar Gading, Jawa, Pondoh, Condet dan Suwaru, mengetahui distribusi dan kandungan total metabolit sekunder, aktivitas antioksidan serta korelasi antara aktivitas antioksidan dan metabolit sekunder dalam buah salak tersebut. Dilakukan uji histokimia menggunakan reagen  $\text{FeCl}_3$  untuk tanin, alkaloid dengan reagen Wagner dan flavonoid dengan NaOH. Uji kuantitatif kandungan total tanin, flavonoid dan alkaloid dilakukan menggunakan spektrofotometri, uji aktivitas antioksidan dilakukan dengan DPPH.

Tanin terdeteksi pada Condet, Gading, Jawa, Pondoh, dan Suwaru yaitu pada sel sekretori & jaringan vaskular pada kultivar selain Pondoh dan terdeteksi pada jaringan vaskular pada kultivar Pondoh, flavonoid dan alkaloid terdapat pada semua kultivar buah salak yang digunakan; flavonoid pada jaringan parenkim dan alkaloid terdapat pada jaringan vaskular. Kandungan total tanin pada lima kultivar buah salak yaitu  $7,25 \pm 0,0177 \mu\text{gGAE}/\mu\text{l}$  (Gading);  $6,98 \pm 0,00946 \mu\text{gGAE}/\mu\text{l}$  (Suwaru);  $6,12 \pm 0,0059 \mu\text{gGAE}/\mu\text{l}$  (Jawa);  $5,99 \pm 0,00882 \mu\text{gGAE}/\mu\text{l}$  (Condet), dan  $4,59 \pm 0,009 \mu\text{gGAE}/\mu\text{l}$  (Pondoh). Kandungan total flavonoid pada buah salak yaitu  $0,942 \pm 0,0239 \mu\text{gQE}/\mu\text{l}$  (Gading);  $0,553 \pm 0,003 \mu\text{gQE}/\mu\text{l}$  (Jawa);  $0,436 \pm 0,000873 \mu\text{gQE}/\mu\text{l}$  (Condet);  $0,295 \pm 0,00033 \mu\text{gQE}/\mu\text{l}$  (Pondoh), dan  $0,00842 \pm 0,00066 \mu\text{gQE}/\mu\text{l}$  (Suwaru). Kandungan total alkaloid untuk lima kultivar yaitu  $14,92 \pm 0,12 \mu\text{gCE}/\mu\text{l}$  (Pondoh);  $6,8167 \pm 0,0951 \mu\text{gCE}/\mu\text{l}$  (Gading);  $6,52 \pm 0,14 \mu\text{gCE}/\mu\text{l}$  (Jawa);  $4,82 \pm 0,07 \mu\text{gCE}/\mu\text{l}$  (Condet), dan  $3,302 \pm 0,082 \mu\text{gCE}/\mu\text{l}$  (Suwaru). Aktivitas antioksidan tertinggi hingga terendah pada ekstrak salak dengan analisis menggunakan DPPH antara lain  $82,6 \pm 0,833\%$  (Suwaru),  $76,5 \pm 0,0962\%$  (Condet),  $56,1 \pm 0,0962\%$  (Jawa),  $40,16 \pm 0,166\%$  (Gading), dan  $22,5 \pm 0,33\%$  (Pondoh) Analisis ANOVA & DMRT yang dilakukan menunjukkan bahwa perbedaan kultivar mempengaruhi kandungan total tanin, flavonoid dan alkaloid serta aktivitas antioksidan pada lima kultivar buah salak tersebut. Analisis korelasi antara pengaruh metabolit sekunder terhadap aktivitas antioksidan pada lima kultivar buah salak menunjukkan bahwa tanin berpengaruh moderat pada aktivitas antioksidan sedangkan alkaloid dan flavonoid tidak berpengaruh.

Kata kunci : *Salacca zalacca*, metabolit sekunder, histokimia, aktivitas antioksidan

MAPPING OF COMPOUNDS AND TOTAL CONTENT OF TANNINS,  
FLAVONOIDS, ALKALOIDS AND ANTIOXIDANT ACTIVITY OF SNAKE  
FRUIT (*Salacca zalacca* (Gaertn.) Voss)

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ABSTRACT

Snake fruit (*Salacca zalacca* (Gaertn.) Voss) is a tropical fruit with unique appearance and taste; Other than consumed as fresh fruit, its skin and flesh have been used by locals as traditional medicine for various ailments. Few cultivars of the fruit also have been studied and have high pharmacological potency. This study was conducted to determine the type of secondary metabolite and their distributions in the flesh of five cultivars of snake fruit (Condet, Gading, Jawa, Pondoh, and Suwaru) using histochemistry analysis, to quantitate the compounds' total contents and antioxidant activity of the fruit. Tannins were detected using  $\text{FeCl}_3$  reagent, alkaloids were detected using Wagner reagent, flavonoids were detected using NaOH reagent. Quantitative analysis was conducted using spectrophotometry and DPPH assay was used to measure antioxidant activity.

Tannin compounds were found in Condet, Gading, Jawa, Pondoh and Suwaru, detected in the secretory cells that located among the parenchyma and vascular tissue in four cultivars except Pondoh which tannins were found only in vascular tissue. Flavonoid compounds were detected in all five cultivars and distributed in the parenchyma. Alkaloid compounds were found in all five cultivars and distributed in vascular tissue. Total tannin content in five cultivars of snake fruit were  $7.25 \pm 0.0177 \mu\text{gGAE}/\mu\text{l}$  (Gading);  $6.98 \pm 0.00946 \mu\text{gGAE}/\mu\text{l}$  (Suwaru);  $6.12 \pm 0.0059 \mu\text{gGAE}/\mu\text{l}$  (Jawa);  $5.99 \pm 0.00882 \mu\text{gGAE}/\mu\text{l}$  (Condet), and  $4.59 \pm 0.009 \mu\text{gGAE}/\mu\text{l}$  (Pondoh). Total flavonoid content in five cultivars were  $0.942 \pm 0.0239 \mu\text{gQE}/\mu\text{l}$  (Gading);  $0.553 \pm 0.003 \mu\text{gQE}/\mu\text{l}$  (Jawa);  $0.436 \pm 0.000873 \mu\text{gQE}/\mu\text{l}$  (Condet);  $0.295 \pm 0.00033 \mu\text{gQE}/\mu\text{l}$  (Pondoh), and  $0.00842 \pm 0.00066 \mu\text{gQE}/\mu\text{l}$  (Suwaru). Total alkaloid content in five cultivars were  $14.92 \pm 0.12 \mu\text{gCE}/\mu\text{l}$  (Pondoh);  $6.8167 \pm 0.0951 \mu\text{gCE}/\mu\text{l}$  (Gading);  $6.52 \pm 0.14 \mu\text{gCE}/\mu\text{l}$  (Jawa);  $4.82 \pm 0.07 \mu\text{gCE}/\mu\text{l}$  (Condet), and  $3.302 \pm 0.082 \mu\text{gCE}/\mu\text{l}$  (Suwaru). Antioxidant activity analyzed using DPPH assay from the highest to the lowest in five cultivars were  $82.6 \pm 0.833\%$  (Suwaru),  $76.5 \pm 0.0962\%$  (Condet),  $56.1 \pm 0.0962\%$  (Jawa),  $40.16 \pm 0.166\%$  (Gading), and  $22.5 \pm 0.33\%$ . From ANOVA and DMRT analysis, it was concluded that the difference of cultivars influenced the total tannis, flavonoids and alkaloids contents in these five cultivars. In correlation analysis that was performed, antioxidant activity was moderately influenced by tannins and not influenced by alkaloids & flavonoids.

Keywords : *Salacca zalacca*, secondary metabolites, histochemistry, antioxidant activity