

**GLUCOSINOLATES AND MYROSINASE  
ACTIVITY IN *Moringa oleifera***



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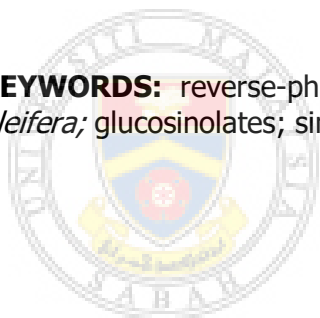
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## ABSTRACT

Studies were carried out on analysis of glucosinolates, a class of phytochemicals of *Moringa oleifera* species by reverse-phase high performance liquid chromatography (RP-HPLC). Intact glucosinolates from *Moringa oleifera* leaves, flowers, pods and root were extracted with hot methanol-water (70:30) mixture to inactivate the endogenous myrosinase. The levels of intact glucosinolates in various part of *Moringa oleifera* was calculated from a standard curve of freshly prepared pure sinigrin (allyl-glucosinolate). Among all the plant parts analyzed, pods contain the highest levels of glucosinolates followed by flowers, leaves and roots. The effect of extrinsic factors (temperature and pH) and intrinsic factors (ascorbic acid and  $\text{Fe}^{2+}$ ) on myrosinase activity was evaluated in order to study the glucosinolates-myrosinase system in *Moringa oleifera* plant. The most favorable temperature for myrosinase activity in all plant parts was  $35^{\circ}\text{C}$  and the activity decreased as the temperature increased. While, the optimal pH for myrosinase activity in leaves, flowers and pods was at pH7 except for root, a broad pH ranging from 3.0- 9.0 was observed. Myrosinase activities in *Moringa oleifera* plant were activated by ascorbic acid and ferrous ions at concentration as low as 2 mM. The activities in different plant part were varied, but all parts indicate some myrosinase activity.

**KEYWORDS:** reverse-phase high performance liquid chromatography; *Moringa oleifera*; glucosinolates; sinigrin; myrosinase activity



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## ABSTRAK

### **GLUKOSINOLAT DAN AKTIVITI MIROSINAS DALAM *Moringa oleifera***

*Kajian dijalankan ke atas analisis glukosinolat, sejenis fitokimia dalam spesis tumbuhan *Moringa oleifera* dengan menggunakan kromatografi cecair prestasi tinggi fasa terbalik (RP-HPLC). Glukosinolat daripada daun, bunga, lenggai dan akar *Moringa oleifera* di ekstrak dengan menggunakan campuran metanol dan air (70:30) yang panas bertujuan melumpuhkan enzim mirosinas. Kandungan glukosinolat di dalam pelbagai bahagian tumbuhan *Moringa oleifera* dikira berdasarkan graf lengkung sinigrin. Di antara kesemua bahagian tumbuhan yang di analisa, lenggai mempunyai kandungan glukosinolat yang tertinggi di ikuti dengan bunga, daun dan akar. Impak faktor ekstrinsik (suhu dan pH) dan faktor intrinsik (asid askorbik dan ion besi (II)) terhadap aktiviti enzim mirosinas di nilai untuk mengkaji sistem glukosinolat-mirosinas di dalam tumbuhan *Moringa oleifera*. Suhu terbaik bagi aktiviti enzim mirosinas pada semua bahagian tumbuhan adalah 35°C dan aktiviti enzim mirosinas menurun dengan peningkatan suhu. Manakala pH optimum bagi aktiviti enzim mirosinas pada daun, bunga dan lenggai adalah pH7 kecuali pada akar, menunjukkan julat pH yang besar iaitu 3.0- 9.0. Aktiviti mirosinas di dalam tumbuhan *Moringa oleifera* di aktifkan dengan kehadiran asid askorbik dan ion besi (II) pada kepekatan serendah 2mM. Aktiviti di dalam bahagian tumbuhan yang berbeza adalah pelbagai, tetapi kesemuanya menunjukkan berlaku aktiviti mirosinas.*

**KATA KUNCI:** *kromatografi cecair prestasi tinggi fasa terbalik; *Moringa oleifera*; glukosinolat; sinigrin; aktiviti mirosinas*



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