

**ESSENTIAL OILS AND BIOACTIVITIES OF**  
*Piper betle*

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## ABSTRACT

### ESSENTIAL OILS AND BIOACTIVITIES OF *Piper betle*

The chemical compositions as well as antioxidant and antibacterial activities of the leaves of *P. betle* collected from Negeri Sembilan, Selangor and Malacca have been studied. The essential oils were extracted by using hydrodistillation method and the chemical compositions were analysed by using gas chromatography-mass spectrometry (GC-MS). The antioxidant effect was carried out using 2,2-diphenyl-1-picrylhydrazyl radical scavenging assay, while screening for antibacterial activity was performed using disc diffusion method. The essential oils from Negeri Sembilan, Selangor and Malacca yielded 32 (90.6%), 22 (95.8%) and 34 (86.2%) compounds, respectively. All essential oils were dominated by phenylpropanoids (41.5-85.2%) with eugenol being the most abundant compound (24.0-61.1%). The essential oil from Negeri Sembilan was also rich in 4-allyl-1,2-diacetoxybenzene (13.9%), chavibetol acetate (12.6%) and germacrene D (9.5%), while the essential oil from Selangor was also contained chavicol (12.2%) and chavibetol acetate (5.9%) as the main compounds. Germacrene D (5.8%),  $\beta$ -caryophyllene (5.2%) and 4-allyl-1,2-diacetoxybenzene (5.2%) were also identified in significant amount in the essential oil from Malacca. All investigated oils showed 2,2-diphenyl-1-picrylhydrazyl radical scavenging activity with the  $IC_{50}$  values 50.53–126.10  $\mu\text{g/mL}$ . The highest radical scavenging activity was showed by the essential oil from Selangor ( $IC_{50}$  50.53  $\mu\text{g/mL}$ ). The essential oil from Selangor also demonstrated the highest antibacterial activity toward *S. aureus* and *E. coli* with the inhibition zones 25.00 and 21.60 mm, respectively.