
PLENARY PRESENTATIONS

**NATURAL PRODUCT DISCOVERY FROM THE MALAYAN FLORA:
RECENT INSIGHTS INTO ESSENTIAL OILS AND SECONDARY
METABOLITES**

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The Malayan flora continues to yield new phytochemical insights, particularly through the study of essential oils and metabolites from *Knema* (Myristicaceae), *Beilschmiedia* (Lauraceae), and *Syzygium* (Myrtaceae). Recent investigations integrating GC-FID/GC-MS, LC-MS/MS, and NMR analyses reveal distinctive volatile chemotypes and bioactive scaffolds across these genera. *Knema* species display sesquiterpene-dominant oils rich in β -caryophyllene, α -humulene, and germacrene D, complemented by lignans and neolignans with antibacterial, antioxidant, and enzyme-inhibitory activities. *Beilschmiedia* oils show mixed mono- and sesquiterpene profiles, notably α -pinene, linalool, and bicyclogermacrene, while their non-volatile extracts yield aporphine alkaloids and neolignans with potent α -glucosidase and lipoxygenase inhibition, suggesting therapeutic potential for metabolic and inflammatory disorders. Meanwhile, *Syzygium* species demonstrate broad chemical variability, from eugenol and methyl eugenol to 1,8-cineole and (E)-caryophyllene, coupled with rich flavonoid and ellagitannin contents in polar fractions that underpin strong antimicrobial, antibiofilm, and antioxidant effects. Modern dereplication and molecular networking approaches, particularly GNPS-based molecular mapping and multivariate chemometrics (PCA/HCA), have accelerated the recognition of genus-specific scaffolds and chemotaxonomic relationships. Collectively, these findings highlight the synergistic chemical diversity and biological potential of the selected Malayan taxa, offering valuable leads for bioprospecting and structure–activity exploration in drug discovery.

The integrated use of volatile profiling, metabolomics, and computational workflows underscores the region’s significance as a reservoir of bioactive phytochemicals with translational pharmacological promise.