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PP13. Composition and antimicrobial activity of the essential oils from a wide range of species from the Atlantic Rainforest in Brazil

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The Neotropical Atlantic Forest is considered one of the world´s richest biome in plant and animal diversity, with high frequency of endemic species. In this work we studied the chemical composition of the essential oils from 41 plants, belonging to 13 botanical families, from distinct locations of the Atlantic rainforest in the state of São Paulo, Brazil. The essential oils were isolated by hydrodistillation and their compositions were determined by GC-MS. Additionally, the antibacterial activity of the oils was investigated by growth-inhibition agar-diffusion assays, in the case of four bacterial species (*Staphylococcus aureus, S. epidermidis, Corynebacterium xerosis* and *Escherichia coli)*, while minimum inhibitory concentrations (MIC) were determined for both bacteria and fungi. For the inhibition halo analyses, *Melaleuca* sp. essential oil and cefotaxime were used as positive controls, whereas sterile mineral oil was used as the negative control. The analyses showed that the most abundant compounds were mono- and sesquiterpenes, although *Lauraceae* and *Myrtaceae* species oils also contained phenylpropanoids and methyl ketones, respectively. Hierarchical clustering analyses demonstrated that the mono- and sesquiterpene composition of the investigated oils was not significantly determined by the botanical family, forest location or seasonality alone; alternatively, the combination of these factors determines the chemical phenotype. The vast majority of the isolated essential oils exhibited an *in vitro* activity against Gram-negative and Gram-positive bacterial species and the composition of the bacterial cell wall is the principal factor affecting the extent of the biological activity of the investigated essential oils. The contents of the detected monoterpenes positively correlated with the observed biological activity against the given bacterial strains. Elevated contents of α- and β-pinene positively correlated with the increased inhibition of *Staphylococci* growth, whereas increased levels of germacrene D were associated with the antibacterial activity against *C. xerosis*.

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