Antioxidant activity evaluation of *Pothomorphe umbellata* L. (*Piperaceae*) aerial parts crude extract, sterol fraction and 4-nerolidylcatechol


ICAQF-Universidade Federal de São Paulo

Key-words: antioxidant activity; 4-nerolidylcatechol; *Piperaceae*; *Pothomorphe umbellata*; sterol fraction.

**Introduction:** *Pothomorphe umbellata* L. (*Piperaceae*), known in Brazil as “caápeba”, has been used for the treatment of a variety of illness. Its root has a highly reactive compound, identified as 4-nerolidylcatechol, with significant antioxidant and peroxyl radical scavenging activities as well as cytoprotection against Fe(II)-dependent DNA damage (Desmarchelier, Planta Med., 63, 561, 1997) and photodamage in the skin (Ropke, Photochem. Photobiol. Sci., 78, 436, 2003).

**Experimental Part:** Aerial parts were dried at 40°C, crushed and extracted by maceration with a 70% hydroethanolic solution. The mash was filtered and concentrated under reduced pressure. The crude extract was subjected to the fractionation process. Extract analysis was performed by GC-MS. 4-Nerolidylcatechol identification was executed by comparison of mass spectra with the injection pattern as well as the rate and retention. A fluorometric microplate assay (Rosenkranz, J. Immunol. Meth.,156, 39, 1992) was established for the detection of oxidative products using 2',7’-dichlorofluorescin-diacetate (DCFH-DA) in human promyelocytic leukemia cells (HL-60 cells) which were suspended in RPMI 1640 medium and antibiotic in 5% CO₂. 125 µl of the cell suspension were added into each well on a 96-well plate. The levels of DCFH-DA were gauged using a fluorescence measurement system.

**Results/Discussion:** The crude extract demonstrated the preeminent antioxidant activity (IC₅₀ = 1.2 µg/mL) against intracellular reactive oxygen species in HL-60 cells, followed by 4-nerolidylcatechol (IC₅₀ = 8.6 µg/mL) and sterol fraction (IC₅₀ =12.5 µg/mL). Vitamin C, the positive control used in this assay, exhibited IC₅₀ value equivalent to 1.7 µg/mL. The activity of the crude extract, however, was better than that observed for vitamin C.

**Conclusion:** The probable reason for the lower activity of 4-nerolidylcatechol and sterol fraction compared with the crude extract should be correlated to solubility and stability. Therefore, other compounds, present in the crude extract, must act synergistically with 4-nerolidylcatechol, improving its pharmacokinetic parameters and increasing significantly its antioxidant activity.

**Financing:** Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).

**Acknowledgements:** Professor Fábio Ferreira Perazzo.