



## PYRIDINE ALKALOID ISOLATED FROM AN ENDOPHYTIC FUNGUS OF THE BRAZILIAN MANGROVE

**Patrícia L. N. de Carvalho<sup>1\*</sup>, Juliana G. F. Silveira<sup>1</sup>, Eliane O. Silva<sup>1</sup>, Paulo T. Lacava<sup>2</sup>, Fernanda L.S. Sebastianes<sup>3</sup>, Jaine H.H. Luiz<sup>1</sup>, Masaharu Ikegaki<sup>1</sup>**

<sup>1</sup>Federal University of Alfenas, Alfenas, Brazil; <sup>2</sup>Federal University of São Carlos, São Carlos, Brazil;

<sup>3</sup>Luiz de Queiroz College of Agriculture of the University of São Paulo, Piracicaba, Brazil;

\*patricia.carvalho@unifal-mg.ed.br

**Abstract:** Mangrove is a unique environment whose plants, animals and microorganisms are adapted to extreme conditions [1]. Endophytic fungi live in plant tissues without causing any negative effects and they have the ability to synthesize a variety of bioactive secondary metabolites that often depends on the plant habitat [2]. This study reports the isolation, structural characterization and antimicrobial activity of a pyridine alkaloid (PA) produced by the endophytic fungus 99(3) isolated from *Laguncularia racemosa* leaves, which was collected in the mangrove forest of Bertioiga, São Paulo state (Brazil) [2]. The fermentation broth was extracted with ethyl acetate (EtOAc), with m= 238.0 mg of the crude extract. This extract was submitted to chromatography column using 10 g of Silica gel (Waters Sep-Pak<sup>R</sup> vac 35 cc) and eluted with gradient of MeOH:EtOAc. Thin Layer Chromatography analysis, revealed with Dragendorff reagent, suggested the presence of alkaloid in some fractions. Subsequent chromatography techniques led to isolation of PA (35.0 mg), which chemical structure was assigned with the aid of Nuclear Magnetic Resonance: <sup>1</sup>H (400 MHz), <sup>13</sup>C, COSY, HSQC and HMBC. The antimicrobial activity of the crude extract and of pyridine alkaloid was evaluated against important human pathogens: *Staphylococcus aureus* ATCC 6538, *Escherichia coli* ATCC 25922 and *Candida albicans* ATCC 10231. The minimum inhibitory concentrations (MICs) showed moderate activity of PA against all microorganisms evaluated, respectively, in µg/mL: 200-400, 50-100 and 25-50. In addition, the antimicrobial potential of PA was higher than crude extract (250-1000 µg/mL). To the best of our knowledge, PA had never been reported as product of secondary metabolism of endophytic fungi from Brazilian mangrove. This information highlights that microorganisms from uncommon environments are important source of pharmacologically active principles with great biotechnological interest.

### References:

- [1] Badola, R., Primavera, J.H., Barbier, E., Dahdouh-Guebas, F. 2008. Ethnobiology, socio-economics and management of mangrove forests: a review. *Aquatic Botany*. 89: 220-236.
- [2] Sebastianes, F.L.S., Cabedo, N., Aouad, N.E.; Valente, A.M.M.P., Lacava, P.T., Azevedo, J.L., Pizzirani-Kleiner, A.A., Cortes, D. 2012. 3-Hydroxypropionic acid as an antibacterial agent from endophytic fungi *Diaporthe phaseolorum*. *Curr Microbiol*. 65: 622-632.

**Acknowledgement:** FAPEMIG; Unifal-MG.