ANTIFUNGAL ACTIVITY OF PROTEIN EXTRACTS OF SEEDS FROM FIFTY AMAZONIAN SPECIES OF FABACEAE

Aline Bastos Brilhante de Sousa¹, Alexandre Felipe Santa Ana de Lima¹, Andreia Varmes Fernandes¹, Diego Pereira Souza¹, Marcio Viana Ramos², José Francisco de Carvalho Gonçalves¹

¹Laboratory of Plant Physiology and Biochemistry, National Institute for Amazonian Research (INPA), Manaus, Amazonas – Brazil. ²Department of Biochemistry, Federal University of Ceará, Fortaleza – Brazil.

In the literature it appears that potential antifungal activity has been attributed to lectins. These bioactive molecules may be promising in control of phytopathogenic fungi and are present in Fabaceae seed of Amazonia. The objective of this study was to investigate the antifungal capacity of protein extracts from seeds of 50 species belonging to the family Fabaceae. The antifungal activity of the protein extracts were evaluated against seven phytopathogenic fungi of agricultural interest, through inhibition assay of the vegetative growth of fungi.

To evaluate the antifungal activity of extracts, 10 µL of conidial suspension (2x10⁵ conidia/mL) were incubated for 12h with 90 µL culture medium (YPD) 96-well microtiter plates. Then, 100 µL of each protein extract (5 mg/mL) were added to the plates. Absorbance at λ=630 nm were made immediately after incubation of the extracts and every 24h to 72h. The highest rates of inhibition of fungal growth were observed in species belonging to the subfamily Mimosoideae where Enterolobium schomburgkii, Macrosamanea spruceana, Zygia cauliflora, Z. inaequalis and Z. trunciflora, all of Ingeae tribe, inhibited significantly (between 44.5 and 96.9%) the mycelial growth of all tested fungi. The species belonging to the subfamily Caesalpinioideae didn’t have or was low antifungal activity. Species subfamily Faboideae the genus Swartzia inhibited, on average, 50% of the growth of six analyzed fungal hyphae.

The results show that each extract has distinct characteristics directly related to its specificity, which may be related to the specific genetic traits of each subfamily, tribe and/or genus as well as of plant pathogen. This was observed in genus Zygia, Ormosia, Swartzia and Parkia, that comparing different species of each genus, showed inhibition profile similar fungal growth. The results revealed new plant species Fabaceae family with potential for controlling phytopathogenic fungi, becoming promising research from studies with protein molecules that exhibit potential antifungal activity.

Keywords: bioprospecting, phytopathogenic fungi, plant proteins.