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CHEMICAL CHARACTERIZATION AND PHYTOTOXIC POTENTIAL OF PYROLIGNONEOUS ACID

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Pyroligneous Acid (PA) is a liquid obtained from the pyrolysis of wood, a process in which charcoal is produced and condensed smoke is collected simultaneously. PA has a reddish-brown color and may contain more than 200 compounds. The quantity and diversity of these compounds vary according to the plant species used and the collection temperature. Some plants produce compounds, called allelochemicals, that can interfere with the growth and development of other plants and can act as bioherbicides if their effectiveness is properly demonstrated. In this context, researchers have investigated PA for its properties as an herbicide derived from natural products. Therefore, the work aimed to chemically characterize the PA obtained from *Eucaliptus grandi*, and to evaluate its inhibitory potential through phytotoxic tests: mean emergence time (MET) and emergence speed index (ESI) of the target plants. PA was subjected to partition liquid-liquid with *n*-hexane and chloroform, called PAHex and PAChlorof, which were chemically characterized by GC-MS and subsequently analyzed via PCA. The correlation between GC-MS and the analysis of PCA *loadings* made it possible to verify that toluene, ethylbenzene, 3,5-dimethoxy-4-hydroxy-toluene, and *o*-xylene were only identified in PAhex, and 2-methoxy-phenol, 2-methoxy-4-methyl-phenol, 4-ethyl-2-methoxy-phenol, and 5-*tert*-butylpyrogallol are in greater quantities in PAHex when compared to the PAChlorof. The compound 2,6-dimethoxyphenol was the majority in both PAHex (21.98%) and PAChlorof (48.43%). The phytotoxicity tests were conducted at concentrations of 10%, 25%, 40%, 55%, 70%, 85%, and 100% of PA, formulated with 0.5% adjuvant mixture (1 SP80: 9 TW20), applied in *Phaseolus vulgaris*, *Eragrostis plana* Nees, and *Euphorbia heterophylla*. The results demonstrated a consistent pattern in response to increasing allelochemical concentration, characterized by an increase in MET and a reduction in ESI, observed in all target plants, corroborating Pesenti (2021). This behavior suggests that the compounds present in PA significantly interfere with the initiation of seed germination, acting as inhibitors. These results reinforce PA's potential as a bioherbicide. Acknowledgments: UTFPR - Pato Branco, LAPNEQ-UFPR, and CAPES.

Keywords: *allelochemical, bioherbicide, gas chromatography, natural products, wood vinegar.*

Pesenti, M. C. Chemical Characterization of Pyroligneous Extract Obtained from *Eucalyptus grandis* and Allelopathic Tests of the Distilled Fraction. UTFPR, Pato Branco, 2021.