YELD, CHEMICAL PROFILE, ALLELOPATHIC POTENTIAL OF ESSENTIAL OILS LEAVES AND STALK FROM *Piper aduncun* COLLECTED IN ITACOATIARA.

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Introduction

Brazil is the country that is home to the largest and most genetically diverse flora on the planet. Currently, the Brazilian flora catalog is made up of 49,980 species, including endemic, cultivated and naturalized, with the Amazon being home to more than 1/4 of this biomass.[1] Among the botanical groups that stand out in the production of essential oils the Piperaceae family, which, inestimable cultural and scientific value, houses many species that exhibit richness in their chemical composition.[2] The gender *Piper* is the most representative of the family and has been the target of several scientific studies that highlighted, among other properties, its insecticidal potential presence of phenylpropanoids and sesquiterpene. Its species can be used in agriculture to control pests[2]. In this scenario, control of pests in agriculture has been a historical challenge, because, although there are effective pesticides, the chemical composition of these products can cause a series of problems, including environmental pollution and compromising food safety for humans and others non-target organisms.[3,4] The objective of this work is to evaluate chemical profile, yield and allelopathic potential of the essential oil of the leaves and stalks of *Piper aduncun* collected in Itacoatiara- AM front seeds *Lactuta sativa* L and *Cucumis anguria* L.

Material and Methods

Leaves and stalks *P. aduncun*. (Piperaceae) was collected in the morning, at the Instituto de Science Exact and Technology of Itacoatiara-AM, Amazonas, Brazil. Essential oils were extracted by hydrodistillation in a Clevenger apparatus, lasting 4 hours. At the end of extraction, the oils obtained were centrifuged for 10 minutes at 3500 revolutions per minute (rpm) for separating and removing water. The income was quantified based on leaf weight (v/m). The essential oils were kept under refrigeration in amber bottles and subsequently sent for analysis to the Faculty of Pharmaceutical Sciences of Ribeirão Preto - USP to identify the chemical composition. The allelopathic test was carried out in the pharmacy laboratory of the University Federal of Amazonas using Rules for Seed Analysis[5]. *P.* aduncun essential oils were emulsified with surfactant (Tween 80), in a 1:1 ratio and from these emulsions solutions were obtained in concentrations 1 and 0.1 % (v/v). Two control treatments were established, one with only distilled water and the other containing a 1% (v/v) surfactant solution, and four treatments in designed completely randomized, applied to two test species (*L. sativa* L. and *C. anguria* L.) purchased in local stores each with four repetitions. The bioassays were conducted in a B.O.D chamber at 25 °C and 12 h photoperiod for packaging the petri. Additionally, two sheets of filter paper were placed on the lid to apply the treatments. Assessments were carried out daily until the moment the germinations have ceased. The data were subjected to normality and homogeneity error, followed tests by analysis of variance (ANOVA) and the resulting means were compared with each other applying the Tukey test at the 5% significance level, using the program Sisvar statistician.

Results and Discussion

The collection and extraction of essential oils from the fresh leaves and branches of *P. aduncun* were carried out in the municipality of Itacoatiara-Am, in May 2023, a usually dry period. Both oils were yellowish, with a lower density than water. O yield was 0.69% for leaf oil and 1.65% for stalks oil. In the leaf oil, 91.1% of the constituents were identified and in the of the branches 92.3%, equivalent to 48 and 46 compounds. The main compounds found in the essential oil of the leaves de *P. aduncun* were: Safrole (14,3%), (E)-Caryophyllene (4,5%), Curzerene (10,4%), Germacrene B (6,2%) and Germacrona (17,0%). The main compounds found in the essential oil of the were: 1,8 cineole (4,6%), Safrole (7,4%), (E)-Caryophyllene (4,5%), Curzerene (11,5%), Germacrene B (6,0%), and Germacrona (17,8%). The compounds safrole, (E)-caryophyllene, curzerene, germacrene B and germacrone were the majority in both the oil essential leaves and oil essential stalks samples, and 1,8-cineole was the majority only in oil essential stalks. The sesquiterpene class was predominant in both oil-essential leaves, *Pi aduncun* leaves and oil-essential *P. aduncun* stalk. At the same time, the percentage of monoterpenes was higher in oil essential *P. aduncun* and phenipropanoids were present in greater quantities in oil essential *P. aduncun* stalks. Essential oils influenced the germination percentage in the average time germination rate, average germination speed, vigor according to the germination speed index germination and the average length of the primary root of *Lactuta sativa* L and *Cucumis anguria* L. The intensity of these effects varied depending on the concentration tested, the part of the donor plant from which the essential oil was extracted from the receiving plant and the variable analyzed. To the variables %G, IVG and CMR exhibited dose-dependent responses, while responses to the TMG and VG variables were not dependent on the increase in concentration. However, the seeds of *L. sativa* L and *C. anguria* L were sensitive to a concentration of 1% of the essential oils.

Conclusion

The oils from the leaves and stalks of *P. aduncun*, collected in Itacoatiara-AM, were chemically similar, with some variations regarding the presence and concentration of their components. The essential oils inhibited the germination of Lactuta sativa and Cucumis anguria L and caused a delay in the germination, compromising seed vigor and root growth. The results demonstrated in the present study are an indication of that oil essential leaves and stalk of *P. aduncun* represent an interesting source of molecules with potential for application in the sustainable control seeds *L sativa* L. and *C anguria* L, being an alternative to synthetic pesticides. However, there is still a great need for more detailed investigations into these oils and their mechanisms of action to guarantee the safety of their use for non-target plant and animal species.

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