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Synthesis of New Molecules Derived from *Eugenol*

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ABSTRACT

Eugenol is the main active component of clove essential oil and has demonstrated relevant biological potential with well-known antimicrobial, antioxidant, antiviral, anti-inflammatory action. Thus, three eugenol derivatives were synthesized, purified, and characterized in this study. The derivatives were produced by O-alkylation reactions (Williamson), which fix polyoxygen chains at the level of eugenol's phenol function.

Keywords: eugenol, semisynthesis, biological activity, bioactive molecule.

1. Introduction

Natural substances have existed in nature since the dawn of time. They have always been used, and until today, in traditional medicine. They contain essential oils (EO) which constitute an interesting source for obtaining new compounds in the search for bioactive molecules. They are considered a potential source of natural molecules that can have different pharmacodynamic activities [1-5]. The interest of this work is to carry out semisynthesis, from existing functions within the eugenol molecule to produce novel compounds with potential biological activity.

2. Experimental

2.1 General synthesis of eugenol derivatives

A solution of eugenol (6 mmol) in ethanol was mixed with a 50% excess of KOH in ethanol solution containing 0.5% KI as cocatalyst, after 10min of stirring, (di or tri or tetra) ethylene glycol ditosylate (3 mmol) was added in the solution, under nitrogen atmosphere. The reaction medium was refluxed for 24 h. After the reaction was completed, the mixture was poured into water and extracted with dichloromethane. the organic layer was washed then dried (MgSO₄). the solvent was evaporated, the residue product was purified by silica gel column chromatography using ethyl acetate/hexane 2/1 volume ratio, as an eluant to obtain a solid.

3. Results and Discussion

It was done O-alkylation reactions (Williamson), which fix polyoxygen chains at the level of eugenol's phenol function. Three compounds with oxygenated chains were isolated and identified by mass spectrometry and nuclear magnetic resonance (1H and 13C) analysis.



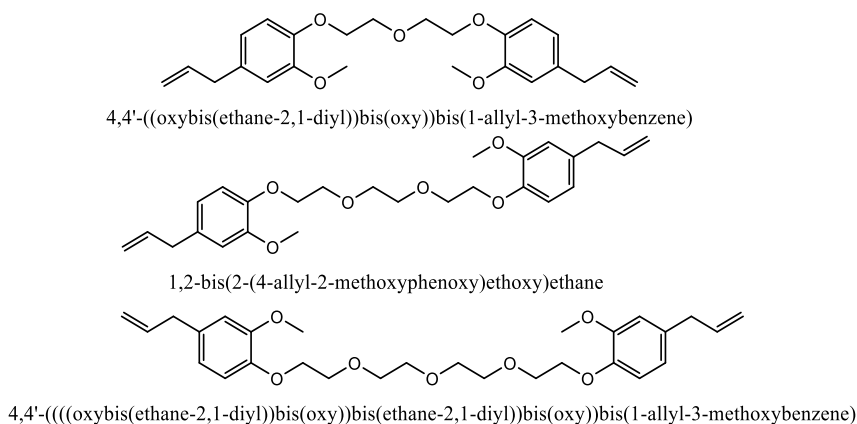


Figure 1: eugenol derivatives

4. Conclusions

Through this work, we obtained new molecules. The structures of these molecules were determined by NMR and mass spectrometry and the experimental conditions are easily adapted. Biological tests for possible pharmacodynamic activities are currently being carried out.

References

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