IDENTIFICATION OF DIMERIC PHLOROGLUCINOLS BY RMN FROM SELECTED FERNS AND THEIR ANTIBACTERIAL ACTIVITY

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Introduction. Phloroglucinol compounds comprise a family of molecules that includes synthetic or semi-synthetic moieties, and more than 700 naturally occurring compounds are present in different botanical families such as Gurriferae, Myrtaceae, Asteraceae and Dryopteridaceae. A vast range of activities like anti-inflammatory, anticancer, antibacterial, antidepressant, and antioxidant have been exhibited by these compounds (1).
The aim of the present study is to identify new sources of dimeric phloroglucinols by H^1 RMN from different species of ferns, and to establish their antibacterial activity.

Methods. The hexanic rhizomes extract of fifteen different ferns colected in Mexico will be analyzed by H^1 NMR and compared with representative signals (δ 10-19 ppm) of dimeric phloroglucinol (IV) isolated from *Elaphoglossum erinaceum* **(fig. 1)** whose crude extract was obtained through supercritical fluid extraction (SFE) with CO_2 at 40°C using a pressure gradient, and purified by high performance liquid chromatography (HPLC). The hexanic crude extracts of all collected ferns, as well as fractions obtained for SFE, and compund IV, were evaluated against ATCC bacteria strains: *Staphylococcus aureus* (25923) and *Escherichia coli* (2522) (concentration range: 200 to 1000 µg/ml) as well as againts *Salmonella typhi* (6539) (concentration range: 50 to 200 µg/ml) by microdilution method (2).

Results. The purification of compound IV was performed through preparative HPLC, and its structure was elucidated by NMR techniques, affording the structure presented in the figure 1.

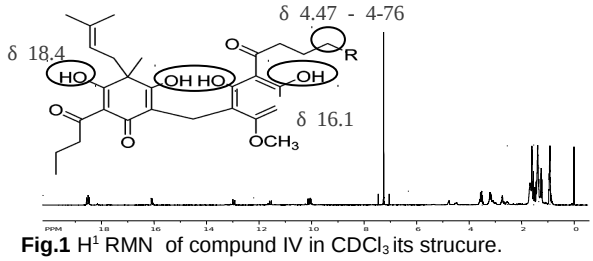

Fig.1 H^1 RMN of compund IV in $CDCl_3$ its strucure.

The high deshielded signals in the ^{1}H RMN spectra of some hexanic crude extracts indicated the dimmeric structure of a acylphloroglucinol, displaying characteristic signals from -OH protons at δ 18.4, 16.1, 12.9 and 10.1, as well as the signals at δ 4.47(br. t) and 4.76 (br. s) corresponding to the prenyl group. The antibacterial activity of the *E. erinaceum* hexanic crude extract, SFE fractions (90, 120 and 200 bars), and compound IV, presented minimum inhibitory concentrations (MICs) values between 250-1000 µg/mL for *S. aureus* and *E. coli.* However, no activity agaist *S. typhi* was registered at the tested concentrations (50 -200 µg/mL) (Tabla 1). Some extracts of the ferns showed higher activity with MIC values between 10 to 200 µg/ml.

Table 1 Antibacterial activity from *E. erinaceum hexanic extact,* fraction obtained by SFE and compound IV.

Sample	MIC (µg/ml)		
	S. aureus	*E. coli*	*S. typhi*
Hexanic extract	>1000	>1000	>200
F 90a/90b	1000	1000	>200
F 120	>1000	>1000	>200
F 200	250	500	>200
IV	>1000	>1000	>200
Ampicilin	0.08	0.08	0.08
Streptomicin	2	2	>2

Conclusions. Ferns are a new source of phloroglucinol derivates. However, some species posses stronger antibacterial activity without the prensence phloroglucinols.

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