SEPTEMBER 23-27 2024
19BMOS
BRAZILIAN MEETING ON ORGANIC SYNTHESIS
BENTO GONÇALVES, RS - BRAZIL

Synthesis of Selenium and Tellurium-Containing Sulfonamides Derived from Lupeol

Leila R. Oliveira[1], Pedro Guillem[2], Samuel Silva[2], Alcindo A. dos Santos[2], Grasiely F. de Sousa[1], Diogo M. Vidal[1*]

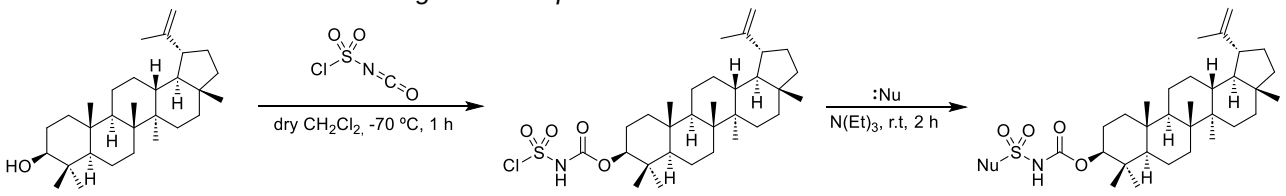
1) Departamento de Química do ICEx, Universidade Federal de Minas Gerais, UFMG, 31270-901
2) Instituto de Química, Universidade de São Paulo, USP, 05508-220
****e-mail: vidal@qui.ufmg.br***

Keywords: *Lupeol, semi-synthesis, sulfonamide, selenium, tellurium*

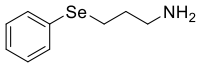
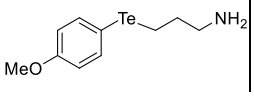
ABSTRACT

Natural products play an important role in drug discovery, however, practical applications have challenges such as low solubility in aqueous media, unstable structures, and high toxicity. The development of semisynthetic derivatives can help overcome these problems and improve the biological activities of a natural product[1]. Sulfonamides are known to have antimicrobial, anti-inflammatory, anti-diabetic and anti-cancer activities[2]. Organic compounds containing selenium and tellurium are reported to exhibit antimicrobial, anti-inflammatory, antidiabetic, antiparasitic and antitumor activities[3,4]. In this study, three sulfonamides were synthesized via a one-pot reaction between the natural triterpenoid lupeol (**1**) and chlorosulfonyl isocyanate (-70ºC, N_2 atmosphere, anhydrous medium), forming a carbamate (**2**), followed by the addition of a nucleophile (water (**3**), amino selenide (**4**), amino telluride (**5**)) in the presence of triethylamine. The final sulfonamides (**3-5**) were obtained with yields ranging from 41% to 99%. As perspectives, we plan to increase the compounds library and evaluate their biological activities.

Figure 1 - Preparation of sulfonamides 3-5



1 2 3-5

Product	Nu	Yield (%)
3	H_2O	98
4		99
5		41

ACKNOWLEDGEMENTS

CNPq, CAPES, FAPEMIG, LAREMAR

REFERENCES

(1) Yao, H.; Liu, J.; Xu, S.; Zhu, Z.; Xu, J. The Structural Modification of Natural Products for Novel Drug Discovery. *Expert Opin. Drug Discov.* **2016**, *12* (2), 121–140. https://doi.org/10.1080/17460441.2016.1272757.

(2) Wan, Y.; Fang, G.; Chen, H.; Deng, X.; Tang, Z. Sulfonamide Derivatives as Potential Anti-Cancer Agents and Their SARs Elucidation. *Eur. J. Med. Chem.* **2021**, *226* (9), 113837. https://doi.org/10.1016/j.ejmech.2021.113837.

(3) Hou, W.; Xu, H. Incorporating Selenium into Heterocycles and Natural Products-From Chemical Properties to Pharmacological Activities. *J. Med. Chem.* **2022**, *65* (6), 4436–4456. https://doi.org/10.1021/acs.jmedchem.1c01859.

(4) Angeli, A.; Etxebeste-Mitxeltorena, M.; Sanmartín, C.; Espuelas, S.; Moreno, E.; Azqueta, A.; Parkkila, S.; Carta, F.; Supuran, C. T. Tellurides Bearing Sulfonamides as Novel Inhibitors of Leishmanial Carbonic Anhydrase with Potent Antileishmanial Activity. *J. Med. Chem.* **2020**, *63* (8), 4306–4314. https://doi.org/10.1021/acs.jmedchem.0c00211.