10th Brazilian Conference on Natural Products
XXXVI RESEM
4-7 November 2025, Belo Horizonte, MG, Brazil

Section: 01

CHEMICAL EPIGENETIC MODULATION AS A STRATEGY FOR TRIGGERS METABOLITE IN UNCARIA TOMENTOSA (WILLD. EX SCHULT.) DC.

Marilia Fontes Barbosa[1*], Mario Machado Martins[2], Adriana Aparecida Lopes[1], Ana Maria Soares Pereira[1]

mari_fbs@outlook.com

1-Unidade de Biotecnologia Vegetal, Universidade de Ribeirão Preto (Unaerp), Av. Costábile Romano, 2201, Ribeirânia, Ribeirão Preto, SP, 14096-900, Brazil. 2-Laboratório de Nanobiotecnologia Dr. Luiz Ricardo Goulart, Universidade Federal de Uberlândia (UFU), Rua Acre, Umuarama, Uberlândia, MG, 38408-100, Brazil.

Nature, through its medicinal plants, has contributed significantly to the development of new drugs. Among these plants, *Uncaria tomentosa* (cat's claw) is of particular interest, being a species native to the Amazon region that has been used in traditional medicine due to its anti-inflammatory action and chemical diversity, which includes alkaloids, polyphenols, and quinovic acid derivatives. However, it is important to note that plants are conditioned to physiological interactions and generally produce these compounds in low concentrations. In this context, *in vitro* cultivation emerges as a promising strategy, demonstrating the optimization of the production of specialized metabolites through specific pathways that are regulated by epigenetic mechanisms. These mechanisms modulate gene expression through activation or silencing under various conditions, reflecting the variation in the chemical composition and concentration of metabolites. The process of epigenetic modulation is mediated by mechanisms such as histone modifications, occurring without any alteration of the genetic code. The present study was conducted to evaluate the effect of sodium butyrate (NaBut), a histone deacetylase inhibitor, on the chemical profile biosynthesis of specialized metabolites in *U. tomentosa* adventitious roots by LC-MS. The adventitious roots were treated with NaBut for a period of 60 days, and then the methanolic extracts obtained were purified by solid phase extraction on a C18 cartridge and semi-preparative HPLC-DAD. Spectrometric analyses were performed on an Agilent Infinity 1260 HPLC system coupled to a high-resolution QTOF mass spectrometer with electrospray ionization. The data obtained by HPLC-DAD and LC-MS showed variations in the concentrations of specialized metabolites at lower treatment doses of NaBut treatment and biosynthesis of azelaic acid was observed, a compound not previously reported in the species. These present results represent the first record of the use of epigenetic strategy chemical in *U. tomentosa* adventitious roots, and thus demonstrate the potential of NaBut in the production of metabolites through the activation of silenced biosynthetic pathways. The authors are grateful for the support of their institutions and financial support from CNPQ.

Keywords: *histone deacetylase, biosynthesis, LC-MS, Rubiaceae, cat´s claw*