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

Section: 05

OBTAINING A GLYCOSYLATED FLAVONOID-ENRICHED FRACTION FROM Agave sisalana RESIDUE VIA MACROPOROUS ADSORPTION RESIN PURIFICATION AND FLASH CHROMATOGRAPHY

Annabel Azevedo da Silva[1,2*], Gedson Sampaio Gomes[2], Louise Souza Santos[2], Isabella Mary Alves Reis[2], Alexsandro Branco[1,2]

annabelfarma@gmail.com

1-PPGFar, Faculdade de farmácia, UFBA, rua Barão de Jeremoabo s/n, Salvador, BA, 40170.115, Brazil. 2-Laboratório de fitoquímica, DSAU, UEFS, Av. Transnordestina, s/n, Feira de Santana, BA, 44036-900, Brazil.

Agave sisalana is extensively cultivated in Bahia for fiber production, generating large amounts of waste. About 95% of the plant material is discarded. Previous studies describe that the residual biomass is rich in flavonoids and glycosides due to the higher expression of biosynthetic genes in processed leaves. Glycosylated flavonoids were obtained from the liquid residue of *A. sisalana*, a by-product of the defibration process. In this study, a two-step purification process was developed, initially involving enrichment on a macroporous adsorption resins, followed by purification via silica gel flash chromatography. The static adsorption step was conducted under constant agitation in a shaker (172 rpm) at 25 °C. A total of 200 mL of sisal liquid residue was contacted with 86 g of PuroSorb PAD950 resin, corresponding to a bed volume of 118 mL. Following adsorption, the resin was transferred and packed into a chromatographic column (36 mm diameter × 115 mm length) for the desorption stage. Dynamic desorption was performed according to the methodology adapted from Freitas *et al*., 2026. Elution with a 40% (v/v) ethanol–water solution produced a flavonoid-rich fraction. Next, the enriched fraction (2.56 g) was subjected to flash chromatography on a silica gel column (pore size: 60 Å; particle size: 220–440 mesh), eluted in three eluents of increasing polarity in ethanol and water, resulting in six fractions monitored by HPLC-DAD. The fraction 6 (0.0532mg) presented characteristic profiles of glycosylated flavonoids, and tandem mass spectrometry (MS/MS) analysis allowed the characterization of two major glycosylated flavonoids: kaempferol 3-rutinoside-4′-glucoside and kaempferol 3-(2"-rhamnosylrutinoside). The proposed method demonstrates potential for preparative-scale application in the separation and purification of glycosylated flavonoids, providing a sustainable approach for the valorization of agro-industrial residues and expanding the use of bioactive compounds.

Keywords: *Agave sisalana, glycosylated flavonoids, purification, macroporous resin, residue.*

Reference: FREITAS, Esther Emily Silva et al. Adsorption and nanoencapsulation: Innovative strategies for recovery and protection of flavonoids from Malpighia emarginata DC (acerola) pomace extract. **Food Chemistry**, p. 145121, 2026.