

ABSTRACT

Moringa oleifera Lam. leaves are known to contain various bioactive compounds and exhibit diverse biological activities, particularly as antioxidants. This study aimed to identify the secondary metabolites, determine the total phenolic content, total flavonoid content, and antioxidant activity of the ethanolic extract of *Moringa oleifera* leaves, as well as to isolate and identify flavonoid compounds from the ethyl acetate fraction. The study was conducted through plant authentication, sample preparation, phytochemical screening, ethanol extraction by maceration, and fractionation. Extract characterization included the determination of total phenolic content using the Folin–Ciocalteu method, total flavonoid content using the aluminum chloride (AlCl_3) colorimetric method, and antioxidant activity using the DPPH assay. Flavonoid isolation was carried out using gravity column chromatography, thin-layer chromatography (TLC), and preparative TLC, followed by purity testing and structural identification using UV–Visible spectrophotometry, shift reagents, and Liquid Chromatography–Mass Spectrometry (LC–MS). The results showed that both the simplicia and ethanolic extract of *Moringa oleifera* leaves contained flavonoids, alkaloids, saponins, tannins, and steroids. The extraction yield of the ethanolic extract was 17.389%, while the ethanol–water fraction yield was 88.184%. The total phenolic content of the ethanolic extract was 73.382 ± 0.213 mg GAE/g extract, and the total flavonoid content was 15.171 ± 0.160 mg QE/g extract. The ethanolic extract exhibited an IC_{50} value of 339.267 mg/L, indicating very weak antioxidant activity. Identification using UV–Visible spectrophotometry, shift reagents, and LC–MS suggested that the isolated compound was a flavonol-type flavonoid, namely quercetin.

Keywords: *Moringa oleifera* leaves, flavonoids, phenolic, antioxidant, quercetin.