**Abstract**

The phytochemical components of the methanol extract of *Liriopeplatyphylla* (*L. platyphylla*) leaves were identified using UHPLC, and their antioxidant activities were studied. The impact of the *L. platyphylla* extract on the corrosion of mild steel by 1 M H2SO4 was assessed using electrochemical and gravimetric techniques. *L. platyphylla* exhibited concentration-dependent corrosion protection activity through a mixed-mode adsorption process, as revealed by polarization studies. Impedance measurements indicated the development of a protective film of the inhibitor, which was confirmed by morphology studies at the micro level with scanning electron microscopy (SEM) and at the nano level with atomic force microscopy (AFM). Fourier transform infrared (FT-IR) studies also confirmed the adsorption of the inhibitor film onto the mild steel surface.