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Synthesis, Characterization and Antibacterial Screening of 3-Hydroxy-2-[3-(2/3/4-Methoxybenzoyl)Thioureido]Butyric Acid

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Abstract : This study presents the synthesis of a series of methoxybenzoylthiourea amino acid derivatives. The compounds were obtained from the reactions between 2/3/4-methoxybenzoyl isothiocyanate with threonine. All of the compounds were characterized via mass spectrometry, ¹H and ¹³C NMR spectrometry, UV-Vis spectrophotometer and FT-IR spectroscopy. Mass spectra for all of the compounds showed the presence of molecular ion [M]⁺ peaks at m/z 312, which are in agreement to the calculated molecular weight. For ¹H NMR spectra, the presence of OCH₃, C=S-NH and C=O-NH protons were observed within range of δ_H3.8-4.0 ppm, 11.1-11.5 ppm and 10.0-11.5 ppm, respectively. ¹³C NMR spectra in all compounds displayed the presence of OCH₃, C=O-NH, C=O-OH and C=S carbon resonances within range of δ_C55.0-57.0 ppm, 165.0-168.0 ppm, 170.0-171.0 ppm and 180.0-182.0 ppm, respectively. In UV spectra, two absorption bands have been observed and both were assigned to the n-π* and π-π* transitions. Six vibrational modes of v(N-H), v(O-H), v(C=O-OH), v(C=O-NH), v(C=C) aromatic and v(C=S) appeared in the FT-IR spectra within the range of 3241-3467 cm⁻¹, 2976-3302 cm⁻¹, 1720-1768 cm⁻¹, 1655-1672 cm⁻¹, 1519-1525 cm⁻¹ and 754-763 cm⁻¹, respectively. The antibacterial activity for all of the compounds was screened against Staphylococcus aureus, Staphylococcus epidermidis, Salmonella typhimurium and Escherichia coli. However, no activity was observed.

Keywords : methoxybenzoyl isothiocyanate, amino acid, threonine, antibacterial
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