INTISARI

Tuberkulosis merupakan penyakit infeksi yang telah menyebabkan kematian jutaan jiwa di seluruh dunia dengan permasalahan pengobatan semakin meluasnya resistensi terhadap OAT. Penelitian ini bertujuan untuk mensintesis senyawa tiofenkarboksaldehid-formamid dan furaldehid-formamid menggunakan reaksi multikomponen serta diuji aktivitasnya sebagai anti tuberkulosis.

Metode reaksi mutikomponen yang digunakan pada penelitian ini berdasarkan pada reaksi amidoalkilasi senyawa aroamtikaldehid, formamid dengan $NaBH_4$ dan asam format. Senyawa target selanjunya diidentifikasi dan dikarakterisasi dengan GC-MS, IR, ^{1}H-NMR dan ^{13}C-NMR. Uji aktivitas anti tuberkulosis menggunakan metode *Microplate Alamar Blue Assay* (MABA) dan media *Middlebrook* 7H9-7H10 dengan seri konsentrasi 1000 – 7,8125 µg/mL serta menggunakan isoniazid sebagai kontrol positif.

Hasil sintesis dari 4 (empat) SM menunjukan bahwa senyawa 2-tiofenkarboksaldehid—formamid (LR-148T6) dan senyawa 3-metil-2-tiofenkarboksaldhid-formamid (LR-118T9) berhasil disintesis menggunakan reaksi multikomponen metode asam format dengan nilai %redemen 62,245% (LR-148T6) dan 52,426% (LR-118T9). Hasil uji aktivitas anti tuberkulosis dari 18 produk hasil sintesis menunjukan bahwa senyawa target LR-148T6 dan LR-118T9 menunjukkan aktivitas anti tuberkulosis dengan nilai MIC 250 dan 23,4375 µg/mL. Aktivitas anti tuberkulosis paling poten ditunjukkan oleh 4 produk samping reaksi, senyawa T2 dengan nilai MIC 11,71875 µg/mL; 25,735 µg/mL sampel T5; 35,714 µg/mL sampel T4; dan 59,21 µg/mL sampel F5. Senyawa target LR-148T6, LR-118T6 serta produk samping reaski memiliki aktivitas anti tuberkulosis, namun lebih tidak poten dibandingkan dengan INH (1 µg/mL) sebagai kontrol obat.

Kata Kunci : reaksi multikomponen, tiofenkarboksaldehid-formamid, furaldehid-formamid, tuberkulosis

ABSTRACT

Tuberculosis is an infectious disease that has caused the deaths of millions of people in the world with treatment problems increasingly widespread resistance to anti tuberculois drugs. The aims of this study to synthesize thiophenecarboxaldehyde-formamid and furaldehyde-formamid compounds using multicomponent reactions and tested their activity as anti-tuberculosis.

The used of muticomponent reaction method in this study was based on the amidoalkylation reaction of aroamticaldehyde compounds, formamid with NaBH4 and formic acid. The target compounds were identified and characterized by GC-MS, IR, 1H-NMR and 1C-NMR. Anti tuberculosis activity test using Microplate Alamar Blue Assay (MABA) method and Middlebrook 7H9-7H10 medium with concentration series 1000 - 7,8125 μg/mL and using isoniazid as positive control.

The synthesis of 4 (four) SM showed that the 2-thiophenecarboxaldehyde-formamide compound (LR-148T6) and the 3-methyl-2-thiophenecarboxaldehyde-formamide (LR-118T9) compound were successfully synthesized by using multicomponent reaction of formic acid method with yield value 62,245% (LR-148T6) and 52,426% (LR-118T9). Anti-tuberculosis activity test results from 18 products of synthesis showed that the target compound LR-148T6 and LR-118T9 showed anti tuberculosis activity with MIC 250 and 23,4375 μg/mL, respectively. The most potent anti-tuberculosis activity was demonstrated by 4 byproducts of the reaction, T2 with MIC 11,71875 μg/mL; 25.735 μg/mL sample T5; 35.714 μg/mL sample T4; and 59.21 μg/mL of sample F5. Target compounds LR-148T6, LR-118T6 and byproducts of anti-tuberculosis have anti-tuberculosis activity, but are less potent than INH (1 μg / mL) as drug control.

Keywords : Multicomponent reaction, thiophenecarboxaldehyde-formamide, furaldehyde-formamide, tuberculosis