SINTESIS TURUNAN *N*-FENIL PIRAZOLINA BERBAHAN DASAR 4-AMINOASETOFENON DAN UJI AKTIVITASNYA SEBAGAI ANTIMALARIA

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INTISARI

Sintesis turunan *N*-fenil pirazolina dari intermediet kalkon berbahan dasar 4-aminoasetofenon dan uji aktivitasnya sebagai antimalaria telah dilakukan. Intermediet kalkon disintesis dari reaksi kondensasi *Claisen-Schmidt* dengan katalis KOH 40% melalui metode konvensional dan sonokimia yang menghasilkan produk (E)-1-(4-aminofenil)-3-(3,4-dimetoksifenil)prop-2-en-1-on (kalkon **A**) dan (E)-1-(4-aminofenil)-3-(4-metoksifenil)prop-2-en-1-on (kalkon **B**). Sintesis turunan *N*-fenil pirazolina dilakukan dengan cara siklisasi senyawa kalkon **A** dan **B** dengan fenilhidrazina dan penambahan katalis KOH 40% melalui metode refluks yang menghasilkan produk 4-(5-(3,4-dimetoksifenil)-1-fenil-4,5-1H-pyrazol-3-il) anilina (pirazolina **A**), 4-(5-(4-metoksifenil)-1-fenil-4,5-1H-pyrazol-3-il)anilina (pirazolina **B**). Elusidasi struktur produk dilakukan menggunakan spektrometer IR, GC-MS, ^{1}H dan ^{13}C-NMR. Uji aktivitas antimalaria dilakukan terhadap P.*falciparum* 3D7 *strain* yang sensitif klorokuin.

Hasil penelitian menunjukkan metode konvensional dan sonokimia menghasilkan kalkon **A** dengan rendemen berturut-turut 68,55 dan 63,69%, sedangkan kalkon **B** 82,63 dan 43,32%. Sintesis pirazolina **A** menghasilkan padatan berwarna merah dengan rendemen 39,26% dan kemurnian 97,64%, sedangkan pirazolin **B** berupa padatan berwarna coklat dengan rendemen 52,64% dan kemurnian 95,04%. Hasil uji aktivitas antimalaria senyawa kalkon **A**, kalkon **B**, Pirazolina **A** dan pirazolina **B** menghasilkan IC_{50} berturut-turut sebesar 8,17, 13,81, 4,39 dan 36,19 µM. Kalkon **A**, **B** dan pirazolina **A** tergolong kategori aktif sebagai antimalaria sedangkan pirazolina **B** memiliki aktivitas antimalaria dengan kategori sedang.

Kata kunci: antimalaria, kalkon, pirazolina.

SYNTHESIS OF *N*-PHENYLPYRAZOLINE DERIVATIVES FROM 4-AMINOACETOPHENONE AND ITS ACTIVITY ASSAY AS ANTIMALARIAL AGENTS

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ABSTRACT

Synthesis of *N*-phenyl pyrazoline derivatives from 4-aminoacetophenone through chalcone intermediates and its activity tests as antimalarial agents had been carried out. The chalcone intermediates were synthesized via Claisen-Schmidt condensation reaction in the presence of 40% KOH as a catalyst using conventional and sonochemical methods to produce (E)-1-(4-aminophenyl)-3-(3,4-dimethoxy phenyl)prop-2-en-1-on (chalcone **A**) and (E)-1-(4-aminophenyl)-3-(4-methoxyphenyl)prop-2-en-1-on (chalcone **B**). The syntheses of *N*-phenyl pyrazoline derivatives were carried out by cyclization of chalcone **A** and **B** with phenylhydrazine and by the addition of 40% KOH as catalyst under reflux to give 4-(5-(3,4-dimethoxyphenyl)-1-phenyl-4,5-1H -pyrazol-3-il)aniline (pyrazoline **A**), 4-(5- (4-methoxyphenyl)-1-phenyl-4,5-1H-pyrazol-3-il)aniline (pyrazoline **B**). The structure elucidations of all products were confirmed by FTIR, GC-MS, ^{1}H- and ^{13}C-NMR spectrometers. All products were evaluated as antimalarial agents using *in vitro* assay against P. *falciparum* 3D7 strain, which is chloroquine sensitive.

The results showed that conventional and sonochemical methods yielded chalcone **A** 68.55% and 63.69%, respectively, while chalcone **B** produced in 82.63 and 43.32% yield, respectively. The synthesis of pyrazoline **A** produced red solid in 39.26% yield and 97.64% purity, while pyrazoline **B** as a brown solid was yielded in 52.64% with 95.04% purity. The antimalarial assay against P. *falciparum* 3D7 strain of chalcone **A**, **B**, pyrazoline **A**, **B** gave IC_{50} of 8.17, 13.81, 4.39, and 36.19 µM, respectively. Chalcone **A** and **B,** and pyrazoline **A** were classified as active antimalarial agents, while pyrazoline **B** was classified as an antimalarial agent with moderate activity.

Keywords: antimalarial agents, chalcone, pyrazoline.