

## ABSTRAK

### SINTESIS, KARAKTERISASI DAN UJI BIOAKTIVITAS ANTIMALARIA SENYAWA TRIFENILTIMAH(IV) 3-AMINO BENZOAT DAN TRIFENILTIMAH(IV) 4-AMINO BENZOAT TERHADAP PARASIT *Plasmodium falciparum* SECARA *IN VITRO*

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Penyakit malaria hingga saat ini belum dapat diatasi dan masih menjadi ancaman serius dikarenakan munculnya resistensi *Plasmodium* terhadap obat-obatan antibiotik. Berbagai upaya terus dilakukan termasuk salah satunya dengan melakukan penelitian terhadap obat-obatan potensial berbasis logam sebagai agen antimalaria seperti senyawa kompleks organotimah(IV) aminobenzoat. Penelitian ini bertujuan untuk mendapatkan senyawa kompleks trifeniltimah(IV) 3-aminobenzoat dan trifeniltimah(IV) 4-aminobenzoat serta menguji efektivitas antimalaria kedua senyawa tersebut terhadap parasit *Plasmodium falciparum* secara *in-vitro*. Penelitian ini dilakukan dengan cara mereaksikan senyawa trifeniltimah(IV) hidroksida sebagai senyawa awal dengan ligan asam aminobenzoat. Senyawa hasil sintesis dikarakterisasi menggunakan spektrofotometer IR, UV-Vis,  $^1\text{H}$  dan  $^{13}\text{C}$  NMR serta *microelemental analyzer*. Produk hasil sintesis berupa serbuk berwarna putih dengan nilai persen rendemen berturut-turut sebesar 88,81 dan 89,37%. Senyawa hasil sintesis selanjutnya digunakan untuk pengujian efektivitas antimalaria dan menghasilkan nilai  $\text{IC}_{50}$  secara berurutan yaitu 0,27 dan 0,64  $\mu\text{g/mL}$ . Hasil ini menunjukkan bahwa kedua senyawa yang disintesis bersifat aktif sebagai antimalaria karena nilai  $\text{IC}_{50}$  yang dihasilkan kurang dari 5  $\mu\text{g/mL}$ . Akan tetapi jika dibandingkan terhadap klorokuin sebagai kontrol positif dengan nilai  $\text{IC}_{50}$  sebesar 0,002  $\mu\text{g/mL}$ , maka aktivitas antimalaria kedua senyawa tersebut belum efektif.

Kata kunci: antimalaria, *Plasmodium falciparum*, trifeniltimah(IV) hidroksida, trifeniltimah(IV) 3-aminobenzoat, trifeniltimah(IV) 4-aminobenzoat.

## ABSTRACT

### SYNTHESIS, CHARACTERIZATION, AND ANTIMALARIAL BIOACTIVITY TEST OF TRIPHENYLTIN(IV) 3-AMINO BENZOATE AND TRIPHENYLTIN(IV) 4-AMINO BENZOATE TO *Plasmodium* *falciparum* PARASITE THROUGH IN VITRO METHOD

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To date, malarial diseases have not been overcome and still become a serious problem due to the resistance of *Plasmodium* toward the antibiotics medicine. Various attempts are continued to be done, including by doing the research and development associated with metal-based medicine as an antimalarial agent, for instance organotin(IV) aminobenzoate complex. Furthermore, the goals of this research were to get the triphenyltin(IV) 3-aminobenzoate and triphenyltin(IV) 4-aminobenzoate and to examine the effectivity of both compounds toward the *Plasmodium falciparum* parasites through in vitro method. In this research, the synthesis of triphenyltin(IV) 3-aminobenzoate and triphenyltin(IV) 4-aminobenzoate compounds by reacting the triphenyltin(IV) hydroxide as a precursor with aminobenzoate acid ligands has been done successfully. Afterwards, the synthesized compounds were characterized using IR, UV-Vis,  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectrophotometer as well as microelemental analyzers. The synthesized compounds produced white-coloured powders with a consecutive yield percent value of 88.81 and 89.37% respectively. The subsequent synthesis of the compounds was conducted antimalarial test and produced the  $\text{IC}_{50}$  equal to 0.27 and 0.64  $\mu\text{g/mL}$  respectively. It can be concluded that both compounds were active as an antimalarial agent because the value of  $\text{IC}_{50}$  produced were less than 5  $\mu\text{g/mL}$ . However, compared to chloroquine as a positive control with a value of  $\text{IC}_{50}$  was 0.002  $\mu\text{g/mL}$ , the antimalarial activity of both compounds was less effective.

Keywords: antimalarial, *plasmodium falciparum*, triphenyltin(IV) hydroxide, triphenyltin(IV) 3-aminobenzoate, triphenyltin(IV) 4-aminobenzoate.