

Abstract

Introduction

Leishmaniasis is an infectious disease caused by different species of *Leishmania*. To treatment of this disease is used from drugs such as glucantime, amphotericin B and paromycin that their side effects and drug resistance attracts attention to find new drugs against the parasite. In this study, in order to develop the pharmacological treatment of leishmaniasis, designed and synthesized a series dihydropyridine derivative by Hantzsch's reaction and investigated their anti-leishmania activity against the forms of Promastigot and Amastigot parasite of *Leishmania major*.

Material and Method

In the present project, designed, synthesized and purified a series of 1,4-dihydropyridine derivatives. Then, their structural identification was performed by $^1\text{H-NMR}$, FT-IR and MS spectra. Their antiparasitic effects were investigated on standard strain (MRHO/IR/75/ER) of *major Leishmaniasis*.

Results

Compounds **2** and **7** showed the highest activity among 1,4-dihydropyridine derivatives against amastigot and promastigot forms ($\text{IC}_{50} = 5.25 \mu\text{g} / \text{ml}$) and ($\text{IC}_{50} = 5.43 \mu\text{g} / \text{ml}$), respectively. Also, almost screened compounds showed slight toxicity against macrophages.

Conclusion

According to the results, the type of groups in *para*-phenyl ring of C4 position of dihydropyrimidine, lipophilicity character and the length of the ester chain of C3 and C5 positions of dihydropyridine ring had positive effect against forms of Promastigot and Amastigot parasite. Although the effectiveness of these compounds is lower than standard anti-leishmaniasis drugs, it can provide the way for design of compounds with more effect.

Keywords: Leishmaniasis, Hantzsch's reaction, Multicomponent Reaction, 1,4-Dihydropyridine