World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:12, No:09, 2018

# Determination of the Inhibitory Effects of N-Methylpyrrole Derivatives on Glutathione Reductase Enzyme

**Authors :** Esma Kocaoglu, Oktay Talaz, Huseyin Cavdar, Murat Senturk, Deniz Ekìncì

**Abstract :** Glutathione reductase (GR) is a crucial antioxidant enzyme which is responsible for the maintenance of the antioxidant GSH (glutathione) molecule. Antimalarial effects of some chemical molecules are attributed to their inhibition of GR; thus inhibitors of this enzyme are expected to be promising candidates for the treatment of malaria. In this work, GR inhibitory properties of N-Methylpyrrole derivatives are reported. Firstly, GR was purified by means of affinity chromatography using 2',5'-ADP-Sepharose 4B as ligand. Enzymatic activity was measured by Beutler's method. Synthesis of the compounds was approved by thin layer chromatography and column chromatography. Different inhibitor concentrations were used and all compounds were tested in triplicate at each concentration used. It was found that all compounds have better inhibitory activity than the strong GR inhibitor N,N-bis(2-chloroethyl)-N-nitrosourea, especially three molecules, 8m, 8n, and 8q, are the best among them with low micromolar $I_{50}$ values. Findings of our study indicate that these Schiff base derivatives are strong GR inhibitors which can be used as leads for designation of novel antimalaria candidates.

**Keywords :** glutathione reductase, antimalaria, inhibitor, enzyme
**Conference Title :** ICABPP 2018 : International Conference on Agricultural Biotechnology and Plant Protection
**Conference Location :** Paris, France
**Conference Dates :** September 20-21, 2018