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SYNTHESIS, IDENTIFICATION AND ANTIBACTERIAL STUDY FOR SOME NEW HETEROCYCLIC COMPOUNDS

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ABSTRACT : Some new heterocyclic compounds including pyrazol, pyradizine, thiazole and oxazole rings. The starting material was mefenamic acid, which converted to ester by using esterification method. Then the ester was reacted with hydrazine hydrate to obtain the hydrazide. The new compounds were characterized by using the spectroscopy method and the melting points were recorded and the purity was checked besides the antibacterial activity studies for some at the synthesized compounds. These activities were determined in vitro using well diffusion method against three types pathogenic strains bacteria *Staphylococcus aureus* (G+), *E. coli* (G-). The results revealed that some at these compounds showed measurable activity.

Key words : Mefenamic acid, hydrazide, pyrazol, phthalazin, pyridazin.

INTRODUCTION

Heterocyclic compounds are considered one of an important type of organic compounds due to their applications in different fields like industrial studies. Heterocyclic compounds are cyclic compounds in which one or more of the atoms of the ring are hetero atoms. Five memberd rings are given the prefix (idine) for saturated rings (Paquette, 1968; Joule and Mills, 2008) (Fig. I).

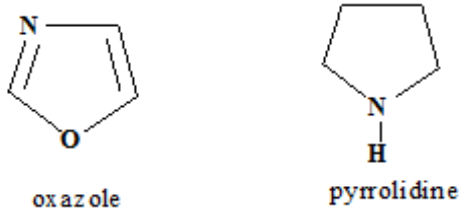

Fig. I :

Heterocyclic compounds, mainly those containing sulfur and nitrogen atoms are an interesting topic of research in planning organic synthesis due to their biological properties (Suthakaran *et al*, 2008) (Fig. II).

Hydrazide and thiosemicarbazide derivatives attracted a lot of attention because they are considered

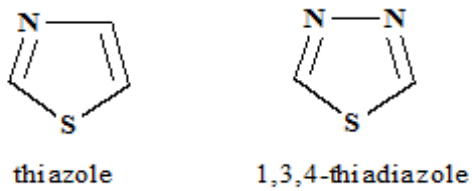

Fig. II :

intermediates to synthesize several compounds such as Schiff bases, thiadiazole (Jassim *et al*, 2012) oxadiazole (Somani and Shirodkar, 2011) and triazole (Jassim *et al*, 2012) derivatives, which all were reported to possess biological activities. The structural formula for this type of compounds is (RCONHNH-). Hydrazide derivatives are considered biologically active; many hydrazide compounds were used in treatment of tuberculosis (Asif and Singh, 2016; Guan *et al*, 2010) (Fig. III).

Some of carboxylic acid hydrazides were reported to have antimicrobial activities as compound below (Jassim *et al*, 2012). (Fig. IV).

Pyrazole is unsaturated heterocyclic organic compounds characterized by a five membered ring structure composed of three carbon atoms and two nitrogen atoms (Ahasan and Islam, 2007) (Fig. V).

Few pyrazole derivatives occur naturally, this may be due to the difficulty for living organisms to consider the N-N bond. The most important derivatives of pyrazole are in fact pyrazolones(Dabholkar and Gavande, 2003). Pyridazine is a heterocyclic organic compound with the molecular formula $(CH)_4N_2$. It contains a six-membered ring with two adjacent nitrogen atoms, and is aromatic. It is a colorless liquid with a boiling point of 208 °C. It is isomeric with two other $(CH)_4N_2$ rings, pyrimidine and pyrazine(Dabholkar and Gavande, 2003) (Fig. VI).

Pyridazine was synthesized from the reaction of 2-quinoline acid hydrazide with maleic anhydride, phthalic anhydride and chloro acetic acid, respectively in the