Present Work:

The present work involves the exploitation of the functionality of the sydnone ring in the synthesis of some heterocyclic systems, which are difficult or in some cases not accessible by routine methods. The important reactions used in the present work are 1,3-dipolar cycloaddition, Claisen-Schmidt reaction and cleavage of ethers. All the compounds have been characterised by elemental analysis and spectral data viz., IR, $^1$H-NMR, $^{13}$C-NMR and Mass. We have also carried out X-ray analysis of some compounds. The *in vitro* antimicrobial testing has also been carried out to study the structure-activity relationship (SAR).

Preparation of Starting Materials:

The 3-arylsydrones which are less toxic than the 3-alkyl sydrones have been used as starting materials for the present work. All the reactions have been carried out on 3-aryl- and 3-p-acetylphenylsydrones, which have been prepared by literature methods$^1$-$^5$. These sydrones have been prepared by obtaining the N-arylsubstituted glycines from the corresponding primary amines, followed by nitrosation and cyclisation with acetic anhydride.

\[
\begin{align*}
\text{R}_1 & \quad \text{N} & \quad \text{H} \\
\text{R}_2 & \\
\text{R}_1 & \quad \text{N} & \quad \text{H} \\
\text{R}_2 & \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \quad \text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{H} & \quad \text{H} \\
\text{R}_2 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{H} & \quad \text{H} \\
\text{R}_2 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{H} & \quad \text{H} \\
\text{R}_2 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{H} & \quad \text{H} \\
\text{R}_2 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\text{R}_1 & \quad \text{H} & \quad \text{H} \\
\text{R}_2 & \quad \text{O} & \quad \text{H} \\
\text{H}_3 & \quad \text{C} & \\
\text{NH}_2 & \\
\end{align*}
\]

The 3-[4-(1-oxo-3-aryl-prop-2-en-1-yl) phenyl] sydrones required for building the heterocycles were obtained form the 3-(p-acetyl)-phenylsydnone by Claisen-Schmidt reaction according to the procedure reported by our earlier workers$^5$. 

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Chapter I describes the synthesis of some 2-[4-{(5-Aryl)-4,5-dihydro-1H-pyrazole-3-yl]-phenyl-5,6-dihydro-2H-pyrazolo[3,4-d]pyridazine-4,7-diones and 1-[4-(2-Aryl-2,3-dihydro-benzo[b][1,4]thiazepin-4-yl)]-phenyl-5,6-dihydro-2H-pyrazolo[3,4-d]pyridazine-4,7-diones.

Chapter II: Preparation of some tetraheterocycles from sydnones.
Chapter III: Preparation of some bis hydrazones of 2-heteroaryl-1H-pyrazole-3,4-dicarbohydrazides.
Chapter IV: Synthesis of triazole, thiazole and thiothiazole derivatives of the DMAD cycloadducts of sydnones.

Chapter V describes the synthesis of pyrazoline and benzothiazepine derivatives of 1H-pyrazole-3-carbonitriles.
Chapter VI Reactions of 3-(4-Hydroxy-phenyl) -5-methyl-3H[1,3,4]-oxadiazol-2-one.
References:


