Summary

The original work contains three parts:

Part (I) :

Part (I) aimed to study the reactivity of β-1,1` -dioxadibenz-othien-4-oylacrylic acid (I) towards active methylene compounds under Michael reaction condition.

Compound (I) was reacted with active methylene compounds namely diethylmalonate, ethylacetoacetate and /or ethylcyanoacetate in presence of sodium methoxide yielding pyranone derivatives (IIa-c). Condensation of (IIa-c) with hydrazine hydrate in boiling ethanol afforded pyranopyridazinone (IIIa-c).

Also the reactions of compound (I) with acetylacetone and/or benzoylacetone in presence of sodium methoxide affordes cyclohexenone derivatives (IVa,b) which condensed with hydrazine hydrate in boiling ethanol to give phthalazinone derivatives (Va,b).

On the other hand the reaction of compound (I) with diethylmalonate, ethylacetoacetate and/or ethylcyanoacetate in presence of ammonium acetate affording the corresponding pyridones (VIa-c) which condensed with hydrazine hydrate in boiling ethanol to yield the corresponding pyridopyridazinone (VIIa-c).

Part (II) :

The second part has been directed to synthesize 4-benzylamino-6-(1`,1`-dioxadibenzothien-4`-yl)-2,3,4,5-tetrahydropyridazin-3-one

(IX) and study its reactivity towards different electrophilic and nucleophilic reagents .

Compound (IX) was allowed to react with ethylchloroacetate in presence of anhydrous K_2CO_3 to give the ester (X).

Alkaline hydrolysis of (X) gave the corresponding acid (XI) which has been cyclized using polyphosphoric acid to yield morphalinopyridazine derivative (XII). Also (IX) reacted with acrylonitrile under Michael reaction conditions to give pyridazinone derivative (XIII) .

The hydroxymethylation of (IX) with formaldehyde in presence of ethanol afforded the corresponding N-hydroxymethylpyridazinone (XIV) which fused with urea and yieldes the condensed compound (XV).

Mannich reactions of (IX) with piperidine and/or morpholine in presence of formaldehyde affords Mannich bases (XVIa,b).

The condensation of (IX) with aromatic aldehydes yieldes the corresponding pyridazinones (XVIIa,b).

Also the reaction of (IX) with phthalyl amino acids and/or tosyl amino acids afforded the corresponding pyridazine amino acid derivatives (XVIII a,b) and (XIX a,b) respectively.

Fusion of (IX) with benzylamine gave the corresponding pyridazine derivative (XX).

Treatment of (IX) with a mixture of $POCl_3/PCl_5$ afforded chloropyridazine (XXI) which has been utilized for the preparation of pyridazinethione (XXIII) by reaction with thiourea and hydrazino-

pyridazine (XXIV) by the action of hydrazine hydrate.

Hydrazinopyridazine (XXIV) was utilized as building block to synthesis some non condensed and condensed heterocycles bearing pyridazine nucleus as pyrazolylpyridazine derivatives (XXV) and (XXVI) (by reaction of (XXIV) with acetylacetone and ethylacetoacetate), triazolopyridazine (XXVII) (by reaction with glacial acetic acid or from reaction of chloropyridazine (XXI) with acetylhydrazine) and tetrazolopyridazine (XXVIII) (was obtained when (XXIV) was treated with sodium nitrite and acetic acid or when chloropyridazine (XXI) was treated with sodium azide).

Part (III)

In this part the reactions of 3-benzylamino-5-(1`,1`-dioxadibenzothien-4`-yl)furan-2-one (XXIX) with base catalysed and acid catalysed ring opening reactions were studied. Thus reaction of (XXIX) with hydrazines affording pyridazinones (XXXa,b). Also when compound (XXIX) was allowed to react with hydroxylamine hydrochloride in boiling pyridine afford oxazinone (XXX).

Reaction of (XXIX) with semicarbazide and/or thiosemi-carbazide gave (XXXIIa,b) which cyclized by acetic anhydride to yield oxadiazole and thiadiazole (XXXIIIa,b) respectively.

The reaction of (XXIX) with glycine in benzene gave the propanamide derivative (XXXIV) but in acetic acid and sodium acetate gave pyrrolinone derivative (XXXVI).

Cyclization of (XXXIV) by acetic anhydride afforded pyrazinedione derivative (XXXV) but condensation of (XXVI) with hydrazine hydrate yieldes pyrrolotriazinone (XXXVII).

Reaction of (XXIX) with antheranilic acid in presence of acetic acid and sodium acetate afforded benzoxazinone (XXXVIII). Compound (XXXVIII) fused with ammonium acetate to give quinazolinone derivative (XXXIX).

The aminolysis of (XXIX) with aromatic amines in presence of acetic acid and sodium acetate afforded pyrrolinone derivatives (XLa,b).

Also (XXIX) reacts with ammonium acetate in presence of xylene to give (XLI) which on treatment with $POCl_3/PCl_5$ gave chloropyrroline (XLII).

Chloropyrroline (XLII) was utilized to synthesis some condensed heterocylic compounds as pyrrolotriazole (XLIII) (by reaction of (XLII) with acetylhydrazine), pyrrolotetrazole (XLIV) (by reaction of(XLII) with sodium azide) and pyrrolotriazine (XLVI) (by reaction of(XLII) with ammonium thiocyante and phenyl isocyante).

Also F.C. reaction of (XXIX) with anhydrous aluminum chloride in presence of reactive aromatic substrate namely benzene, toluene and anisol gives butandione derivatives (XLVIIa-c).

The structure of all synthesized compounds were established by (i) elemental analysis (ii) spectral studies (IR, ^{1}H-NHR and mass spectra).

Also the antimicrobial activities of some synthesized compounds were investigated and it was found that some of these compounds have remarkable biological activities against some bacteria and some fungi.