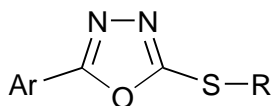


## Abstract

Two new series of heterocyclic compounds of azole were prepared:

1) 1,3,4-Oxadiazole series

2-alkylthio-5-aryl-1,3,4-oxadiazole (**I**)



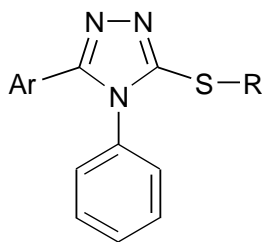
**I**

R = H, CH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>(CH<sub>2</sub>)<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>Ph, CH<sub>2</sub>CO<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>CO<sub>2</sub>H.

Ar = 2-hydroxybenzene, 5-bromofuryl.

2) 1,2,4-Triazole series

3-alkylthio-5-aryl-4-phenyl-1,2,4-triazole (**II**)



**II**

R = H, CH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>(CH<sub>2</sub>)<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>Ph, CH<sub>2</sub>CO<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>CO<sub>2</sub>H.

Ar = 2-hydroxybenzene, 5-bromofuryl.

The two series were identified by elemental analysis, UV-visible spectrophotometer, FT-IR spectrophotometer and <sup>1</sup>H-NMR spectrophotometer.

The biological activity, including antimicrobial activity, of these two series was examined against two bacterial strains, Gram negative (*E. coli*) and Gram positive (*S. aureus*), and pathogenic fungi *Aspergillus niger*. Preliminary antimicrobial assay was tested for all oxadiazoles and triazoles. The minimum inhibition concentration (MIC) was determined for all compounds against two bacterial strains.

The antibacterial results showed that the oxadiazole derivatives have higher activity than triazole derivatives, and the mercaptoester-oxadiazole

and –triazole have good activity as compared with other compounds and standard drugs. The antifungal results showed that some mercaptoester-oxadiazoles and –triazoles have higher activity than other compounds and than standard drug.

LD<sub>50</sub> values were determined for some selected compounds which have a good antimicrobial activity. These results showed that the selected compounds exhibited moderate toxic values and the LD<sub>50</sub> were in the range 1.84-3.5g/kg.

Table I Names and symbols of the oxadiazole compounds

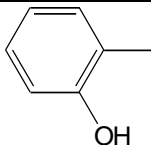
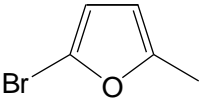
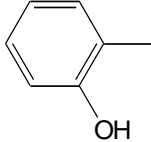
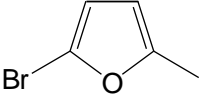
R	R <sub>1</sub>	Symbol	Name
	-H	SO	5-salicyl-1,3,4-oxadiazole-2-thiol
	-CH <sub>2</sub> -CH <sub>3</sub>	SO1	2-ethylthio-5-salicyl-1,3,4-oxadiazole
	-CH <sub>2</sub> -(CH <sub>2</sub> ) <sub>2</sub> -CH <sub>3</sub>	SO2	2-butylthio-5-salicyl-1,3,4-oxadiazole
	-CH <sub>2</sub> -Ph	SO3	2-benzylthio-5-salicyl-1,3,4-oxadiazole
	-CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>	SO4	2-ethoxycarbonylmethylthio-5-salicyl-1,3,4-oxadiazole
	-CH <sub>2</sub> CO <sub>2</sub> H	SO5	2-carboxymethylthio-5-salicyl-1,3,4-oxadiazole
	-H	BO	5-(5-bromofuryl)-1,3,4-oxadiazole-2-thiol
	-CH <sub>2</sub> -CH <sub>3</sub>	BO1	2-ethylthio-5-(5-bromofuryl)-1,3,4-oxadiazole
	-CH <sub>2</sub> -(CH <sub>2</sub> ) <sub>2</sub> -CH <sub>3</sub>	BO2	2-butylthio-5-(5-bromofuryl)-1,3,4-oxadiazole
	-CH <sub>2</sub> -Ph	BO3	2-benzylthio-5-(5-bromofuryl)-1,3,4-oxadiazole
	-CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>	BO4	2-ethoxycarbonylmethylthio-5-(5-bromofuryl)-1,3,4-oxadiazole
	-CH <sub>2</sub> CO <sub>2</sub> H	BO5	2-carboxymethylthio-5-(5-bromofuryl)-1,3,4-oxadiazole

Table II Names and symbols of the triazole compounds

R	R <sub>1</sub>	Symbol	Name
	-H	ST	5-salicyl-4-phenyl-1,2,4-triazole-3-thiol
	-CH <sub>2</sub> -CH <sub>3</sub>	ST1	3-ethylthio-5-salicyl-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> -(CH <sub>2</sub> ) <sub>2</sub> -CH <sub>3</sub>	ST2	3-butylthio-5-salicyl-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> -Ph	ST3	3-benzylthio-5-salicyl-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>	ST4	3-ethoxycarbonylmethylthio-5-salicyl-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> CO <sub>2</sub> H	ST5	3-carboxymethylthio-5-salicyl-4-phenyl-1,2,4-triazole
	-H	BT	5-(5-bromofuryl)-4-phenyl-1,2,4-triazole-3-thiol
	-CH <sub>2</sub> -CH <sub>3</sub>	BT1	3-ethylthio-5-(5-bromofuryl)-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> -(CH <sub>2</sub> ) <sub>2</sub> -CH <sub>3</sub>	BT2	3-butylthio-5-(5-bromofuryl)-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> -Ph	BT3	3-benzylthio-5-(5-bromofuryl)-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> CO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>	BT4	3-ethoxycarbonylmethylthio-5-(5-bromofuryl)-4-phenyl-1,2,4-triazole
	-CH <sub>2</sub> CO <sub>2</sub> H	BT5	3-carboxymethylthio-5-(5-bromofuryl)-4-phenyl-1,2,4-triazole