

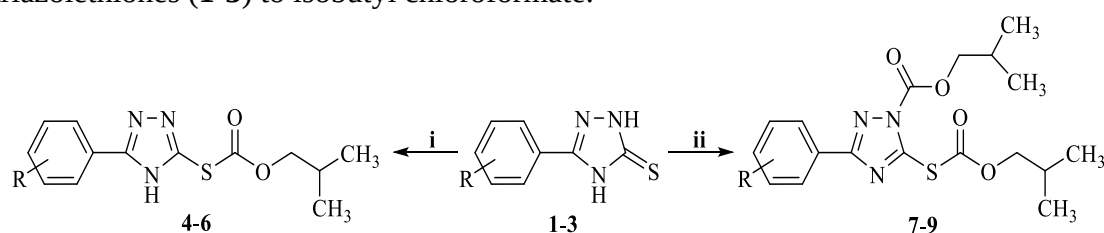
POSTER PRESENTATIONS

SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF S-ACYL AND S,N-BISACYL DERIVATIVES OF 5-ARYL-2,4-DIHYDRO-1,2,4-TRIAZOLE-3-THIONES

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To obtain novel derivatives of 5-aryl-2,4-dihydro-1,2,4-triazole-3-thiones (**1-3**) (aryl = 2-, 3-, or 4-hydroxyphenyl) with potential biological activity, their reactions with isobutyl chloroformate were investigated. The reactions were carried out under mild conditions (acetone, K₂CO₃, 56°C, 5 h) using two different molar ratios (1:1 and 1:2) of triazolethiones (**1-3**) to isobutyl chloroformate:



R=2-OH (**1, 4, 7**), 3-OH (**2, 5, 8**), 4-OH (**3, 6, 9**).

i= ClCOOCH₂CH(CH₃)₂; (CH₃)₂CO, K₂CO₃, 56°C, 5h.

ii= 2ClCOOCH₂CH(CH₃)₂; (CH₃)₂CO, K₂CO₃, 56°C, 5h.

Analysis of the products by IR, ¹H NMR, and ¹³C NMR spectroscopy demonstrated that, at a 1:1 molar ratio, the reaction proceeded regioselectively to afford exclusively the S-acyl derivatives, namely O-isobutyl S-(5-(2-, 3-, or 4-hydroxyphenyl)-4H-1,2,4-triazol-3-yl) carbonothioates (**4-6**), in 65–80% yields. In contrast, increasing the molar ratio to 1:2 resulted in simultaneous acylation of both the sulfur atom and the N² atom of the triazole ring, affording the corresponding S,N-bisacyl derivatives, namely isobutyl 3-(2-, 3-, or 4-hydroxyphenyl)-5-((isobutoxycarbonyl)thio)-1H-1,2,4-triazole-1-carboxylates (**7-9**), in yields of 70–91%.

The antimicrobial activity of compounds **4-9** was evaluated by *in vitro* screening against Gram-positive bacteria (*Staphylococcus aureus* and *Bacillus subtilis*), Gram-negative bacteria (*Pseudomonas aeruginosa* and *Escherichia coli*), and the fungi *Candida albicans*. The synthesized compounds exhibited noticeable antibacterial activity only against the Gram-positive strains, producing inhibition zones of 7–14 mm. In particular, the S,N-bisacyl derivatives (**7-9**) displayed significantly greater antibacterial activity (13–14 mm) than the corresponding S-acyl derivatives (**4-6**), which showed inhibition zones of only 7–8 mm.

A regioselective method for the synthesis of S-acyl and S,N-bisacyl derivatives of 5-aryl-1,2,4-triazole-3-thiones has been developed. The S,N-bisacyl derivatives showed enhanced antibacterial activity against Gram-positive bacteria.

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