



## DERIVATIVES OF 3-METHYL-5-(METHYLSULFANYL)-4H-1,2,4-TRIAZOL-4-AMINE WITH ANTIMICROBIAL AND ANTIOXIDANTIVES PROPERTIES

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Recently the chemistry of triazoles and their derivatives received considerable attention due interesting their synthesis and important biological activity. Triazole compounds of groups N,N- dimethyl eurydice in the literature are lacking. The literature investigation shows that derivatives 1,2,4-triazole presents a wide range of biological activities including antiproliferative, antibacterial, antituberculosis. We have aimed at the synthesis of 1,1-dimethyl-3-(3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl)thiourea and 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea research to determine the structure and biological properties.

The dependence of yield of 1,1-dimethyl-3- (3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl) thiourea and 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea was investigated in dependence of factors different. It was found that 4-amino-5-methyl-4H-1,2,4-triazole-3-thiol to tetramethylthiuram disulfide (TETD) heating at a molar ratio of 1:1.1 for eight hours at 100-105 °C leads to 1,1-dimethyl-3-(3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl)thiourea with a yield of 83%. 3-Methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-amine under similar conditions gave a yield of 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea only 57%. A great difference in yields a may be explained by the steric difficulties arising from 3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-amine in reaction with TETD, were the SH group is replaced by SCH<sub>3</sub>. When 1,1-dimethyl-3-(3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl)thiourea and 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea are treated with iodomethane expected the formation of S-methylisothiurea expected. Analisis of these reactions demonstrated that only 1,1-dimethyl-3-(3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl)thiourea was methylated to the SH group, and the group C=S thioureide 1,1-dimethyl-3-(3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl)thiourea and 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea remains unaffected, likely due to the steric factor. The structure of 1,1-dimethyl-3-(3-methyl-5-sulfanyl-4H-1,2,4-triazol-4-yl)thiourea and 1,1-dimethyl-3-[3-methyl-5-(methylsulphanyl-yl)-4H-1,2,4-triazol-4-yl]thiourea were confirmed by <sup>1</sup>H, <sup>13</sup>C-NMR and IR spectra.

Antibacterial and antioxidantive properties of the parent compound were investigated TETD pas the important antibacterial activity MIC 0.0007 mg/mL, 3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-amine showed results of MIC 0.06 mg/mL and 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea has the respectively MIC 0.007 mg/mL. The antioxidant activity of 1,1-dimethyl-3-[3-methyl-5-(methylsulfanyl)-4H-1,2,4-triazol-4-yl]thiourea is IC<sub>50</sub> = 29 μM like as Trolox with.

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