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Synthesis of 2-methoxy-6-(pyrazin-2-ylimino methyl) phenol and its antibacterial activitity

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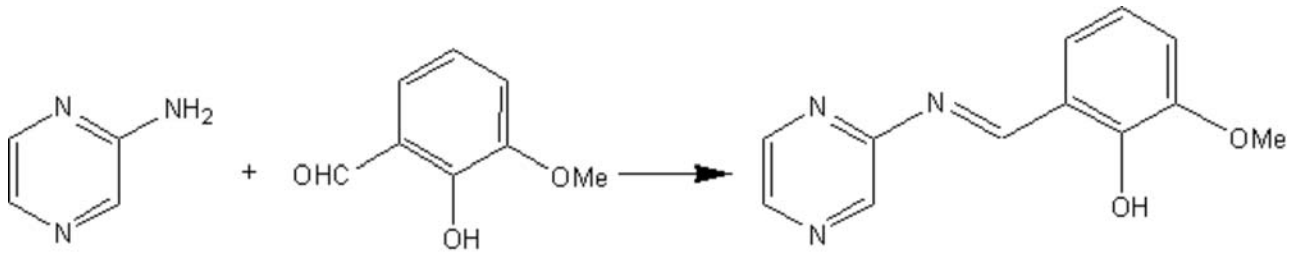
Pyrazines are found in such heated foods as bread, different meats, baked potatoes and coffee [1],which are formed from serine and thereonine [2]. Pyrazine compounds have shown antifungal [3], antimyco- bacterial [3-4] activities. Furthermore, pyrazine derivatives have been used as antioxidation compounds [3,5-6]. Schiff bases have been used as ligands in complex formation with some metal ions [7]. They have shown biological activities including antibacterial [8-10], antifungal [9-11], anticancer [12-13] and herbicidal [14] activities. On the other hand, Schiff bases have applied as starting materials in the synthesis of a large bioactive and industrial compounds via ring closure, cycloaddition, replacement reactions, etc [15]. In addition, the methoxy group on the molecule enhances the various biological activities [16]. According to above facts, we synthesized 2-methoxy-6-(pyrazin-2-ylimino methyl) phenol **3** and then it was tested against four microorganisms *Staphylococcus aureus* (Gram positive), *Bacillus subtilis* (Gram positive), *Kelebsiella pneumonia* (Gram negative) and *Pseudomonas aeruginosa* (Gram negative). Compound **3** was moderately active against *Kelebsiella pneumonia* at 200 μg and it was inactive against other mentioned bacteria.



A mixture of 2-amino pyrazine **1** (0.95 g, 10.00 mmol), o-vanillin (2-hydroxy-3-methoxy benzaldehyde) **2** (1.52 g, 10.00 mmol) and anhydrous sodium sulfate (3.00 g) in dry dichloromethane (40.00 mL) was stirred at room temperature for five hours. The suspension was filtered and washed with CH_2Cl_2.The solvent was evaporated under reduced pressure and imine **3** was formed as a red solid which was recrystalized from methanol (1.90 g , 83%).

m.p.132-134 ^{o}C.

IR (KBr) (cm^{-1}): 1575.73 (CH=N), 1610.45 (C=N ring), 3190.5 -3645.20 (OH).

^{1}H-NMR($CDCl_3$) (250 MHz) δ(ppm): 3.87 (3H, s, OCH_3), 6.81-7.20 (3H, m, aryl hydrogens), 8.3-8.6 (3H, m, pyrazin ring), 9.3 (1H, s, N=CH), 13.30 (1H, br, OH).

^{13}C- NMR ($CDCl_3$) (62.90 MHz) δ(ppm): 56.64 (OCH_3), 116.47-142.90 (aryl and pyrazine carbons), 167.30 (N=CH).

MS (m/z, %): 229 (M^+, 60.3), 150 ($HOPhOCH_3CH=N$, 22.0), 135 ($HOPhOCH_3C$, 18.0), 106 ($C_4N_2H_3$ N=C, 14.0), 79.0 ($C_4N_2H_3$, 44.4), 43 (C-OCH_3, 100.0), 41 (N=CH-N, 96.0).

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Sample Availability : Available from MDPI.