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Synthesis and *In Vitro* Anti-Bacterial Screening of *N*-Arylidene-5-Aryl-1,3,4-Thiadiazol-2-Amine Derivatives

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SUMMARY: Two series of *N*-arylidene-5-(4-hydroxyphenyl)-1,3,4-thiadiazol-2-amine derivatives **(3a-e)** and *N*-arylidene-5-(4-nitrophenyl)-1,3,4-thiadiazol-2-amine derivatives **(3f-j)** were synthesized and evaluated for *in vitro* antibacterial activity. The title compounds were synthesized by following steps of reaction; 2-arylidene-hydrazine carbothioamide **(1a-b)** derivatives were formed by the reaction of appropriate aromatic aldehyde and thiosemicarbazide. Compounds 5-aryl-2-aminothiadiazole **(2a-b)** were formed by the cyclization of compound (1a-b) in presence of bromine, acetic acid, and sodium acetate. Title compounds or Schiff's bases **(3a-e and 3f-j)** were prepared by the reaction of compounds **(2a-2b)** with appropriate aromatic aldehydes. Structures of synthesized compounds were elucidated by IR, 1HNMR, and Mass spectral measurements. All the compounds showed significant activity against *Staphylococcus aureus, Escherichia coli,* **and** *Mycobacterium tuberculosis*.

RESUMEN: Dos series de derivados de N-ariliden-5-(4-hidroxifenil)-1,3,4-tiadiazol-2-amina (**3a-e**) y *N*-ariliden-5-(4-nitrofenil)-1,3 Se sintetizaron derivados de ,4-tiadiazol-2-amina (**3f-j**) y se evaluó su actividad antibacteriana *in vitro*. Los compuestos del título se sintetizaron siguiendo los siguientes pasos de reacción; Los derivados de carbotioamida (**1a-b**) de 2-ariliden-hidrazina se formaron mediante la reacción del aldehído aromático apropiado y la tiosemicarbazida. Los compuestos 5-aril-2-aminotiadiazol (**2a-b**) se formaron mediante la ciclación del compuesto (**1a-b**) en presencia de bromo, ácido acético y acetato de sodio. Los compuestos del título o bases de Schiff (**3a-e** y **3f-j**) se prepararon mediante la reacción de los compuestos (**2a-2b**) con aldehídos aromáticos apropiados. Las estructuras de los compuestos sintetizados se dilucidaron mediante mediciones espectrales de masas, IR y 1HNMR. Todos los compuestos mostraron actividad significativa contra *Staphylococcus aureus*, *Escherichia coli* y *Mycobacterium tuberculosis*.

KEY WORDS: antibacterial, antimycobacterial, Schiff's bases, thiadiazole derivatives.

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