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Synthesis, *in silico* toxicity prediction, and *in vitro* antibacterial activity of new 4-amino-*N*-arylbenzenesulfonamide derivatives

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ABSTRACT A significant class of compounds with a variety of biological applications is sulfonamides. The present work deals with the synthesis of 4-amino-*N*-arylbenzenesulfonamide derivatives (**1-8**) by the reaction of acetanilide-4-sulfonyl chloride and 4-substituted arylamine followed by hydrolysis to deprotect the acetyl group and give free amino group. Using disc diffusion, the synthesized derivatives were tested for *in vitro* antibacterial activities against *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Ampicillin was used as a reference standard drug. Prediction of chemical toxicity was determined by ProTox-II, all compounds exhibited inactive organ toxicity model report. The ProTox-II application was used for endpoint LD_{50} (1200–5000 mg/kg), and toxicity classes (class 4–5) were reported. The results of this study revealed that some sulfonamide derivatives have good antibacterial activity and the remaining compounds showed low inhibition activity based on the substitutions on the aromatic ring. Antibacterial activity indicated that the electron-withdrawing group substituted phenyl ring sulfonamide derivatives (**6-8**) are more active than the remaining compounds.

KEYWORDS Sulfonamides, Chlorosulfonic acid, Acetanilide-4-sufonyl chloride, Antibacterial activity.

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