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Design, synthesis, and *in vitro* antimicrobial activity of novel isoxazolo [2,3-*a*]pyrimido[4,5-*d*]pyrimidin-4-yl-1*H*-pyrazolo-[3,4-*b*]pyridines

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A new series of hybrid compounds, *viz.*, isoxazolo[2,3-*a*]pyrimido[4,5-*d*]pyrimidin-4-yl-1*H*-pyrazolo[3,4-*b*]pyridines **5** have been efficiently synthesized by reaction of 5-amino-2-methyl-7aryl-7*H*-isoxazolo[2,3-*a*]pyrimidin-6-carbonitriles **1** with triethyl orthoformate followed by treatment with excess of hydrazine hydrate, which have undergone Dimroth rearrangement to afford the key intermediate 4-hydrazinyl-8-methyl-5-aryl-5*H*-isoxazolo[2,3-*a*]pyrimidin[4,5-*d*]pyrimidines **3**. The reaction of **3** with benzoylacetonitrile affords the compounds **4**, which upon treatment with aromatic aldehydes and benzoyl acetonitrile in presence of $FeCl_3$ and basic Al_2O_3 produce the title compounds **5** by a three-component one-pot reaction. The structures of newly synthesized compounds **2-5** have been established on the basis of spectral and analytical data, and the title compounds have been evaluated for their *in vitro* antimicrobial activity.

Keywords: Isoxazolo[2,3-*a*]pyrimido[4,5-*d*]pyrimidin-4-yl-1*H*-pyrazolo[3,4-*b*]pyridines, Dimroth rearrangement, One-pot synthesis, Antimicrobial activity