Synthesis of Some New Chiral Tricyclic and Macrocyclic Pyridine Derivatives as Antimicrobial Agents

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A series of chiral macrocyclic pyridines has been prepared starting from N^2,N^2-(pyridine-2,6-dicarbonyl)diamino acid hydrazides **(2a-c)** and N,N-bis-(1-carboxy-2-substituted)-2,6-diaminocarbonyl)pyridines **(3a,b)**. The coupling of **(2a-c)** with 2,6-pyridine dicarbonyldichloride **(4)** gave the compounds **(5a-c).** Compounds **2a-c** were coupled with 2,6-diacetylpyridine **(6)** to yield compounds **(7a-c)** and with heterocyclic aldehydes **(8)** or **(10)** to give the compounds (**9a-c**) or (**11a-c**). In addition, the hydrazides **(2a-c)** were reacted with diformylcalix[4]arene **12** to afford the macrocyclic calix[4]arene hydrazone derivatives **(13a-c)** in reasonable yields. Finally, reaction of diaminocalix-[4]arene derivatives **(14a,b)** with hydrazides **2a,b** or acids **(3a,b),** using azide or mixed anhydride methods afforded macrocyclic calix[4]arene derivatives **15a,b** and **16a,b**, respectively. The structure assignments of the new compounds are based on chemical and spectroscopic evidence. The biological activity screening tests showed that many of the obtained compounds exhibit high antimicrobial activity comparable to ampicillin and chloramphenicol which are used as reference compounds

Key words: Pyridine-2,6-dicarboxamides, Chiral Tricyclic Pyridine, Amino Acids, Macrocyclic Calix[4]arene, Antimicrobial Agents