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NOTE

Biocidal Activities of Some 2-Amino Biphenyl Derived Amides

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Several 2-amino biphenyl derived amides have been found active against various microogranisms. 2-Amino biphenyl itself active against various infectious and dreadful microorganisms. Biologically active 2-amino biphenyl derived amides have been obtained from the condensation of 2-amino biphenyl and different acid chlorides.

Key Words: Synthesis, 2-Aminobiphenyl, Biochemical, Biocidal, Pathogens, Fungicides, Microorganisms.

In recent years, biphenyl and its analogues have been well executed in different areas including the synthesis of many biologically active molecules. Some derivatives of dimethyl ester of diphenic acid showed anti HIV activity[1]. Substituted biphenyl dicarboxylic acids exhibited anti-inflammatory activity and have been employed in the diagnosis of Alzheimer's disease[1]. Many biphenyl dicarboxylic acid amides have been reported to possess antimicrobial[2] and anticoagulant[3] activities. The amino biphenyl derived compounds have shown antifungal, antibiotic, insecticidal and anti-HIV activities. 2-Amino biphenyl compounds have also been reported as the starting material for the preparation of HIV-inhibitor[4] and in the synthesis of many insecticidal agents[5]. The synthesis of new azo Schiffs bases as potential bacteriostats has been described in the literature[6].

The esters of biphenyl acetic acid showed analgesic, antipyretic and anti-inflammatory activities in humans[7]. Biphenyl-4-acetamide hydroxamates have also been reported to show anti-inflammatory activity[8]. The ointment and various types of patches containing biphenyl-4-acetic acid work very effectively as anti-inflammatory and as analgesic agents[9].

Evaluation of anibacterial activity[10-16]

All the synthesized compounds (in ethanol) have been screened *in vitro* against the four bacteria *viz.*, *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus* and *Bacillus subtilis* using streptomycin as a standard.

In the present work, the medium employed had the following composition: meat extract (100 mL), perpone (1.0 g), sodium chloride (0.5 g) distilled water (1000 mL), agar powder (2 g) and Nutrient broth (100 mL). The antibacterial activity of various compounds tested has been given in the Table-1.

TABLE-1
ANTIBACTERIAL ACTIVITIES OF THE BIPHENYL COMPOUNDS

Compounds	*E. coli*		*P. aeruginosa*		*S. aureus*		*B. subtilis*	
	μg/ mL							
	25	50	25	50	25	50	25	50
N-[1,1´-biphenyl-2-yl]butryramide	+	+	–	–	–	–	–	–
N-[1,1´-biphenyl-2-yl]-*m*-toluamide	+++	++++	–	–	+++	++++	++	+++
N-[1,1´-biphenyl-2-yl]-*p*-toluamide	–	–	–	–	–	–	+	++
N-[1,1´-biphenyl-2-yl]cinnamide	++	+++	+	++	++	+++	++	+++
N-[1,1´-biphenyl-2-yl]-4-nitrobenzamide	+	++	+	++	–	–	–	–
N-[1,1´-biphenyl-2-yl]-3,5-dinitrobenzamide	+++	++++	+	++	–	–	+++	++++

Zone of inhibition: + = 1-3 mm, ++ = 3-6 mm, +++ = 6-8 mm, ++++ = 8-10 mm,
– = non measurable activity

Evaluation of Antifungal Activity

All the synthesized compounds (in ethanol) were also screened for their antifungal activity *in vitro* against the selected fungi *viz.*, *Aspergillus niger, Aspergillus flavus, Candida albicans* and *Trichoderma viride* using griseofulvin as a standard:

Sabourauds dextrose agar medium was used for antifungal screening which consists of dextrose (20.0 g), patato (200 g), agar (20 g) distilled water (1000 mL) and streptomycin (0.02 g). Streptomycin was used to check the growh of undesirable bacteria.

The spore suspension of each test organism (72 h culture) was kept in a broth at 35-40ºC. These petridishes were incubated at 30ºC for 48 h. The zones of inhibition was considered as an indication for the antifungal activity. The antifungal activity of the derived amides are given in Table-2.

TABLE-2
ANTI-FUNGAL ACTIVITIES OF THE BIPHENYL COMPOUNDS

Compounds	*A. niger*		*A. flavus*		*C. albicans*		*T. viride*	
	μg/mL							
	25	50	25	50	25	50	25	50
N-[1,1´-biphenyl-2-yl]butyramide	–	–	+	+	–	–	+	++
N-[1,1´-biphenyl-2-yl]-*m*-toluamide	+++	++++	++	+++	+++	++++	++	+++
N-[1,1´-biphenyl-2-yl]-*p*-toluamide	–	–	+	++	–	–	+	++
N-[1,1´-biphenyl-2-yl]cinnamide	–	–	–	–	+	++	–	–
N-[1,1´-biphenyl-2-yl]-4-nitrobenzamide	+	++	–	–	+	++	–	–
N-[1,1´-biphenyl-2-yl]-3,5-dinitrobenzamide	+++	++++	+	++	++	+++	+++	++++

Zone of inhibition: + = 10-20 mm, ++ = 20-35 mm, +++ = 35-60 mm, ++++ = 60-80 mm, – = non measurable activity.

Table 1 and 2 shows that all the compounds derived from 2-amino Biphenyl are found active against the bacterial and fungal organisms.

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