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**RESEARCH ARTICLE**

# SYNTHETIC AND BIOLOGICAL STUDY OF SOME N, N DISUBSTITUTED CINNAMAMIDES

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**ABSTRACT**

Cinnamamides has a great era of its applications in medicinal as well as pharmaceutical fields. Several cinnamamides were isolated from plants and many of them are prepared in laboratory by different routes. In the present study different cinnamamides were synthesized by convenient witting reaction pathway. And resulting products were screened for possible antimicrobial activities.

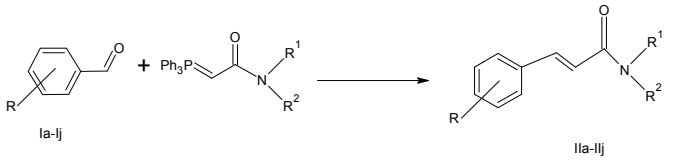


## INTRODUCTION

Several cinnamamides were reported to shows variety of applications in different fields, some of them are used as a precursor in different organic synthesis and many derivatives are used in the formulations of variety medicines and pharmaceuticals. This literature survey encourages the author to undertake the present research work.

**General procedure for synthesis of cinnamamides:**

Aldehyde (Ia–Ij, 25 mmol) and witting reagent (2.86 g, 25mmol) were taken in a 100 ml beaker containing benzene (10 ml). Reaction mixture was stirred for few minutes now poured the contents to the R.B. flask and attached to the condenser and reflux the reaction mixture till the completion of reaction. Progress of reaction was monitored by thin layer chromatography. After completion of reaction, the products (IIa-IIj) were separated by column chromatography.




R= H, -$NO_2$,-Cl,-OH, -OMe, -$N(Me)_2$,-$NH_2$,-F,-$(OMe)_2$ etc.
$R^1$ & $R^2$= $CH_3$

**List of Compounds Prepared:**

1. (2*E*)-*N*,*N*-dimethyl-3-phenylprop-2-enamide,**(IIa):**
2. (2*E*)-*N*,*N*-dimethyl-3-(4-nitrophenyl)prop-2-enamide,**(IIb):**
3. (2*E*)-3-(4-chlorophenyl)-*N*,*N*-dimethylprop-2-enamide,**(IIc):**
4. (2*E*)-*N*,*N*-dimethyl-3-(4-hydroxyphenyl)prop-2-enamide,**(IId):**
5. (2*E*)-*N*,*N*-dimethyl-3-(4-methoxyphenyl)prop-2-enamide,**(IIe):**
6. (2*E*)-3-[4-(dimethylamino)phenyl]-*N*,*N*-dimethylprop-2-enamide,**(IIf):**
7. (2*E*)-3-(4-aminophenyl)-*N*,*N*-dimethylprop-2-enamide,**(IIg):**
8. (2*E*)-*N*,*N*-dimethyl-3-(4-fluorophenyl)prop-2-enamide,**(IIh):**
9. (2*E*)-3-(3,4-dimethoxyphenyl)-*N*,*N*-dimethylprop-2-enamide,**(IIi):**
10. (2*E*)-3-(1,3-benzodioxol-5-yl)-*N*,*N*-dimethylprop-2-enamide,**(IIj):**

**Spectral study of some compounds:**

**(2*E*)-*N*,*N*-dimethyl-3-phenylprop-2-enamide,(IIa):** IR ($cm^{-1}$): 1656, 1595, $^1$H NMR ($CDCl_3$400MHz) (δppm): 3.18(S), (6H),$NMe_2$,6.44(d)(1H)(CH=CHCO)J=15.95Hz,7.2&7.5(m)(5 H)(C6H5),7.6(d)(1H)(CH=CHC6H5), J=15.95 Hz

**(2*E*)-*N*,*N*-dimethyl-3-(4-methoxyphenyl)prop-2-enamide, (IIe):** IR ($cm^{-1}$) :1685, 1600 $^1$H NMR ($CDCl_3$ 400MHz)(δppm): 3.26 (s)(6H)$NMe_2$,3.9(s) (3H)OMe,7.69(d) (1H) (CH=CHC6H5), J=15.59 Hz,7.47(d)(2H) (CH=CH-Ar),J=8.80 Hz,6.84(d)(2H)(CH=CH- Ar),J=8.80 Hz,6.42 (d), (1H), (CH=CHCO), J=15.59 Hz

**(2*E*)-3-(1,3-benzodioxol-5-yl)-*N*,*N*-dimethylprop-2-enamide,(IIj):** IR ($cm^{-1}$):1678, 1646 $^1$H NMR ($CDCl_3$ 400MHz)(δppm):3.15 (s) (6H)$NMe_2$, 6.03 (s)(2H)(-OCH2O-),6.75-7.15 (m)(3H)(Ar-H),6.98(d)(1H)(Arch=CH), J=15.6Hz, 7.7(d)(1H)(CH=CHCO),J=15.6Hz

**Biological activity**

Synthesized compounds were screened in vitro for their antimicrobial activity. Samples were prepare in a 1 mg/mL$^{-1}$ solution of DMF (Dimethyl formamide) and tested against four strains of bacteria E-coli (ATCC 25922), Pseudomonas aeruginosa (ATCC 27853), Staphylococcus aureus (ATCC 25923) and Staphylococcus albus. The bacteria were maintained on nutrient agar, DMF showed no inhibition zone. The agar media was inoculated with different microorganism's culture and tested after 24 hours of incubation at 30$^0$c, finally the zone of inhibition was measured in mm.

Antimicrobial Activity: (Gentamycin was used as reference)

| *Sample* | *Zone of Inhibition (mm)* | | | |
|---|---|---|---|---|
| | *Escherichia coli* | *Pseudomonas aeruginosa* | *Staphylococcus aureus* | *Staphylococcus albus* |
| IIa | 02 | 08 | No Zone | No Zone |
| IIb | 24 | 16 | 12 | 18 |
| IIc | 02 | No Zone | 08 | No Zone |
| IId | 04 | 05 | 14 | 06 |
| IIe | 08 | 10 | 07 | 10 |
| IIf | 16 | 04 | 10 | 08 |
| IIg | 10 | 12 | 05 | 14 |
| IIh | 18 | 06 | 12 | 13 |
| IIi | No Zone | 08 | No Zone | 04 |
| IIj | No Zone | 04 | 07 | No Zone |

Antifungal Activity: (Amphotericin B was used as reference)

| *Sample* | IIa | IIb | IIc | IId | IIe | IIf | IIg | IIh | IIi | IIj |
|---|---|---|---|---|---|---|---|---|---|---|
| *Candida Albicans* | 18 | 04 | 12 | 14 | No Zone | 26 | 10 | 18 | No Zone | No Zone |

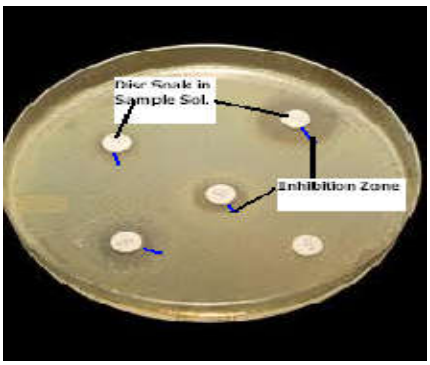



Fig.1

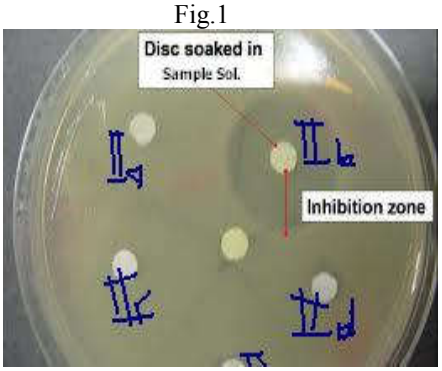



Fig.2.

## RESULT AND DISCUSSION

All compounds except IIa, IIc, IIi and IIj were found to shows excellent biological activities against selected bacteria. Therefore the synthesized compounds are biologically active molecules and may be used for important applications in medicinal and pharmaceuticals.

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