

Section C

Antimicrobial activities of the isolated compounds from *C. bonplandianum* Bail

1. Antifungal activity of the isolated compounds

All the compounds (1, 2 and 3) isolated from the ethyl acetate soluble fraction were tested for their antifungal activity by the disc diffusion method (Table 3) against the microorganisms which are very much native to North Bengal,²¹ India; viz. *Calletotricheme camellie* (CC), *Fussarium equisetae* (FE), *Alterneria alternate* (AA), *Curvularia eragrostidies* (CE) and *Colletrichum Gleosproides* (CG). These fungal pathogens are responsible to cause wilt disease to tomatoes, pine apple *etc.* cultivated traditionally in this region. The MIC values including that of reference sample Bavistin are tabulated in table 1. The MIC values of Bavistin against these fungal pathogens were also determined. A comparison of antifungal activities of compound 1, 2 and 3 to that of Bavistin showed that although they are less active compare to Bavistin, but all of them exhibited moderately good activity against all the fungal pathogens tested.

Suitable fungal strains were procured from the microbiology laboratory of our institute. DMSO (dimethyl sulfoxide) was used as solvent to prepare different concentrations of the triterpenoid. Solvent control (DMSO) was also maintained throughout the experiment. All experiments were performed in petridishes and were incubated at 37 °C for 48 hour. Culture media for fungal pathogens were prepared by mixing in suitable proportions of potato extract, dextrose and agar powder. All glass apparatus, culture media were autoclaved before use. The whole process was carried out in inoculation chamber.

Table 3 MIC of Compound 1 against different fungi

Compound	MIC of 1 in µg/mL against different fungi				
	CC	CG	AA	FE	CE
1	10	<15	10	<10	15
2	<10	20	10	<10	10
3	15	<10	10	<15	<15
Bavistin	2.5	1.25	2.5	2.5	<2.5

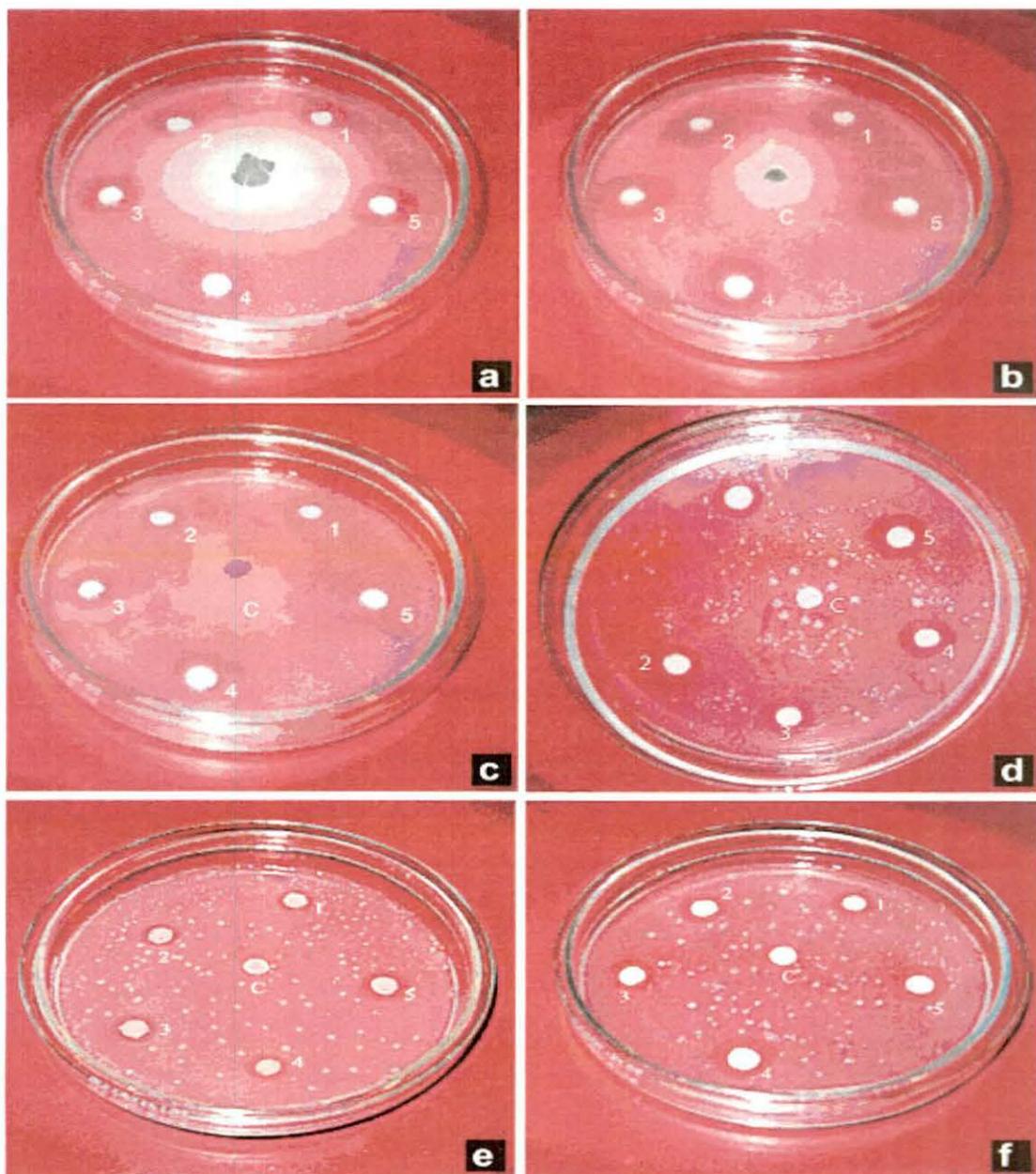


Figure 24 Representative Petri dishes of the antifungal activities, (c) for compound **1** against *Calletotricheme camellia*, (d) for compound **1** against *Fussarium equisetae*, (e) for compound **1** against *Alterneria alternate* and (f) for compound **1** against *Curvularia eragrostidies*.

To determine the antifungal efficiency of the isolated compounds the MIC values were compared to that of bavistin, an important antifungal drug molecule. Although the determined MIC values of bavistin against all the tested organisms were better than the isolated compounds, still the isolated compounds were promising as all of them showed good MIC values against all the tested organisms.

2. Antibacterial activity of the isolated compounds

All the isolated compounds were tested for their antifungal activity against a series of bacterial pathogens namely *Bacillus subtilis*, *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Enterobactor sp.*, *S.dysenteriae*, *Aspergillus niger*, *Penicillium chrysogenum*. MIC values of different compounds are tabulated in table 4. The isolated compounds showed good antibacterial activities. The determined MIC values were compared with that for streptomycin.

Table 4 MICs in $\mu\text{g/mL}$ against different strains of bacteria

Compounds	EC	BS	SA	PA	CA	SD	EN	PC	AN
1	100>	200	100	75	75	100	75	100	75
2	100>	50	75	50	100	100	100	75	50
3	100	75	50	75	50	75	75	100	50
Streptomycin	8	5	8	8	8	8	5	8	8

BS-*Bacillus subtilis*, EC-*Escherichia coli*, SA-*Staphylococcus aureus*, PA-*Pseudomonas aeruginosa*, EN-*Enterobactor sp.*, SD-*S.dysenteriae*, AN-*Aspergillus niger*, PC-*Penicillium chrysogenum*, MIC - Minimum inhibitory concentratio

3. Conclusion

A new triterpenoid of ursane skeleton has been isolated from the root of *C. bonplandianum* and characterized as 3 β -hydroxy-urs-12,15-dien (1) along with two known triterpenic acids, oleanolic acid (2) and ursolic acid (3). β -sitosterol (4) was also obtained as the most polar fraction of the ethylacetate phase. Antifungal and antibacterial

potentiality of compound **1** was also detected against five different fungal pathogens. A plausible biosynthetic pathway was also suggested.