

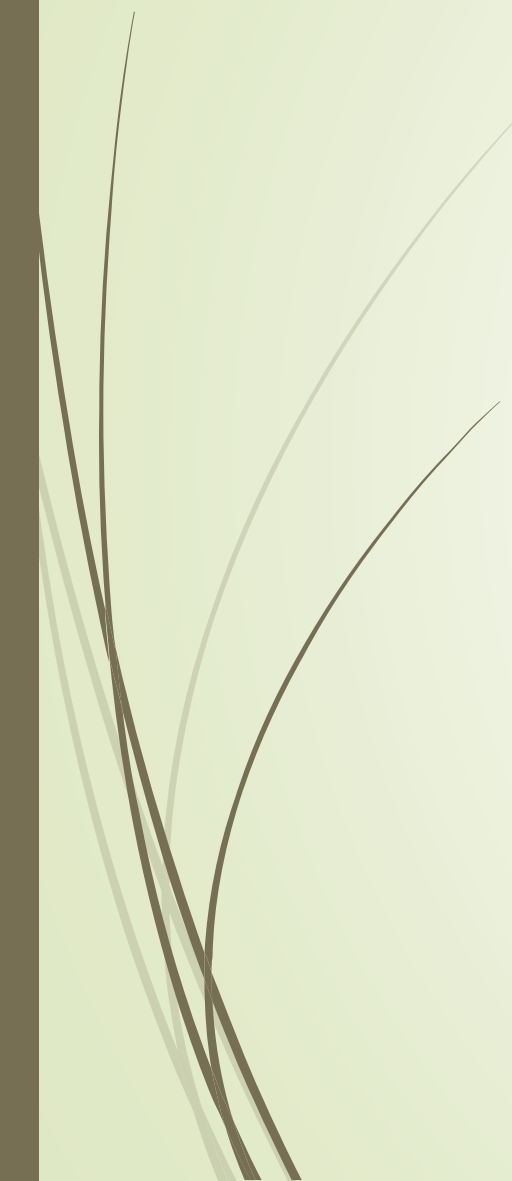
# Antimicrobial Activity of New Propolis Extract: A Comparison



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# Background

- Different color, varied composition





Its color changes from green to dark Brown.



➤ **Why bees collect propolis ?**

- ❖ Constant humidity
- ❖ Defense purposes
- ❖ **In order to cover carcasses of intruders**
- ❖ **Sterilization of combs of brood area**

➤ **Why we are using propolis ?**

Either for prevention or for curing certain diseases

It should be administered to correctly

That is why the administration route and the vehicle should be safe and not be hazardous



➤ What kind of vehicle do we have now

- ✓ Tinctures
- ✓ Extracts
- ✓ Powder forms






## Why we need diverse vehicles ??

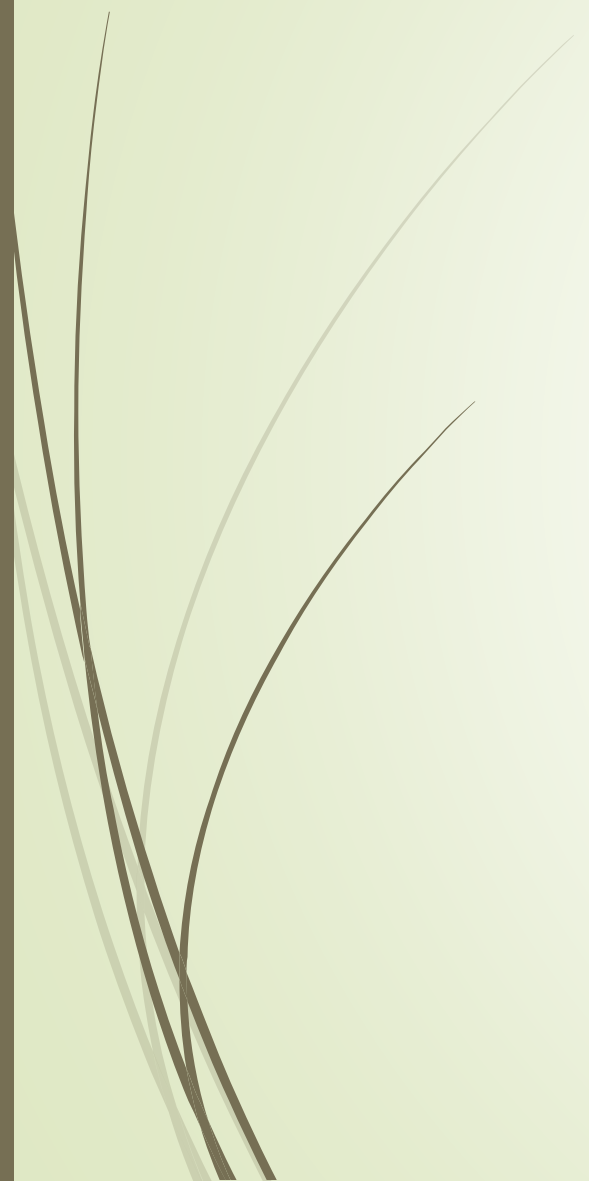
- Most often, it is stated that there is a correlation between phenolic composition and biological activity of propolis extracts.
- That is why extraction of propolis active compounds is a hot topic
- Ethanol is reported to be the best solvent for propolis extraction
- It is also a limiting factor for propolis usage
- Since it is a cancerous solvent, not suitable to put into food formulations etc..



# What could be used instead of Ethanol?



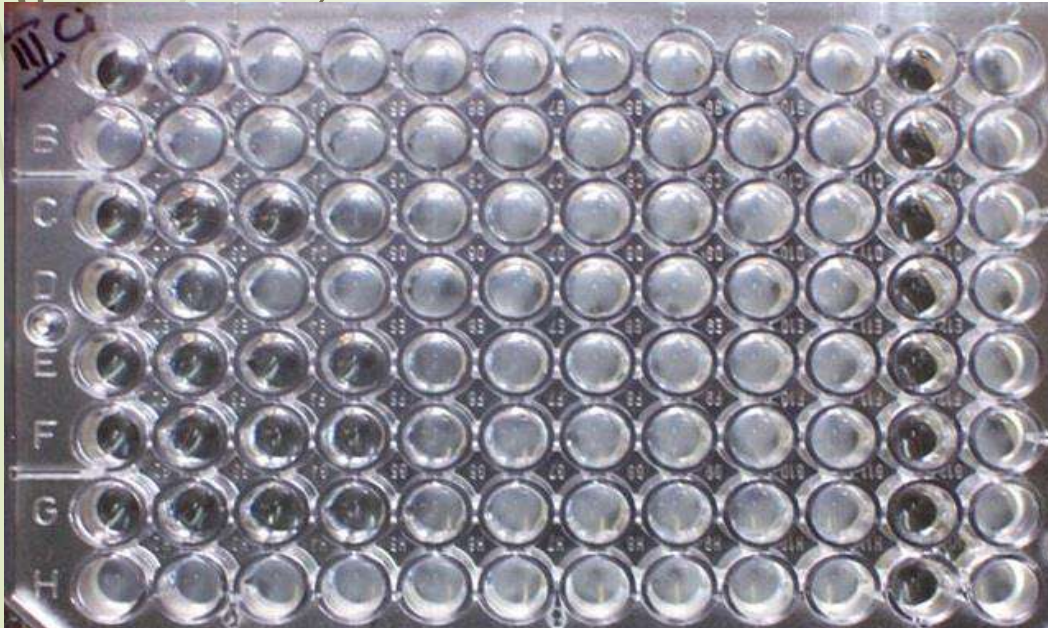
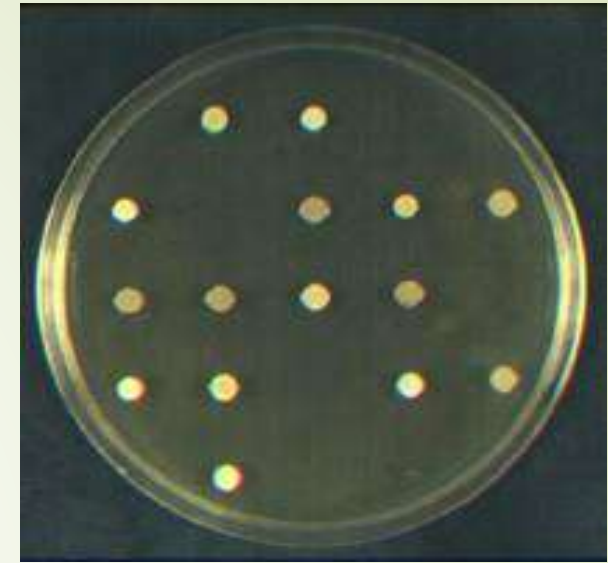
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- We have written 2 papers about propolis extraction by using volatiles
  - One of them has been accepted by Indian J of Chemical Technology
  - The other is still under consideration by



	<u>Volatile Oils</u>	<u>Ethanol</u>
➤ <b>Volatiles</b>	High	Trace
➤ <b>Fatty Alcohols</b>	High	Trace
➤ <b>Free Fatty Acids</b>	High	Trace
➤ <b>Phenolic Acids</b>	High	More than in oils
➤ <b>Flavonoids</b>	High	More than in oils
➤ <b>Sugar Derivatives</b>	High	Trace

# Method

- MIC value of the tested samples was determined
- Agar well dilution
- Broth-dilution



Propolis Sample	Gram Negative Bacteria			Gram positive Bacteria			No Gram	Yeast Like Fungi		
	Ec	Yp	Pa	Sa	Ef	Bc	Ma	Ca	Ct	Sc
Pm	1875	-	-	7.3	7500	>3.7	14.7	468.75	234.4	117.2
PmPE	-	-	-	>3.7	7500	>3.7	>3.7	468.75	234.4	468.75
Rm	7500	1875	-	29.3	937.5	>3.7	7.3	234.4	468.75	234.4
RmPE	-	-	-	>3.7	>3.7	>3.7	>3.7	58.6	58.6	58.6
Lp	-	-	-	1875	7500	1875	>3.7	937.5	937.5	234.4
LpPE	-	-	-	58.6	58.6	58.6	>3.7	937.5	234.4	234.4
Ty	>3.7	>3.7	3750	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7
TyPE	>3.7	>3.7	7500	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7
Cl	1875	937.5	7500	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7
CIPE	1875	3750	7500	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7	>3.7
EtOH	-	-	7500	14.7	117.2	117.2	>3.7	117.2	117.2	117.2
Amp	10	18	>128	35	10	15				
Str							4			
Flu								<8	<8	<8

**Ec:** *Escherichia coli*, **Yp:** *Yersinia pseudotuberculosis*, **Pa:** *Pseudomonas aeruginosa*, **Sa:** *Staphylococcus aureus*, **Ef:** *Enterococcus faecalis*, **Bc:** *Bacillus cereus*, **Ma:** *Mycobacterium smegmatis*, **Ca:** *Candida albicans*, **Ct:** *Candida tropicalis*, **Sc:** *Saccharomyces cerevisiae*  
**Amp:** Ampicillin; **Str:** Streptomycin; **Flu:** Fluconazole; –:No activity



## Conclusion

- Ethanol is still the best solvent in terms of extracting the phenolics
- But volatile oil extracts are mech better antimicrobial agent
- They could be a platform for putting propolis into food or feed formulations
- Because they are already there
- They also could be a platform for preparing different apitherapeutic products.