In vitro bioguided trials on *Cinnamomum zeylanicum* percolate as target antimicrobial agent

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Abstract: C*innamomum zeylanicum* gender, a wildly used plant as spice and medicinal plant, is investigated in both chemical and biological fields, since development of bio-guided trials on medicinal plants therapeutic target has increased recent years through pharmacology which is interested in discovering new molecules expressing a therapeutic activity and development of useful drugs by selecting the most active fraction and isolating the active compound responsible of the therapeutically effect.
Therefore, identification and quantification analysis of main bioactive compounds were performed in order to undergo bio-guided tests using several solvents' polarities to evaluate its *in vitro* antimicrobial potential. To achieve this objective, qualitative and quantitative methods were used to identify bioactive compounds of the obtained extracts. The *in vitro screening of* antimicrobial effect was evaluated on 10 bacteria and 2 funguses by disc diffusion method which gave almost very interesting results for all tested pathogens in addition to richness in secondary metabolites.
Keywords: Medicinal plants; bioactive compounds; bioguide assays; antibacterial activity.

Results and Discussion

Cinnamomum

Used in ancient Egypt and China then Europe.

Origin
Sri Lanka and India

<u>Classification:</u>
Family: *Lauraceae*.
Gender: *Cinnamomum*.
Name: *Cinnamomum zeylanicum*.

Phytochemistry

Leaves

- Phenols
- Esters
- Sesquterpenes
- Phenols Alcool

Aromatic aldehydes

- Dioxydes
- Cetones

Bark

- Aromatic aldehydes

Phenols

- Alcools monoterpens
- Sesquiterpens
- Acids
- Pyranocoumarins
- Cetones
- Furanocoumarins

liquide-liquide Extraction

Methanol extract

Water

Aqueous phase

Ethyl acetat confrontation

Chloroforme confrontation

n-butanol confrontation

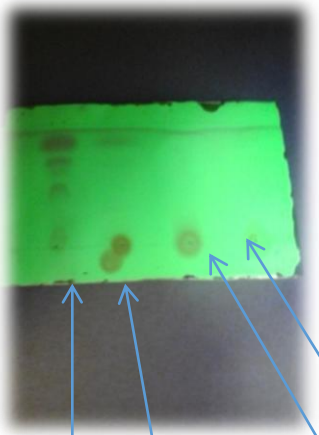
Yield= 0,40%

Yield 0,33%

Yield = 2,46%

Aqueous phase

Organic Phase



Chloroforme extract

Ethyl acetate

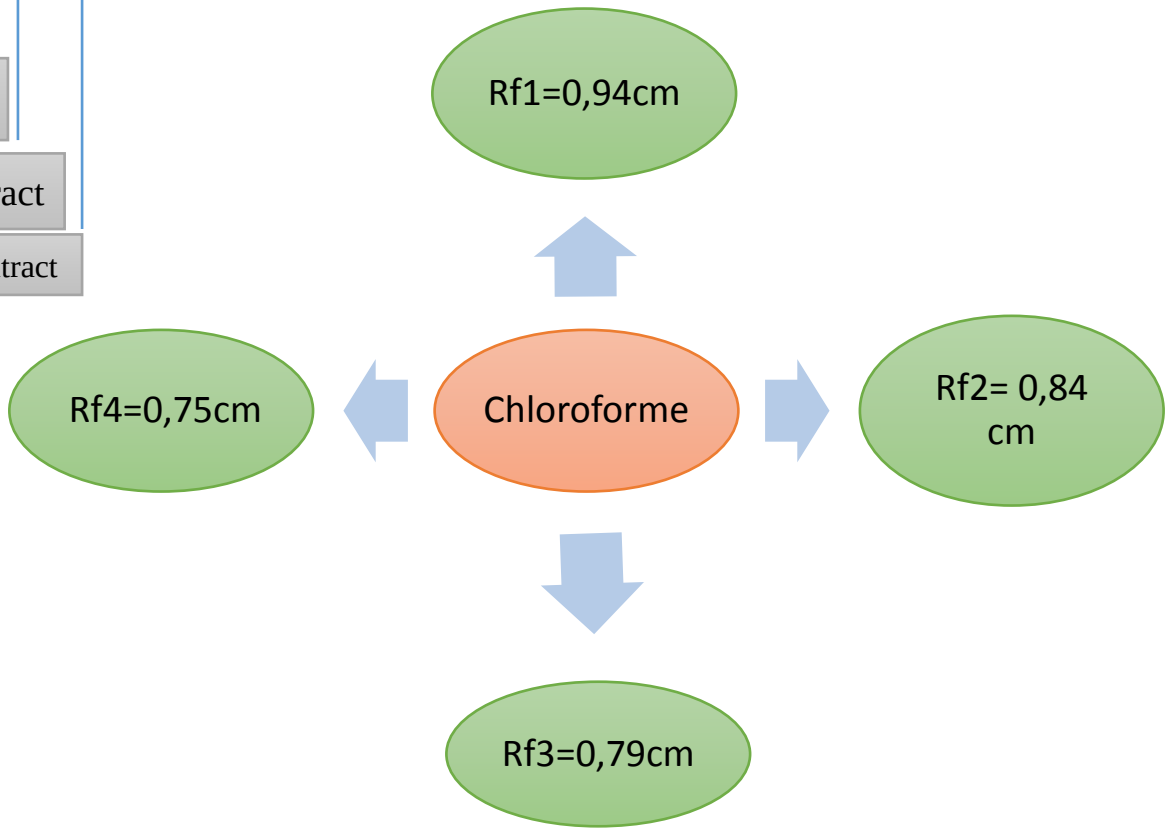
n,butanol extract

Aqueous extract

Chloroforme extract

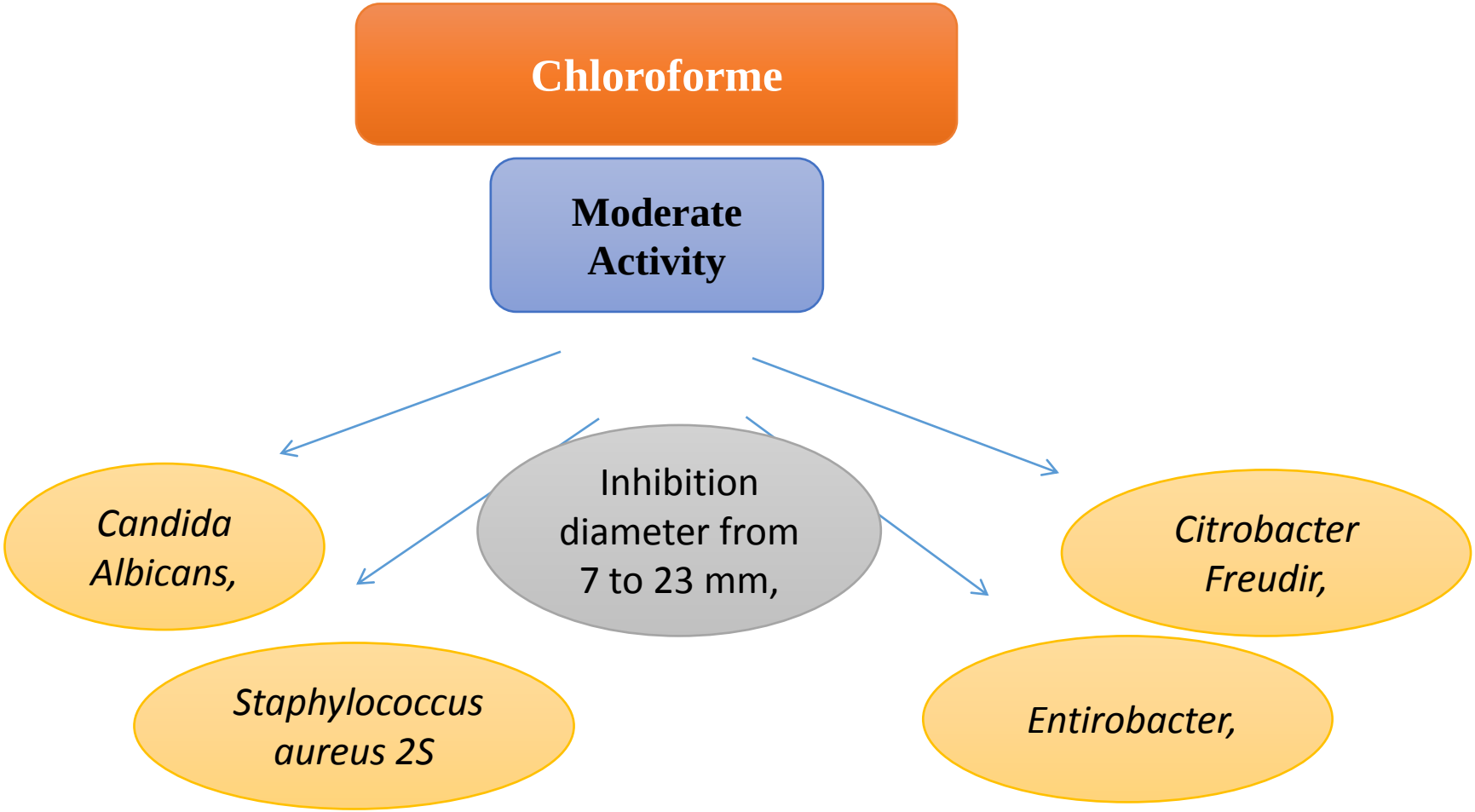
Four yellow-orange spots after chemical revelation, which indicates flavonoïde classe.

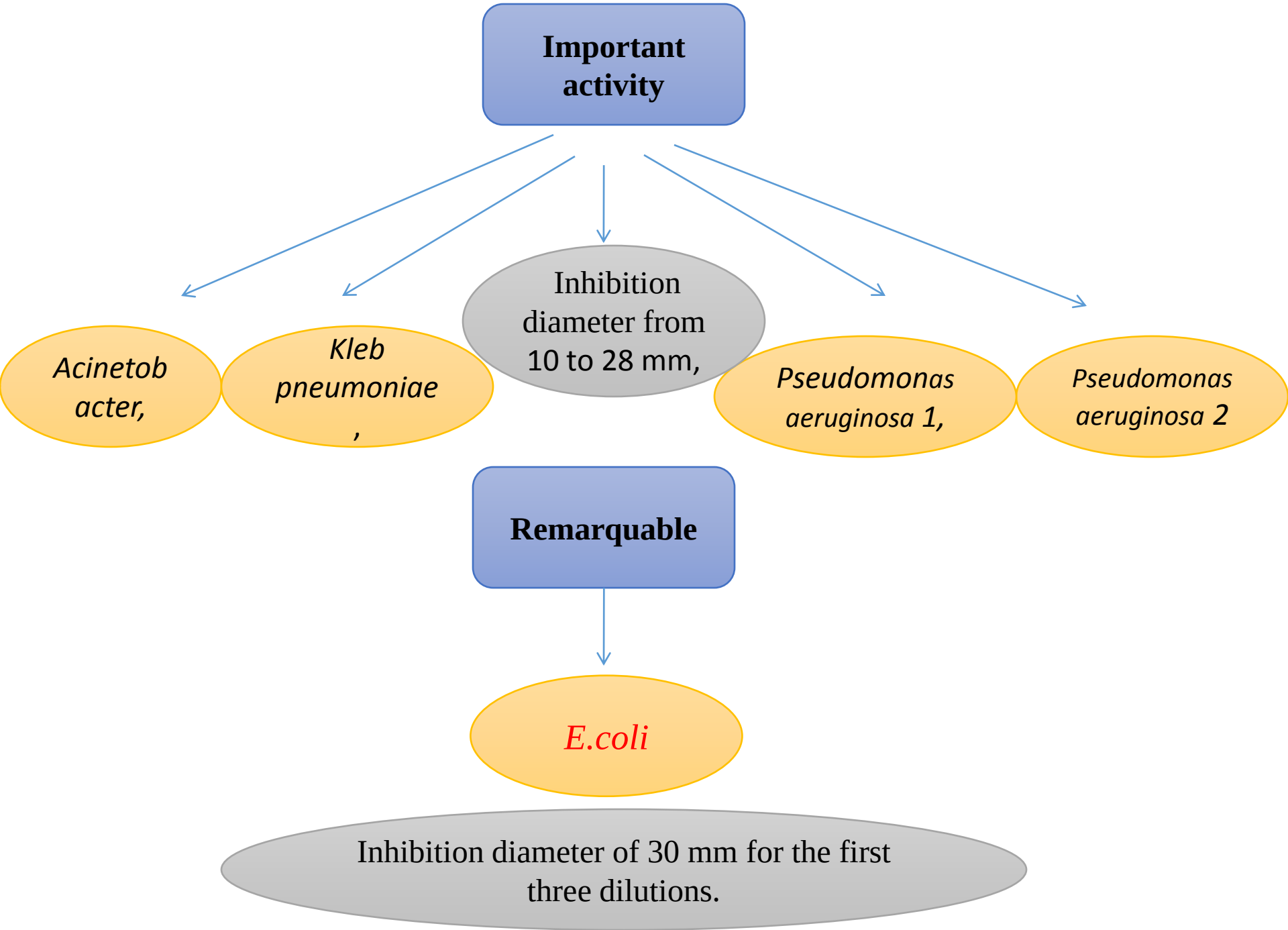
$Rf = d_{spot} / d_{solvant}$



Total phenol and flavonoid compound content results

- The total phenol content showed total polyphenols content of (300±0.01) µg EGA/mg DE,
and total flavonoids content of (158±0.1) µg QE/mg for ethyl acetate extract.
- The total phenol content showed total polyphenols content of (28±0.15) µg EGA/mg DE, and total flavonoids content of (2.5±0.2) µg QE/mg for n-butanol extract.
- Total flavonoids content of (50±0.05) µg QE/mg for chloroform extract.


Chloroforme
Moderate Activity
Candida Albicans,
Inhibition diameter from 7 to 23 mm,
Citrobacter Freudir,
Staphylococcus aureus 2S
Entirobacter,


Important activity
Inhibition diameter from 10 to 28 mm,
Acinetob acter,
Kleb pneumoniae ,
Pseudomonas aeruginosa 1,
Pseudomonas aeruginosa 2
Remarquable
E.coli
Inhibition diameter of 30 mm for the first three dilutions.

Comparison

Strains	Inhibition diameter(references)	Inhibition diameters(our results)
Candida albicans	27mm	23 mm
Staphylococcus aureus	16mm	13mm
Escherichia coli	30mm	30mm
Klebsiella pneumoniae	14mm	18mm
Pseudomonas	22 mm	24mm

Ethyl acetat

Moderate activity

- *Candida Albicans*
- *Enteobacter*
- *Proteus,*

Inhibition diameter from 6 to 18 mm,

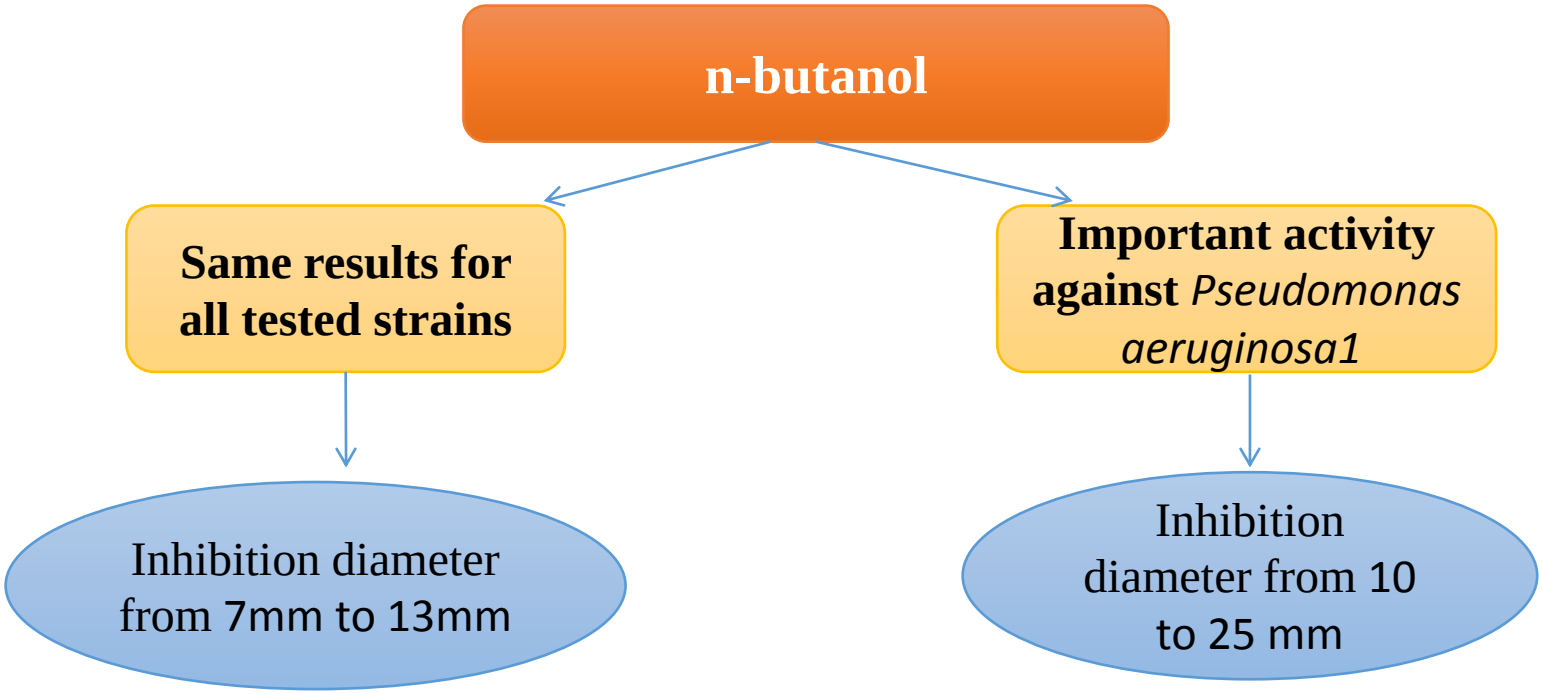
Important activity

- *Citrobacter freundii,*
- *Kleb pneumoniae*
- *Pseudomonas aeruginosa 1,*
- *Pseudomonas aeruginosa 2,*

Inhibition diameter from 8 to 24 mm.

Comparison

Strains	Inhibition diameter (references)	Inhibition diameter (our results)
Candida Albicans	27 mm	18mm
Proteus,	10mm	12mm
Kleb pneumoniae	14mm	24mm
Pseudomonas aeruginosa	20mm	20mm


n-butanol
Same results for all tested strains
Important activity against Pseudomonas aeruginosa1
Inhibition diameter from 7mm to 13mm
Inhibition diameter from 10 to 25 mm

Chloroforme extract riche in flavonoïds → *E.Coli* 30mm

Ethyl acetat extract riche in polyphenols → *Klebsiella pneumoniae* 24mm

n-butanol extract riche in polyphenols → *Pseudomonas aeruginosa 1* 25mm

Conclusions In the present work, *Cinnamomum zeylanicum* a wildly cultivated and used spice, famous in all pharmacopeias for its therapeutic effect was phytochemically and biologically assessed, by subjecting its ethanol percolate to a bio-guided fractioning using different solvent polarities, identification and quantification of secondary metabolites by layer chromatography (TLC) and UV spectroscopy, undergoing *in vitro* biological trials by mean of anti bacterial and antifungal activities on several referential strains, which gave an important inhibiting activity against Gram (+) bacteria : *Staphylococcus aureus*, seven Gram (-) bacteria : *Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae, Acinetobacter baumannii, Citrobacter freundii, Enterobacter aerogenes, Proteus Sp*, and one fungi : *Candida albicans*. Obtained results, open large perspectives on bioguided fractioning in order to identify bioactive molecules responsible of therapeutic effect and pharmaceutical enhancement of studied spice promoting it as an efficient nutraceutical for treating human microbial resistant phenomenon using some preparations as toothpastes, chewingums.

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