

Studies on Cosmeceutical Effects of *Melaleuca alternifolia* Leaf Extracts

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Abstract

In this study, the antioxidant and antimicrobial activity of the two types extracts of that are water and 70% ethanol from *Melaleuca alternifolia* were investigated. The polyphenol contents of the *Melaleuca alternifolia* leaf water extracts(MAW) and *Melaleuca alternifolia* leaf 70% ethanol extracts(MAE) showed 70.18 mg/g, 190.2 mg/g respectively compared to the Tannic acid. The eletron donating ability of the MAW and MAE showed each over 51%, 76% at a 1000 ug/ml concentration. ABTS+ cation radical scavenging ability of MAW and MAE showed over 90% at a 1000 ug/ml concentration. MAW and MAE exhibited antimicrobial activity on *Staphylococcus epidermidis*, *Propionibacterium acnes* and *Staphylococcus aureus* at a 2 mg/ml. Therefore, *Melaleuca alternifolia* leaf extracts is cosmeceutical material due to its potential as a antioxidant and antimicrobial.

Objective Methods

1. Electron donating ability (EDA)
: measured by Blois¹⁾ method
2. ABTS+ cation radical scavenging activity assay
: measured by ABTS+ cation decolorization²⁾ assay
3. Superoxide anion radical scavenging inhibition effect : measured by nitroblue tetrazolium(NBT)³⁾ method
4. Polyphenol contents
: measured by A.O.A.C⁴⁾ method
5. Clear zone
: Paper disc⁵⁾ method

Melaleuca alternifolia



Fig. 1. *Melaleuca alternifolia*.

Extraction

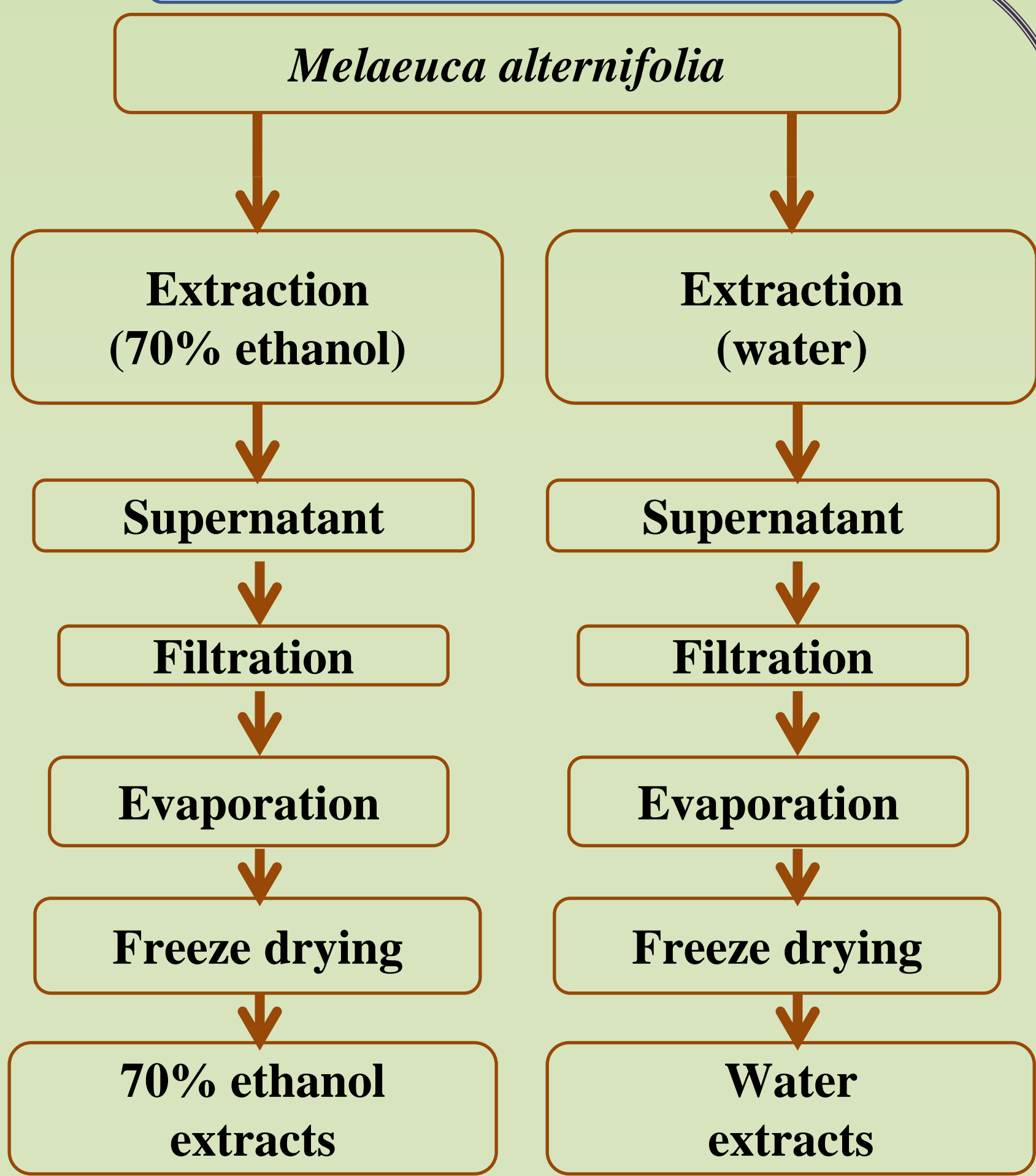


Fig. 2. The procedure for extraction from *Melaleuca alternifolia*.

EDA

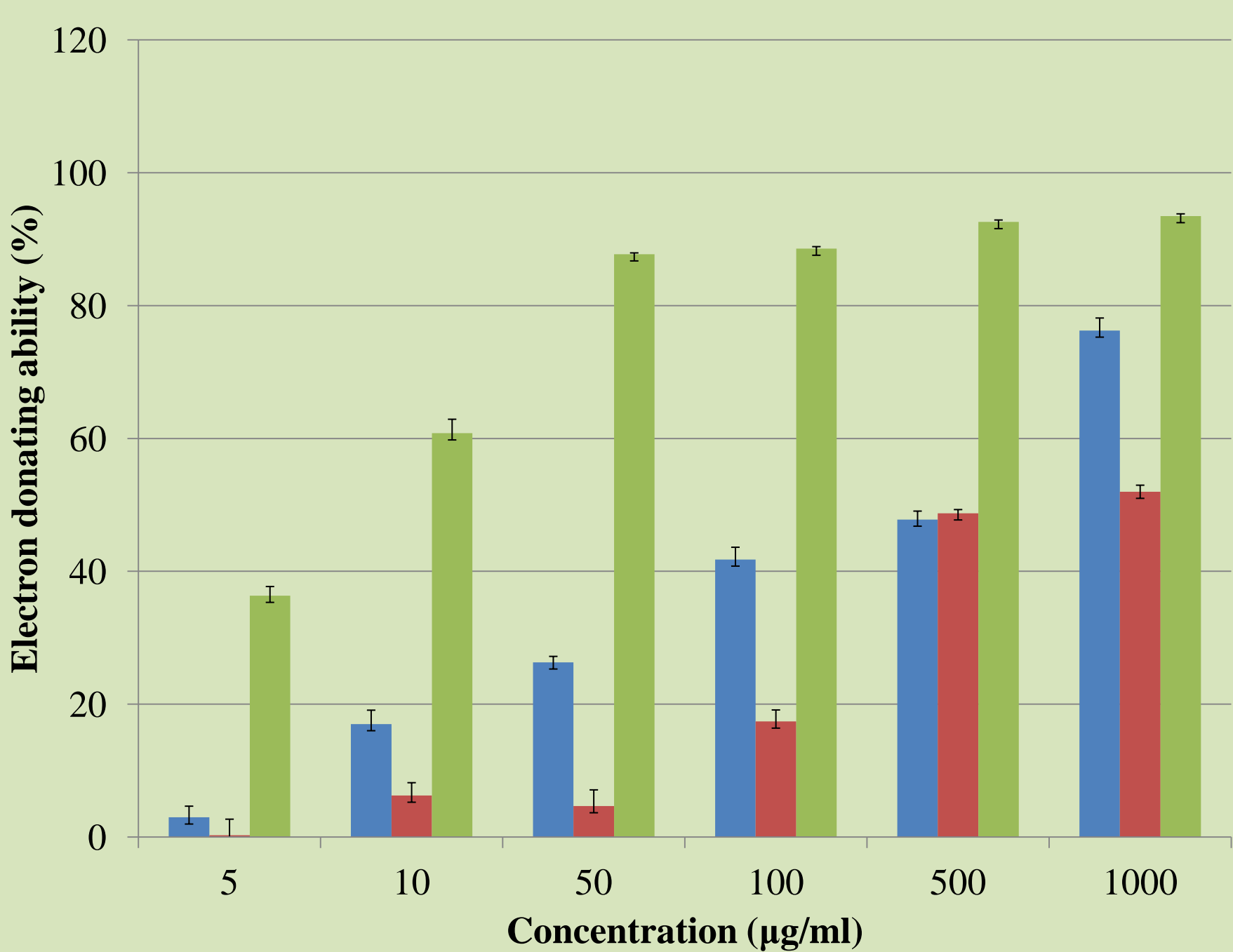


Fig. 3. Electron donating ability of extract from *Melaleuca alternifolia* extracts.

MAE : 70% ethanol extracts from *Melaleuca alternifolia*.
MAW : Water extracts from *Melaleuca alternifolia*.
BHA : Butylated hydroxyanisole

ABTS+

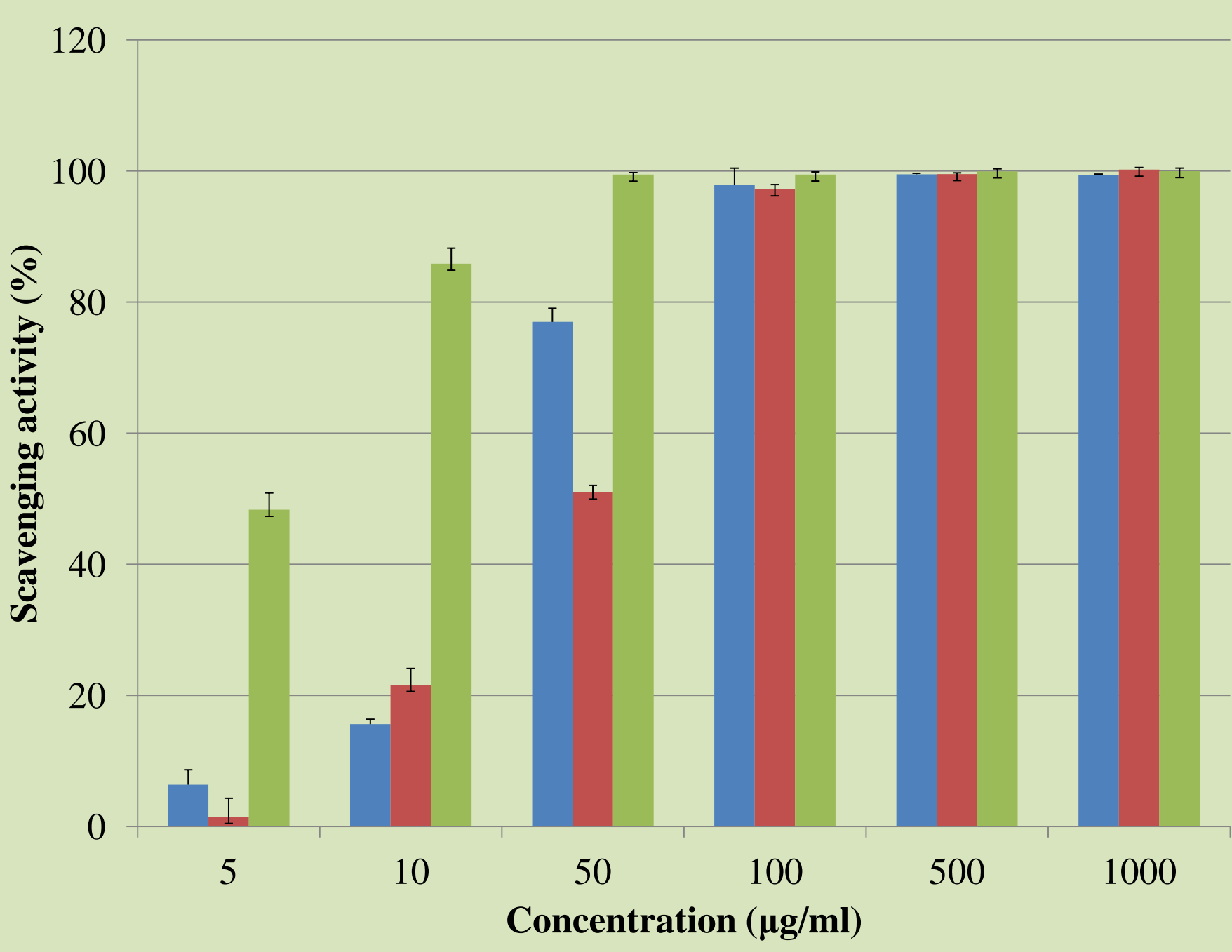


Fig. 4. ABTS+ cation radical scavenging activity of extract from *Melaleuca alternifolia* extracts.

MAE : 70% ethanol extracts from *Melaleuca alternifolia*
MAW: Water extracts from *Melaleuca alternifolia*
BHA : Butylated hydroxyanisole

Antibacterial

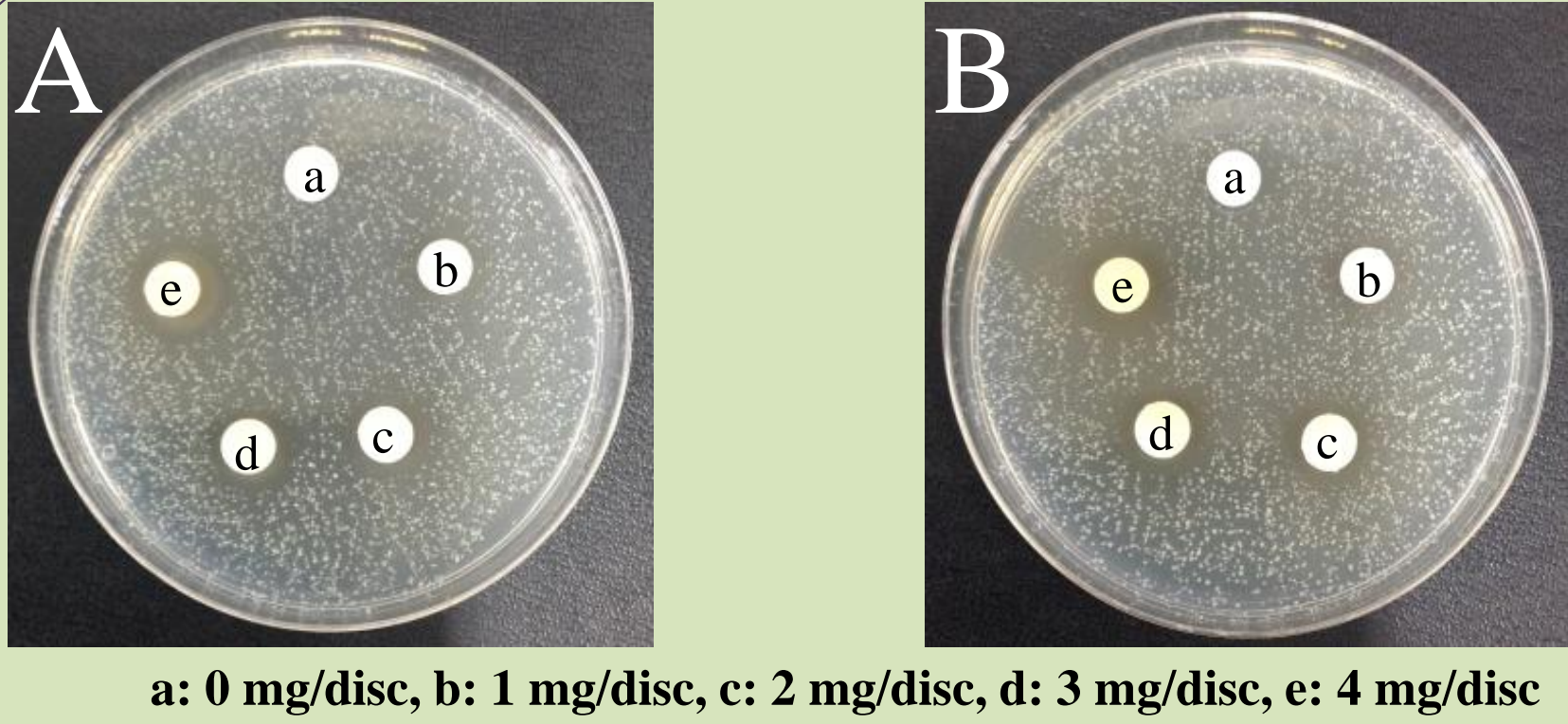


Fig. 6. Antimicrobial activity from *Melaleuca alternifolia* extract on *Staphylococcus epidermidis*.

A : 70% ethanol extract from *Melaleuca alternifolia*
B : Water extract from *Melaleuca alternifolia*

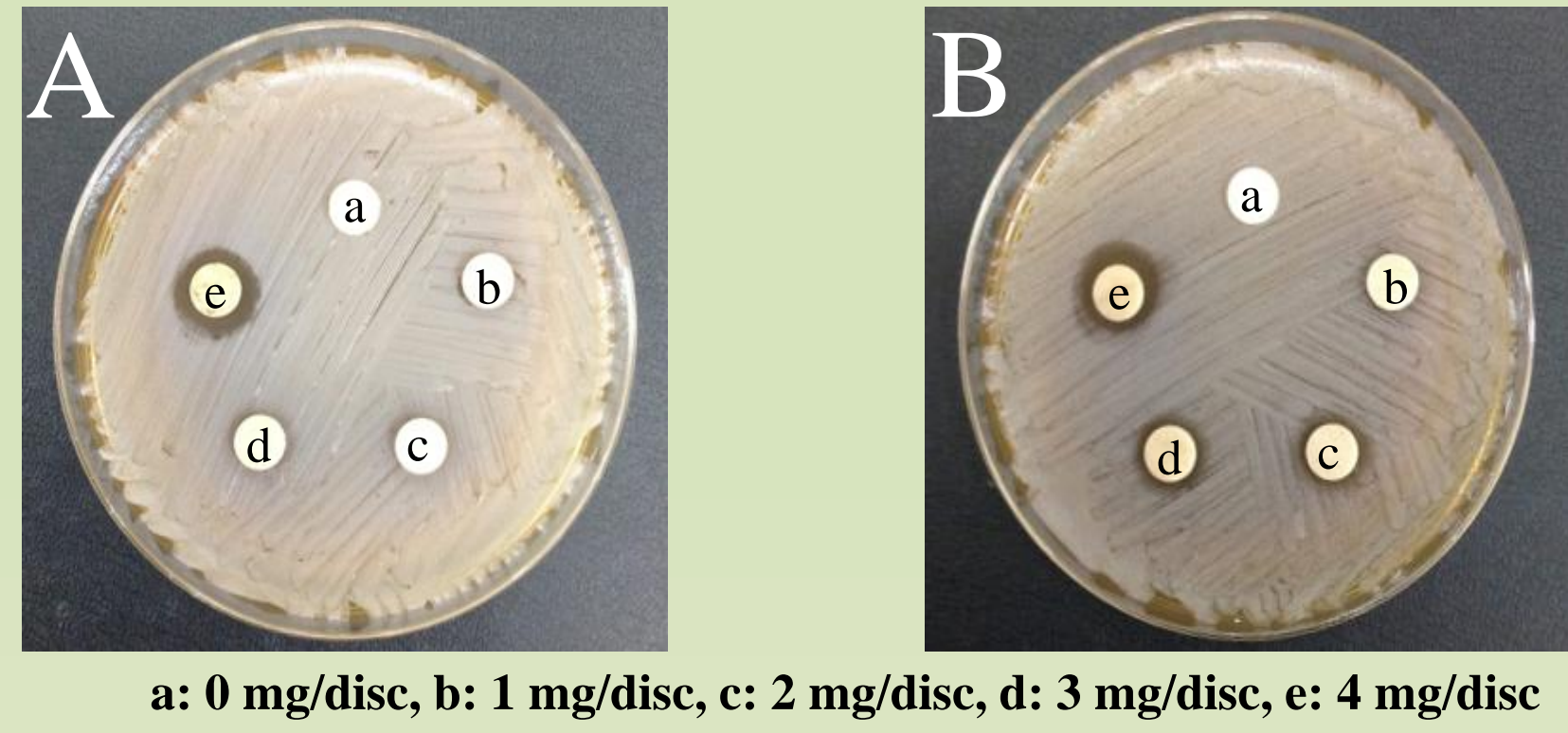


Fig. 7. Antimicrobial activity from *Melaleuca alternifolia* extract on *Propionibacterium acnes*.

A : 70% ethanol extract from *Melaleuca alternifolia*
B : Water extract from *Melaleuca alternifolia*

NBT

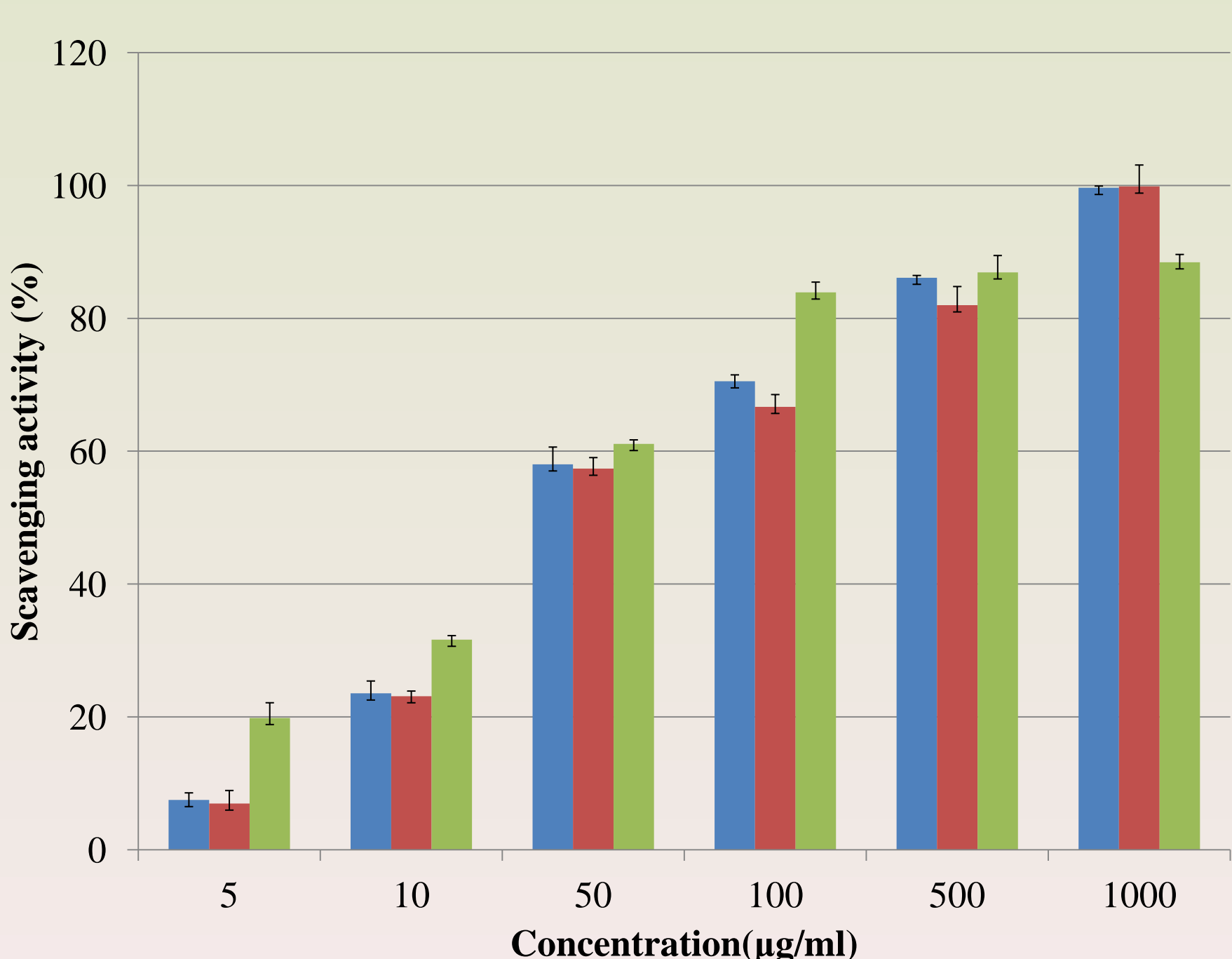


Fig. 5. Superoxide anion radical scavenging activity of from *Melaleuca alternifolia* extracts.

MAE : 70% ethanol extracts from *Melaleuca alternifolia*
MAW : Water extracts from *Melaleuca alternifolia*
Vit.C : Ascorbic acid

Polyphenol

Table 1 .The contents of total polyphenols of solvent fractions from *Melaleuca alternifolia*

Sample	Contents(mg/g)
Water	70.18
70% ethanol	190.20

Conclusion

1. The electron donating ability of the MAW and MAE showed each over 51%, 76% at a 1000 µg/ml concentration.
2. ABTS+ cation radical scavenging ability of MAW and MAE showed over 90% at a 100 µg/ml concentration.
3. Superoxide anion radical ability of MAW and MAE showed over 99% at a 1000 µg/ml concentration.
4. The contents of total polyphenols of solvent fractions over 70 mg/g.
5. MAW and MAE exhibited antimicrobial activity on *Staphylococcus epidermidis*, *Propionibacterium acnes* and *Staphylococcus aureus* at a 2 mg/ml.
6. Therefore, *Melaleuca alternifolia* leaf extracts is cosmeceutical material due to its potential as a antioxidant and antimicrobial.

Reference

- 1) Blois MS. : *Nature.*, 26, 1199-1200 (1958).
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5. Corner DE, Beuchat LR, sensitivity of heat-stressed yeasts to essential oils of plants. *Appl. Environ. Microbial* 1984;47(2):229-233.