ANTIBACTERIAL EFFECTS OF VARIOUS PLANT EXTRACTS SOLD AS HERBAL SUPPLEMENTS ON STAPHYLOCOCCUS AUREUS

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Staphylococcus aureus

- Opportunistic bacteria / normal flora

- Effects on the human body as bacterial infections
  - Boils
  - Urinary tract infections
  - Pneumonia
  - Toxic Shock Syndrome
  - Sepsis

- Multi-drug resistant strains
Potassium Diformate

- Feed additive in livestock in European Union (EU), Asia and Australia
- First approved non-antibiotic growth-promoter in the EU
Plant Extracts as Supplements

• Claims
  - Green Tea – prevents cancer
  - *Echinacea* – colds, immunity
  - Licorice – bronchitis
  - Alfalfa – coughs

• Antimicrobial activity
  - Effects on *S. aureus*

• Unregulated
  - Dietary Supplement Health & Education Act of 1994
Growth Curve

Phases: Lag, Log, Stationary, Death
Growth Studies

- Side arm flasks
  - nutrient broth
  - manufacturers’ recommended dose
- Shaking water bath –
  - 37°C
- Spectrophotometer
  - indicates number of cells
Growth of *S. aureus* in Presence & Absence of Various Plant Extracts

- **NB + Glycerin**
- **NB + Green Tea**
- **NB + Licorice**
- **NB + Alfalfa**
- **NB + Echinacea**
Diffusion Studies

Zones of Inhibition for Various Plant Extracts

Green Tea Plate
Licorice
Green Tea

Alfalfa
Control
Echinacea
Results

• Overall, our studies revealed varying degrees of inhibition

• Concerns
  - Other microbes
  - Altering human normal flora
  - Prolonged/unregulated use

• Furthering research