East Java Propolis Inhibits cytokine Pro-inflammatory in Odontoblastlike cells Human Pulp

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**Introduction**

The maintenance of healthy and functional pulp-dentine complex is the principle of restorative dentistry. Healing is a potential characteristic of pulp tissue.

- Bacterial penetration
- Cytotoxicity of dental materials
- Sensitivity of operative procedure

\[\text{Compromise pulp healing}\]
Direct pulp capping is defined as treatment of an exposed vital pulp by sealing the pulpal wound with a dental material placed directly on a mechanical or traumatic exposure to facilitate the formation of reparative dentin and maintenance of the vital pulp.
Calcium hydroxide is the gold standard for pulp capping in human teeth.

Wide range of materials have been suggested for the dressing of the exposed pulp.

Some limitations with calcium hydroxide are

1. presence of tunnels in the dentine barrier
2. extensive dentine formation obliterating the pulp chamber
3. high solubility in oral fluids
4. lack of adhesion and degradation after acid etching

Failure 66.7%

Pereira JC, Segala AD (Am J Dent 2000)

Cox CF, Subay RK (Oper Dent 1996)
ALTERNATIVE MATERIAL ????

PROPOLIS ????
What is Propolis?

- Propolis is a wax-like, resinous substance that bees collect from tree buds, or other botanical sources, and use as a sealant for unwanted open spaces in the hive.
Compounds responsible for the biological activity of propolis

- **Resins** - CAPE, bioflavonoid, artepilin, apigenin - 45-55%
  - anti-inflammatory,
  - antioxidant,
  - antibacterial
  - anti viral,
  - immunomodulatory,
  - wound healing

- **Waxes and Fatty Acids** - beeswax and plant origin - 25-35%

- **Essential Oils** - 10%

- **Pollen proteins** - arginine and proline

- **Other Organics and Minerals** - 14%
  - trace minerals, iron & zinc.
  - Ketones, lactones, quinones, steroids, benzoic acid, vitamins
PROPOLIS

PROPOLIS CHARACTERISTICS

• Natural resin smells good and sticky
• Extreme temperature < 15°C, fragile < 5°C
• 25°C - 45°C temperature, soft, elastic and very sticky
• Temperature > 45°C very sticky
• Temperature 60°C - 100°C, propolis will

Propolis solution
• Ethanol, water dan glycol
Research design

- *Post test only control group design*
RESEARCH PROCEDURE

4 STEP:

1. *Lactobacillus acidophilus* inaktif → HEATKILLED ..... AUTOCLAVE 121° (5 minutes)
2. ISOLATION AND PULP CELL CULTURE
3. *Lactobacillus acidophilus* inaktif DOSE
4. EFECTIVITY PROPOLIS EXTRACT
Gigi Molar lower jaw

Pulp isolation

Fibroblast culture cells

**odontoblast like cell (ODL)**

**EP (K-)**

**LA (K+)**

**LA+ EP 3µg/ml**

**TNFα, TGFβ1**

**DATA**

**ANALYSIS DATA**
Result

1. Inactive *Lactobacillus acidophilus*  
2. Odontoblast characteristic
Expression TNF-$\alpha$
Expression  TGF-β1
The data were analyzed by analysis of variance followed by the Tukey HSD test for multiple comparisons. Results were considered statistically significant when the p-value was less than 0.05.
DISCUSSION

- **PROPOLIS EXTRACT** is a potent and a specific inhibitor of NF-kB activation and this may provide the molecular basis for its multiple immunomodulatory and anti-inflammatory activities.

- NF-κβ is located in the cytoplasm in an inactive form, bound to an inhibitor molecule called I kappa β. Stimulation of cell through a variety of mechanisms by *Lactobacillus acidophilus* triggers a signaling events that ultimately results in the degradation of I kappa β.

- inhibited TNF-α and increase expression of TGF-β1

Wang et al (2009)
DENTINOGENESIS

Murray and Windsor (2002)
Propolis extract can inhibit the expression of TNFα and increase the expression of TGF-β1 on odontoblast like cell in human dental pulp.

Anti-inflammatory effects of east Java propolis extract are associated with cytokine modulation.
Thank you