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# Formulation of Ethanol Extract (Myrmecodia pendans) as an Antibacterial Streptococcus mutans in Chewable Lozenges for Children with Early Childhood Caries

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## 3 Formulation of Ethanol Extract (*Myrmecodia pendans*) as an Antibacterial *Streptococcus mutans* in Chewable Lozenges for Children with Early Childhood Caries

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### ABSTRACT

**Background:** Riskesdas showed an increase in the prevalence of dental caries in Indonesia, which was 43.4% in 2007 to 53.2% in 2013. Not only among adults affected by caries but also children. One of the caries that often occurs in children under five. Early Childhood Caries. To overcome this, a solution using herbal plants, one of which is the ant nest (*Myrmecodia pendans*) which can reduce the number of *Streptococcus mutans* bacteria as the main bacteria that causes caries. Chewing lozenges is one preparation that can be used as an alternative to antibacterial treatment in the mouth.

**Objectives:** aims to determine the effectiveness of ether extract from ant nests (*Myrmecodia pendans*) as an antibacterial *Streptococcus mutans* in the preparation of chewing lozenges in the case of early childhood caries.

**Materials and Research Methods:** This study used field and laboratory experiments with a pretest-posttest control group research design. The sample consisted of 30 children consisting of 3 groups, namely 10 children chewing xylitol market, 12 children chewing chewable moisturizing tablets 3.75%, and 7.5%. Data processing and analysis using SPSS version 22.0 for windows.

**Results:** The results of the paired t-test showed a significant reduction

in the number of *Streptococcus mutans* colonies before and after chewing the ant nest of chewable tablets, 3.75% and 7.5%. From the paired t test results obtained p-value of 0.004. This shows that the p-value obtained is smaller than 0.05 so it can be concluded that the treatment of chewable nest tablet concentration of 7.5% has a significant effect in reducing the number of bacteria in the mouth.

**Conclusion:** The extract of the ant nest lozenges saffron (*Myrmecodia pendans*) etquette was 7.5% more effective than the chewed lozenges nest (*Myrmecodia pendans*) 3.75%, so in this study the nesting lozenges chewable tablets.

**Keywords:** Ant nest (*Myrmecodia pendans*), Chewable lozenges, Early Childhood Caries (ECC)

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### INTRODUCTION

Dental and oral health have not received special attention among the Indonesian people, according to Riskesdas data<sup>1</sup>, an increase in the prevalence of dental caries in Indonesia, namely patients with active dental caries increased by 9.8% from 43.4% in 2007 to 53.2% in 2013. Not only among adults affected by caries but also children and even toddlers can also be infected with caries, according to data from the PDGI (Indonesian Dental Association)<sup>2</sup> states that at least 89% of caries sufferers are children. Based on the results of the characteristics of the health survey, the prevalence of dental caries in children aged 3-5 years is 81.7%. The prevalence of dental caries according to their age group, age 3 years (60%), age 4 years (85%) and age 5 years (86.4%), thus the toddler age group is a vulnerable group of dental caries.

One of the caries that often occurs in children under five, namely Early Childhood Caries. Children with ECC have a history of consuming sugar in the form of fluid for a long time and often. Sugar as the cause of caries such as sucrose, glucose and fructose contained in fruit juices and some baby formula foods, this type of feeding during sleep will increase the risk of caries, because cleansing the oral cavity and reduced flow rate of saliva.

To overcome the high prevalence of caries among children, especially Early Childhood Caries, a solution is needed by the

use of herbs, fruits, etc., which can reduce the number of *Streptococcus mutans* bacteria one of the typical Indonesian plants which is an epiphytic plant that hangs or attaches to another larger plant, has a bulging trunk and inside it contains small spaces or cavities inhabited by ants. Ant nest plants are often found in Kalimantan, Sumatra, Papua New Guinea, Philippines, Cambodia, Malaysia, Cape York, Solomon Islands and Papua.

Ant nest plants (*Myrmecodia pendans*) contain chemical compounds from flavonoids, tannins, polyphenols, multimineral and polysaccharides are known to be able to cure various diseases. Flavonoids act as antibiotics, antivirals for the HIV virus and herpes.<sup>3</sup> Several studies have reported that ant nest extracts have anti-inflammatory, antidiarrheal, and can reduce uric acid levels<sup>4</sup>, anticancer<sup>5</sup>, antioxidants<sup>6</sup>, and it can inhibit bacterial growth.<sup>7</sup> The effect is because ant nest plants have active substances terpenoids/steroids, phenolic<sup>8</sup>, flavonoids, tannins, and polyphenols.<sup>9</sup> As an effort to supply natural antibacterial compounds which are efficacious, inexpensive and safe as well as increasing the usability of Indonesia's abundant natural resources,<sup>10</sup> ant nest plants are used as an alternative ingredient for root canal irrigation solutions to reduce the number of bacteria in the root canals.<sup>11,12,13</sup>







## CONCLUSION

Based on research that has been done, it can be concluded as follows:

1. Chewable lozenges ethanol extract of ant nests (*Myrmecodia pendans*) 3.75% and 7.5% have an influence on *Streptococcus mutans*, which is an antibacterial that can reduce the number of *Streptococcus mutans* bacteria colonies
2. Chewable lozenges ethanol extract of ant nests (*Myrmecodia pendans*) 7.5% is more effective than Chewable lozenges ant nests (*Myrmecodia pendans*) 3.5%, thus in this study the chewable lozenges ant nests (*Myrmecodia pendans*) has a 7.5% more significant effect as an antibacterial in reducing the number of *Streptococcus mutans*.

## CONFLICT OF INTEREST

There is no conflict of interest in this study

## SOURCE OF FUNDING

Domestic Government

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