CHEWING BETEL LEAVES (Piper betle Linn.): PREVENT ORODENTAL DISEASE AND COVID-19

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ABSTRACT

Betel (Piper betle Linn.) is available in most of South and Southeast Asia. Betel leaves has the function of healing wounds in traditional Balinese medicine. This habit of chewing fresh betel leaves which are wrapped together with the areca nut, mineral, catechu and tobacco, is traditionally known as "nginang". The several research stated that the habit of chewing betel leaf together with tobacco and areca nut has led to oral cancer. This paper aims to inform readers that chewing betel leaf is actually beneficial for health, as long as it is consumed without tobacco and areca nut. This paper focuses on the prevent orodental disease, and COVID-19. This systematic review was conducted through three steps: (1) A search (on Pubmed, Google scholar and other journal databases with published articles from 2009 to 2020); (2) Read the title and abstract of the individual papers; (3) Determine whether these articles were from diverse backgrounds. The nutritional content of the betel leaves for orodental health and anti-COVID-19 are protein, essential oils, carbohydrate, vitamin A, B and C and mineral like Mg, K, Ca, Fe, I, P and Zn. Betel leaves contains potassium potential nutrition and antioxidants including chevibetol and allylpyrocatechol, act as anti-COVID-19. Betel helps to cure various orodental diseases such as mouth cancer, cariogenic, sores, toothache, halitosis etc. The researcher concluded that "nginang", chewing of fresh young betel leaves without areca nut and tobacco is very good to be continued, because of its many benefits and very good properties, especially for overcoming orodental disease and COVID-19.

Keywords: Betel, Nginang, Orodental Disease, COVID-19

INTRODUCTION

The habit of chewing betel leaves with tobacco and areca nut, which is traditionally known as "nginang", has been known by Balinese people since the 6th century and carried from generation to generation. This practice involves chewing fresh betel leaves which are wrapped together with the areca nut, mineral slaked lime, catechu and tobacco. However, "nginang" nowadays is only practiced during social, cultural and religious events.

A number of plants are used to perform religious ceremonies and rituals of different kinds everywhere and are thus sacred to mankind. They are so important that religious rituals cannot be performed without their availability. The use of medicinal plants is increasingly popular and expanding globally with the development of science. The potential effect of this betel leaf in the development of therapeutically active herbal drugs against different microbial infection especially for oral cavity, which also gives the opportunity to pharmaceutical companies interested in formulation and production of natural-based drugs (Alit Wiswasta & Ari Agung, 2019; Pradhan et al., 2013).

Betel leaves have the function of healing wounds in traditional Balinese medicine. Not only it has significant nutraceutical properties, but it is also very easy to get, and has a low cost. Squeezed betel leaf will give a pleasant smell (Alit Wiswasta & Ari Agung, 2019; Pradhan et al., 2013). The books like Charak Samhita mentions that the betel leaf extracts can also cure flu-like symptoms which may be caused by respiratory viruses (Kumar, 2018), such as Corona Virus Disease 19 (COVID- 19) symptoms.

However, several research results stated that chewing betel leaf with tobacco and areca nut (nginang) can cause oral cancer, therefore it is not recommended to chew betel (Amarasinghe et al., 2013). This research is conducted based on the problem and aim to show the anti-orodental disease and anti-COVID-19

benefits of chewing betel leaf without tobacco and areca nut.

RESEARCH METHOD

This review was conducted in accordance with the Systematic Review (Liberati et al., 2009). A systematic database search was performed from 2009 to 2020. The database included Pubmed, Google Scholar and other journal databases. which have identified 1979 articles. The results of the selection found 17 relevant articles, representing several countries which came from Taiwan, Malaysia, India, Sri Lanka, Indonesia, China and Japan.

For inclusion criteria, the researchers considered a study (feasible) that was suitable for systematic review: (1) goals: chewing betel and nutrition (2) outcome: orodental health, (3) research methods: qualitative and quantitative, (4) research was written in English. While exclusion criteria is conducted by selecting published articles based on titles and abstracts that were not complete text and irrelevant. The dependent variable was betel chewing. The independent variable was anti-orodental disease and anti-COVID-19.

RESULTS AND DISCUSSION

Betel, a member of the Piperaceae, which is a large plant family, is also known as Base in Bali. Betel is one of the invaluable medicinal plants whose leaves have been used for many medicinal purposes. Chewing betel has been a culture for Balinese people since the 6th century. Nginang is a Balinese term for chewing betel which requires other ingredients, such as areca nut, lime, catechu, and tobacco. The fresh betel leaves have long been used in Balinese local medicine. In ancient Bali, betel leaves are considered auspicious and still extensively used during religious functions in Bali. The guests are welcome to chew betel and areca nut first. Not chewing betel can be considered as not respecting the host (Alit Wiswasta & Ari Agung, 2019).

In chronic chewers, a condition called betel nut chewers mucosa is often found where the quid is placed. Betel nut chewing is implicated in oral submucous fibrosis and its use along with tobacco can cause leukoplakia, both of which are potentially malignant in the oral cavity because mainly areca nut and tobacco that has been exposed is vulnerable to exposure to viruses that cause tumors and cancer (Anand et al., 2014).

Chewing betel leaf (Piper betle Linn.) prevents orodental disease. Betel is known to worldwide and is consumed frequently as a mouth freshener. Betel is one of the herbs that is closely related to caries control, periodontal disease, conserve the teeth and control of halitosis (Hossain et al., 2017; Shah et al., 2016).

Anticancer potential

Betel is one of the herbs that is closely related to the prevention of oral cancer. Betel leaf contains antioxidants like vitamin C, vitamin A, riboflavin, chlorophyll and phenolic is high, so it can cure cancer sores and toothache. Betel leaves as well as their active phenolic compound eugenol exhibited strong anticancer activity in oral carcinoma cells. The anticancer effect of the extract was attributable to the component phenolics, eugenol respectively in betel leaves, as the phenolics also exhibited strong cytotoxicity in cancer cells (Dwivedi et al., 2010; Pradhan et al., 2013; Surono, 2016). It also contains enzyme-like diastase and catalase. Betel leaves are earlier reported to possess anticancer potential (Hossain et al., 2017; Shah et al., 2016).

Anti Dental Caries Activity. Dental caries result from demineralization of enamel and then dentin by the acid produced by plaque microorganisms as they metabolize dietary carbohydrates. Betel leaves is the best natural ingredient in dental caries control in Asia, which provides the best oral and contribution oral

hygiene (Chauhan et al., 2016). Results of the study showed the extract of betel leaves may exert anticariogenic activities related to a decrease in acid production and changes to the ultrastructure of Streptococcus mutans (Shah et al., 2016).
Strengthen teeth

Chewing betel leaves can strengthen teeth, because its contains vitamins and minerals such as ascorbic acid, thiamine, niacin, riboflavin, carotene, Mg, K, Ca, Fe, I, P and Zn (Grober, 2009; Hossain et al., 2017; Shah et al., 2016). The leaves are nutritive and hold a considerable quantity of vitamins and minerals and therefore, six leaves with a small bit of slaked lime are said to be equivalent to about 300 ml of cow milk mainly for vitamin and mineral nutrition (Chauhan et al.,2016). Betel leaf contains vitamin C, essential oils and antioxidants (vitamin A, riboflavin and chlorophyll) is high, besides that it also contains calcium, phosphorus, iron, iodine, nicotinic acid, thiamine, and potassium, so it can strengthen teeth (Hossain et al., 2017; Shah et al., 2016; Surono, 2016).

Chewing betel leaves (Piper betle Linn.) prevents COVID-19

On 30 January 2020, the WHO declared the outbreak of COVID-19 a Public Health Emergency of International Concern. The rapid increase in confirmed cases makes the prevention and control of COVID 19 extremely serious. Health authorities in China are turning to millennia-old traditional medicines to treat the coronavirus. the province with the highest number of deaths and infections recovered following treatment with a combination of Traditional Chinese Medicine and Western Medicine. Betel is also used as a potent source for novel therapeutic value (Li You, 2020).

The betel leaf has significant antimicrobial activity against a broad spectrum of microorganisms (Hossain et al., 2017; Shah et al., 2016). The betel leaf extracts can also cure flu-like symptoms which may be caused by respiratory viruses like influenza, respiratory syncytial viruses, human metapneumoviruses, etc. Among the respiratory viruses, influenza viruses are the leading cause of morbidity and mortality among the diverse age groups and are RNA viruses that show frequent changes in their genome, hence posing a great challenge to the development of therapeutics.

Many antiviral drugs have been developed and commercialized against these viruses but as a result of mutations in the viral genome, there has been an increasing trend in the generation of antiviral drug-resistant strains which needs to be addressed (Kumar, 2018). Betel leaf contains vitamin C, A and mineral Fe, Zn, K, and also contains eugenol, quercetin, chavibetol, caryophyllene, allylpyrocatechol, campene, pinene, limonene, saprobe, and cineol, which acts as immunomodulatory and anti-COVID-19 (Salehi et al., 2019; Vernekar et al., 2019; Wang & Song, 2018). Betel leaf has fundamental constituent specifically eugenol and quercetin, have been demonstrated to exhibit antiviral properties (Gregory & Kelly, 2011; Kamatou et al., 2012).

Betel leaf has ingredients with antioxidant properties which may minimize the disease severity caused due to the generation of free radicals during influenza virus infections. The antioxidant activity of betel leaf extracts is due to the presence of phenolic compound, hydroxy-chavicol (Das et al., 2016). It has been shown that the chevibetol and allylpyrocatechol are the two components of betel leaf extracts which are also responsible for the antioxidant activities and hence, for their therapeutic potential. The antioxidant and anti-inflammatory activity of betel leaf extracts has the capacity to combat COVID 19 like illness (Dwivedi et al., 2014; Kumar, 2018).

One of the triggering conditions for a fusion of COVID 19 with a human cell is acidified endosome on the surface of the cell. In other words, the virus needs a low

pH environment, occurring at pH 5,5, and thrives in it. The higher the body's acidity (alkalin), the better the fusion and spread of the virus, the rapid and out-of-control increase of COVID 19. therefore the condition of high body pH (alkalin) must always be maintained.

Betel leaf can normalize the body's pH, so the coronavirus cannot live, by chewing fresh betel leaves can make alkaline body conditions, with low cost and practical (Alan, 2020; Chu et al., 2016; Kavitha, 2017). This happens because of the potential content of potassium betel leaf (Hossain et al., 2017; Kavitha, 2017). Further, if commercially available COVID-19 specific antivirals are tested in combination with betel leaf ingredients, they may show a synergistic activity and the effective dose of antivirals may be reduced thus minimizing the drug pressure and development of resistant virus strains in treated individuals (Kumar, 2018).

CONCLUSIONS

Chewing fresh and hygienic betel leaves without tobacco and areca nuts will not cause oral cancer. Instead, it will bring many orodental health benefits and to combat COVID-19. The nutritional content of the betel leaves for prevents orodental diseases and COVID-19 are protein, fat, carbohydrate, vitamin A, B, and C, and minerals like Mg, K, Ca, Fe, I, P and Zn. Betel helps to cure various orodental diseases such as halitosis, mouth cancer, sores, toothache, etc. Betel leaf has fundamental constituent specifically eugenol and quercetin have been demonstrated to exhibit the antiviral properties. Betel leaf contains important antioxidants act as anti-COVID 19, including hydroxychavicol chevibetol and allylpyrocatechol. Betel leaf contains high potassium potential nutrients, can normalize the body's pH, as an anti-COVID 19.

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