UPDATE REVIEW OF PHYSALIS: ETHNOGRAPHY VALUE AND ITS USEFULNESS IN STROKE ISCHEMIC DISEASE)

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ABSTRACT

One of Indonesian herbal medicine that deserves attention is *Physalis minima* Linn. Identifying medications and their use in the correct dosages is crucial for effective treatment. Country gooseberry, or *Physalis minima* Linn, has anti-cancer, anti-diabetic, analgesic, antipyretic, and anti-inflammatory properties. This paper aims to reveal the potential use of *Physalis minima* Linn in stroke ischemic disease, a substantial current health issue in Indonesia. We used Scopus and Google databases to screen the intended articles with keywords used were TITLE-ABS- KEY (stroke) AND physalis AND antioxidant OR antiinflammation, "*Physalis minima*" AND "stroke ischemic" AND "thrombolytic" OR " Antiinflammatory" OR "Antioxidant". Two other fellow researchers screened the resulting articles and read the articles together, and resumed the narration. Ten articles resulted in the screening—however, only 1 article was included in this article from the Scopus Databases. However, we got five articles out of 10 articles from Google databases. We divided the narration based on several items, such as anti-thrombolytic effects, antioxidant and antiinflammation, and ethnography of the plant. *Physalis minima* has its potency to be explored as an alternative treatment to stroke ischemic. Firstly *P.minima* tends to thrombolytic clot in case of thrombosis in stroke ischemia. Secondly, *P.minima* have an effect of antioxidants and anti-inflammation that is useful in acute stroke ischemia.
Keywords: Alternative; Herbal; Ischemic; Stroke treatment.

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INTRODUCTION

The incidence of stroke is a significant concern, especially in developing country like Indonesia. A survey conducted by the Indonesian health ministry from 2013 to 2018 revealed a 20% increase in stroke cases. Furthermore, stroke survivors are more likely to be left with disabilities than those with other ailments (1).

The search for new alternative treatments gives hope to stroke patients. Currently, ischemic stroke has a treatment that is most effective in the early stages of the disease but has several side effects. Herbal medicine is prevalent in all developing nations, as per a 2003 WHO report.

In China, herbal medicine accounts for 30 to 50% of all drugs consumed (2). However, in contrast to Eastern countries, particularly Indonesia, few Indonesian herbal remedies have been tested for their potential in treating stroke (3).

One Indonesian herbal medicine that deserves attention is *Physalis minima* Linn. Identifying medications and their use in the correct dosages is crucial for effective treatment. Country gooseberry, or *Physalis minima* Linn, has anti-cancer, anti-diabetic, analgesic, antipyretic, and anti-inflammatory properties (4). This paper is aimed to reveal the potential use of *Physalis minima* Linn in stroke ischemic disease which is a huge current health issue in Indonesia.

METHODS

Scopus
The keyword use is TITLE-ABS-KEY (stroke)AND physalis AND antioxidant OR antiinflammation.
The keywords used in Google databases are "physalis minima" and stroke ischemic" and "thrombolytic" OR " Antiinflammatory" OR "Antioxidant".

Figure 1*.Keywords use to screen the articles*

We used Scopus and Google databases to screen the intended articles. The keywords used in Scopus databases are TITLE-ABS-KEY (stroke) AND Physalis AND antioxidant OR antiinflammation during the late twenty years. Scopus was chosen to write this literature review because it contained thousands of journal articles. The articles that resulted from chemical engineering journals were exempted from this article. The keywords used in Google databases are "*Physalis minima*," and stroke ischemic" and "thrombolytic" OR " Antiinflammatory" OR "Antioxidant". Google databases used because not many articles were indexed in Scopus and we hoped that we could find all articles related to the *Physalis minima* in stroke ischemic. Other two fellow researchers screened the resulted articles and read the articles together and resumed in the narration.

RESULT AND DISCUSSION

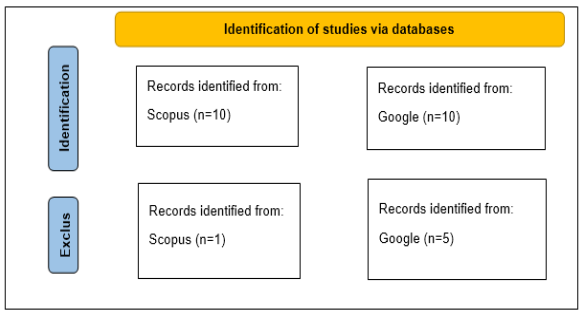

Figure 2. Schematic Identification of Studies via Databases

There are 10 articles that resulted in the screening, however only 1 article included in this article from the Scopus Databases. However, we got 5 articles out of 10 articles from Google databases. We divided the narration based on several items such as anti-thrombolytic effects, antioxidant and antiinflammation, and ethnography of the plant.

Ethnography of *Physalis minima*

In India, *Physalis minima* Linn also called *Physalis micrantha* Link. is known as Kupanti, Budda, Budamma (Andhra Pradesh); Ban Tipariya (Bengal); Parpoti, Popti (Gujarat); Tulatipati (Hindi); Gudde Hannu (Karnataka); Njodi Njotta (Kerala); Chirboti, Dhan Mori (Maharashtra); Tholtakalli (Tamil Nadu); Tankaari, Parpotikaa, Chirapotikaa (Ayurvedic); Sodakkuthakkali (Siddha/Tamil). Its common name in English is Wild Capegooseberry. There are between seventy-five and ninety species in the Physalis genus, and many of them have reported ethnopharmacological and ethnomedicinal applications, leading to the traditional medical systems(5).

Figure 3*. Physalis minima*

In Indonesia, we often encounter this fruit plant in many areas, even growing wild in empty land in yards. This fruit will grow anywhere as long as the soil is not muddy, both lowlands and highlands. This plant, which only grows as high as 10 to 80 centimeters, comes from tropical America. It was brought in by the Spaniards during the seventeenth century colonial era, when the VOC people were still rampant competing

with the Spanish and Portuguese to colonize our nation. It is suspected that the people who first became acquainted with this innate plant were the Moluccas (who called it boba leaves), and the Minahasa (who called it leietokan), because they were the first to be colonized by the Spanish colonizers from the Philippines. From Maluku, some later introduced it to Jakarta (as cecenet), Jepara (as ceplukan), Bali (keceplokan), and Lombok (dededes). From Jakarta, they were introduced to East Sumatra (as catfish)(6).

In-Vitro Thrombolytic Activity of Methanolic Extract of *Physalis minima* Linn

Methanolic extract of *Physalis minima* Linn show significant thrombolytic activity 52.22% in Wistar Albino Rats weighing 200-250g, compared to 100 µl Streptokinase , a positive control (30,000 IU), that showed 79.6 % lysis of clot. In this research work plant extract exhibited flavonoids, steroids, alkaloids, tannins and phenolic compounds. These phytochemicals may be responsible for its thrombolytic activity(7).

The above article has similar result with another in vitro study comparing streptokinase (positive control) to the methanol extract of *Physalis minima*. This extract showed a highest human clotted blood lysis at 80 µg/mL produced 43.27 ± 1.21 percentage, while SK at 100 µL (30,000 IU) showed percentage clot lysis of84.45 ± 0.78 percentage(8).

Antioxidant and Antiinflammatory activity of *Physalis minima*

*P.minima*is used to treat skin problems in Bangladesh, and its root juice is used as a diuretic(9,10). *P.micrantha* is a bitter tonic, palatable, diuretic, and laxative that may help with inflammations, antigonorrhea, spleen enlargement, and gastrointestinal problems (11,12). For stomach discomfort and constipation, fruits and flowers are employed. Herb paste is used to treat ear problems. In the production of sharbat, ripe fruits are utilized. The Malay population in Malaysia consumes a decoction of the whole plant as a cancer treatment. To treat fever, the mashed entire plant is mixed with palm wine(5).

A in-vitro trial to evaluate the potency of antiinflammation resulted in that MEPM showed inhibition of protein denaturation by 12.01, 31.45, and 56.70% at 125, 250, and 500 µg/mL, respectively. The standard ASA (Acetyl SAlycyl Acid) showed inhibition of protein denaturation of 78.92, 86.36, and 97.22% at 125, 250, and 500 µg/mL, respectively. Phytochemicals, including alkaloids and glycosides, are valuable sources of antiinflammatory agents(5).

In this study also, MEPM evaluated % DPPH radical scavenging activities of 10.88, 20.89, 33.05, 40.64, and 52.70% at 31.25, 62.5, 125, 250, and 500 µg/mL, respectively. The standard ascorbic acid (Vit C) showed %DPPH radical scavenging activities of 51.25, 65.62, 76.62, 81.62, and 90.37% at 31.25, 62.5, 125, 250, and 500µg/mL, respectively. The extract and standard produced a concentration-dependent radical scavenging effect (**Table 3**). The IC50 of the MEPM and standard were 4.76 and 0.55 µg/mL(5).

CONCLUSION

Physalis minima has its potency to be explored as an alternative treatment to stroke ischemic. Firstly *P.minima*tends to thrombolytic clot in case of thrombosis in the stroke ischemia. Secondly, *P.minima*has an effect of antioxidant and anti-inflammatory that is useful in acute stroke ischemia.

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