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TITLE:

**PREPARATION OF HONEY-EFFERVESCENT
TABLETS FROM BEE POLLEN EXTRACTS**

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ABSTRACT

Pollen is a mixture of nectar, and pollen from different flowers, enzymes, and saliva that bees produce spontaneously. Bee pollen is one of the most nutritious bee products due to its high levels of essential nutrients such as proteins, polysaccharides, polyphenols, lipids, minerals, and vitamins. It has a far-reaching, beneficial effect on medicine and health, providing protection against numerous ailments like diabetes, cancer, infectious disorders, and cardiovascular disease. Pollen from bees is often cited as a healthy and affordable food option. Though bee pollen has been studied for its effects on cancer and skin conditions, its primary usage in clinical trials has been for the treatment of allergies and prostate diseases. Studying the effervescence time, pH, and solubility of a manufactured effervescent tablet containing bee pollen extracts is the primary goal of this investigation. With stingless bee pollen crude and non-pulverized as the major raw materials, extracts were made using the agitation method to create honey-effervescent tablets. For 48 hours at 40 degrees Celsius, bee pollen from stingless bees was dried in an oven. The changes in its properties, such as its moisture level, water activity, and surface stickiness. Extracts of bee pollen, 1.44 grams of citric acid, 3.44 grams of sodium bicarbonate, and 1.65 grams of tartaric acid make up the effervescent tablets. Wet granular formulations showed higher hardness and better flowability, while directly compressed tablets had a better effervescence duration and improved solubility. This easy and practical technique produces bee pollen-effervescent pills that are of consistent quality, highly soluble, have a low pH, need a short effervescence time, and are easy to take.

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CHAPTER 1

BACKGROUND

1.1 Introduction

Bee pollen contains fructose, glucose, and other sugars that the body can absorb. It is made from pollen that the bees collect as they fly from flower to flower. Bee pollen could contain bee saliva. Bee pollen is highly nutritious and intense, with a mature heat yield of approximately 12560 joules per kg (Jieweizhang, 2013). Bee pollen is widely available in health food stores. If you are allergic to pollen, you may end up with more than you bargained for. Bee pollen, like ragweed and other plants, can cause severe allergic reactions such as itching, redness, shortness of breath, hives, swelling, and anaphylaxis. Bee pollen can cause excessive bleeding when combined with certain blood thinners, such as warfarin. If you are taking prescription or over-the-counter medications or herbal supplements, consult your doctor before taking bee pollen. Because bee pollen is an untested treatment, there is no standard dose. Some herbalists recommend bee pollen for improving athletic performance, reducing allergies and asthma, and alleviating the side effects of chemotherapy (Olczyk et al., 2016). However, children and pregnant women should avoid bee pollen. If a woman is breastfeeding, she should avoid touching her skin with bee pollen.

Honey is the raw material used to make an effervescent tablet. Honey contains a variety of ingredients, including raw honey, bee pollen, and propolis. This project will concentrate on the raw material, bee pollen, a by-product of honey. According to the study, excipients, which are inert pharmaceutical ingredients used in product formulations, are found in bee pollen. It contributes to the manufacturing process by protecting, supporting, improving stability, or increasing bioavailability. The effervescent tablets made from bee pollen show that a waste product can be turned into a useful product. It also retains the nutrients and flavor of bee pollen, which aids in the development of a wide range of flavor profiles for effervescent foods. It increases drinking interest by including flavoring sweetness, and coloring agents for good taste, as the effervescent tablet dissolves easily in water, becomes hot and cold, and can produce a carbonated beverage after dissolving (Jieweizhang, 2013).

Bee pollen is extremely nutritious because it is high in vitamins, minerals, and antioxidants. Reduced inflammation, improved immunity, menopausal symptoms, and wound healing have all been linked to bee pollen and its constituents. An agitation process is a technique for obtaining bee pollen. It is recommended as the best extraction method for extracting the highest concentration of antioxidant principles from bee pollen samples (Rzepecka-Stojko et al., 2012). The agitation process does not expose the pollen sample to high temperatures for an extended period of time, which is advantageous because heating bee pollen at high temperatures during processing may result in the formation of Maillard products from these carbohydrates. Effervescent tablets are available in solid and liquid forms (Jieweizhang, 2013). Solid preparation is required for this project to produce effervescent tablets that are easy to transport and distribute quickly in water, with high bioavailability benefits, and an effective component that is easily absorbed by the body due to the presence of special additive disintegrants that promote disintegration (the breakage of a tablet into small fragments when in contact with a liquid medium such as water). In cold water, effervescent disintegration occurs quickly, assisting absorption by the body and making it easy for the consumer to take and carry.

1.2 Literature Review

1.2.1 Stingless Bee Pollen

Bee pollen can be extracted and used as an active agent by using it as a raw material. It is high in nutrients and beneficial to our health. For example, bee pollen contains antioxidants that can strengthen our immune system and anti-inflammatory drugs, which can reduce inflammation in the body, such as redness, swelling, and pain (Lawag et al., 2021).