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Acceptance of Type 2 Diabetes Patients in *Veitchia merrillii* Fruits (Bunga de Tsina) as an Alternative Medicine in Lowering Blood Sugar Level

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Abstract: ***The study is all about the Veitchia fruit also known as Bunga De China in the Philippines. The people living in Aduas Sur, Nueva Ecija, Philippines believed that Veitchia fruit can lower the blood sugar level of an individual who is suffering from Type 2 Diabetes. The researcher became interested to find out if there is a scientific basis that Veitchia fruit can lower high blood sugar level. Based on the phytochemical test result, Veitchia fruit contains Alkaloids, Saponins, Reducing Sugar, and Cardiac Glycosides which is good for the body of an individual with Type 2 Diabetes. The study also found out that the people with Type 2 Diabetes in Aduas Sur, Nueva Ecija, Philippines highly believed in the effectiveness of the fruit. The researcher recommends a further study of the fruit by isolation of individual phytochemical constituents and subjecting it to drug designing will definitely give fruitful results in phyto pharmaceutical.***

Keywords: Veitchiamerrillii, Alkaloid, Saponins, Reducing Sugar, Cardiac Glycosides, T2D

1. Introduction

According to the World Health Organization (WHO), diabetes is a chronic metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads overtime to serious damage to the heart, blood vessels, eyes, kidneys and nerves. The type 2 diabetes usually occurs among adults when the person's body becomes resistant to insulin or does not make enough insulin. For the past three decades the occurrence of type 2 diabetes has risen dramatically in countries of all income levels. The Type 1 diabetes also known as juvenile diabetes or insulin dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin by itself. Based on World Health Organization data, about 422 million people worldwide have diabetes and majority are living in low and middle-income countries. WHO also reported that about 1.6 million deaths are directly attributed to diabetes each year. The couple number of cases and the prevalence of diabetes have been increasing over the past few decades.

Figure 1: The Veitchia Fruit

Figure 2: The Veitchia Tree

In 2016, the World Health Organization profileda number of deaths in the Philippines attributable to high blood glucose was 19,560 from ages 30 – 70+ years old mostly came from lower middle-income group.

Many diabetic patients in the lower middle group cannot afford to buy their medicine. They seek an alternative medicine to treat their condition. In a certain barangay in Cabanatuan City, Nueva Ecija uses Veitchia fruit (Photograph 1) in treating high blood sugar level.

Veitchiamerrillii also known as bunga de chinais anative Philippine palm growing up to 6 to 10 meters high, with a solitary and slender trunk, 15 to 0.2 meter in diameter, marked with rings and leaf scars. The fruit of veitchia is used by native filipinosas masticatory or "nga-nga" for chewing when ripe, but it is an inferior substitute for betel-nut. The veitchia trees are used in giving glow in parks, gardens, offices, among others.

The researcher wants to find the efficacy of veitchia fruit in treating high blood sugar level by knowing the substances present on it and the level of acceptance of patients to the said fruit in lowering high blood sugar level.

2. Methodology

The Veitchia fruits were gathered from Aduas Sur, Cabanatuan City, Nueva Ecija, Philippines. The samples were brought to NEUST chemistry laboratory for phytochemical screening to determine the substance present on it.

Fifty diabetic patients were used in the study to know the level of their acceptance to veitchia fruit as an alternative medicine in treating their diabetic condition.

3. Results and Discussion

Table 1: Phytochemical Test Result for Crushed Veitchia Fruit

Phytochemical Screening	Result	Interpretation
Alkaloids	White precipitate	Positive
Saponins	Formation of soluble emulsion	Positive
Reducing sugars	Red-brown precipitate	Positive
Cardiac glycosides	Browning interface	Positive

Table 1 shows the result of the phytochemical test of Veitchia fruits. As a result of the phytochemical screening, alkaloids, saponins, reducing sugar, and cardiac glycosides were present in the crushed Veitchia fruits.

An alkaloid is a class of organic compounds made up of carbon, hydrogen, nitrogen, and usually oxygen that are often derived from plants. Alkaloids are a muscle relaxant. According to Kurek (2019), alkaloids occurred to be extremely important for human beings for ages, besides that they are secondary metabolites. Alkaloids exhibited strong biological effects on animal and human organisms in very small doses. The presence of Alkaloids isnot only in human daily life in food and drinks but also in the stimulant drugs. Alkaloids has an anti-inflammatory, anticancer, analgesic, local anesthetic and pain relief, neuropharmacologic, antimicrobial, antifungal, and many other activities. Alkaloids are practical as diet ingredients, supplements, and pharmaceuticals, in medicine and in other applications to human life.

Saponins are substances can be found in plants that foam up when shaken in water, similar to detergent. Every saponin consists of a sugar group linked to either a steroid or triterpene group. It has a bitter flavor and are found in oats, legumes, potatoes, spinach, tomatoes yucca, ginseng and alfalfa sprouts. A few saponins are toxic in large doses, but most saponins are safe and may be beneficial for the health. Saponins may reduce elevated cholesterol levels by forming complexes with cholesterol and bile acids, which prevents them from being absorbed in the small intestines. The cholesterol and bile acids are excreted in the stool, which lowers cholesterol levels in the blood and liver. Saponins may decrease the risk of cancer. In a 2004 study published in "Journal of Medicinal Food" claimed that colon, breast, uterine and prostate cancer rates are lower in countries where inhabitants consume large amount of legumes. This may be because of the immune system modulating effects of saponins that increase anti-tumor activity in the body. The incitement of bile acid secretion in the intestinal tract, and antioxidant activity may also contribute to a reduced risk of cancer.
Reducing sugars are those that can donate ions to other molecules. It helps to prevent weight gain and chronic diseases.

According to World Health Organization, reducing sugar intake lowers specifically the risk of developing overweight and obesity, and in turn in developing diabetes. It also has a significant effect on lowering dental caries.

In the Medline plus article defined the cardiac glycosides as medicines for treating heart failure and certain irregular heartbeats. They are one of several classes of drugs used to treat the heart and related conditions.

Cardiac glycosides help heart to beat more efficiently. This means blood gets more oxygen and nutrients to the body cells. Cardiac glycosides function by acting directly on the cell membranes of heart fibers. They rise the contraction or pumping strength of the heartbeat. This is referred to as positive inotropic action wherein heart can then pump more blood per beat through the body.

Based on the result of phytochemical testing, there is a scientific basis that Veitchia fruit can lower high blood sugar level.

Table 2: Profile of the Respondents

Demographic	Frequency	Percentage
Age		
41 – 45	3	6
46 – 50	5	10
51 – 55	10	20
56 – 60	12	24
Over 61	20	40
Gender		
Male	25	50
Female	25	50
Job Status		
Employed	15	30
Unemployed	35	70

Table 2 shows that 40% of the respondents are from over 61 years old. In the 2014 prevalence estimates published by the International Diabetes Federation, it is estimated that there are 3.2 million cases of T2D (Type 3 Diabetes) in the Philippines with a 5.9 percent prevalence rate in adults between the ages of 20 –79 years old.

In terms of gender, the respondents were equally distributed where 50 percent were males and 50 percent were females.

According to Gerry Tan (2015), the highest prevalence rate was found among the richest in the wealth index, those living in urban areas, and those from 60 – 69 age groups of both sexes.

In relation to job status, most of the respondents are unemployed. According to Dynahealth (2017), men unemployed for more than a year were 1.6 times more likely to have prediabetes and 2.6 times more likely to develop type 2 diabetes, even after adjustment for education, lifestyle

factors and BMI (Body Mass Index). In women, the risks reduced after adjustments for lifestyle factors and BMI.

Based on the unstructured interviews done by the researcher, all of the respondents believed that by swallowing one Veitchia fruit everyday can lower their high blood sugar level. The respondents have high faith on the effectiveness on its fruits.

4. Conclusion

The researcher concludes that the physiologically active components of crushed Veitchia fruits were alkaloids, saponins, reducing sugars and cardiac glycosides. The medicinal potency of crushed Veitchia fruits can be linked with treatment to diabetes, high blood cholesterol, congestive heart failure and cardiac arrhythmia.

5. Recommendations

The researcher recommends the following for further study:

1) Undertake animal experimentation and administration of the Veitchia fruit for the determination of the helpful and adverse effects of the sample;
2) Undertake further studies for the medicinal potency of Veitchia Palm fruit;
3) Isolation of individual phytochemical constituents and subjecting it to drug designing will definitely give fruitful results in phyto pharmaceutical; and
4) Use other respondents from different places of Cabanatuan City, Nueva Ecija, Philippines to test the efficacy of Veitchia fruit in lowering high blood sugar level.

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