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ENERGY STIMULANT ACTIVITY TEST OF PAPAYA LEAF EXTRACT THROUGH GLUCOSE UPTAKE RATE APPROACH

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ABSTRACT

Food and beverage that serve to increase energy in the body are increasingly being produced. This is related to the composition of the energy stimulant components present in the food product. The purpose of this research is to determine the effectiveness level of papaya leaf extract related to its function as energy stimulant. The test method was performed by approaching the rate of uptake of blood glucose in vivo in animal test. Papaya leaf extract is suspected to contain carpain alkaloid compounds. From the test results note that papaya leaf extract has a lower level of effectiveness of stimulants than caffeine. This is based on the ability of papaya leaf extract compounds with a standard dose (3 mg) is low or slower in increasing the rate of glucose uptake. Papaya leaf extract can increase the rate of glucose uptake but by using high doses (9 mg).

Keywords: stimulant, papaya leaf extract, carpain, caffeine, glucose uptake

INTRODUCTION

The development of the current era resulted in more full community activity and demanded them to get energy faster. Foods consumed as usual (such as carbohydrate foods) can not produce energy in a short time because it needs a digestive process that takes a long time, so there is a need for a supplement so that nutrients in food can be absorbed and produce energy faster. One of the supplements is in the form of energy drink. Energy drinks contain alkaloid compounds such as caffeine that serves as a stimulant to accelerate the absorption of nutrients. According to Nurachman (2004), stimulant compounds work by blocking adenosine receptors. As it is known that adenosine if bound to nerve cell receptor effect lowers the activity of nerve cells. This happens as long as a person sleeps. As a result of the similarity of the caffeine molecule structure to the adenosine structure, caffeine can be bound to the receptor but does not have a decreasing effect on nerve cell activity. Due to the nerves working continuously, this causes the release of the hormone epinephrine. If this condition persists, it results in some effects, such as a higher heart rate, increased blood pressure, increased blood flow to the muscle, blood flow to the skin and internal organs decreases, and the release of glucose by the liver increases.

In addition to caffeine compounds, alkaloid compounds that have the same function as a stimulant are carpain compounds. Karpain supposedly has the ability to stimulate the formation of energy in the body. Scientifically, Roth and Lindolf in South American Medicine Plants (2002) called papaya leaves contain karpain, active compounds that affect the heart activity, reduce pressure in blood vessels, reduce the frequency of uric pulse, and peluruh urine. Alkaloids are usually obtained by extracting the acidic water-based material. It aims to dissolve as salt, then the material liberated with sodium carbonate and free base is extracted with an organic solvent such as chloroform and ether (Robinson, 1995). Caffeine and carpain have some similarities, such as the similarity of alkaloids and stimulating energy formation in the body. It is possible in addition to utilizing caffeine, energy drink processing can also utilize karpain as a compound stimulannya. If carpain can be an alternative compound stimulant, it will increase the potential of papaya as a functional food commodity. From an economic point of view, karpain

utilization is also very beneficial because papaya sap is easier and cheaper to obtain than tea, coffee and tobacco plants.

Papaya plant is a plant that is widely studied today because almost all parts of the plant can be utilized both the leaves, sap, seeds, roots, stems, and fruit. Papaya is a Caricaceae Carica family of plants that are herbs derived from tropical America and suitable also for planting in Indonesia (Rahayu and Tjitraresmi, 2016). The number of papaya commodities that exist in Indonesia is not offset by its processing into high value food products. Most papawas are consumed without going through the previous processing. Part of the sap is considered to be an unfortunate part, even in the sap contained various beneficial active compounds. Therefore, the utilization of carpain compounds in papaya sap is one form of increased value of the papaya commodity.

To prove whether the carpain compound is quite appropriate to be used as an alternative energy stimulant that can be applied in food products, then the special testing of carpain compounds that are commonly found in papaya sap. One such test is to use a measurement approach of upteke glucose in blood. The method used is the method of biological testing (In Vivo) by using animal trials. The purpose of this research is to determine the effectiveness level of papaya leaf extract related to its function as energy stimulant

MATERIALS AND METHODS

Materials

The materials used in this study were papaya leaf, benzine, 95% ethanol, HCL 5 M, 15% NaOH, chloroform, filter paper and aqueads dragendorff reagent. The tools used in alkaloid extraction are beaker glass, magnetic stirer, glass funnel, separating funnel, rotary evaporator, pH meter, dropper drop, volume pipette, and sockhlet while the tools used in biological testing are Blood Glucose Test Strips, Blood Glucose Test Meter Accutrend

Methods

The experimental design used was Completely Randomized Design (RAL) 1 Factor is extract of alkaloid compound which is condensed. The mice used were 10 Wistar species with the treatment as the following table:

Table 1. Combination of Treatments

Mice Group	Treatments
Control	None
I	Caffeine treatment (dose of 3 mg/kg body weight)
II	Papaya leaf extract treatment (dose of 3 mg/kg body weight)
III	Papaya leaf extract treatment (dose of 3 mg/kg body weight)
IV	Papaya leaf extract treatment (dose of 3 mg/kg body weight)

Karpain Extraction from Papaya Leaf

Extracting ingredients that have been destroyed with petroleum benzine to remove fat. Extracted with 95% ethanol and concentrated. The concentrated ethanol extract was extracted with HCL 0.5 N. The acid solution was treated with 15% NaOH to pH 10 then extracted with chloroform. Chloroform extract contains secondary and tertiary alkaloids. While the water phase contains quaternary alkaloid.

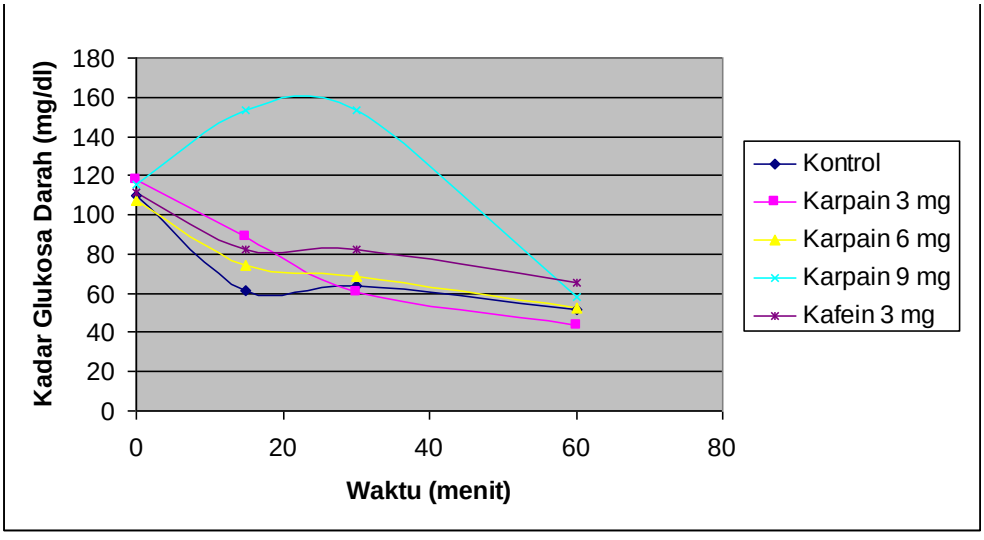
Blood Glucose Measurement

Preparation of caffeine and crude extract of carpain compounds at a dose of 50 mg / kg body weight. Prepare 10 test animals, mark the animals into 5 groups based on the dose of the stimulant compound (caffeine and carpain). Perform a period of adaptation in mice for 7 days.

Measure blood glucose levels before treatment. Perform sonde process to test animal. With the frequency of time every 20 minutes (up to 80 minutes) was measured again blood glucose levels of animal testing

RESULTS AND DISCUSSION

In this test the alkaloid compound is obtained through the extraction process. Maldoni (1991) isolated the alkaloids by extracting the soxhlet of crushed material with petroleum ether to remove fat, then extracted with ethanol and concentrated. The concentrated ethanol extract was extracted with HCL 0.5% N. The acid solution was treated with 15% NaOH to pH 10 then extracted with chloroform. Chloroform extract contains secondary and tertiary alkaloids. While the water phase contains quaternary alkaloid. The results of the isolate extract were then tested for their stimulant effects in terms of their ability to influence changes in blood glucose levels after they were given to mice. Compounds obtained from extraction and isolation are carpain compounds extracted and isolated from the papaya leaf. The experimental results of this study are as follows:



Picture 1. Graph of blood glucose measurement against time with alkaloid sample

From the graphic images of changes in blood glucose levels over time can be seen that there is only one graph that forms a mountain pattern or increased blood glucose levels before then decreased. The graph is a change in blood glucose levels over time caused by the addition of high-dose carpain compounds, which is 9 mg. The other four graphs do not show the desired stimulant graph pattern. From the figure it is also known that caffeine compound isolates do not provide patterns of increased blood glucose levels at the beginning of time. Factors that affect the results of measurements of changes in blood glucose levels after administration of isolates of caffeine compounds is a dose of caffeine is too small so that the effect of stimulants can not work optimally and it causes the process of glycogen reshuffle in the liver run more slowly.

The treatment of isolates of carpain compounds with three different doses has the objective of knowing the proper dosage of carpain compound in order to obtain the stimulating effect of glucose release from the liver to the bloodstream. From the test results obtained that the administration of compounds carpain with a high dose of 9 mg will provide stimulant effects in rats try. This can be seen from the pattern of graphs that show increased levels of glucose at the beginning of time. The increase in blood glucose levels is a glucose compound from the result of a glycogen reshuffle in the liver and also because of inhibited insulin function, whereas the decrease indicates the rate of cell glucose uptake. The glucose absorbed by the cell is then metabolized to produce energy.

CONCLUSSION

From the above research found that carpain compounds have a lower level of effectiveness of stimulants than caffeine compounds. This is based on the ability of carpain compounds with a standard dose (3 mg) that is low or difficult in increasing glucose uptake rate. Carpain compounds can increase the rate of glucose uptake but by using high doses (9 mg).

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