



# The Effect Of Mbilimbi On The Blood System

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## Introduction:

Bilimbi is a tropical fruit with scientific name *Averrhoa bilimbi* and a family of oxalidaceae. It is composed of moisture, protein, ash, fibre, thiamine, ascorbic acid, calcium, niacin, phosphorus and iron. The juice of bilimbi has high concentration of oxalic acid with pH of 4.47. The fruit is used as an appetizer and is used in preparation of juice and wine.

Oxalic acid from bilimbi contains oxalate ions which are very reactive. This ion reacts with mineral ions such as  $Ca^{2+}$  and  $Fe^{2+}$  in the blood to form precipitates. The precipitates form small solid crystals which transported along the blood vessels. In most cases oxalic acid (Ethanodioic acid) react with  $Ca^{2+}$  to form insoluble Calcium Ethanodiote. This precipitates out; blocking blood vessels and so causes muscle cramps. In extreme cases, over a long period of time the Calcium Ethanodiote builds up in the kidney forming hard rock like crystals known as **kidney stones**. These stones may block very fine kidney blood vessels and sometimes may even pass out in the urine.



## Methods:

In our research to investigate the effects of bilimbi in the blood system rats were used as sample spacemen for the experiment on the basis that rats have similar body system to those of human being especially in circulation and digestion system.

## MATERIALS AND METHODS USED

- 6 rats
- 3 cages
- Beam balance
- 3 syringes
- 2 beakers
- 3 water bottles
- 2 kg of broiler starter
- 1 kg of bilimbi
- Pure water



Cage A contained 1 rat, Cage B contained 2 rats and Cage C contained 3 rats.

Bilimbi juice was extracted from bilimbi by squeezing the fruit.

Cage A was set as control and fed with broilers starter initial 5 grams and 50 ml of pure water each day without mixing up the food and water with bilimbi juice

In Cage B rats were fed initially with 10 grams broiler starter mixed with 5 ml of bilimbi juice and supplied with pure water without mixing with bilimbi juice.

In Cage C rats were fed initially with 15g broiler starter mixed with 5 ml of bilimbi juice and supplied with 150ml of pure water initially mixed with 3ml of juice.

The amount of bilimbi juice mixed with food in Cage B was varied up to 20ml at end of experiment.

The amount of bilimbi juice mixed with food and water in cage C was varied up to 20ml.

Urine was collected and urinalysis test was taken after each week during 28 days of the experiment.

## Results:

The concentration urine became more dilute following the increase of bilimbi in food and water. Little urine which was cloudy with brown in colour at the end of the experiment was collected from Cage B and C as the concentration of bilimbi intake was increased in food and water. From the 2<sup>nd</sup> week very little urine was formed per day and in the 3<sup>rd</sup> to 4<sup>th</sup> week urine was hardly collected from Cage B and C.

### Week 1

	CAGE A	CAGE B	CAGE C
Amount of food	5 grams	10 grams	15 grams
Amount of water	25ml	50 ml	75 ml
Amount of bilimbi juice in food	-	5ml	5ml
Amount of bilimbi juice in water	-	-	5ml
Amount of urine	2 cc per day	2.6 cc per day	3 cc per day

### Week 4

	CAGE A	CAGE B	CAGE C
Amount of food	5 grams	20 grams	25 grams
Amount of water	25ml	50 ml	75 ml
Amount of bilimbi juice in food	-	20ml	20ml
Amount of bilimbi juice in water	-	-	20ml
Amount of urine	2 cc per day	2 cc per 3 days	1.8 cc per 3 days



## Conclusions:

Results obtained signify the symptoms of kidney stones which are highly caused by the deposite of Calcium salts as one of the causes of kidney stones. Hence this implies that there is high concentration of Calcium ethanodiote in the blood which has resulted into Calcium ethanodiote salt being deposited into kidney. Due to this the oxalic acid in bilimbi has effects in the blood system by combining with  $Ca^{2+}$  ions (one of the component of blood). The product that is formed (Calcium ethanodiote precipitate) affects the blood system by blocking blood vessels and making hardship in blood circulation. In extreme cases excretory system is affected by causing kidney stones. Therefore bilimbi has effects in blood system.

## References:

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