

EFFECT OF MODERATE INTAKE OF A MIXTURE OF GARCINIA KOLA AND HONEY ON BLOOD CELLS

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ABSTRACT

A mixture of *Garcinia kola* and honey has been used for the treatment of certain conditions including dry coughs. The aim of this study was to study the effect of the mixture of *G. kola* and honey on blood cells. Twenty five rats were grouped into 5 of 5 rats each. A mixture of *G. kola* 0.16 g/kg and 0.5 ml honey was given orally to rats in Group 1 twice daily for 14 days. Each rat in Group 2 had a mixture of 0.20 g/kg *G. kola* and 0.5 ml honey for a similar period as Group 1, while Groups 3 and 4 rats had 0.24g/kg *G. kola* and 0.5 ml honey, and 0.28 g/kg *G. kola* and 0.5 ml honey respectively. Group 5 served as the control, and was not administered with the mixture of *G. kola* and honey. The result did not reveal any significant difference in the packed cell volume (PCV), leucocyte differential count and the total leucocyte count in the control and test animals. Moderate intake of the mixture of *G. kola* and honey does not affect production of leucocytes and red bloodcells.

Key words: *Garcinia kola*, honey, blood cells.

INTRODUCTION

Garcinia kola is widely consumed habitually, and used as traditional remedy for various diseases in Nigeria. It is a medium size tree that grows up to 12 m in height. It has straight bole with somewhat drooping branches (Iwu et al., 1999). They are subglobose, reddish yellow and about 2.5 inches in diameter, containing 2 to 4 ellipsoid, brown seeds 3 to 3.5 cm long and 1.5 cm broad embedded in an orange – coloured pulp (Key et al., 1964). The use of *Garcinia kola* for the treatment of cough and liver disorders in folkloric medicines may be related to its phytochemical content. Hence, moderate consumption of the fruit should be encouraged as an antioxidant supplement (Ogunmoyole et al., 2012).

Chemical substances derived from plants have attracted wide research interests because of their versatile applications in medicine. Medicinal plants are very rich sources of drugs used in traditional medicine, modern medicines and food supplements. They also form the chemical basis for synthetic drugs because of the secondary metabolites contained in them (Ncube et al., 2008). *G. kola*, sometimes called bitter kola is a widespread tree of the evergreen

forest valued in Nigeria for its medicinal nuts. This has led to its exploitation in the natural forests in recent times (Farombi et al., 2005).

The nut is chewed extensively in Nigeria for several reasons such as a masticatory to cause nervous alertness and for the treatment of coughs and throat infections (Farombi et al., 2005). The stem bark of *G. kola* contains a complex mixture of phenolic compounds (Etkin, 1981), biflavonoids, xanthenes, benzophenone, kola flavanone, and garcinia flavanone all of which have antimicrobial activity (Iwu and Igboko, 1982). *G. kola* has also been used as a purgative and as an antiparasitic agent. It has anti-inflammatory, anti-bacterial and antiviral properties. It has also been used for the management of sickle cell disease and as a poison antidote (Kabangu et al., 1987; Egunyomi et al., 2009).

Honey is a sweet, viscous fluid produced by honeybees derived from the nectar of flowers. It is a mixture of sugars and other compounds (Riddle, 2001). It also contains trace amounts of several vitamins and minerals (Standifer, 2007), which include fructose: 38.0%, glucose: 31.0%, sucrose: 1.0%, water: 17.0%, other sugars (maltose, melezitose): 9.0%, ash: 0.17%, others: 3.38% (Erguder et al., 2008). It also contains small amounts of antioxidants, including chrysin,

pinobanksin, vitamin C, catalase and pinocembrin (Martos et al., 2000).

Honey has been effective as an anti-bacterial, anti-inflammatory agent as well as an immune-stimulant, antiulcer and wound/ burn healing agent (Fiorani et al., 2006). Honey has long been used for the treatment of some medical conditions such as gastric disturbances, ulcers and asthma. Honey has been used as an antibiotic and as an antiseptic (Grotte, 1998). It promotes wound healing and good circulatory system (Pand, 2014). It has been used in the treatment of chronic rhino-sinusitis (Philip, 2014), and for the treatment of sore throat and cough (Chris, 2014) as well as an ointment for rashes and burns (Vanghn, 2001).

In recent times, traditional medical practitioners have combined oral administration of the mixture of honey with *Garcinia kola* in the treatment of certain ailments particularly dry coughs. Its effects on the kidney and the liver have been investigated (Avwioro et al., 2014), but not much work has been done on its effect on the blood cells when taken moderately twice daily for 14 days.

MATERIALS AND METHODS

Preparation of *Garcinia kola* powder

Five dry nuts of *G. kola* weighing between 5 and 10 g were obtained from Aleshinloye market at Ibadan, Oyo State, Nigeria in September, 2014. The nuts were rinsed with tap water, dried and weighed. They were further dried in an open air oven (Gallenkamp) at 56°C for 24 h. The outer coverings were removed, and the nuts cut into tiny bits of about 1 mm in thickness with a sharp knife and further dried for 12 h at 56°C. They were milled to a fine powder. The powder was weighed, labeled and kept at room temperature for the experiment.

Procurement of honey

About 250 ml pure honey was obtained from a supermarket at Abraka, Delta State, Nigeria. It was dispensed into 5 ml containers and kept at room temperature

Administration of the mixture

Twenty five Wistar albino rats weighing 170±10 g were obtained from the Animal

House, Faculty of Basic Medical Science, Delta State University, Abraka and acclimatized for 14 days. They were grouped into 5 of 5 rats each. Each rat in Group 1, had oral administration of a mixture of *G. kola* 0.16g/kg and 0.5 ml honey twice daily at 8.00 am and at 6.00 pm for 14 days. Each rat in Group 2 had a mixture of 0.20 g/kg *Garcinia kola* and 0.5 ml honey for a similar period as Group 1. Groups 3 and 4 also had 0.24 g/kg *G. kola* and 0.5 ml honey, 0.28 g/kg *G. kola* and 0.5 ml honey respectively. Group 5 served as the control, and was not administered with the mixture of the *G. kola* and honey. All the tested groups and control rats had access to water and feeds ad libitum. The rats were sacrificed on the 15 th day, and blood was collected into ethylenediamine tetraacetic acid (EDTA) bottles.

Full blood count

The blood samples were mixed gently for about 30 s, and PCV was performed with the haematocrit centrifuge (Hawksley) and read with a Haematocrit reader. Total white blood cells count was determined manually by making a 1:20 dilution of blood with Turks fluid (tinged 1% acetic acid). Few drops of the mixture were placed on an improved Neubear counting chamber, and cells were counted according to standard practice. Blood films were also made on slides, allowed to dry and stained with Leishman stain. The smears were examined with the oil immersion objective and 200 leucocytes were counted. The different leucocytes were expressed as a percentage (Table 1).

RESULTS AND DISCUSSION

Blood picture

The red blood cell picture was normal when compared with the control sample. Recent evidence suggests that a mixture of *G. kola* and honey administered by traditional medical practitioners has been effective against a wide range of ailments particularly dry coughs. The quantity given is usually one nut *G. kola* with about 5 ml honey taken twice a day for 5 to 7 days. Not much literature is available on the combination of these local products in the treatment of diseases.

However, 0.5g/kg *G. kola* was administered to Wistar albino rats by Nanyak et al. (2013) but did not find any evidence of degenerative changes or cyto-architectural distortions of the

Table 1. Full blood count.

G. kola and honey	PCV (%)	TWBC (/ml³)	N	L	M	E	B
0.16 g/kg and 0.5 ml	42±2	3.500±500	49±3	49±2	2±1	0±0	0±0
0.20 g/kg and 0.5 ml	43±2	3.800±300	50±3	49±2	1±1	0±0	0±0
0.24 g/kg and 0.5 ml	44±3	3.400±400	48±2	49±3	2±1	0±0	0±0
0.28 g/kg and 0.5 ml	44±1	3.600±400	51±2	48±2	1±1	0±0	0±0
Control	44±3	3.600±300	49±3	49±2	2±1	0±0	0±0

Key: PCV- Packed cell volume, TWBC- Total white blood cells count, N-Neutrophils L-Lymphocytes, M- Monocytes, E- Eosinophils, B- Basophils, RBC-Red blood cells.

hepatic tissue. They concluded that intake of *G. kola* does not cause distortion to the liver. The result of their experiment is similar to that of this study, where the study did not find changes between the tests and the control in the blood cells of the rats studied although what was administered was about half of what was administered by Nanyak et al. (2013).

The effect of the mixture of aqueous *G. kola* extract and honey on bacterial growth has been reported by Akinnibosun and Itedjere (2013). They observed that the combination of aqueous *G. kola* extract and honey was more effective in inhibiting bacterial growth than the separate use of aqueous *G. kola* extract and honey. There are conflicting values of the LD₅₀ of *G. kola*. Udenze et al. (2012) reported 6.74 g/kg, Essien and Nwafor (2014) reported 1±0.067 g/kg, while Kagbo and Ejebe (2009) found the 24 h LD₅₀ to be 358 mg/kg. It was on this basis that the study restricted the dosage given to the rats to a maximum of 0.28 g/kg, equivalent to the weight of one nut of *G. kola* per adult human according to what is prescribed by the traditional medical practitioners.

Honey is commonly prescribed for the treatment of several ailments as well as a food additive. It has been used for wound healing, and to improve the circulatory system (Pand, 2014), while Philip (2014) used it for the treatment of chronic rhinosinusitis, Chris (2014) used it for the treatment of sore throat and cough, and as an ointment in cases of rashes and burns (Vanghn, 2001). While there is evidence that the mixture could be used for the treatment of certain disease conditions, its level of toxicity to blood cells has not been determined. It is obvious that excessive intake of drugs and other products have adverse effects, sometimes lethal, this study is limited to the recommended dosage by the traditional

medicine healers of one nut eaten over a period of about 30 min followed with about 5 ml of honey for 5 to 7 days. The study intentionally extended the duration of this research to two weeks so that the effect of the mixture on the cells of the blood when its use is prolonged could be determined. The study concludes that moderate intake of a mixture of *G. kola* and honey for 14 days has no adverse effect on blood cells.

Conflict of interests

The authors have not declared any conflict of interests.

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