



Ameliorative Effect of *Mangifera indica* (Mango) and its Effects on Some Haematological Profile of Male Brief Psychotic Disorder Subjects of Enugu State

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ABSTRACT

This study investigated the ameliorative effect of *Mangifera indica* (Mango) and its effect on some haematological profile of male brief psychotic disorder subjects of Enugu State. Thirty (30) male brief psychotic subjects were selected for this study and grouped into three (3) groups.

Results showed that *Mangifera indica* contains principle elements such as quercetin and fibers that helps the brain of psychotic subjects. On the haematological profiles, the result showed that *Mangifera indica* caused no observable effect ($P>0.05$) on the haemoglobin concentration packed cell volume, white blood cell counts white blood cell differentials and platelet counts of the psychotic subjects.

It could be deduced from this study that mango can be used to maintain the energy level of the brain and the blood volume of the psychotic subjects.

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INTRODUCTION

Mangifera indica (Mango) is a juicy fruit belonging to the genus *Mangifera*, consisting of tropical fruiting trees, which are cultivated mostly for edible fruits (Oguwike 2014). Mango comes in different shapes and sizes depending upon cultivar types. Internally, its flesh is juicy orange-yellow in colour with numerous soft fibrils radiating from its centrally placed flat oval-shaped stone (enveloping a single large kidney shaped seed). Its flavor is pleasant and rich and tastes sweet with mild tartness.

Chemical constituents of *Mangifera indica*.

They are dietary fiber (4.5%) carbohydrates (13%), total fat (1%), and vitamins such as vit. A (25.5%) Vit. E (7.5%), Vit. K (3.5%), Vit. B6 (pyridoxine 10%) Niacin (3.5%), proteins (1%). Other contents include electrolyte such as sodium (0%), potassium (3%). Minerals such as calcium (1%), copper (12%) zinc (0%) Magnesium (2%), iron (1.5%) manganese (1%).

Trace metals such as phosphorus (4%) and phyto-nutrients such as carotene- β (445 μ g)

Medical uses:

Many parts of the plants are used for various medicinal purposes. The leaves of the tree can be used to fight diabetic disease. The ethno medical practitioners recommended that diabetic subjects drink three to four glasses of fresh boiled mango leaves every morning to help cut down blood sugar. Mango fruit is rich in pre-biotic dietary fiber, vitamins, minerals and poly-phenolic, flavonoid antioxidant compounds which are known to offer protection against breast and colon cancer.

Potassium contained in Mango fruit is an important component of cell and body fluids that helps in controlling heart rate and blood pressure. Psychotic disorder is a cluster of symptoms not an illness (Arciniegas, 2015). It is sometimes described as "losing touch with reality". What is likely happening during psychosis is that the person has disruptions in their thoughts and the way they interpret their thoughts that makes it hard for them to recognize what is real and what is not real.

Symptoms and signs

- Delusions which are false beliefs that the person can't tell are false
- Hallucinations which are sensory experiences that other people don't see or can't share
- Disorganized behavior which are patterns of behavior that are unpredictable or inappropriate
- Negative symptoms which are a decrease or loss of normal functioning e.g. the person may stop expressing any emotions or they may speak any certain phrases or stop speaking altogether

Types of Psychotic disorders

- a. Schizophrenia: A very serious psychiatric condition involving delusions, hallucinations, disorganized speech or catatonic behavior, negative symptoms such as diminished emotional expression or a lack of motivation to start and keep doing goal-directed activities. Other types are:
- b. Brief psychotic disorder, psychiatric condition where you have sudden onset of psychosis that lasts less than 1 month and then goes completely into remission when you take an antipsychotic treatment. Sometimes this may be triggered by a stressful event or trauma
- c. Psychotic disorder due to underlying medical condition that affects the brain function such as Parkinson's disease, Alzheimer's disease and other dementias, delirium, head injury, Brain tumor and stroke.
- d. Substance/medication-induced psychotic disorder caused by use of or withdrawal from substances such as hallucinogens and crack cocaine and some medications (Blackburn 2005)
- e. Schizoaffective disorder (8) Schizophreniform disorder
- f. Schizotypal (personality) disorder

Causes

The American Psychiatric Association's diagnostic and statistical manual of mental disorders 5th Edition (Dsm.5) has categories of the causes

1. Schizophrenia
2. Brief psychotic disorder
3. Delusional disorder
4. Schizoaffective disorder
5. Schizophreniform disorder
6. Schizotypal (personality) disorder
7. Substance/medication induced psychotic disorder
8. Psychotic disorder due to another medical condition

Other causes of psychosis:

- i. Misuse of alcohol, prescription medications or recreational drugs
- ii. Severe head injuries (concussions and traumatic brain injury)
- iii. Traumatic experiences (past or present)
- iv. Unusually high levels of stress or anxiety (Gelder, 1983)

Virtually all plants have been discovered to have medicinal value (Olaleye et al 2000). These plants have been used as a source of various drugs to treat diseases.

Mangifera indica has been an interesting tree with varieties of uses including eating it to quench hunger. Our interest for embarking on this study is to find its ameliorative effect on psychotic subjects since it contains many fibres and its effect on some haematological indices of male psychotic disorder

MATERIAL AND METHODS

Subjects

30 young male subjects attending clinic at Neuro Psychiatric Unit park lane where selected for the study.

Experimental design selected for the study.

The 30 subjects were selected and assigned to three groups. Group A (10 subjects) is the control group consisting of apparently healthy subjects, group B and C are brief psychotic subjects constituting 10 persons.

Group B were given 2 mango fruits to eat every day for 2 weeks along with their antipsychotic drugs, group A did not receive mango fruit nor antipsychotic drugs while group C were given only their anti psychotic drugs without mango fruits.

Phytochemical Analysis of fruits

The procedure is as described by Harbourne (1973). Trease and Evans (1996). The fruit was tested for resins, calcium alkaloids, flavenoids, reducing sugars, saponins, glycosides, carbohydrates, steroids, acidic compounds, fats and oils.

Toxicity study

The LD₅₀ of extract in albino mice was determined using Lerke's method (1983). The procedure of determining the lethal dose is by increasing the concentration of the extract giving to the mice (per body weight) in each group consisting of eight (8) mice per group for five days. The concentrations used are 500mg/kg, 1,000mg/kg, 1500mg/kg, 2000 mg/kg, 3000mg/kg, 4000mg/kg and 5000mg/kg respectively.

The mortality rate was determined in a graph plotted to determine LD₅₀

Determination of haematological indices:

5ml of blood samples were collected from the cubital fossa of psychotic subjects and placed into anticoagulant (EDTA) bottles, mixed properly and placed in a sample rack for analysis. The samples that cannot be run that day were kept in a refrigerator for the next day

The haematological tests and methods

Haemoglobin concentration and packed cell volumes were done according to the haematocrit method described by Alexander and Griffiths (1993), white blood cell count, platelet count, and white blood differential were done according to visual method of Dacie and Lewis (1991)

Statistical Analysis

The results obtained in the study for Hb concentration packed cell volume, platelet count, and WBC count, and differential counts were represented as mean and standard deviation (Mean± s.d) while students t-test was used to compare the result of the control and the test. Ap-value of less than (P<0.05) or equivalent (P=0.05) was considered statistically significant.

RESULTS

Table 1: The phytochemical study of *Mangifera indica*

	Alkaloid	Glycosides	Flavenoids phenols	Carbohydrate	Calcium	Reducing sugar	Tannins	Sapnins Resins steroids terpenoids
Degree of concentration	-	++	++	+++	++	+	+	—

- Negative, + present in small concentrations

++ present in moderate concentrations

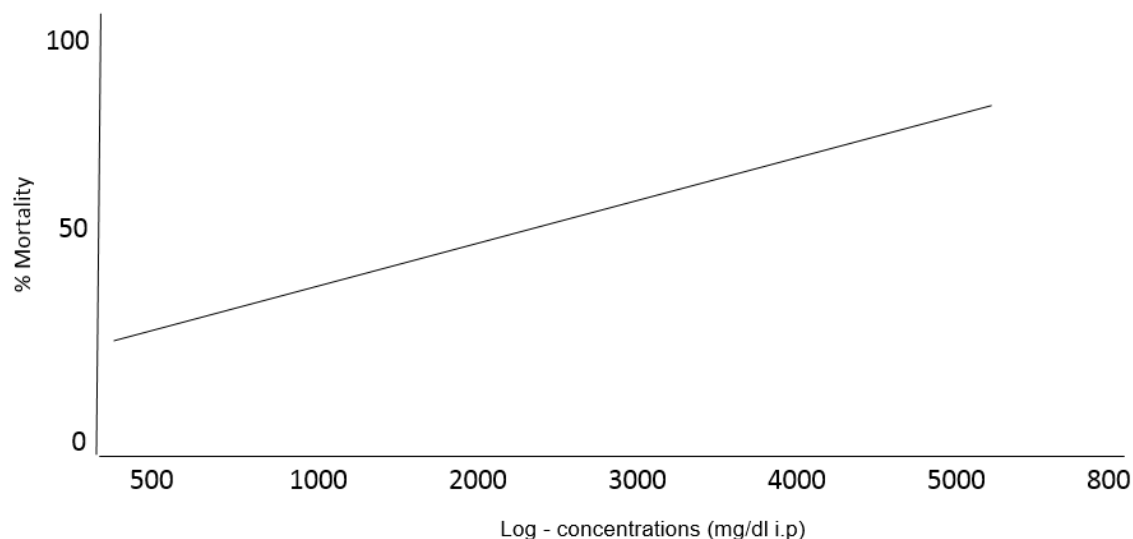
+++ present in high concentration

Table 2: Haematological profile of psychotic subjects on *Mangifera indica*

Groups	Hb g/100ml $\pm$ S.D	PCV L/L $\pm$ S.D	WBC per mm ³ $\pm$ S.D
Control subjects n = 10	15.8 $\pm$ 0.4	45.2 $\pm$ 0.6	6,570 $\pm$ 30
Psychotic subjects after eating <i>Mangifera indica</i> Grp B n = 10	15.9 $\pm$ 0.2	45.8 $\pm$ 0.3	6, 570 $\pm$ 24
Psychotic subjects without eating <i>Mangifera indica</i> Group C n= 10	15.4 $\pm$ 0.3	45.0 $\pm$ 0.2	6,570 $\pm$ 22
P value	P> 0.05	P>0.05	P>0.05

Table 3: Platelet counts and white blood cell differential counts of psychotic subjects on *Mangifera indica*

Groups	Platelet x 10 ⁹ /L $\pm$ S.D	Neutrophils % S.D	Lymphocytes % S.D	Eosinophils% $\pm$ S.D	Monocytes % $\pm$ S.D	Basophils % $\pm$ S.D
Group A Control subjects n= 10	270 $\pm$ 26.0	68 $\pm$ 3.0	30 $\pm$ 0.6	1 $\pm$ 0.2	1 $\pm$ 0.2	0 $\pm$ 0
Group B Psychotic subjects on <i>Mangifera indica</i> n=10	280 $\pm$ 23.0	69 $\pm$ 0.5	28 $\pm$ 0.3	1.0 $\pm$ 0.2	2 $\pm$ 0.1	0+0
Group C Psychotic subjects without <i>Mangifera indica</i> n=10	272 $\pm$ 18.0	67 $\pm$ 0.3	30 $\pm$ 4.0	1 $\pm$ 0.2	2.0 $\pm$ 0.1	0 $\pm$ 0
P value	P>0.05	P>0.05	P>0.05	P>0.05	P>0.05	P>0.05

**Fig 1:** Mortality study showing the effect of administering graded doses (500-800mg/kg i.p) in the mice of pulp extract of mango against the percentage mortality LD 50 is 5,000 mg/dl i.p

DISCUSSION

The study on the ameliorative effect of *Mangifera indica* (mango) and its effects on some haematological profile of male brief psychotic disorder subjects of Enugu state has been done.

The macro nutrients (chemical composition) and the micro nutrients (Table 1) composition of *Mangifera indica* confers *Mangifera indica* the natural ability to improve health conditions of male psychotic subjects. Several studies showed that phytochemicals contained in Mango play an anti-inflammatory role in several

chronic pathological disorders. The high content of carbohydrates contribute to nutrition and fruit texture, while the dietary fiber (4.5%) has some health benefits. Dietary fiber represents 1.6 to 2.5% of the edible part of the mango fruit. *Mangifera indica* is considered as one of the best brain foods. It contains fiber, Vit B6, which is essential to maintain brain function. Mango polyphenols and fiber may promote gut health through their pharmacological activities, modulation of beneficial gut microbiota.

Antioxidants presents in *Mangifera indica* like fisetin and quercetin protect brain cells from inflammation and free radical damage. The fiber content, and vitamin B6 and flavonoids contained in mango help to improve cognitive function, memory and mood due to antioxidant and anti-inflammatory properties. Also the carbohydrates and fiber contents in mango offer a combination that can help maintain energy and blood concentrations of consumers and lower serum cholesterol levels.

The haematological profile provides physiological information on a proper blood assessment. The haemoglobin concentrations and packed cell volumes of the subjects (table 2) were not increased ($P>0.05$) regardless of the high content of carbohydrate and Glucose in Mango. This is because Mango is not known to be a haemopoietic plant.

The high content of carbohydrates and sugar in the fruit of mango when consumed by these psychotic subjects (Group B) helps their brain to maintain energy and function well.

The brain is known as a complex organ that controls thought, memory, emotion, touch, motor, skills, vision, breathing, temperature, hunger and every process that regulates our body.

Each region of the brain serve a different role. The Gray matter is primarily responsible for processing and interpreting information, while the white matter transmits that information to other parts of the nervous system. The largest part of the brain, the cerebrum initiates and coordinates movement and regulates temperature. Other areas of the cerebrum enable speech judgment, thinking and reasoning, problem solving, emotions and learning.

As earlier stated, psychosis is a cluster of symptoms not a disease (Arcinegas, 2015). It is sometimes described as losing touch with reality. The person has disruptions in their thoughts and the way they interpret their thoughts that makes it hard for them to recognize what is real and what is not.

The consumption of mango by the group B individual helped them to recover fast and be able to

have a right interpretation of reality than those in group C who were only taking the psychotic drugs.

Also in table 2, the white blood cell count of subjects in group B and C were not reduced or increased ($P>0.05$) compared to their corresponding control in group A. this indicates that *Mangifera indica* has no effect on white blood cell counts. The same pattern followed in table 3 where none of the parameters measured viz, platelet count and white blood cell differential count were affected ($P>0.05$) by the consumption of *Mangifera indica*

Having noticed the principles contained in *Mangifera indica* which renders a great ameliorative effect in the fast recovery of brief psychotic subjects it is suggested in this study that the fruit should be one of the nutritional prescription when managing psychotic subjects.

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