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ACUTE AND SUBACUTE TOXICITY STUDY ON VENKARA PARPAM

(Dissertation subject)

for the partial fulfillment of the requirements to the degree of

DOCTOR OF MEDICINE (SIDDHA)

Branch VI – Nanju Noolum Maruthuva Neethinoolum

SEPTEMBER 2007

CERTIFICATE

Certified that I have gone through the dissertation, submitted by **Dr. P. PONMARIAMMAL**, Student of Final M.D.(S), Post Graduate **Branch VI – Nanju Noolum, Maruthuva Neethi Noolum** of this college and the dissertation work **"Acute and Subacute Toxicity Study on Venkara Parpam"** have been carried out by the individual only. The dissertation does not represent or reproduce the dissertation submitted and approved earlier.

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INTRODUCTION

Siddha System is one of the oldest system of medicine in India. The word “Siddha” comes from the word Siddhi, which means an object to attain perfection or heavenly bliss. Siddha generally refers to Attama Siddhi that is the 8 super natural powers. Those who attained or acheived the above said powers are known as “Siddhars”. Siddhars were saintly figures, acheived results in medicine through the practice of Yoga. There were eighteen important siddhars in olden days and they developed this system of medicine.

Origin

The origin of siddha system of medicine traces back to the submerged Lemurian continent and it was conceived and crafted by the ancient Siddhars whose principal language was Tamil. The origin of the system and the usage of medicinal plants belongs to the age of the sangam literatures as early as 3000 B.C. “Tholkappiam” and “Thirumanthiram” stands as a proof to this.

Basic Principles

Siddha science considers nature and man as essentially one. Nature is man and man is nature. Man is said to be the microcosm and Universe is the macrocosm because what exists in the world exists in man. Man is nothing but a miniature world, containing the five elements of the various principles which constitute the minerals, vegetables and animal kingdom.

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From the knowledge of the relationship between the human body and the cosmos, the great siddhars evaluated the sequence and relationship between the five boothams, mukkuttram (three humors) and Arusuvai. On the basis of this principle, they evaluated the diagnosis & therapeutics of the system. The relationship is as follows.

Arusuvai	Bootham	Muthathukal
Inippu – Sweet	Piruthvi + Appu	Vadham – Vayu + Agayam
Pulippu – Sour	Piruthvi + Theyu	Pitham – Theyu
Uppu – Salty	Appu + Theyu	Kabam – Appu + Piruthvi
Kaippu – Bitter	Vayu + Agayam	
Kaippu – Pungent	Vayu + Theyu	
Thuvarppu – Astringent	Vayu + Piruthvi	

Materia Medica

The Siddha system has three main classifications over the sources of the drug. They are

Mooligai Vaguppu	-	Plant Sources
Thathu Vaguppu	-	Metal and Mineral Sources
Jeeva Vaguppu	-	Animal Sources

The Thathu vaguppu, which deals with metals and minerals further classifed into four types. They are,

1. Ulogam (Metals)- Classes of metals and alloys, these are eleven in number

2. Karasaaram - These are 25 varieties of water soluble in-organic(Alkalies & Salts) compounds called uppu.

3. Padaanam - These are 64 varities of mineral drugs that donot dissolve in water, but emit vapour when put in fire

4. Upa rasam - These are 120 in number

Chemistry in Siddha System

In siddha system, chemistry had been found well developed into a science auxillary to medicine and alchemy. It was found useful in the preparation of medicine as well as in transmutation of basic metals into gold. The siddhars were aware of several alchemical operations divided into several process such as:

Calcination
Sublimation
Distillation
Fusion
Separation
Fermentation
Exaltation etc.

Importance of Toxicology and Toxicity Study

Toxicology is that branch of medical science which deals with poisons with reference to their sources, characters and properties etc. A poison is commonly defined as a substance which, when administered, inhaled or swallowed is capable of acting deleteriously on the body. Thus almost anything is poison.

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There is actually no boundary between a medicine and a poison, for a medicine in a toxic dose is a poison and a poison in a small dose may be a medicine.

The real difference between a medicine and a poison is the intent with which it is given. There are four main factors which modify the action of poisons. They are,

1. Quantity
2. Form
3. Mode of administration and
4. Condition of the body

In fact, these four factors are the lying boundaries between toxic property and therapeutic property of an administered drug. Hence to reveal the actual status of a drug, over the administered body, we should go for Toxicity Study of the drug. It will give a broad idea about the drug, towards its therapeutic value, lethal dose, and symptoms which they produce. Hence, the toxicity study of a drug will be the best preface for its therapeutic episode.

Toxicology in Siddha System

"Too much of anything is good for nothing" which is the actual meaning of the Tamil proverb,

"AÍÄUS «ÔÚõÀ Aªu¬® {g\õS®"

This is also expressed by Thiruvalluvar as,

"¥¼ö£´ \õUPõk® Aa]Ö® A¨£sh®
\õ» ªSzx¨ ö£°ß"

In this materialistic world each and every objects has two characters Good and Bad, which are lying invariably among them. So, whenever we go to prepare a medicine, should remove the toxins and unwanted materials from them.

In our country, toxic plants and materials were identified more than 5000 years ago, itself. In that time poisons are used with food-stuffs to kill the enemies or to steal out the property of kingdom. Poisons are also used in the weapons for hunting.

Siddhars like Agasthiyar and Bogar were knew the usage of toxins. They were well versed about the purification, lethal dose, therapeutic dose and usage of the toxins.

"Seevaka chinthamani" - a smana literature gives detail about the usage of toxic materials to kill or mesmerize the enemies. It also gives idea to identify those toxic materials from food, cloth, beverages etc.

By keeping all these facts in mind the author had selected **"Venkara Parpam"** for her dissertation study. This study makes a detailed idea about the toxicity of the drug.

AIM AND OBJECTIVES

Venkara Parpam comprising mainly Venkaram & egg albumin as major ingredients which are good for their diuretic and Nutritive property is used among many of the traditional practioners now and then. It is useful for moothira kiricharam (urinary tract infection) & neer adaippu.

Hence the main aim of the dissertation work is to study the toxic effects of short term administration of **"Venkara Parpam".**

The prime object of this study is to find out the acute and sub acute toxicity of **Venkara Parpam** by using animal models (Wistar albino rats). The main aim at the back of author's mind is to brought out the drug into the scientific light so that the clinicians will find more confidence over the drug.

The study will be complete and made useful by corroborating the comprehensive knowledge of siddha system with modern concept about lethal dose, therapeutic dose, signs and symptoms, and bio-chemical mechanism.

The following specific objectives have been drawn to achieve the above aim.

- Collecting literary evidences in detail about the **Venkara Parpam**
- Collecting the Physio Chemical, Gunapadam and Toxicological aspects of the constituents of **Venkara Parpam.**
- To know the lethal dose, therapeutic dose and usage of **Venkara Parpam** in general.

- To find out the chemical combination of the drug through chemical analysis.
- To find out and define the toxicity of the drug by Acute and sub acute toxicity study.
- To support the study of toxicity using Histopathological investigations.
- To discuss, whether this drug has got any side effects in short term administration to patient.

LITERATURE REVIEW

VENKARAM - UNPURIFIED FORM

VENKARAM - PURIFIED FORM

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GUNAPADAM ASPECT

VENKARAM

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Source

It occurs as a natural deposit. Crude borax is found in masses by evaporation of water on shores of dried up lakes in India and Tibet .

It is also obtained from the mud of lakes surrounded by hills in Nepal. In this crude state it is known as sohagoor or tinkala. When purified by dissolving it in water straining through cloth evaporating to dryness and crystallizing it is called borax or **tankankhar.**

Characters

It is composed of boric acid and soda. In the native state it exists as an impure saline incrustation of a dirty white colour. It exists as crystalline tough masses or in the form of translucent irregular masses exposed to the air it becomes opaque. Another variety known as Telio tankana is an impure salt met with in small pieces or smooth translucent six sided prisms . The colour is greyish - white on exposure it becomes opaque or dirty white it has a faintly balsamic odour and taste like papadakhar.

Purification

Borax is purified by being steeped for a night in Kanjika and dried in the sun.

Action

Diuretic
Emmenogogue
Astringent
Antacid
Local Sedative
Anti septic.

Uses

Borax is given internally in doses varying from 0.5 – 2g in acidity of the stomach, amenorrhoea, dysmenorrhoea, menorrhagia, puerperal convulsions and to promote uterine pain during labour.

In prolonged and tedious labours due to want of action or power in the uterus to expel the foetus and in abortion under the same circumstances 2g of borax with 0.5g of powdered cinnamom in a little warm kanjee may be given one or two hours to extent of 3 or 4 doses.

In cases of irregularity of the menstrual discharges and in some chronic uterine affections doses of 0.5g with 0.5g of cinnamom occasionally prove useful.

As a sedative to the mucus membranes in irritable condition of the fauces and pharynx, in chronic bronchitis of children.

It is used in the convulsions of infants and children in doses of 65-325mg given in mother's milk according to the age of the child.

Borax enters into the composition of numerous formulae for dyspepsia loss of appetite and indigestion.

A mixture of equal parts of borax, long pepper and baberang seeds is given for five days at the menstrual period for the purpose of preventing conception. It is also used for procuring abortion and inducing labour pain.

Useful Preparations

- Borax, Aconite, Alpotaxis auriculata alum, long pepper, Embelia ribes, cloves, nutmeg and Helle borus niger mix and make a pill mass in honey.

Dose : 130 – 325 mg given with betel leaves for cough.

- Take of borax impure carbonate of potash, trikadugu, triphala, curcuma longa, pancha lavana, cassia lanceolata powder, Embelia ribes and Aconitum hetero phyllum equal parts and Balsamodendron mukul equal in weight to all mix and make a pill mass.

Dose : 195 – 325mg given in milk or Kanjee for gonorrhoea, rheumatism heart disease, epilepsy etc.

- Take of borax 4 parts, pinus longifolia 3 parts, Black Pepper 2 parts, Anacyclus Pyrethrum 2 parts, Datura seeds 3, Aconite 2 parts mix add honey and make pill mass.

Dose : 325 mg with betel leave juice for Asthma

- Borax 2 part, triphala, dry ginger, long pepper, coriander seeds, cumin seeds each 1 part, cinnabar, ferriperoxidum sulphur and black pepper each 2 parts and honey 3 parts mix and make a pill mass.

Dose : 325 mg
Uses : Chronic bronchitis with profuse expectoration.

External Uses

- Externally borax is used as Lotion (1-40 of water) in Acne, freckles and cholasma etc.
- To sore nipples and in prickly heat and other forms of skin eruptions a solution of borax (1 in 8) is applied before and after sucking the infant.
- In the distressing irritation of the genital organs both in males and females clothes saturated with strong solution of borax (1 in 16) kept to the parts afford much relief. In case of women the solution should be used in the form of vaginal injection.
- The solution (1-5) proves very useful as injection in cystitis, Gonorrhoea, leucorrhoea and in lithic acid deposits.
- For ringworm a solution of borax in distilled vinegar (1-16) is an effectual application.
- Thrush, soreness of mouth or throat, stomatitis - mixture of borax and honey.
- In mercurial salivation a solution of borax is an excellent gargle.

PHARMACOLOGICAL ASPECT

It is only bacteriostatic and a very weak antiseptic. But being non irritating even to delicate structures, saturated aqueous solutions (4%) have been used for irrigating eyes, mouthwash, douche etc. Boroglycerine paint (30%) is used for stomatitis and glossitis A 10% Ointment (Borocide) is available for cuts and abrasion. It is included in prickly heat powders and ear drops. However, boric acid is not innocuous. Systemic absorption causes vomiting, abdominal pain, diarrhoea, visual disturbances and kidney damage. Hence its use for irrigating bladder, large wounds, as ointment on extensive burnt areas, liberal use of powder for infants is not recommended.

PHYSIO CHEMICAL ASPECT

Other names

Borax-decahydrate, Boricin, Dinatrium-tetraborate-decahydrate, Disodium-tetraborate-decahydrate, Gerstley-borate, sodiumbiborate decahydrate, solubor.

Origin of the name

The origin of the name is traceable to the Persian word *burah* which in turn comes from middle persian *burag*. Some say that the use came from advertisement displays for the household cleaner, though the use may also derive from the yiddish word "borachs", meaning rented furniture.

Sources:

It occurs naturally in evaporate deposits produced by the repeated evaporation of seasonal lakes. The most commercially important deposits are found in Turkey, California and other locations in the American South West, the Atacama desert in chile, and in Tibet. Borax can also be produced synthetically from other boron compounds.

General

Systematic name	:	Sodium tetraborate decahydrate
Molar Formula	:	$Na_2B_40_710H_2O$
Molar Mass	:	381 37 g/mol
Appearance	:	White solid

Borax is an important boron compound a mineral and a salt of boric acid. It is usually a white powder consisting of soft colourless crystals that

dissolve easily in water. Borax is used in detergents and cosmetic as an ingredient.

To make buffer solutions in biochemistry as a fire retardant and anti-fungal compound for fiberglass and cellulose insulation and as an ingredient of slime, as an insecticide to kill ants and fleas, as a flux in metallurgy and as a precursor for sodium perborate monohydrate that is used in detergents as well as for boric acid and other borates. Commercially sold borax is usually partially dehydrated.

Properties

Density and Phase	:	1.73g / cm^3, Solid
Solubility in water	:	5.1 g/100ml (20^0C)
Melting Point	:	75^0C
Boiling Point	:	32^0C
Crystal Structure	:	Monoclonic

Related Compounds

Other anions	:	Sodium aluminate
		Sodium gallate
Other cations	:	Potassium tetraborate
Related Compounds	:	Boric acid Sodium Perborate

Chemistry

The term borax is often used for a number of closely related mineral or chemical compounds that differ in the crystal water content.

Anhydrous borax ($Na_2B_4O_7$)
Borax Pentahydrate ($Na_2B_4O_75H_20$)
Borax decahydrate ($Na_2B_4O_710H_20$)

Borax is generally described as $Na_2B_4O_710H_2O$. How ever it is better formulated as $Na_2[B_4O_5(OH)_4]8H_20$. Since Borax contains the $Na_2[B_4O_5(OH)_4]^{2-}$ ion.

In this structure, there are two four coordinate boron atoms (two BO_4 tetra hedra) and two three coordinate boron atoms (two BO_3 triangles)

Borax is also easily converted to boric acid and other borates which have many applications, if left exposed to dry air it slowly loses its water of hydration and becomes the white and chalky mineral tincalconite ($Na_2B_4O_7$ $5H_2O$).

Uses

Borax is used as a food additive in some countries with E number E285, but is banned in the United States. Its use is similar to salt, and it appears notably in French and Iranian caviar.

Sodium borate is used in biochemical and chemical laboratories to make buffer solutions e.g for gel electro phoresis of DNA.

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TOXICOLOGICAL ASPECT

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TOXICOLOGICAL ASPECT (Modern)

Boracic acid occurs as a powder or in white pearly lamellar crystal form. It is feebly acid and soapy or greasy to touch as is slightly acidic and bitter in taste it is soluble in 25 parts of cold water in 3 parts of boiling water in 4 parts of glycerin and in 30 parts of alcohol.

Sodium borate occurs as a transparent colourless crystals having a saline alkaline taste. If is soluble in 25 parts of cold water and in equal parts of glycerin but insoluble in alcohol.

Symptoms

Loss of appetite, epigastric pain, nausea, vomiting and diarrhoea.

- An erythematous rash and later desquamation appear on the skin
- Jaundice, cerebral edema, qudosis fever and chynestoke respiration may be seen.
- Oliguria or anuria, high temperature, muscular twitching, convulsions, collapse and death may occur.
- Sometimes delirium and hallucination also appears.
- A level of 50 mg / 100 ml blood indicates boron poisoning.
- Chronic poisoning may be a alopecia through raw tongue, anorexia and kidney damage.

Fatal Dose

Adults	-	15 - 20g
Children	-	5g

but a woman aged seventy died in 46 years after she had taken a teaspoonful of boric acid by mistake for epsom salts. Tissues normally contain some what less than 1mg P.feiffer et al investigated boric acid poisoning and quotes values of above 1mg / g.

Fatal Period

3 - 4 days

These substances are toxic to all cells and have a slow excretion rate through the kidneys. Kidney toxicity is the greatest, with liver fatty degeneration, cerebral edema and gastroenteritis. Boric acid solutions used as an eyewash or abraded skin is known to be especially toxic to infants, especially after repeated use due to its slow elimination rate

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GUNAPADAM ASPECT

Egg albumin

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Gallus Domestics is a domestic cock and hen. The part used in medicine is the egg of it. The white is the ovi albumen often called also albumin - the liquid albumen of egg.

Other varieties are called after their sources or characteristic reactions as acid-albumin, vegetable - albumin etc. Normal albumin is the type of a group of proteids known as albumins.

It contains albumen 15 - 18pc, a little mucus, fat, sugar, extractive matter, lecithin. Ash consisting of alkaline salts and water 82 - 85%.

This albumen is distinguished from albumen of the serum of blood by being coagulated by ether. In weight it is about 5 drachms in one egg.

Action

Emollient
Demulcent
Laxative and nutritious

Uses

The oil known as the yellow oil is prepared by boiling the hard, removing the yolk and acting on this by hot movara spirit or brandy. Glyceritum vitelli or glycerine of yolk is a dietetic preparation containing the yolk of egg 45 pc and glycerine 55 pc.

Mistura spiritus Vini Gallici is another preparation made up of yolk of 2 eggs, brandy 120ml, cinnamon water 120ml and refined sugar 16g. Dose of this mixture is 30-60ml.

Egg wine prepared by beating up on egg with a tablespoonful of cold water and a mixture of a glass sherry and half a glass of water previously heated together poured over this and stirred all the time, this sweetened with white sugar and a little grated nutmeg to taste and taken with toast or biscuits twice daily is more digestive and nourishing to invalids.

Egg syrup is prepared by beating 1 Ib of eggs with 1 Ib of water and then straining it through a cloth and then beating it to a froth and than adding 1¾ Ibs of powdered sugar and 20 drops of orange blossom water when used it is mixed with 10 times its volume of water.

Eggs covered with boiling water and allowed to stand for 5 minutes are more nourishing and digestive than eggs placed in boiling water and allowed to boil furiously for 3½ min.

White of egg is useful in cases of poisoning by corrosive sublimate perchloride of mercury, soluble salts of lead, copper and Zinc creosole etc. in poisoning by other acid metallic salts it acts mechanically by enveloping poisonous particles and also coating the mucous membranes of the stomach and intestines.

NUTRITIONAL ASPECT

Taste, nutritional value, availability, and the minimum cost make eggs universally popular. Due to the taste, ease, and flexibility of cooking, egg preparations are a favourite among bachelors and working couples. This traditional breakfast food is also consumed in different forms throughout the day. Even though eggs are of animal origin, there are appreciable numbers of "eggetariens" among the vegetarians. Some people even consider unfertilised eggs as vegetarian. The eggs of hen, duck, goose, quail, turkey, and turtle are consumed in different parts of the world. Among them, the hen variety is the most popular one. The shell pigmentation of white or brown does not bear any relation to the nutritive value. Egg protein are best in quality and are taken as standard for comparing the quality of other food proteins. Egg protein is better digested, absorbed, and utilised by the body than any other source.

A hen's egg weighs about 55 to 60 gm and consists of 10% outer layer, 60% white and 30% yellow yolk. The outer shell consists of calcium carbonate; the white portion is made up of protein known as egg albumin which is of high biological value. The egg contains about 11% proteins. The egg white is also a good source of riboflavin. The yolk contains mainly fat. The egg supplies fat in an emulsified form, which can be very easily digested and assimilated in the body. The egg yolk contains 1.33gm of cholesterol per 100 gm. The egg yolk is a source of vitamin A, vitamin B, calcium, phosphorous, lecithin and iron.

An average hen's egg of 60 gm consists of 7.9 gm of protein, 7.9 gm of fat, 103 kcl, 36 mg of calcium, 132 mg of phosphorous, and 1.26 mg of iron. Egg powder contains about 49% of proteins and 43% fat and it is also a good source of vitamin A and riboflavin. It is rich in cholesterol (3.9 gm per 100 gm) and is a good source of iron and phosphorous.

Soft boiled and poached eggs are better than eggs cooked in other ways. The yolk is easily digested even by infants of 9 months old. Eggs are used in slimming diets since they have only negligible amounts of carbohydrate, but plenty of protein, vitamins, and minerals. The limiting factor of egg is that it does not contain vitamin C. Raw albumin contains an anti-digestive factor that interferes with digestion. The egg also has a compound called avadin, which reacts with biotin (Vitamin H) and makes it unavailable. Both these factors get destroyed while heating.

Eggs are the ideal nutritive food for the ill and convalescent patients. Those who suffer from gastrointestinal tract disorders, particularly in diseases of the colon, eggs are the best food because of their nutritional value and lack of residue. A common question asked is about the recommended number of eggs per person. There is an ambiguity regarding the numbers. The British Heart Foundation recommends eating no more than four eggs a week. But the World Health Organisation however suggests an upper limit of ten eggs per week from all sources including mayonnaise, biscuits, cakes, mousse and sauce.

Fresh eggs have the best nutritive value. Eggs stored in a cool place and away from any odour stay fresh for a longer period. It must be stored with the pointed end down, so that the yolk remains centred in the egg and away from the air pocket. The method of testing fresh eggs is to dip them in water. A rotten egg due to liberation of gases like carbon dioxide and ammonia will float, while a fresh egg sinks to the bottom.

TOXICOLOGICAL ASPECT

Eggs or its products may be the cause of allergies in some people. It usually manifests as skin rashes or breathing difficulty. Eggs may cause constipation due to low residue. Egg allergy is a common food hyper sensitivity in children. Atopic dermatitis represents the main clinical manifestation in infancy. In first exposure many of these infants present with utricaria Angio edema or anaphylaxis. The role of egg allergy in gastro intestinal conditions is less well understood.

Eating a hard boiled egg when angry produces the same effect as eating a toadstool according to Dr.Hilton Ira Jones a noted chemist and psychologist "The poison in toad stools is a chemical substance called Muscarine" Dr.Jones says : The greater part of an egg is composed of Colin a harmless substance. When a person is angered the acidity of the stomach is increased, oxidising the colin when oxidised the colin of the egg becomes muscarine, the poison in toadstools. That is why the effect is the same.

MATERIALS AND METHODS

COLLECTION, IDENTIFICATION & PURIFICATION OF DRUG

COLLECTION

The drug was collected from local market in Chennai.

IDENTIFICATION

The drug was identified as Venkaram by Gunapadam Department, National Institute of Siddha, Chennai.

PURIFICATION

The drug was powdered well and fried in a mud vessel until the water content of it evaporates.

PREPARATION OF VENKARA PARPAM

Required incredients :

Purified Venkaram – 1 palam (35 gms)
Egg albumin – from 2 eggs.

Method of preparation

Purified venkaram was powdered in the stone mortor. Then the powder was grinded with egg albumin for four days continuously. Until it becomes a wax consistency finally made disc, the disc was allowed to dry and put a putam with 25 cow dung cakes. Next day after cooling the above disc was grinded and measured.

Dose

2-3 grains (130-195mg)

Vehicle

Butter, ghee, tender coconut water or water.

Indications

Vellai

Moothira kiricharam (Urinary tract infection)

Neer adaippu etc.

CHEMICAL ANALYSIS

X- RAY POWDER DIFFRACTION (XRD)

The powder method of diffraction was devised independently by Debye and Scherrer. Powder diffraction method involves the diffraction of monochromatic X- rays by a powder specimen. Monochromatic usually means a strong Kα characteristic component of the filtered radiation from a X- ray tube operated above the K α excitation potential of the target material.

Selection of Kα renders the incident beam to be a highly monochromatised one. The focusing monochromatic geometry results in narrower diffracted peaks and low background at low angles. The sample is mounted vertically to the Seemann- Bohlin focusing circle with the scintillation counter tube moving along the circumference of it. It is possible to record the diffracted beam from 2 to 160 degrees. The diffractometer is connected to a computer for data collection and analysis. The scintillation counter tube can be moved in step of 0.01 degree by means of a stepper motor and any diffracted beam can be closely scanned to study the peak profile.

Identification of the material

The powder diffraction of a substance is characteristic of the substance and forms a sort of fingerprint of the substance to be identified. The peaks of the X-ray diffraction pattern can be compared with the standard available data for the conformation of the structure. For the purpose of comparison, many standards are available, some of which are, Willars hand book, Joint Committee on Powder Diffraction Standards (JCPDS) Pepdfwin and National Bureau of Standards.

ACUTE TOXICITY STUDY

Colour	: White colour
Odour	: Odourless
Solubility	: Partially water soluble
Nature	: Fine powder
Adjuvant Used	: 2% Carboxy methyl cellulose(CMC)

Venkaraparpam suspended in 2% CMC was administered to the groups of wistar rats in a single oral dose by gavage using a feeding needle. Starting dose was 5mg/kg. And the subsequent doses are 10, 50, 100, 250, 500, 1000, 2000 and 4000mg/kg p.o. The control group received an equal volume of the 2% CMC vehicle. Six females and males were used for each dosage level. The principles of laboratory animal care were followed and the Department's ethical committee approved the use of the animals and the study design. Observations were made and recorded systematically 1, 2, 4 and 24 hour after substance administration. The visual observations included skin changes, mobility, aggressiveness, sensitivity to sound and pain, as well as respiratory movements. They were deprived of food, but not water 16–18 hour prior to the administration of the test suspension. Finally, the number of survivors was noted after 24 hour and these animals were then maintained for a further 13 days and observations made daily. At the conclusion of the experiment, all surviving animals were sacrificed with an injection of pentobarbital and their organs such as liver, lungs, heart, spleen, adrenals, kidneys, testes and ovaries were excised and weighed. The pathological observations of these tissues were performed on gross and macroscopic bases. The toxicological effect was assessed on the basis of mortality, which was expressed as LD_{50}.

Additional Observations

1. Alertness
2. Aggressiveness
3. Pile erection
4. Grooming
5. Gripping
6. Touch Response
7. Increased Motor Activity
8. Tremors
9. Convulsions
10. Muscle Spasm
11. Catatonia
12. Muscle relaxant
13. Hypnosis
14. Analgesia
15. Lacrimation
16. Exophthalmos
17. Diarrhoea
18. Writhing
19. Respiration

Statistical analysis

Either the analysis of variance (ANOVA) or Student's t-test (SPSS/PC computer program) was employed to analyze the results statistically. A statistical comparison was carried out using the Duncan Multiple Range Test. All values were expressed as back transformed mean ±S.D. $P<0.01$ were considered statistically significant.

SUB ACUTE TOXICITY STUDY

Housing And Feeding

Temperature maintenance at 22^0C lighting should be artificial 12 hours light 12 hour dark. Conventional laboratory diets with unlimited supply of drinking water.

Preparation of Animals

Animals are randomly selected and marked to permit individual identification. They are kept in cages for at least 5 days prior to dosing to allow for acclimatization to the laboratory conditions.

Number of Animals and Dose Levels

Group Number	Test Group	No. of Animals
1	Control	6 (3m + 3f)
2	200 mg / kg	6 (3m + 3f)
3	400 mg / kg	6 (3m + 3f)
4	600 mg / kg	6 (3m + 3f)

Administration of Doses

Test doses had given once daily for 28 days.

Observation

All animals were observed for 28 days No. of animals dead and their time of death noted. The were sacrificed on day 28.

Male and female rats housed in individual cages and maintained under uniform animal husbandary conditions described above were given with 200-600 mg of **Venkaraparpam** daily for a period of 28 days. Control group animals were given adjuvant only. After the completion of 28 days feeding the animals were killed by decapitation. Blood was collected directly from the retroorbital vein into tubes containing double oxalate solution. The liver, kidney, Stomach, Testes and ovary were removed and weighed individually.

Sections of the liver, kidney, stomach, testes and ovary were fixed in formalin solution were processed and cut at 6µ thickness and stained with haematoxylin eosin.

RESULTS

CHEMICAL COMPOSITION

Sodium (Na)	12.06 %
Boron (B)	11.34 %
Hydrogen (H)	5.29 %
Oxygen (O)	71.32 %
	100.00%

Na_2O	16.25%
B_2O_3	36.51%
H_2O	47.24%
Total oxide	100.00%

X-RAY POWDER DIFFRACTION

In XRD analysis, the graph of unpurified Venkaram & Venkara Parpam was matched with the standard graph of sodium biborate, and the graph of purified Venkaram was matched with the standard graph of tincalconite.

ACUTE TOXICITY STUDY

No death was recorded during the treatment period in either the control or treated groups given 4g/kg of **Venkaraparpam** orally. The animals did not show any changes in general behaviour or other physiological activities. There were no significant differences between the control and treated groups in the body and organ weights of male and female rats. But in the female animals liver weight was slightly differed when compared to control animals. (Table-1). Moreover, there was no significant difference in the liver weight of male rats. Pathological examinations of the tissues on a gross and macroscopic basis indicated that there were no detectable abnormalities. No pathological alterations were grossly detected. The organs of both control and treated groups were unremarkable and comparable to each sex. It can be concluded that a test substance is practically non-toxic or non-lethal after an acute exposure. This test limit for acute oral toxicity is generally considered to be 4.0g/kg body weight. If no mortality is observed at this dose level, a higher dosage is generally not necessary.

SUB ACUTE TOXICITY STUDY

Animals of both sexes given 200-600mg/kg of **Venkaraparpam** showed significant weight loss (Table-1) and food, water consumption rate at 5, 10 and 21st day (Table-2&3). **Venkaraparpam** treated animals consumed gradually reduced level in the 400mg/kg treated group but low dose level **Venkaraparpam** administered group consumed almost normally. Similarly, the water consumption rate at moderate dose treated group is reduced remarkably. This may be due to decreased appetite at this dose level. The body weight, growth pattern, rate of food and water intake of the animals given different levels of **Venkaraparpam** was thus comparable with those of the normal rats (Tables 1-3). There were no major alterations in haematological parameters in drug treated group but eosinophil level is slightly increased in 400mg/kg group (Table 4). No remarkable changes were identified in the biochemical parameters in all the drug treated group of animals. But the bilirubin range is modified significantly by the given **Venkaraparpam**.(Table-5). In the gross examination of urine of test animals, the volume and intensity of colour is increased in dose dependent manner and epithelial, pus cells and oxalate crystals were present in the urine deposit of the **Venkaraparpam** treated animals (Table-6). The isolated liver and ovary shows the change in weights significantly (Table-7).

Histopathology

Animals after 28 days exposure to **Venkaraparpam** revealed no significant changes in the vital organs. Microscopic observation of liver found to be normal in all dose level. But kidney architecture shows damage to lining cells and epithelial damage, Stomach section indicates superficial ulceration with hyper plastic glands, dysplastic glands in the basal mucosal layer and mild erosion of the lining epithelium at high dose level. Section of Testis shows edema of interstitium at moderate dose level and reduced spermatogenesis. Ovary of rats fed with different concentration of **Venkaraparpam** for a period of 28 days suggest no significant tissue damage and were comparable with those of normal control animals.

TABLES, DIAGRAMS & PHOTOS

ACUTE TOXICITY STUDY

Table 1. Body and organ weights (g) of rats treated with Venkaraparpam in an acute toxicity

Body weight	**Control (2%CMC)**	**Venkaraparpam (4000mg/kg)**
Male		
Initial	304.16±11.63	288.16±19.75
Final	365.33±17.50	347.33±11.69
Increased (%)	16.74	17.03
Female		
Initial	239.5±11.58	232±11.91
Final	258.5±9.35	239.66±7.00
Increased (%)	7.35	3.19
Organ weight		
Male		
Lung	1.393±0.10	1.271±0.08
Heart	1.331±0.09	1.287±0.10
Liver	10.55±0.36	10.46±0.67
Spleen	0.821±0.059	0.785±0.044
Adrenal	0.045±0.00	0.025±0.002
Kidney	1.171±0.05	1.257±0.05
Testis	1.943±0.15	1.78±0.26
Female		
Lung	1.10±0.09	1.21±0.08
Heart	1.04±0.02	0.96±0.06
Liver	6.69±0.19	6.17±0.23
Spleen	0.63±0.08	0.56±0.05
Adrenal	0.028±0.00	0.033±0.00
Kidney	0.879±0.02	0.871±0.064
Ovary	0.046±0.00	0.037±0.00

Data are expressed as mean ±S.D., n =6. No statistical difference between control and **Venkaraparpam** group ($P<0.05$).

Table 2 Incremental dose finding experiment and its Signs of Toxicity

No	Treatment	Dose mg/kg	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	I	5	+	-	+	+	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-
2	II	10	-	-	-	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
3	III	50	-	-	+	+	-	-		-	-	-	+	-	+	-	-	-	-	-	-	-
4	IV	100	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
5	V	250	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
6	VI	500	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
7	VII	1000	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
8	VIII	2000	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
9	IX	4000	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-

1. Alertness 2. Aggressiveness 3. Pile erection 4. Grooming 5. Gripping 6. Touch Response 7. Increased Motor Activity 8. Tremors 9. Convulsions 10. Muscle Spasm 11. Catatonia 12. Muscle relaxant 13. Hypnosis 14. Analgesia 15.Lacrimation 16. Exophthalmos 17. Diarrhoea 18. Writhing 19. Respiration 20. Number of Deaths (Mortality)

SUB-ACUTE TOXICITY STUDY

Table 1. Body wt (g) of albino rats exposed to Venkaraparpam for 4 weeks.

Dose (g/kg/day)	Days					
	1	5	10	15	21	28
Control	115.65±2.043	118.83±8.08	113.03±5.57	112.75±6.75	122.5±3.88	118.5±5.91
200	114.08±1.56	110.16±5.19*	102.91±3.16**	112.5±6.35	114.05±4.11*	114.83±7.38
400	106.33±6.63**	115.5±5.46	104.83±2.85**	112.33±10.83	121.83±7.05	119.5±7.09
600	114.83±2.84	107.58±2.95**	102.71±4.76**	102.91±3.38	104.66±4.17**	105.5±4.84**

Values are mean of 6 animals ± S.D. (Anova followed by Dunnett's test).

*p< 0.05; **p<0.01 vs control.

Table 2. Food (g/day) intake of male and female albino rats exposed to Venkaraparpam for 4 weeks.

Dose (g/kg/day)	Days					
	1	5	10	15	21	28
Control	38±3.8	37.5±3.88	35.83±1.94	42.5±3.27	40.83±2.31	41.5±2.73
200	40.16±4.26	45.5±2.58**	41.33±2.65*	39.83±2.40	49.33±4.96**	40.16±2.63
400	50±3.84**	40±3.84	37.33±5.27	44.83±3.81	39.83±4.53	44.66±3.01
600	40.5±2.66	35.16±2.92	34.5±3.27	45.5±2.66	40.33±2.58	40.5±2.66

Values are mean of 6 animals ± S.D. (Anova followed by Dunnett's test).

*p< 0.05; **p<0.01 vs control.

Table 3. Water (ml/day)intake of albino rats exposed to Venkaraparpam for 4 weeks.

Dose (g/kg/day)	Days					
	1	5	10	15	21	28
Control	31.16±3.31	38.83±5.91	40.16±4.07	45±3.84	41.33±4.17	37.83±2.92
200	34.83±2.92	38±4.77	40.16±6.67	38.5±4.76	40±4.447	40.16±3.18
400	90.16±4.30**	69.66±2.33**	41.5±6.15	60±2.70**	40.83±2.48	40.16±40.2
600	25.66±3.55**	35±2.60	45.16±3.54	50.16±2.56	39.83±2.13	40.33±2.73

Values are mean of 6 animals ± S.D. (Anova followed by Dunnett's test).
*p< 0.05; **p<0.01 vs control.

Table 4. Hematological parameters after 4 weeks treatment with the Venkaraparpam.

Parameter	Control	200mg/kg	400 mg/kg	600 mg/kg
Red blood cell count (millions/mm^3)	6.71±0.78	6.85±0.44	6.91±9.27	6.88±0.36
Hb (g)	15.1±0.66	15.18±0.21	15.06±0.32	15.06±0.23
Leukocyte (x10^6/mL)	10816.66±487.51	11383±990.79	11266±504.65	11384±845.22
PCV(%)	45.66±2.95	41.33±4.17	42±3.40	42±3.84
MCV(cubic *micro*)	68.38±4.53	60.48±6.64	60.8±6.14	60.31±5.25
MCH(pg)	22.66±2.36	22.25±1.52	21.8±1.12	21.98±1.36
MCHC(%)	33.16±2.30	37.05±3.77	36.1±3.40	36.45±4.27
Platelets(thousands/microliter)	957.66±75.38	935.66±21.83	930.5±53.14	938.5±21.81
DIFFERENTIAL LEUKOCYTE COUNT(%)				
Neutrophil	7±1.67	6.5±1.37	7±1.41	6.66±1.63
Basophil	0±0.00	0±0.00	0±0.00	0±0.00
Eosinophil	1±0.00	1±0.00	1.5±0.54*	1±0.00
Lymphocyte	89.66±1.03	90.33±2.16	90.16±1.47	90.16±3.06
Monocyte	1.83±0.40	2±0.89	1.83±0.75	2±0.63

Values are mean of 6 animals ± S.D. (Anova followed by Dunnett's test).
*p< 0.05; **p<0.01 vs control. No significant difference was observed in any parameter except eosinophils.

Haematological studies:

Blood analysis of male and female animals after repeated feeding of **Venkaraparpam** did not suggest any kind of haematological changes except eosinophils.

Table 5. Biochemical parameters after 4 weeks treatment with the Venkaraparpam.

Parameter	**Control**	**200**	**400**	**600**
Total protein(g/dl)	7.98±0.47	8.06±0.39	8.23±0.37	8.08±0.43
Albumin(g/dl)	3.01±0.26	3.16±0.29	3.31±0.27	3±0.35
Globulin(g/dl)	4.96±0.61	4.9±0.56	4.93±0.59	4.91±0.46
Alb/Glo Ratio	0.63±0.1	0.65±0.13	0.7±0.12	0.66±0.08
Blood Glucose(mg/dl)	100.83±18.28	99.16±15.62	102.66±12.64	105.83±15.30
Cholesterol(mg/dl)	40.66±2.65	40±1.67	39.66±1.36	41.33±2.14
Biliurubin(mg/dl)	0.31±0.09	0.33±0.08	0.4±0.02	0.45±0.05*
Biliurubin direct(mg/dl)	0.15±0.083	0.15±0.054	0.16±0.08	0.02±0.089
Biliurubin Indirect(mg/dl)	0.16±0.081	0.21±0.07	0.23±0.08	0.28±0.07*
SGOT (U/L)	153.33±16.04	156±15.38	159.33±16.23	170.33±11.05
SGPT (U/L)	62.5±15.21	55.5±5.32	57.66±5.39	52.5±5.01
ALP (U/L)	189±63.56	239±41.35	197.33±56.09	206.33±64.30
Gamma-glutamyl transferase (U/L)	7.66±1.03	7.33±1.21	7.5±0.83	7.05±1.04
Creatinine (mg/dL)	0.70±0.09	0.68±0.09	0.71±0.07	0.68±0.09
Urea(mg/dl)	38.572.28	39.18±2.65	38.33±3.20	38.83±2.78
Uric acid(mg/dl)	1.43±0.35	1.51±0.27	1.51±0.29	1.46±0.23
Sodium(mM/L)	125.66±6.25	127.16±5.67	124.33±7.23	124.16±4.40
Potassium(mM/L)	29.33±2.42	27.83±1.16	28.5±1.87	29.16±1.47
Chloride(mM/L)	102.5±2.81	102.83±3.37	102.5±2.42	103.16±2.13

Values are mean of 6 animals ± S.D. (Anova followed by Dunnett's test).
*p< 0.05; **p<0.01 vs control.

Biochemical studies

The results of the activity of glutamic oxaloacetic transaminase, glutamic pyruvic transaminase and alkaline phosphatase of treated and control rats are shown in table 5. No significant deviation in serum glutamic oxaloacetic transaminase and protein and the liver enzyme (P<0.05)was noticed. There was significant bio chemical change in bilirubin (P<0.05) were observed.

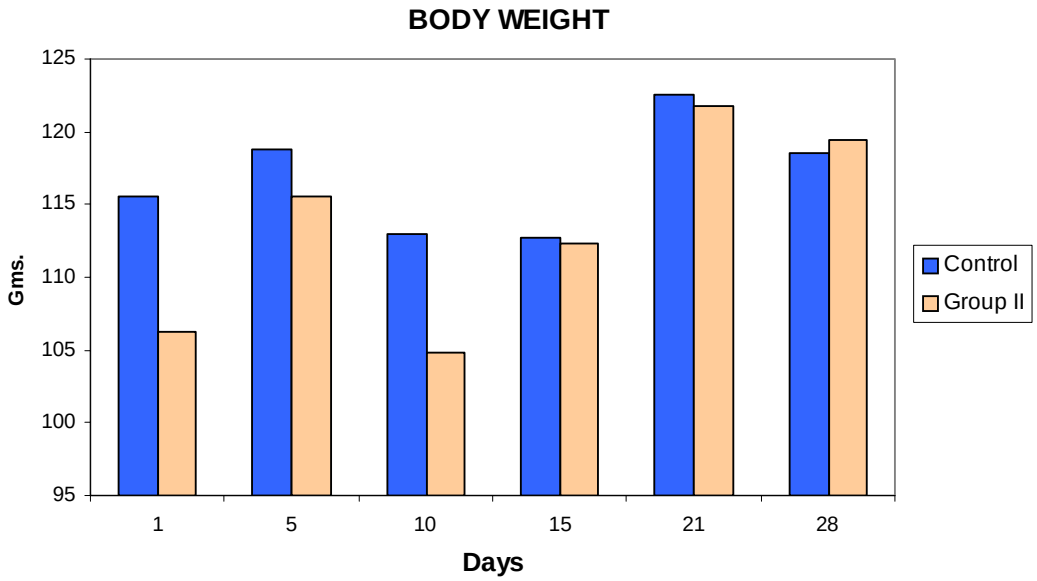
Table-6. Gross examination of Urine

S.No	Parameter	Control	200mg/kg	400mg/kg	600mg/kg
1.	Volume(ml)	4.2	4.8	5.1	5.6
2.	Colour	Straw yellow	Yellowish brown	Yellowish brown	Reddish brown
3..	Odour	Acrid	Acrid	Acrid	Acrid
4.	PH	7.8	8	8	8.1
5.	Albumin	Nil	Nil	Nil	Nil
6.	Sugar	Nil	Nil	Nil	Nil
7.	Deposits	Epithelial cells seen,	Epithelial, Pus cells oxalate crystals seen	Epithelial cells, oxalate crystals seen	Epithelial cells, oxalate crystals seen
8.	Occult Blood	Not seen	Not seen	Not seen	Not seen

Table 7. Organ weight (g) of albino rats exposed to Venkaraparpam for 4 weeks.

S.No.	Organ	Control	200mg/kg	400mg/kg	600mg/kg
1.	Liver	5.38±0.25	5.33±0.57	5.12±0.12	4.79±0.14**
2.	Kidney	0.68±0.01	0.63±0.4	0.60±0.04	0.75±0.08
3..	Stomach	1.47±0.09	1.20±0.13	1.24±0.10	1.49±0.13
4.	Testis	1.37±0.06	1.31±0.14	1.35±0.13	1.30±0.20
5.	Ovary	1.99±0.09	2.04±0.43	2.34±0.13*	2.38±0.12*

Values are mean of 6 animals ± S.D. (Anova followed by Dunnett's test).
*p< 0.05;**p<0.01.


BODY WEIGHT
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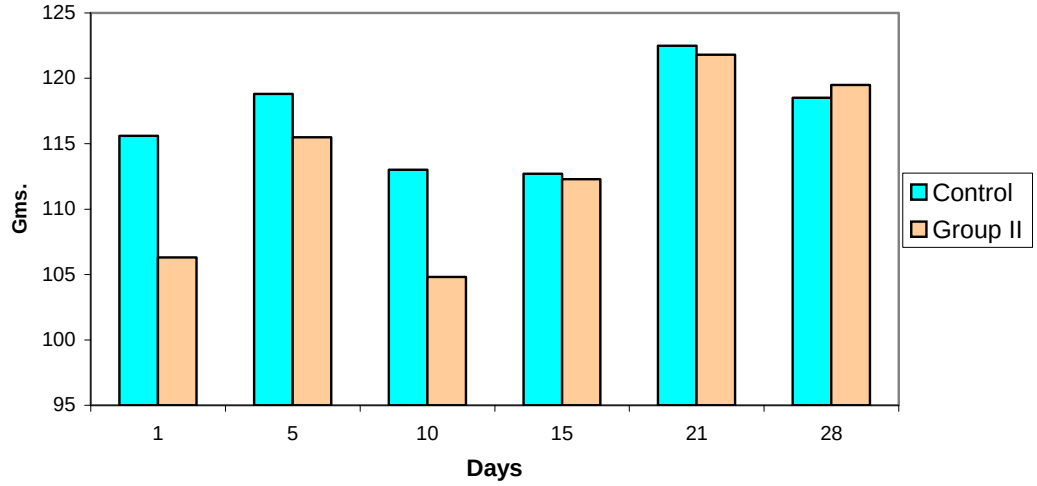
Days
Control
Group II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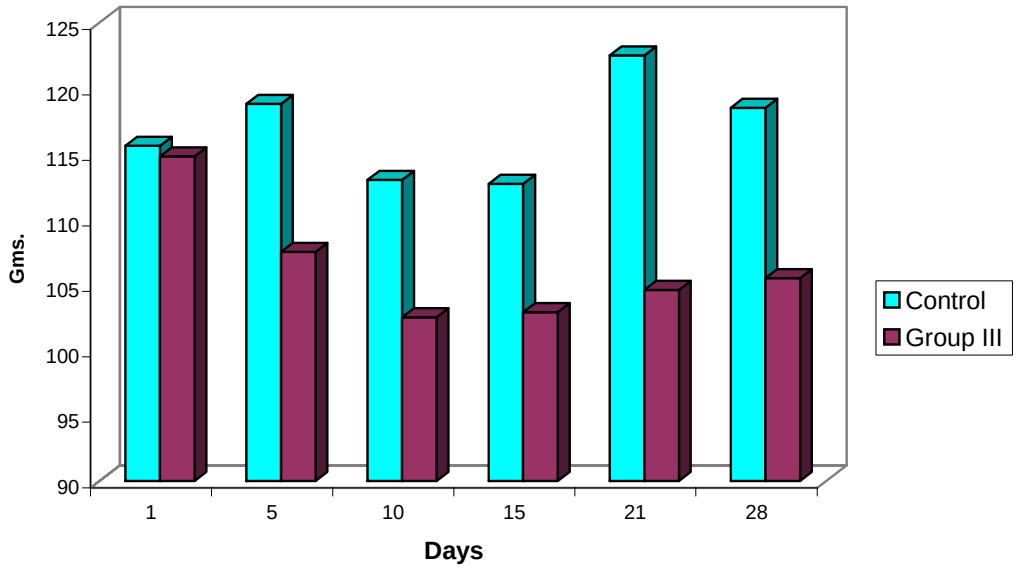
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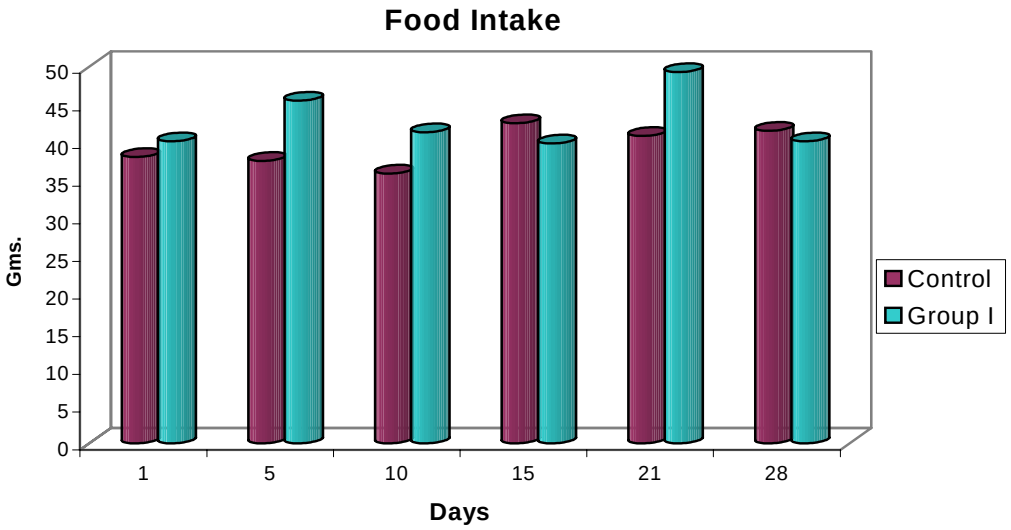
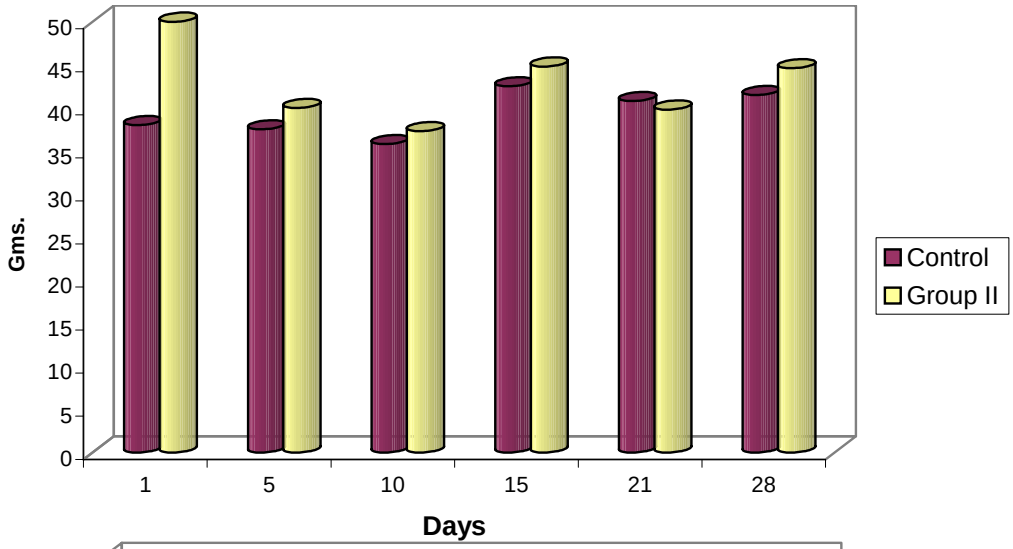
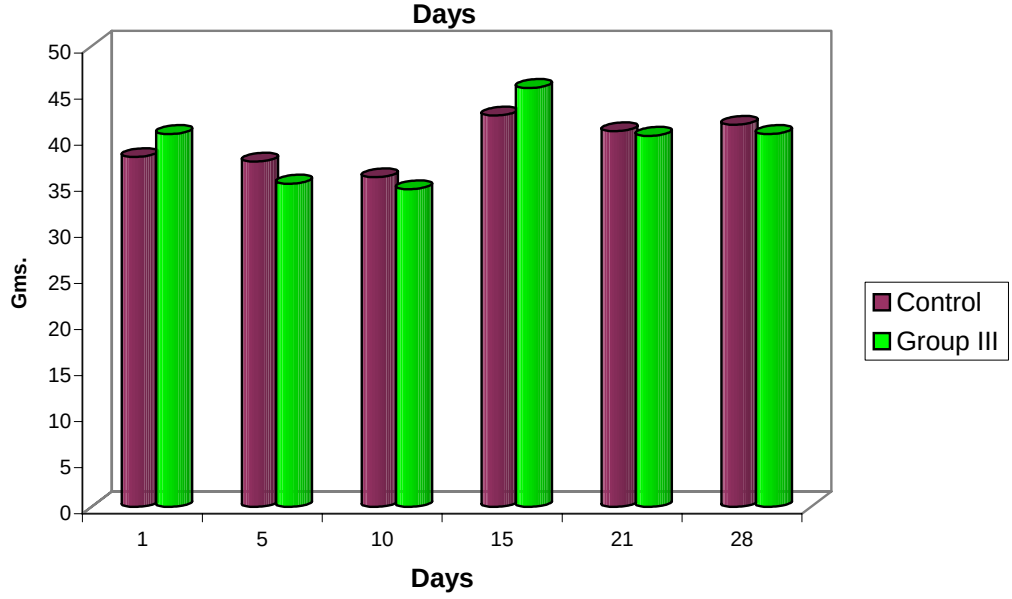
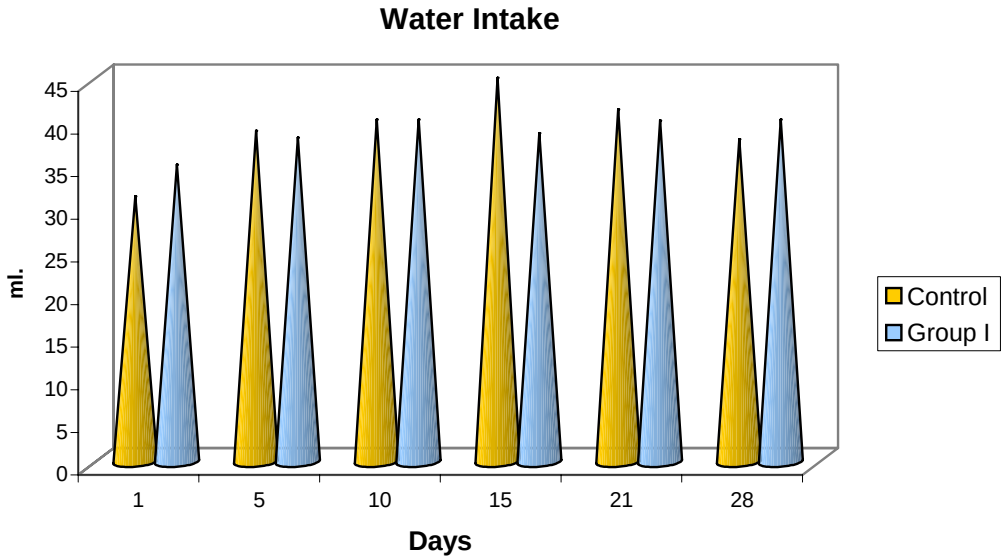
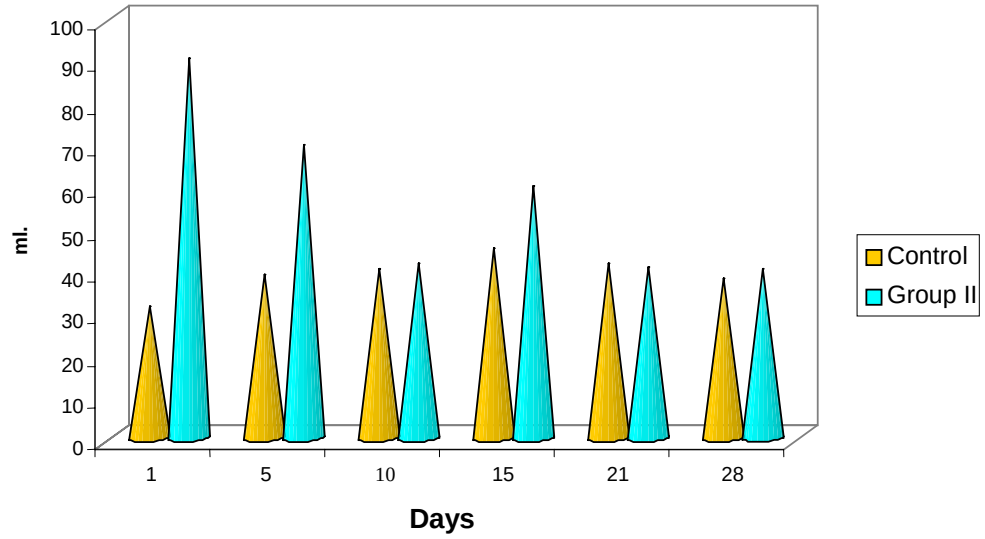
100
95
90
Gms.
1
5
10
15
21
28
Days
Control
Group III

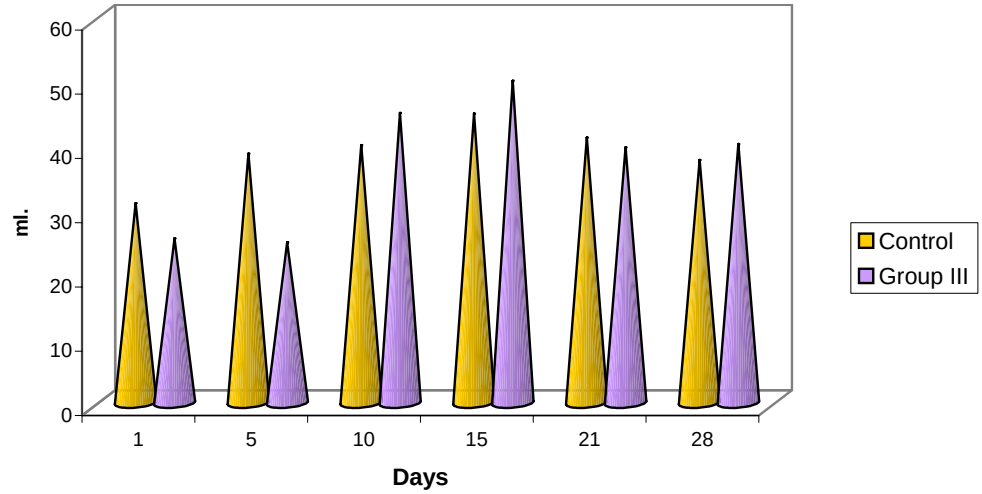

Food Intake
Gms.
50
45
40
35
30
25
20
15
10
5
0
1
5
10
15
21
28
Days
Control
Group I

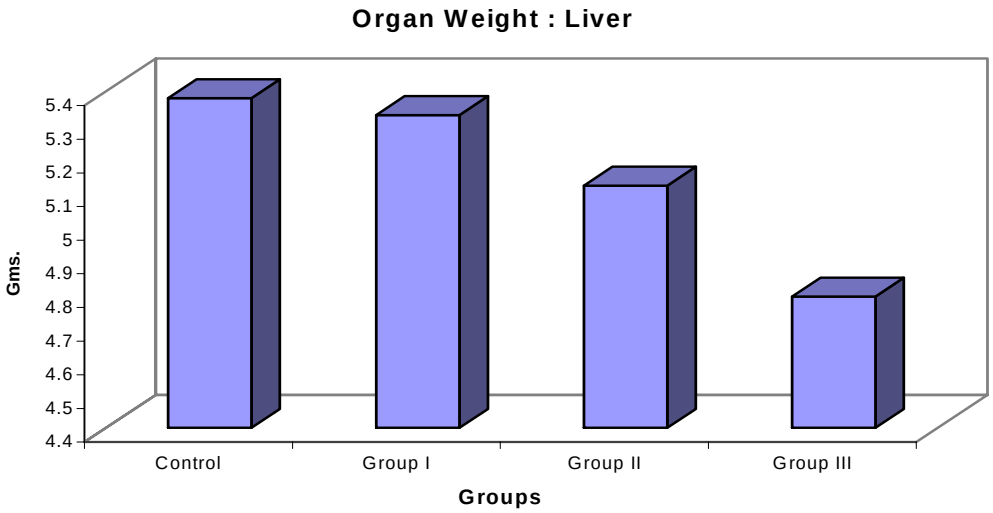

Gms.
50
45
40
35
30
25
20
15
10
5
0
1
5
10
15
21
28
Days
Control
Group II

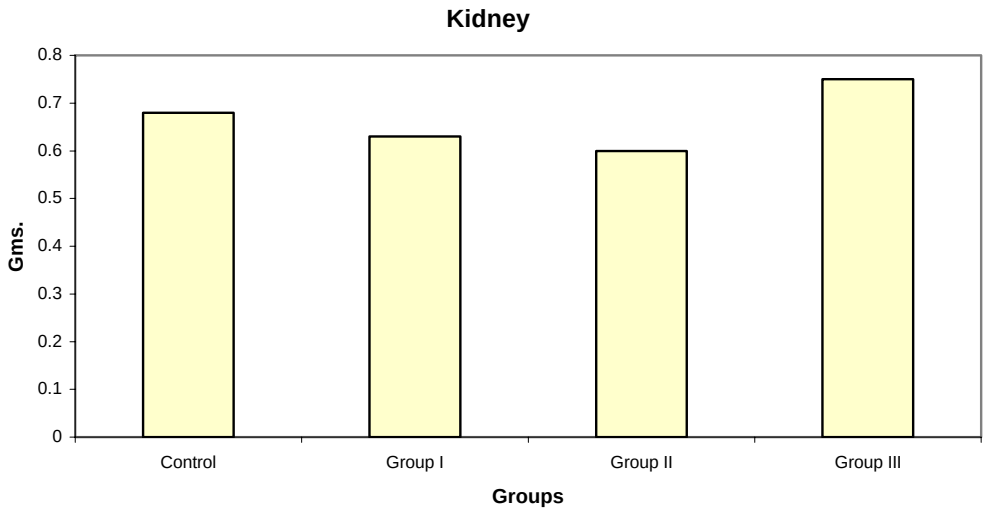

Gms.
50
45
40
35
30
25
20
15
10
5
0
1
5
10
15
21
28
Days
Control
Group III

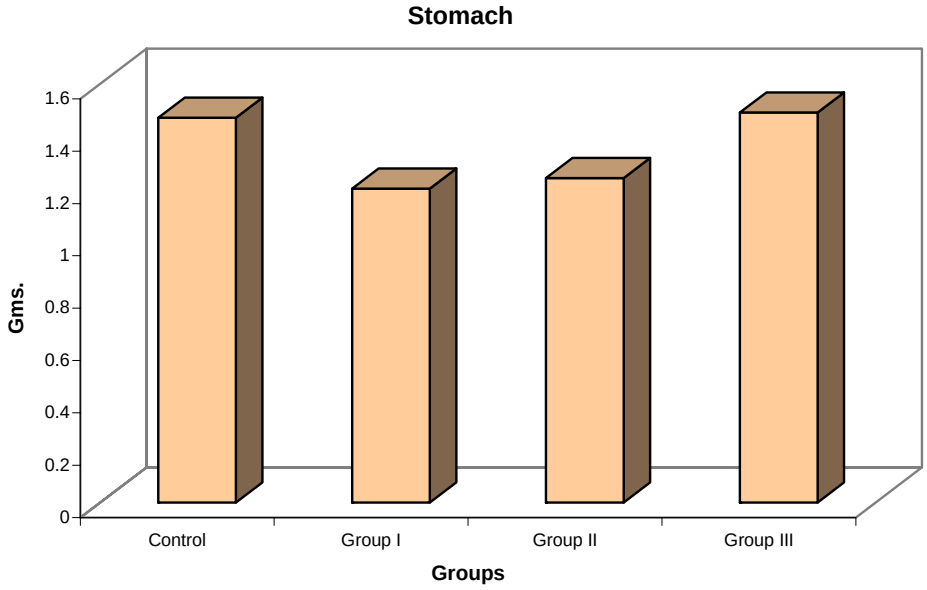

Water Intake
45
40
35
30
25
20
15
10
5
0
ml.
1
5
10
15
21
28
Days
Control
Group I

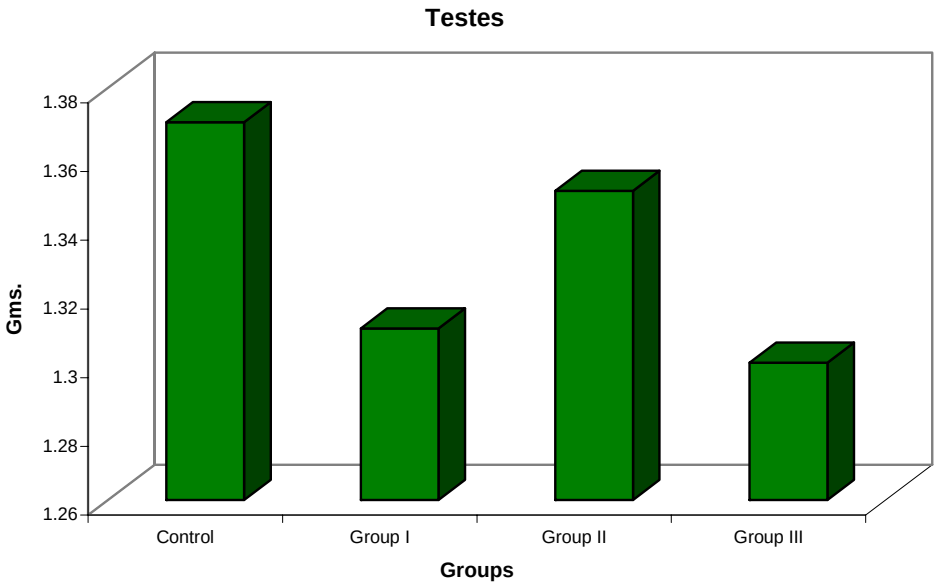

100
90
80
70
60
50
40
30
20
10
0
ml.
1
5
10
15
21
28
Days
Control
Group II

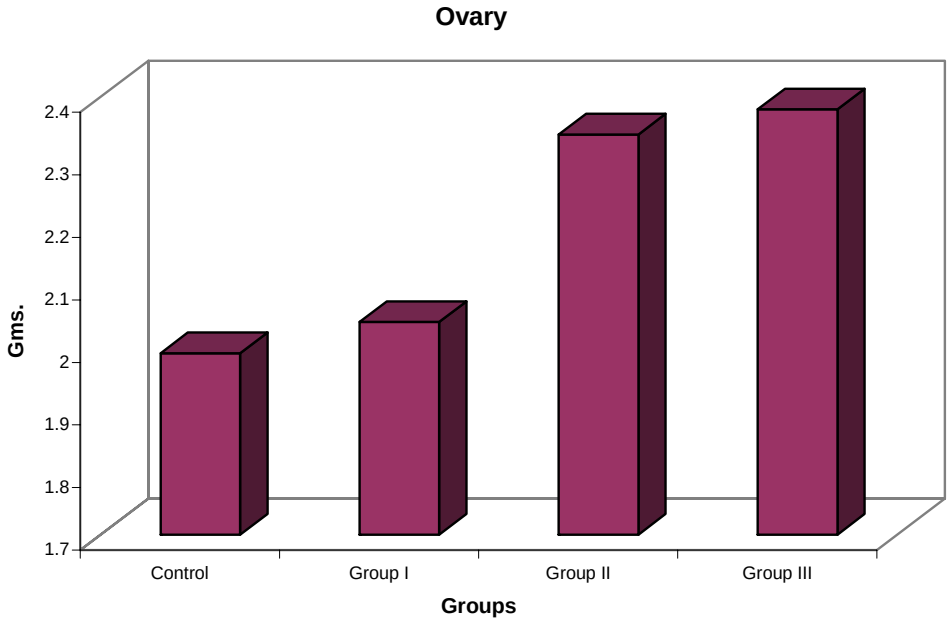

60
50
40
30
20
10
0
ml.
1
5
10
15
21
28
Days
Control
Group III


Organ Weight : Liver
Gms.
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
Control
Group I
Group II
Group III
Groups


Kidney
Gms.
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Control
Group I
Group II
Group III
Groups

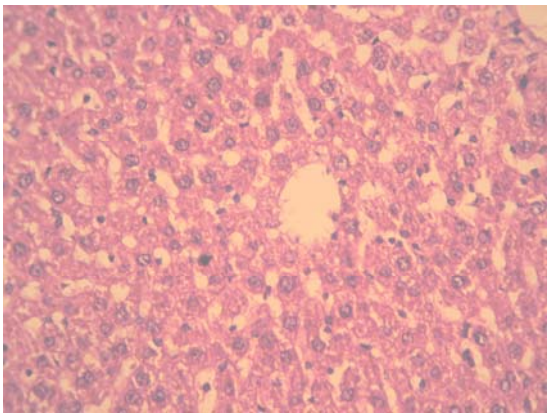

Stomach
Gms.
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Control
Group I
Group II
Group III
Groups


Testes
1.38
1.36
1.34
1.32
1.3
1.28
1.26
Gms.
Control
Group I
Group II
Group III
Groups

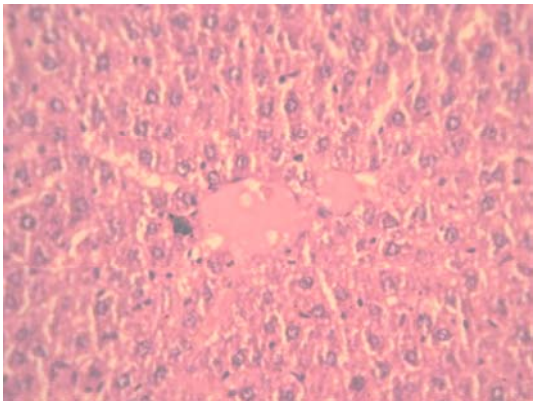

Ovary
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
Gms.
Control
Group I
Group II
Group III
Groups

LIVER

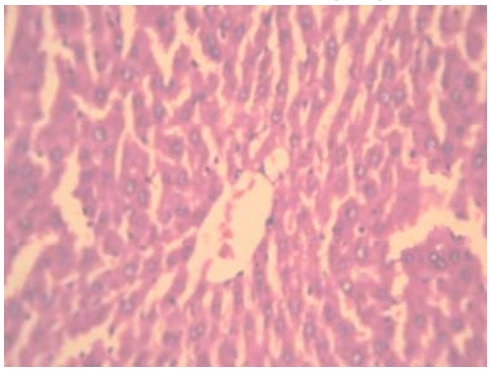
CONTROL



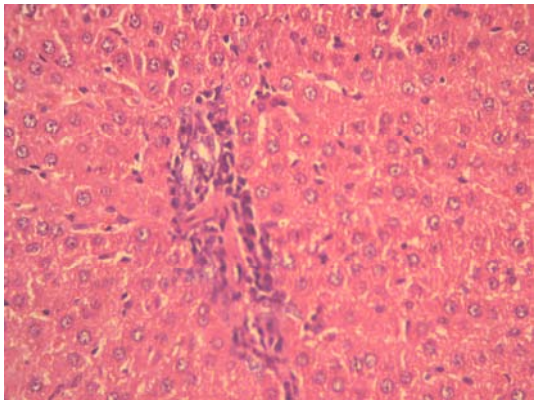
GROUP 1 (200mg/kg)



GROUP 2 (400mg/kg)

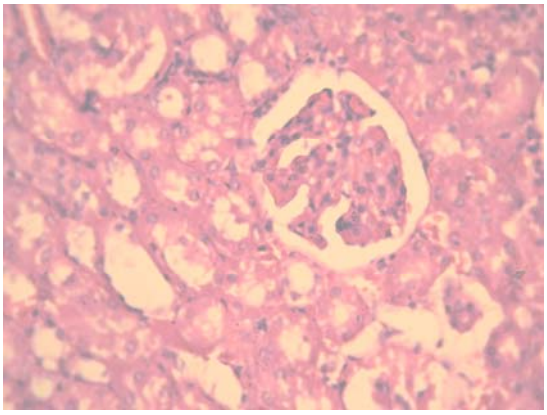


GROUP 3 (600mg/kg)



KIDNEY

CONTROL



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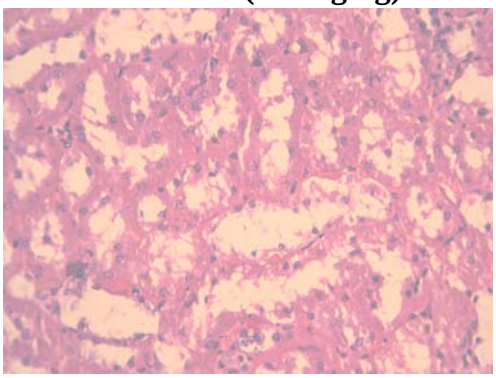
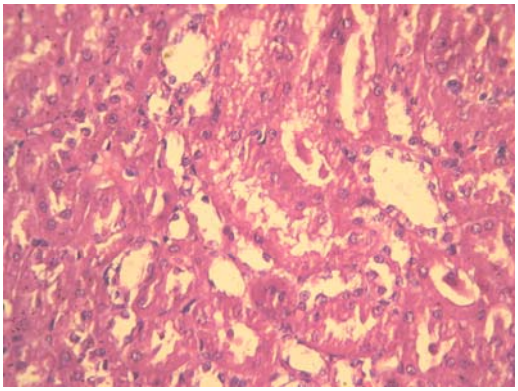


GROUP 2 (400mg/kg)



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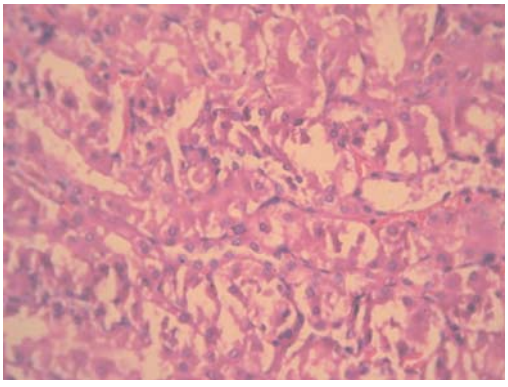
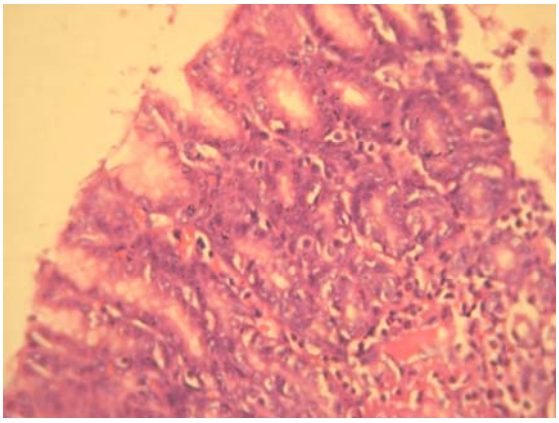


STOMACH

CONTROL



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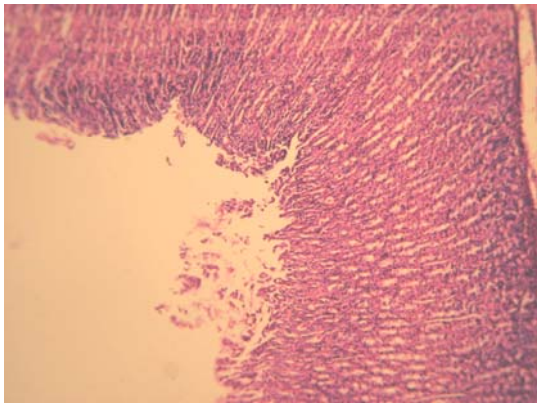

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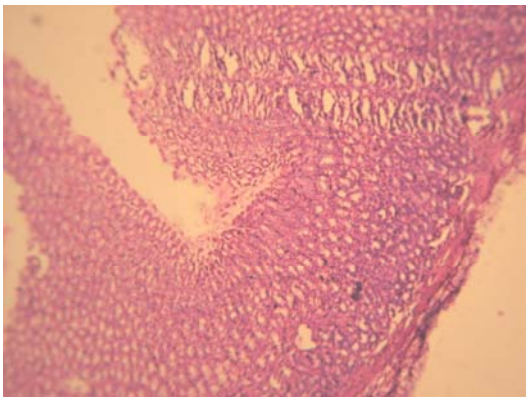

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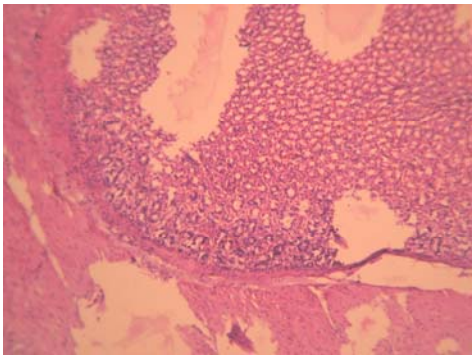
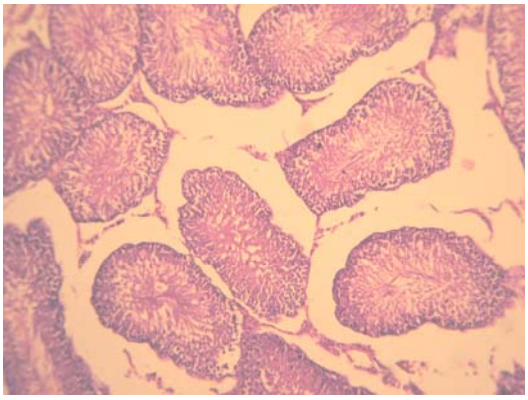


TESTES

CONTROL



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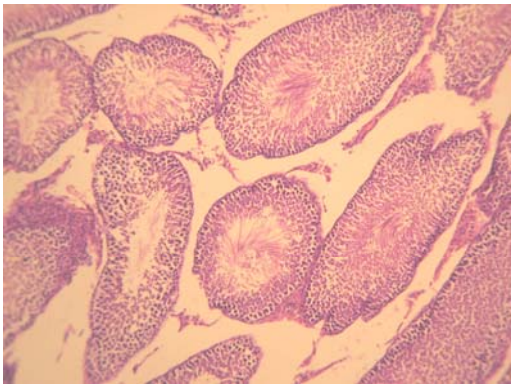

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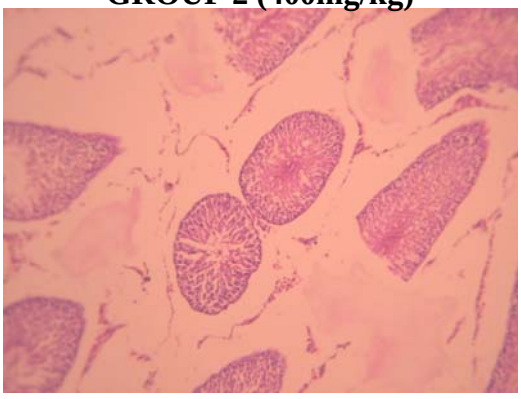

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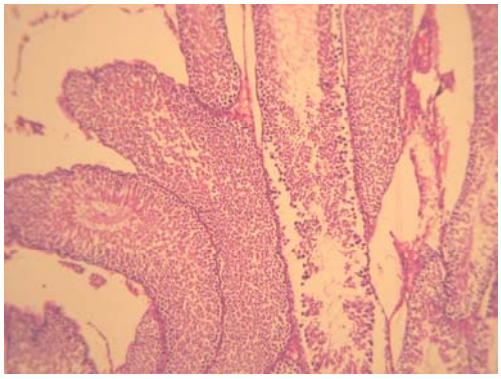
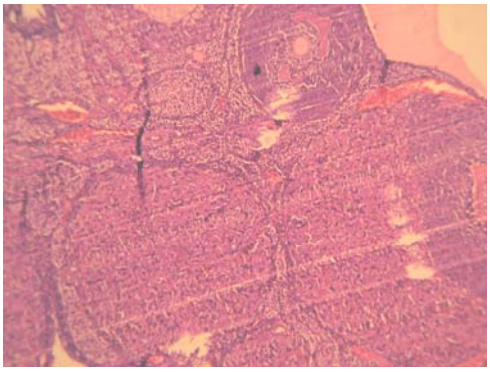
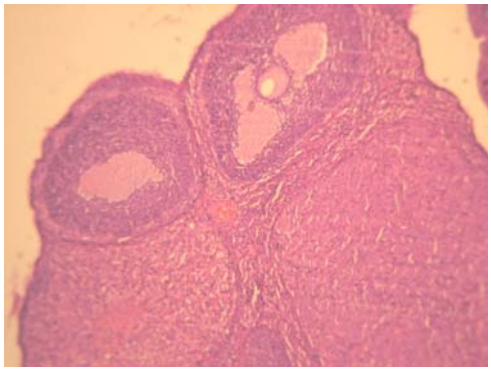


OVARY

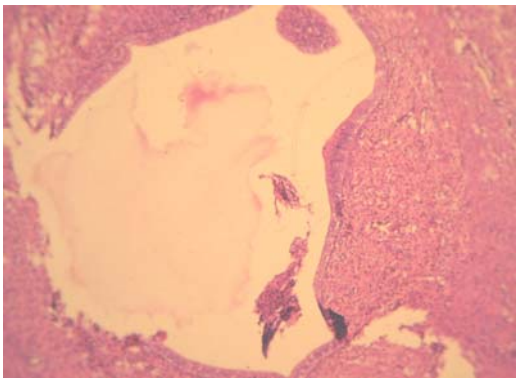
CONTROL



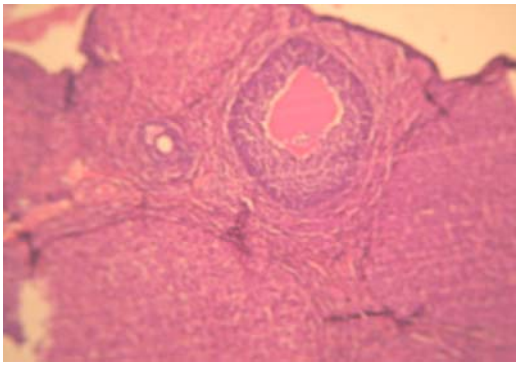
GROUP 1 (200mg/kg)



GROUP 2 (400mg/kg)



GROUP 3 (600mg/kg)



DISCUSSION

The present study with "**Venkaraparpam**" with an objective of finding, whether this drug has got any adverse effect in short term administration or not. **Venkaraparpam** consists,

Venkaram and
Egg albumin

The drug is mainly indicated for moothira kiricharam (Urinary Tract Infection) & neeradaippu.

In this study **Venkaraparpam** was analysed in Chemical, Gunapadam and Toxicological aspects.

In XRD analysis, the graph of unpurified Venkaram and Venkara Parpam was matched with the standard graph of sodium biborate, and the graph of purified venkaram was matched with the standard graph of tincalconite.

As the details of the experiment have already been given, here is the discussion about the results of the experiments.

Acute Toxicity Study

It was found from the study that the single oral dose, upto 4000 mg/kg of **Venkaraparpam** didn't produce any mortality.

No pathological alterations were grossly detected.

Sub acute toxicity study

It was found from the study that the administration of **Venkaraparpam** in the doses such as 200 mg/kg, 400 mg/kg and 600mg/kg for 28 days didn't produce any death and marked changes.

Animals show significant weight loss & food, water consumption rate.

Blood analysis of male and female animals after repeated feeding of **Venkaraparpam** did not suggest any kind of haematological changes except eosinophil count.

No remarkable changes were identified in the biochemical parameters in all the drug treated group of animals. But the bilirubin range is modified significantly by the given **Venkaraparpam**.

The isolated liver and ovary shows the change in weights significantly Animals after 28 days exposure to **Venkaraparpam** revealed no significant changes in the vital organs. Microscopic observation of liver found to be normal in all dose level. But kidney architecture shows damage to lining cells and epithelial damage, Stomach section indicates superficial ulceration with hyper plastic glands, dysplastic glands in the basal mucosal layer and mild erosion of the lining epithelium at high dose level. Section of Testis shows edema of interstitium at moderate dose level and reduced spermatogenesis. Ovary of rats fed with different concentration of **Venkaraparpam** for a period of 28 days suggest no significant tissue damage and were comparable with those of normal control animals.

SUMMARY

Venkaraparpam is a well known siddha drug and it is extensively used by the physicians now and then.

The aim of this dissertation is to find-out the acute and subacute toxicity of this drug on the experimental animals.

In the Literary survey, the constituents of **Venkaraparpam** are discussed in focus on the peculiar features and medicinal uses.

In XRD analysis, the graph of unpurified Venkaram and Venkara Parpam was matched with the standard graph of sodium biborate, and the graph of purified venkaram was matched with the standard graph of tincalconite.

The preparation of **Venkaraparpam** is given and the Toxicity studies are done as follows,

The Wistar albino rats of both sex were selected. The rats weigh 100-120 gms, were selected and provided with standard animal feed and water.

Venkaraparpam suspended in 2%CMC was administered to the groups of wistar rats in a single oral dose by gavage using a feeding needle. Starting dose was 5mg/kg. And the subsequent doses are 10, 50, 100, 250, 500, 1000, 2000 and 4000mg/kg body weight orally. **Venkaraparpam** did not elicit any signs of toxicity or death in both sexes of rats. Daily administration of **Venkaraparpam** at different dose levels (200, 400 and 600 mg/kg) for a period of 28 days showed no adverse effects in male and female rats. The body weight, growth pattern, food and water intake were comparable with those of the normal rats.

Blood analysis of male and female animals after repeated feeding of **Venkaraparpam** did not suggest any kind of haematological changes except eosinophil count.

No remarkable changes were identified in the biochemical parameters in all the drug treated group of animals. But the bilirubin range is modified significantly by the given **Venkaraparpam**.

The isolated liver and ovary shows the change in weights significantly Animals after 28 days exposure to **Venkaraparpam** revealed no significant changes in the vital organs. Microscopic observation of liver found to be normal in all dose level. But kidney architecture shows damage to lining cells and epithelial damage, Stomach section indicates superficial ulceration with hyper plastic glands, dysplastic glands in the basal mucosal layer and mild erosion of the lining epithelium at high dose level. Section of Testis shows edema of interstitium at moderate dose level and reduced spermatogenesis. Ovary of rats fed with different concentration of **Venkaraparpam** for a period of 28 days suggest no significant tissue damage and were comparable with those of normal control animals.

CONCLUSION

From the acute studies conducted, we came to know that **Venkaraparpam** didn't produce death even up to the dose of 4 gms as random (in albinorats). The animals did not show any changes in general behaviour or other physiological activities. There were no significant differences between the control and treated groups in the body and organ weights of male and female rats. No pathological alterations were grossly detected.

Therefore, we come to a conclusion that even upto 4 gms of **Venkaraparpam** never produce death in man.

Also the doses taken in sub acute study did not produce any mortality in animals. But they produced some significant histopathological changes in the kidney. Even, this may be due to continuous administration of this drug for a long period at relatively higher doses when compared to man.

Because an ideal man of 70 k.g. body weight requires 200 mg of the drug 3 times daily. But rats body weight is approximately 100 – 120 gm. But we have given 200 mg per kg, 400 mg per kg and 600 mg per kg daily. These doses are more than human dose. So, we can come to a conclusion that if the drug was in normal dose it might not produce any pathological changes.

The aim of giving such a high dose was to find out the type of toxicity if the drug is given in abnormal high doses. This toxicity due to overdose could occur in a patient, if proper dose is not prescribed by the physician or followed by the patient.

So, the recommended human dose may not produce any ill effects and this must be proved by further animal studies and also by clinical studies by volunteers. This dissertation work is the first step for continuous research in this title.

BIBLIOGRAPHY

1. ***Anuboga Vaithiya Navaneetham*** - by Hakkim. P.M. Abdullah Sahib
2. ***Siddha Vaithiya Pathartha Guna Vilakkam*** - by C. Kannuswamy Pillai
3. ***Raja Vaithiya Magudam*** - by Hakkim. P.M. Abdullah Sahib
4. ***Bogar Nigandu 1200***
5. ***Gunapaadam - Mooligai Vaguppu*** by Dr. C.S. Murugesa Mudaliar
6. ***Gunapaadam - Tathu Jeeva Vaguppu*** by Dr. C.S. Murugesa Mudaliar
7. ***Formulary of Siddha Medicines*** - IMCOPS
8. ***Siddha Vaithya Thirattu*** - by Dr. C.S. Uthamarayan, H.P.I.M.
9. ***Yoogi muni Karisal - 151***
10. ***Yagobu Loha Chendooram***
11. ***Chindoora Vilambagam***
12. ***Nanju Murivu Nool*** - by Pandit K.S. Murugesa Mudailar and Dr. Pon. Gurusironmani, B.A., G.C.I.M.
13. ***Introduction and Brief History in Modern Toxicology*** - by Gupta. P.K.
14. ***Clinical management of poisoning and Medical Toxicology*** - by Gupta. P.K.
15. ***Modi's Medical Jurisprudence and Toxicology*** - by Modi
16. ***The Essential of Forensic Medicine and Toxicology***

    - by Reddy, M.D, D.C.P., Ph.D.,
17. ***The Essential of Forensic Medicine and Toxicology***

    - by Dr. Krishna Reddy

18. ***Sattam Sarntha Maruthuvamum, Nanju Maruthuvamum*** **-** by Dr. P.A. Mohamed Iqbal, M.D., (S).

19. ***Chemical Dictionary*** **-** by Etherington and Roberts

20. ***Text book of Bio-Chemistry*** **-** by D.M. Vadudevan and Sree Kumari

21. ***A text book of Bio-Chemistry*** **-** by A.V.S.S. Rama Rao

22. ***A text book of Bio-Chemistry*** **-** by Ambika Shanmugam

23. ***A text book of Bio-Chemistry*** **-** by A.C. Deb

24. ***Modern in-organic Chemistry*** **-** by R.D. Mandan

25. ***Text book of Pathology*** **-** by Harsh Mohan

26. ***Robbins Pathologic basis of diseases*** **-** by Cotran and Kumar

27. ***Symmers Systemic Pathology*** **-** by Derek G.D. Wight

28. ***The Wealth of India*** **-** Volume II & IIb, CSIR, New Delhi.

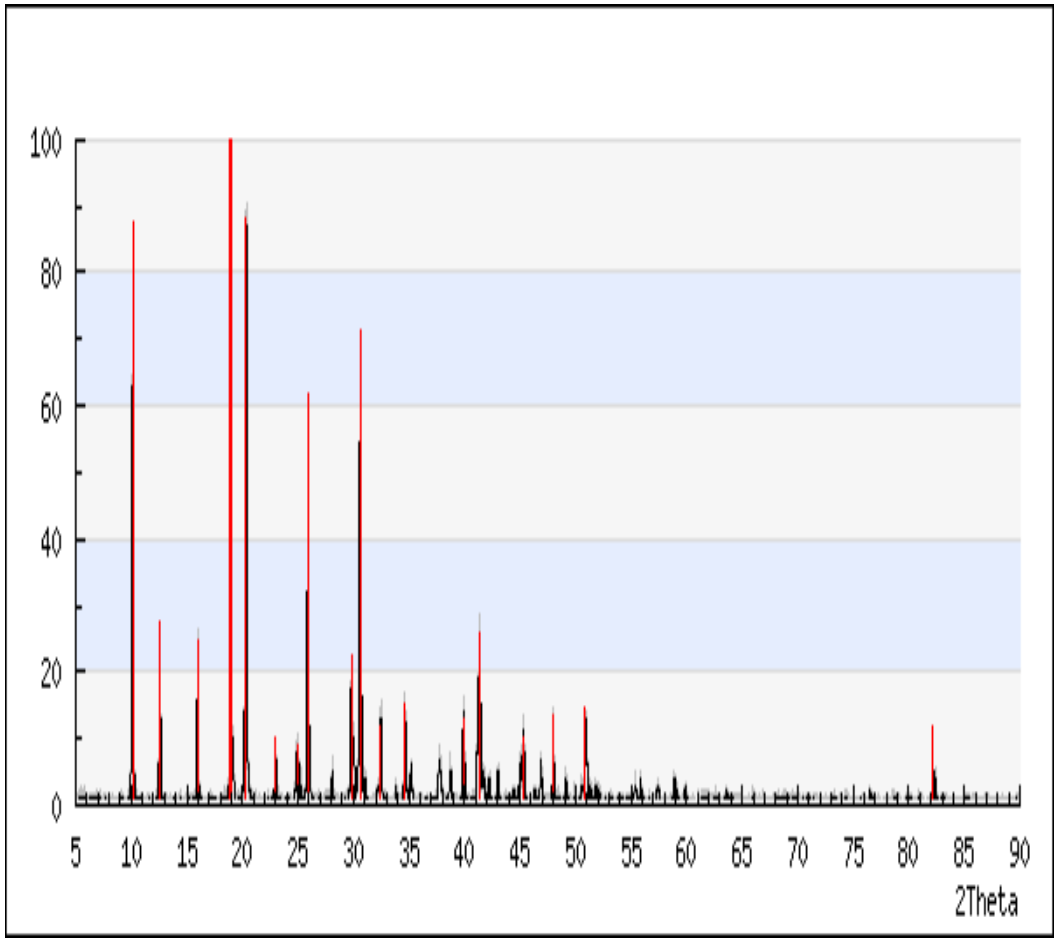
29. ***Indian Materia Medica*** **-** by Dr. K.M. Nadkarni. vol. I & II.

30. ***Hand book of Poisoning*** – by Robert H. Dreishack.

31. ***Text book of Pharmacology*** – by Good man & Gillman.

32. ***Text book of Essentials of Pharmacology*** **-** by KD Tripathi.

TIN CALCONITE



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51-1715 Quality: I

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Volume[CD]: 1331.13
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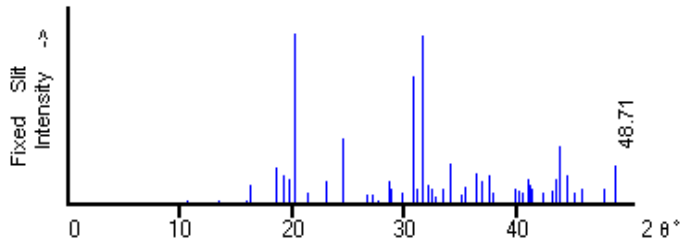
Sys: Monoclinic

S.G.:
Cell Parameters:
a 14.39 b 16.59 c 5.596
α β 95.09 γ

SS/FOM: F30=7(0.037,120)
I/Icor:
Rad: CuKa1
Lambda: 1.5406
Filter: Graph
d-sp: diffractometer

Also called:
sodium diborate

β-Na2 B4 O7
Sodium Borate
Ref: Li, H., Liang, J., J. Am. Ceram. Soc., 78, 470 (1995)



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19.280	17	$\bar{2}$	0	1	29.726	6	2	5	0	35.337	10	5	3	0
19.280	17	3	1	0	29.726	6	4	3	0	36.419	18	5	0	1
19.739	14	$\bar{1}$	2	1	30.808	75	4	0	1	36.884	13	5	1	1
20.240	100	2	3	0	31.160	8	5	0	0	36.884	13	4	5	0
21.399	6	0	4	0	31.647	98	5	1	0	37.604	17	3	6	0
21.399	6	3	2	0	31.647	98	$\bar{1}$	5	1	37.604	17	6	0	0
23.101	13	$\bar{1}$	3	1	32.161	11	0	0	2	37.901	6	$\bar{2}$	6	1
24.524	38	3	3	0	32.161	11	$\bar{1}$	0	2	37.901	6	0	7	0