DISCUSSION
Amohods of fertility regulation for men is being conducted by several International agencies, National research councils and Pharmaceutical companies since 1972.

A male contraceptive must reduce the number of fertile sperm in the ejaculate that it reliably prevents fertilization. Such a method can avert pregnancy by diverting or suppressing sperm count and or inhibiting sperm fertilizing capacity. The substance which could suppress the post testicular maturation of spermatozoa in the epididymis and vas deference hence making the spermatozoa incapable to fertilize the ovum can act as a successful male contraceptive because it would not effect the testosterone level in the body and would be without or very little side effects.

The work done in this laboratory has already shown that the eluted fraction of chloroformic extract of seeds of A. precatorius affect spermatogenesis, sperm motility and cause malformations in the spermatozoa (Khan 2008) and have very little effect on hepatic tissue (Sharma 2007). Therefore its effect on kidney was studied for the present work.

_Abrus precatorius_ has been reported to be highly poisonous. The seeds cause vomiting, diarrohea and abdominal pain because it contains abrin, agglutinin and isoflavin (Anitha et al. 1999; Linn et al. 2000;
Pannerselvam et al. 2000). This problem was overcome by treating the extract at 80°C, till it dried, to destroy the abrin activity which is the main source of toxicity in this plant. This is in agreement with the observation of (Ved 1989) who reported that heating at 80°C for 1 hour destroys the abrin activity.

The Abrus precatorius seeds show the antifertility activity due to presence of Saponin, agglutinin, glycyrrhizin and glycolytic enzymes (Maa et al. 1998). Probably this was the reason that Sapindus emarginatus was selected by CDRI to develop male antifertility pill. Abrus precatorius seeds are also quite rich in Saponin which shows antifertility effect.

The kidney is one of the main target organs of the present project because the project has been mainly concerned with renal toxic effect of herbal male contraceptive. The kidney was examined by keenly observing any possible changes in its morphology as well as its histology. For final assessment, however, the biochemical study was thoroughly screened and conclusions were drawn by correlating with the morphological parameters. The biochemical study is probably the most important tool. It gives and given quite an elaborate picture of anatomical changes (Mohan Harsh 2005).

The kidneys are bean shaped paired organs. The heliurn of the kidney is situated at the midpoint on the medial aspect where the artery,
**Discussion**

**Chronic Renal Failure (CRF)-:** Chronic renal failure is a syndrome characterised by progressive and irreversible deterioration of renal function due to slow destruction of renal parenchyma, eventually terminating in death when sufficient number of nephron have been damaged. Acidosis is the major problem in CRF with development of biochemical Azotaemia and clinical Uraemia syndrome.

Some toxic substances induce slow tubular injury, eventually culminating in CRF. The most common example is intake of high doses of analgesics (Chronic analgesic nephritis).

**Cystic diseases of kidney-:** Cystic lesions of the kidney may be congenital are acquired, non-neoplastic or neoplastic. Cystic lesions of the kidney may occur at any age, extending from foetal (detected on ultrasonography) to old age. Their clinical presentation may include abdominal mass, infection, respiratory distress (due to accompanied pulmonary hypoplasia), haemorrhage and neoplastic transformation.

**Polycystic kidney disease-:** Polycystic disease of the kidney (PKD) is a disorder in which major portion of the renal parenchyma is converted into cysts of varying size. Kidneys in ADPKD (Adult Polycystic Kidney Disease) are always bilaterally enlarged, usually symmetrically heavy. The cut surface shows cysts throughout the renal parenchyma varying in size.
Acquired Renal Cysts: A number of acquired conditions give rise to renal cysts. The include drug induced cystic disease in experimental animals.

Renal Cortical Necrosis: Renal cortical necrosis is infraction of renal cortex varying from microscopic foci to a situation where most of the renal cortex is destroyed. The medulla, the juxtamedullary cortex and a rim of cortex under the capsule are usually spread. The conditions develop most commonly as an obstetrical emergency. Other causes include septic shock, poisoning, severe trauma etc.

Patients present with sudden oliguria or anuria and haematouria. If the process has involved renal cortex extensively, acute renal failure and uraemia develop and prognosis is grave.

Comparative histological changes in kidney

No significant changes were observed in kidney of animals treated with an oral dose of 20mg/rat/day of chloroformic extract and 2mg/rat/day of eluted methanolic and aqueous extract of Abrus precatorius.

These extracts caused no changes in glomerulus and Bowman’s capsule. Proximal convoluted tubules, distal convoluted tubules, the loop of henle and the collecting tubules were normal in histology no cyst or necrosis was seen. When these findings in all the three extract
(chloroformic, eluted methanolic and aqueous fractions) of Abrus precatorius seeds were compared with observation of other workers, it was observed that these findings are of variable Indian medicinal value and formulations of variable Indian medicinal plant which are used for renal disorder. These findings are in agreement with the findings of Adhikary et al. (1989) who reported no toxic effect on liver and kidney caused on administration of Piper betle Linn. stalk in albino rats. Similarly these findings are agreement with the findings of Rajaram et al. (1992) and Ivan (2003) who observed that aqueous extract of seeds of A. precatorius have protective effect against alcohol induced renal damage and this effect is related to a reduction in alcohol induced peroxidation.

These findings are also in agreement with the findings of Young and Meciejewski (1997) who have reported similar result with crude extract stem and bark of Mangifera indica. These findings are also similar to the findings of Gosh and Suryawanshi (2001) who reported the regeneration of kidney parenchyma with crude extract of Vinca rosea leaf and flower (VRL & VRF) in diabetic kidney of albino rats.

These observations are also in agreement with the observations of Shirwaikar et al. (2003) who have reported the flower of Pongamia pinnata have a protective effect against Cisplatin and Gentamicin induced renal injury in rats. Noor et al. (2007) reported similar findings with Aloe vera
extract in Streptozotocin induced diabetic rats reported its nephroprotective nature. Gupta et al. (2008) and Wurochekke et al. (2008) also reported similar results with the aqueous extract of Rhodiola imbricate roots and aqueous stem bark extract of Xemenia americana in rats respectively.

These observations are agreement with the observations of Prasad et al. (2009) who have reported the aqueous leaves extract of Murraya koenigii, Psidium guajava and Catharanthus roseus causes no significant histological changes of kidney in Streptozotocin induced diabetic albino rats. Ligha et al. (2009) reported the aqueous extract of the seeds of Abrus precatorius protect the kidney against alcohol induced parenchyma injury.

However, these findings contradict the findings of Kheifat et al. (2002) who have reported the ethanolic extract of Teucrium polium causes markedly high damage in liver and kidney of rats. Akdogan et al. (2003) reported the hydropic degeneration of tubular epithelial cells, the epithelial cytoplasm, tubular dilation and enlargement in Bowman’s capsule on administration of Mentha piperita Linn. and Mentha spicata in rats.

These observations contradict the observations of Amole and Izegbu (2005) who have reported the aqueous leaf extract of Chenopodium ambrosioides cause necrosis of kidney tubules resulting chronictoxicity in rats. Ganesan et al. (2006) reported that Helicteres isora bark extract has the antihyperglycaemic effect and consequently may alleviate liver and renal damage associated with streptozotocin (STZ) induced diabetic rats.
Discussion

These findings contradict the findings of Bakhiet and Adam (2007) observed enterohepatonephro-toxicity on administration of Cassia italica seeds in Bovans chicks. Jimoh et al. (2008) reported the aqueous extract from the shoots of Arctotis arctotoides causes hyperplasia of the epithelium of the distal convoluted tubule with adjacent chronic inflammation in kidney of rats and mice.

These observations contradict the observations of Adedapo et al. (2008) reported mild congestion in kidney and liver on histoathological examination on administration of aqueous extract of Acacia karroo stem bark in rats and mice. Jaykaran et al. (2009) also observed significant abnormality in liver and kidney on administration of aqueous extract of Ficus racemosa Linn. bark in albino mice. Al-Attar MA (2010) reported that oral administration of alfa-lipoic acid produces significant antihepatotoxicity and nephrotoxicity effects in Malathion treated rats.

These histological observations in kidney were correlated with biochemical and haematological changes in Bilirubin, Creatinine, Urea, SGOT, SGPT, Acid and Alkaline phosphatase and CT, PT, Hb%, ESR, RBCs, WBCs, TLC, DLC, PCV%, MCV, MCH, MCHC. The inference drawn the histological observations are supported by biochemical and haematological observations, as no significant alterations were observed in
the animal treated with the three extract (chloroformic, eluted methanolic and aqueous fractions) of *Abrus precatorius* seeds.

**Comparative biochemical changes in blood biochemistry**

Creatinine is a nitrogenous substance found exclusively in muscle (98% of total body content). It is important for muscular contraction and is excreted as Creatinine. It has advantages over Urea as a renal function test because it is inactive metabolically. It is derived entirely from endogenous metabolism. Its excretion is independent of diet. It is quite constant in health and is not reabsorbed.

Any elevation in Creatinine is indicative of renal dysfunction but during the present study no significant changes were observed in Creatinine in when animals were treated with chloroformic and eluted methanolic and aqueous extract of *Abrus precatorius* seeds after 15 days as well as 30 days of treatment. These findings are in agreement with the findings of Gathumbi *et al.* (2000) and Shinde *et al.* (2003) who have reported similar results with the aqueous extract of *Prunus africana* stem bark and *Arctotis arctotoides* extract in rats.

These observations are in agreement with the observations of Sharma (2005) who have reported similar result with chloroformic extract of *Abrus precatorious* seeds. Adedapo *et al.* (2007a) who have reported the aqueous extract of leaves of *Acacia karroo* cause decrease in Creatinine level in albino rats.
Jimoh et al. (2008) who have reported the aqueous extract from the shoots of Arctotis arctotoides causes no toxic changes in Creatinine level in rats and mice. These findings are in agreement with the findings of Gupta et al. (2008) who reported no acute and sub-acute changes in Creatinine level with aqueous extract of Rhodiola imbricate roots in rats.

These observations are in agreement with the observations of Wurochekke et al. (2008) who have reported the aqueous stem bark extract of Xemenia americana causes no significant differences in Serum levels of Creatinine in rats.

These findings are in agreement with the findings of Okasha et al. (2008) reported no significant changes in Creatinine level on administration of aqueous seeds extract of Hibiscus sabdariffa in female albino rats. These observations are in accordance with the observations of Jaykaran et al. (2009) who have reported the aqueous extract of Ficus racemosa Linn. bark cause no lethal effects on Serum Creatinine level in albino rats.

However, the findings contradict the findings of Murali and Goyal (2001) who have reported that Tinospora cordifolia used in insulin treatment cause increase in Serum Creatinine levels only after 30 days in diabetic rats. Akdogan et al. (2003) reported increase in the levels of Serum Creatinine on administration of Mentha spicata and Mentha piperita Linn. in rats.
These observations contradict the observations of Shinde and Goyal (2003) who reported that Serum Creatinine level indicate the impaired renal function of diabetic animals.

The findings contradict the findings of Kesari et al. (2007) who reported increase in the level of Creatinine level on administration of aqueous extract of *Murraya koenigii* in albino rats. Brown et al. (2007) reported significant changes of Serum Creatinine level on administration of aqueous and alcoholic stem extract of *Tinospora cordifolia* in diabetic rats. Mohzgheghi et al. (2011) reported no changes in Serum Creatinine level caused due to *Hibiscus sabdariffa* in diabetic rats.

These observations contradict the observations of Singh et al. (2007) who reported a significant increase in the activity of Serum Creatinine level on administration of Dimethyl Mercury in rats.

The findings contradict the findings of Alwakeel (2009) who have reported the Mytotoxins fungal extract cause high Creatinine levels in the blood of albino mice. Bulbul et al. (2009) reported increase in the level of Creatinine on administration of “Garbha Gintamani Rasa” (GGM) in rats.

Urea is one of the main nitrogenous waste products excreted in the urine. It is the major excretion product of protein catabolism. Liver is the sole site of urea formation. Urea is formed from CO₂ and NH₃, passed to the blood & filtered at the glomeruli and partly reabsorbed in the tubules.
Any elevation in blood urea is indicative of renal dysfunction but during the present study no significant changes were observed in blood Urea in animals treated with chloroformic and eluted methanolic and aqueous extract of *Abrus precatorius* seeds after 15 days as well as 30 days of treatment. These findings are in accordance with the findings of *Garg et al.* (1992) who have reported aqueous extract of silken styles of corn *zea maize* Linn. cause no significant toxic effect on blood urea level in rats. *Gathumbi et al.* (2000) reported no significant changes in blood urea level on administration of aqueous extract of *Prunus africana* stem bark in rats.

These observations are similar to the observations of *Sharma* (2005) who reported no acute changes in blood urea level on administration of *Abrus precatorius* seeds extract in albino rats. *Adedapo et al.* (2007a) who have reported blood urea were unchanged on administration of *Ballota nigra* in albino rats.

These findings are in agreement with the findings of *Wurochekke et al.* (2008) who have reported the aqueous stem bark extract of *Xemenia americana* no significant changes in blood urea level in rats. *Sahoo et al.* (2008) reported no changes in blood urea level caused due to *Abrus precatorius* seeds extract in albino rats.

These findings are also similar to the findings of *Jaykaran et al.* (2009) who reported no effect on blood urea level on administration of aqueous extract of *Ficus racemosa* Linn. bark in albino mice.
However, the findings are contradictory to findings of Kheifat et al. (2002) who have reported increase in blood urea level on administration *Teucrium polium* ethanolic extract in rats. Akdogan et al. (2003) reported increase in the plasma urea level on administration of *Mentha spicata* and *Mentha piperita* Linn. in rats.

These observations also contradict the observations of Sharma (2008) who reported significant toxic changes on administration of Malathion in male albino rats. Jimoh et al. (2008) who have reported the aqueous extract from the shoots of *Arctotis arctoides* causes decrease in blood urea level in rats.

These findings are contradictory to the findings of Alwakeel (2009) reported high Urea level in the blood of albino mice caused on administration of Mytotoxins fungal extract. Bulbul et al. (2009) who have reported increase in the level of Blood Urea on administration of “Garbha Gintamani Rasa” (GGM) in rats.

Bilirubin is known to interfere with mitochondrial respiration and causes uncoupling of oxidative phosphorylation. Thus, the elevation in its level in blood is indicates impairment in liver functioning. Any hepatic impairment or dysfunction can be a strong reason of renal disorder or renal impairment. Thus, any elevation in serum bilirubin is indicative of renal dysfunction but during the present study no significant changes were observed in serum bilirubin when animals were treated with
Discussion

chloroformic and eluted methanolic and aqueous extract of *Abras precatorius* seeds after 15 days as well as 30 days of treatment. These findings are in agreement with the findings of Sharma (2007) who reported no significance changes in Bilirubin level in administration of chloroformic extract of *Abras precatorius* seeds in albino rats. Adedapo et al. (2007a) reported total bilirubin were unchanged on administration of *Ballota nigra* in albino rats.

These findings are also similar to the findings of Gupta et al. (2008) who have reported no acute and sub-acute changes in serum bilirubin level on administration of aqueous extract of *Rhodiola imbricate* roots in rats. Sahoo et al. (2008) reported no changes in Serum Bilirubin level caused due to *Abras precatorius* in albino rats. Mohagheghi et al. (2011) reported no changes in Serum Bilirubin level caused due to *Hibiscus sabdarifff* in diabetic rats.

However, these observations contradict the observations of Kesari et al. (2007) who reported significance toxic effect in serum bilirubin level on administration of aqueous extract of *Murraya koenigii*. Singh et al. (2007) showed a significant increase in the activity of serum bilirubin on administration of Dimethyl Mercury in rats.

These findings contradict with the findings of Adedapo et al. (2008) who reported a decrease in the levels of total and unconjugated bilirubin on administration of aqueous extract of *Acacia karroo* stem bark
in rats and mice. Jimoh et al. (2008) who have reported the aqueous extract from the shoots of *Arctotis arctotoides* causes decrease in the serum bilirubin level in rats.

These observations also contradict the observations of Sharma (2008) who observed increase in the activity of serum bilirubin on administration of *Endosulfan* and *Diazinon* in male albino rats. Sharma (2008) reported significant toxic changes on administration of *Malathion* in male albino rats.

SGOT and SGPT are indicative of liver injury. These enzymes are released during acute muscular necrosis of liver and tissue damage. Any hepatic impairment or dysfunction can be a strong reason of renal disorder or renal.

Any elevation in SGOT and SGPT is indicative of renal dysfunction but during the present study no significant changes were observed in SGOT and SGPT in animals treated with chloroformic and eluted methanolic and aqueous extract of *Abrus precatorius* seeds after 15 days as well as 30 days of treatment these findings are in agreement with the findings of Garg et al. (1992) who reported no significant toxic effect on SGOT and SGPT levels on administration of aqueous extract of silken styles of corn *Zea mays* Linn. Dubey et al. (1994) who reported no significance changes in SGOT and SGPT levels on administration of Liv-52 in albino rats.
These observations are in agreement with the observations of Gathumbi et al. (2000) who have reported the aqueous extract of *Prunus africana* stem bark on administration of no significance changes in SGOT and SGPT levels in rats. Mittal (2001) reported no significance changes in SGOT and SGPT levels caused due to some indigenous plants in male albino rats.

These findings are similar to the findings of Baskaran et al. (2001) showed that lactulose upto 5% level in the diet do not cause any toxicity in rats as evidenced by Glutamic Oxaloacetic Acid (SGOT), Glutamic Pyruvate Transminase (SGPT) levels. Gosh and Suryawanshi (2001) reported no significance changes in SGOT and SGPT levels caused due to crude extracts of *Vinca rosea* leaf and flower (VRL & VRF) in male albino rats.

These observations are in accordance with the observations of Sharma (2002) who have reported the effects of *Abrus precatorius* and *Aloe barbadensis* in the SGOT and SGPT levels no significance changes on male albino rats. Jindal (2004) reported the extract of *Abrus precatorius* and *Andrographis paniculata* on administration of no toxic changes in the SGOT and SGPT levels in male albino rats.

These findings are similar to the findings of Sharma (2005) reported no acute changes in SGOT and SGPT levels on administration of
*Abrus precatorius* seeds extract on albino rats. **Sharma (2007)** who have reported no significance changes in SGOT and SGPT levels on administration of chloroformic extract of *Abrus precatorius* seeds in albino rats.

These observations are in accordance with the observations of **Bhatt et al. (2007)** who have reported no appreciable alteration in SGOT and SGPT levels caused *Abrus precatorius* in male mice (*Mus musculus*). **Jimoh et al. (2008)** reported no toxic changes in SGOT and SGPT levels cause due to aqueous extract from the shoots of *Arctotis arctotoides* in rats and mice.

These findings are similar to the findings of **Sahoo et al. (2008)** who have reported no changes in Serum Aminotransferase (SGOT), Aspartate Aminotransferase (SGPT) levels on administration of *Abrus precatorius* seeds on albino rats. **Gupta et al. (2008)** reported no acute and sub-acute changes in SGOT, SGPT levels on administration of aqueous extract of *Rhodiola imbricate* roots in rats and mice.

These observations are in accordance with the observations of **Adedapo et al. (2008)** who have reported no significant changes in SGOT, SGPT levels caused aqueous extract of *Acacia karroo* stem bark in rats and mice. **Jaykaran et al. (2009)** who reported no lethal effects in SGOT, SGPT levels on administration of aqueous extract of *Ficus racemosa* Linn. bark in albino mice.
However, these observations contradict the observations of Singhal and Merali (1976) reported significance changes in SGOT, SGPT levels on administration of Cadmium in albino rats. Hussian (1987) who reported significance changes in SGOT, SGPT levels on administration of Diazinon in albino rats.

The present findings contradict the findings of Rahman et al. (1990) who have reported significant reduction in SGOT, SGPT levels on administration of Isoprocarb in Chicken. Jain et al. (1995) reported an increase in level SGOT on administration of Eldrin.

These observations also contradict the observations of Adedapo et al. (2007a) who have reported the extract of Ballota nigra causes decrease in SGOT, SGPT levels in rats. Adedapo (2007b) reported high SGOT level or AST level in blood on administration of the leaves of Abrus precatorius in rats.

The findings are contradictory to the findings of Singh et al. (2007) who showed a significant increase in the activity of Serum Alanine Transaminase (ALT), Serum Aspartate Transaminase (AST) on administration of Dimethyl Mercury in rats. Balakrishnan and Menon (2007) reported increase in levels of plasma Alanine Transaminase (ALT), Aspartate Transaminase (AST) on administration of Nicotin in wistar rats.
Discussion

These observations are contradictory to the observations of Kesari et al. (2007) who reported toxic changes in SGOT, SGPT levels caused aqueous extract of *Murraya koenigii* in rats. Jimoh et al. (2008) reported decrease the levels of Alanine Transaminase (ALT) or SGPT level on administration of aqueous extract from the shoots of *Arctotis arctotoides* in rats and mice.

These findings contradict the findings of Sharma (2008) who reported an increase in SGOT, SGPT levels on administration of Endosulfan and Diazinon in male albino rats. Sharma (2008) reported significant toxic changes on administration of Malathion in male albino rats. El- Kashoury and Tag- El- Din (2010) reported decrease in the activity of alkaline and acid phosphatase in treated groups on administration of Chlorypyrifos.

Alkaline Phosphatase is found in the osteoblast cells of bone, liver cells, intestine, kidney & placenta. The Phosphatase can also function as transverses, linking the released inorganic phosphate with suitable acceptor substances. A wide range of organic phosphatase esters are attacked. Alkaline Phosphatase is increased in renal biliary disease and high biliary obstructions.

Elevation in acid Phosphatase activity may also be found occasionally in women with breast cancer. Increase in Acid Phosphatase activity show damage in kidney tissues. Any hepatic impairment or dysfunction can be a strong reason of renal disorder or renal damage.
Discussion

Any elevation in Acid and Alkaline Phosphatase is indicative of renal dysfunction but during the present study no significant changes were observed in Acid and Alkaline Phosphatase in animals treated with chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These findings are in agreement the findings of Garg et al. (1992) who reported no significantly toxic effect on the activity of Acid Phosphatase caused due to aqueous extract of silken styles of corn zea maize Linn. in rats. Baskaran et al. (2001) who showed that lactulose upto 5% level in the diet do not cause any toxicity in rats as evidenced by Acid Phosphatase (ACP).

These observations are in accordance with the observations of Sharma (2002) who reported no significance changes in the activity of Acid and Alkaline Phosphatase on administration of Abrus precatorius seeds and Aloe barbadensis extract in male albino rats. Jindal (2004) reported the extract of Abrus precatorius and Andrographis peniculata causes no toxic changes in the in the activity of Acid and Alkaline Phosphatase in male albino rats.

These findings are in agreement with the findings of Sharma (2005) reported no acute changes in the activity of Acid and Alkaline Phosphatase on administration of Abrus precatorius seeds extract on albino rats. Sharma (2007) who reported no significance changes in the
activity of Acid and Alkaline Phosphatase on administration of chloroformic extract of *Abras precatorius* seeds in albino rats.

However, these observations contradict the observations of Singhal and Merali (1976) who reported significance changes in the activity of Acid and Alkaline Phosphatase on administration of *Cadmium* in albino rats. Hussian(1987) reported an increase in the activity of Alkaline Phosphatase on administration of *Diazinon* in albino rats.

These findings contradictory to the findings of Rahman et al. (1990) who reported an increase in the activity of Acid Phosphatase on administration of *Isoprocarb* in Chicken. Singh et al. (2007) showed a significant an increase in the activity of Acid and Alkaline Phosphatase on administration of *Dimethyl Mercury* in rats.

These observations contradict the observations of Balakrishnan and Menon (2007) reported an increase in the activity of Alkaline Phosphatase on administration of *Nicotin* in wistar rats. Kesari et al. (2007) reported toxic changes in the activity of Acid and Alkaline Phosphatase caused due to aqueous extract of *Murraya koenigii* in rats.

These findings are contradictory to the findings of Adedapo et al. (2008) who have reported some toxic changes in the activity of Acid and Alkaline Phosphatase on administration of aqueous extract of *Acacia karroo* stem bark in rats and mice. Jimoh et al. (2008) reported decrease
in the activity of Alkaline Phosphatase on administration of aqueous extract from the shoots of *Arctotis arctotoides* in rats and mice.

These observations contradict the observations of Sharma (2008) who have reported increase in the activity of Acid and Alkaline Phosphatase on administration of **Endosulfan** and **Diazinon** in male albino rats. Sharma (2008) reported significant toxic changes in the activity of Acid and Alkaline Phosphatase on administration of **Malathion** in male albino rats.

**Comparative haematological changes in blood haematology**

The Haemoglobin value is employed as the major parameters for determine women. Although Hb% value is employed as the major parameter for determine whether or not **anaemia** in present. Subnormal level of haemoglobin causes lowered O₂ carry capacity of the blood tissue. Thus hypoxia develops due to **anaemia** causing impaired function of the affected tissue. A decrease or increase in haemoglobin concentration must be reported as a sign of disease requiring further investigations.

Any elevation in haemoglobin level is indicative of blood dysfunction but during the present study no significant changes were observed in haemoglobin in animals treated with chloroformic and eluted methanolic and aqueous extract of *Abrus precatorius* seeds after 15 days.
as well as 30 days of treatment. These findings are in accordance to the findings of Garg et al. (1992) who have reported no significant effect in Haemoglobin (Hb%) caused on administration of aqueous extract of silken styles of corn *Zea mays* Linn. in rats.

These findings are in accordance with the findings of Sharma (2005) reported no acute changes in Haemoglobin (Hb %) on administration of *Abrus precatorius* seeds extract in albino rats. Sharma (2007) who reported no significance changes in Haemoglobin (Hb %) on administration of chloroformic extract of *Abrus precatorius* seeds in albino rats.

These observations are in accordance with the observations of Sharma et al. (2007) who reported no toxic changes in Haemoglobin (Hb%) caused due to the ethanolic extract of *Piper betle* Linn. (petiole) on female albino rats. Babayi et al. (2007) reported no significant changes in Haemoglobin (Hb %) on administration of aqueous extract of *Cassytha filiformis* in rats.

These findings are similar to the findings of Adedapo et al. (2007a) observed no toxic effect in Haemoglobin (Hb%) on administration of aqueous extract of leaves of *Acacia karroo* in rats. Bhatt et al. (2007) who have reported no appreciable alteration in Haemoglobin (Hb%) caused *Abrus precatorius* in male mice (*Mus musculus*).
These observations are in accordance with the observations of Abuelgasium et al. (2007) suggested no changes in Haemoglobin (Hb%) on administration of methanolic extracts of Ambrosia moritima in rats. Jimoh et al. (2008) reported no changes in Haemoglobin (Hb%) on administration of aqueous extract from the shoots of Arctotis arctotoides in rats and mice.

These findings are similar to the findings of Sahoo et al. (2008) who have reported no changes in Haemoglobin (Hb%) on administration of Abrus precatorius seeds in albino rats. Gupta et al. (2008) reported no acute and sub-acute changes in Haemoglobin (Hb%) on administration of aqueous extract of Rhodiola imbricate roots in rats.

These observations are in accordance with the observations of Adedapo et al. (2008) who reported no significant changes in Haemoglobin (Hb%) caused due to the aqueous extract of Acacia karroo stem bark in rats and mice. Jaykaran et al. (2009) reported no lethal effects in SGOT, SGPT levels on administration of aqueous extract of Ficus racemosa Linn. bark in albino mice.

However, the findings are contradict the findings of Isaacson et al. (1946) reported toxic effect of Azo Carmine causes reduction in the Haemoglobin (Hb%) concentration in rats. Taylor et al. (1968) who reported Sodium Cyclamate and Saccharin results in toxic effect
Discussion

decrease in Hb%. Gopal et al. (1982) who reported Endosulfan induced Haemoglobin (Hb%) changes in fishes.

These observations are contradict the observations of Rao et al. (1984) reported an increase in the Haemoglobin (Hb%) concentration on Hetropneustes fossilis on administration of Delamethrin. Coles (1986) reported some significant changes in Haemoglobin (Hb%) on administration of aqueous extract of Acacia karroo in rats.

These findings are contradictory to the findings of Pravbati et al. (1988) who reported decrease the level of Haemoglobin (Hb%) on administration of Azo-carmine. Prasad and Rai (1988) reported decrease the level of Haemoglobin (Hb%) on administration of non-nutritive sweetener Saccharin in albino rats.

These observations are contradict the observations of Rahman et al. (1990) who reported an increase in the Haemoglobin (Hb%) on administration of Isoprocarb in Chicken. Prabhu et al. (1997) studied some changes in Haemoglobin (Hb%) on administration of Cybil in albino rats.

These findings contradict to the findings of Bhargav (1998) who reported decline the Hb Content cause Organochlorinated pesticides in albino rats. American Diabetes Association (2000) studies the higher value of Haemoglobin (Hb%) on administration of aqueous extract of Mangifera indica Linn. (Mango) stem bark in rats.
Discussion

These findings contradict the findings of Adedapo et al. (2007) who reported the aqueous leaf extract of A. precatorius also caused due to decreased the Haemoglobin concentration (Hb%). Nwinuka et al. (2008) reported decrease the levels of Haemoglobin (Hb%) on administration of the crude aqueous stem bark extract of Mangifera indica (mango) on albino rats.

These observations are contradict the observations of Sharma (2008) who reported increase in the activity of Serum Bilirubin on administration of Endosulfan and Diazinon in male albino rats. Sharma (2008) reported significant toxic changes on administration of Malathion in male albino rats.

Red Blood Cells (RBCs) are highly adapted for its principal function of oxygen and carbon dioxide transport. During differentiation in the bone marrow, vast quantities of the iron containing respiratory pigment haemoglobin are synthesized. Erythrocytes are primarily involved in the transport of oxygen and carbon dioxide and function exclusively within the vascular system. The whole mass of red blood cells and their precursors in the bone marrow is called the Erythron. The fully differentiated erythrocyte thus consists merely of an outer plasma membrane enclosing haemoglobin and the limited number of enzymes necessary for maintenance of plasma membrane integrity and gaseous transport function.
Any elevation in red blood cells is indicative of blood dysfunction but during the present study no significant changes were observed in red blood cells in animals treated with chloroformic and eluted methanolic and aqueous extract of *Abrus precatorius* seeds after 15 days as well as 30 days of treatment. These findings are in accordance the findings of Garg et al. (1992) who reported no significantly toxic effect in RBCs caused due to aqueous extract of silken styles of corn *zea maize* Linn. in rats.

These findings are similar to the findings of Grinberg et al. (1997) studied the protective effects of tea polyphones against oxidative damage to Red Blood Cells (RBCs). American Diabetes Association (2000) studied the higher value of Red Blood Cells (RBCs) on administration of aqueous extract of *Mangifera indica* Linn. (mango) stem bark in rats. These observations are in accordance with the observations of Sharma et al. (2007) who reported no toxic changes in RBCs caused due to the ethanolic extract of *Piper betle* Linn. (petiole) in female albino rats. Babayi et al. (2007) reported no significant changes in RBCs on administration of aqueous extract of *Cassytha filiformis* in rats.

These observations are similar to the findings of Bhatt et al. (2007) who reported no appreciable alteration in RBCs in male mice (*Mus musculus*) on administration of *Abrus precatorius* seeds. Adedapo et al. (2007a) who reported no toxic effect in Red Blood Cells (RBCs) on administration of aqueous extract of leaves of *Acacia karroo* in rats.
Gupta et al. (2008) reported no acute and sub-acute changes in RBCs on administration of aqueous extract of *Rhodiola imbricate* roots in rats.

These observations are in agreement with the observations of Adedapo et al. (2008) who have reported no significant changes in RBCs caused aqueous extract of *Acacia karroo* stem bark in rats and mice. Nwinuka et al. (2008) reported increase the Red Blood Cells (RBCs) on administration of the crude aqueous stem bark extract of *Mangifera indica* (Mango) on albino rats. Jaykaran et al. (2009) reported no lethal effects in RBCs on administration of aqueous extract of *Ficus racemosa* Linn. bark in albino mice.

However, the findings are contradictory to the findings of Rajni et al. (1981) and Mars et al. (1984) reported RBCs damage due to the Endosulfan toxicity.

These observations also contradict the observations of Gopal et al. (1982) who have reported Endosulfan induced RBCs damage in fishes. Coles (1986) reported some significant changes in Red Blood Cells (RBCs) on administration of aqueous extract of *Acacia karroo* in rats. Dinel et al. (1986) reported the Endosulfan damages the human Red Blood Cells (RBCs) membrane.

The findings are contradictory to the findings of Pravbati et al. (1988) who have reported decrease the Red Blood Cells (RBCs) on
administration of Azo-carmine. Prabhu et al. (1997) studied some changes in Red Blood Cells (RBCs) on administration of Cybil in albino rats.

These findings are contradictory to the findings of Adedapo et al. (2007) who have reported decreased the Haemoglobin concentration (Hb%) cause due to the aqueous leaf extract of A. precatorius in rats.

These observations also contradict the observations of Sharma (2008) who reported increase in Red Blood Cells (RBCs) on administration of Endosulfan and Diazinon in male albino rats. Sharma (2008) reported significant toxic changes in Red Blood Cells (RBCs) on administration of Malathion in male albino rats.

**White Blood Cells (WBCs) or Total Leucocytes Counts (TLC)** -

The leucocytes constitute an important part of the defense and immune systems of the body and, as such, act mainly outside blood vessels in the tissues, thus the leucocytes found in circulating blood are merely in transit between their various sites of activity. **Leucocytes** constitute an important part of the body's defenses against foreign invaders. In general, all the leucocytes perform their functions in the tissues and merely use the blood as a vehicle for transit between sites of formation, storage and activity.

Any elevation in White blood cells or TLC is indicative of blood dysfunction but during the present study no significant changes were observed in white blood cells or TLC in animals treated with
chloroformic and eluted methanolic and aqueous extract of *Abras precatorius* seeds after 15 days as well as 30 days of treatment. These findings are in accordance with the findings of Grinberg *et al.* (1997) who reported the protective effects of *tea polyphones* against oxidative damage to White Blood Cells (WBCs). *American Diabetes Association* (2000) who reported that the higher value of White Blood Cells (WBCs) on administration of aqueous extract of *Mangifera indica* Linn. (mango) stem bark in rats. *Toss-Luty et al.* (2001) who reported an increase in Total Leucocytes Count (TLC) on administration of oral treatment of Daltamethrin and Fenralerate in mice.

*Babayi et al.* (2007) reported no significant change in WBCs on administration of aqueous extract of *Cassytha filiformis* in rats.

These findings are similar to the findings of *Adedapo et al.* (2007a) who observed no effect in White Blood Cells (WBCs) on administration of aqueous extract of leaves of *Acacia karroo* in rats. *Sharma et al.* (2007) observed no effect in White Blood Cells (WBCs) on administration of ethanolic extract of *Piper betle* Linn. (petiole) in female albino rats.

These observations are in agreement with the observations of *Gupta et al.* (2008) reported no acute and sub-acute changes in WBCs on administration of aqueous extract of *Rhodiola imbricate* roots in rats.
These observations are in agreement with the observations of Adedapo et al. (2008) who reported no significant change in WBCs on administration of aqueous extract of *Acacia karroo* stem bark in rats and mice. Jaykaran et al. (2009) reported no lethal effects in WBCs on administration of aqueous extract of *Ficus racemosa* Linn. bark in albino mice.

However, the findings are contradictory to the findings of Isaacson et al. (1946) reported toxic effect of *Azo Carmine* on WBCs due to the Endosulfan toxicity in rats. Gopal et al. (1982) who reported Endosulfan induced WBCs damage in fishes.

These findings are contradictory to the findings of Prasad and Rai (1988) who reported decrease in the White Blood Cells (WBCs) on administration of oral dose of non-nutritive sweetener Saccharin in albino rats. Kumar (1990) reported an increased the Total Leucocytes Count (TLC) in *Clarius batracus* exposed to lethal dose 46 Hrs. Lc50 of organophosphate group of insecticide.

These observations also contradict to the observations of Mishra (1993) who reported an increase the total leucocytes count (TLC) in *Clarius batracus* exposed to 48 Hrs Lc50 of a series an Organophosphorus group of insecticide. Prabhu et al. (1997) studied some significant changes in White Blood Cells (WBCs) on administration of Cybil in albino rats.
These findings are contradictory to the findings of Akay et al. (1999) who reported an increase in Total Leucocytes Count (TLC) upon exposure of rats to a combination of insecticide viz. Endosulfan, Dimethoate and Carboxyl.

These findings are contradictory to the findings of Adedapo et al. (2005) observed significant changes in the total White Blood Cells (WBCs) caused due to the aqueous extract of the leaves of Phyllanthus amarus in rats. Adedapo et al. (2007) who reported decrease in the White Blood Cells (WBCs) caused due to the aqueous leaf extract of A.precatorius in rats.

These findings are contradictory to the findings of Abuelgasium et al. (2007) who reported increase in the White Blood Cells (WBCs) on administration of methanolic extracts of Ambrosia moritima. Nwinuka et al. (2008) reported an increase the White Blood Cells (WBCs) on administration of the crude aqueous stem bark extract of Mangifera indica (mango) in albino rats.

These observations also contradict the observations of Jimoh et al., (2008) reported an increase the White Blood Cells (WBCs) on administration of aqueous extract from the shoots of Arctotis arctotoides in rats and mice. Sharma (2008) who reported an increase in White Blood Cells (WBCs) on administration of Endosulfan and Diazinon in
male albino rats. Sharma (2008) reported significant toxic changes in White Blood Cells (WBCs) on administration of Malathion in male albino rats.

Erythrocyte Sedimentation Rate (ESR) at which the red blood cells fall, when blood is allowed to stand, is known as Erythrocyte Sedimentation Rate (ESR). In severe anaemia, the ESR is markedly elevated. The concentration of the erythrocytes in the blood is decreased. The ESR reflects mainly changes in the plasma proteins that accompany most of the acute and chronic infection, a non specific response to tissue damage and denotes the presence of disease, nephritis, acute hepatitis etc.

Any elevation in ESR is indicative of blood dysfunction but during the present study no significant changes were observed in ESR in animals treated with chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These findings are similar to the findings of Sahoo et al. (2008) who reported no changes in Erythrocyte Sedimentation Rate (ESR) on administration of Abrus precatorius seeds.

However, the findings are contradictory to the findings of Rajni et al. (1987) who reported an increase in Erythrocyte Sedimentation Rate (ESR) on administration of Diazinon. Jain and Bhargava (1992, 1994)
reported decline in ESR value in *Methyl Parathion and Phosphamidon* in treated rats.

These observations also contradict the observations of *Sharma* (2008) who have reported increase in ESR on administration of *Endosulfan* and *Diazinon* in male albino rats. *Sharma* (2008) reported significant toxic changes in ESR on administration of *Malathion* in male albino rats. *Yashowardhan et al.* (2008a) reported increased Erythrocyte Sedimentation Rate (ESR) treated with *Diazinon* on albino rats.

Differential Leucocytes Count (DLC) is vital for the diagnosis of a number of blood related disorders involving either red cells or white cells. Its primary use is to identify changes in the distribution of white cells. Which may related to specific types of disorders like infection (*bacterial, viral or parasitic*) or leukaemia (*myelogenous, lymphocytic, monocyes etc.*). *Granulocytes* are so named for their prominent cytoplasmic secretary granules. Each of the three different types of granulocytes has type specific granules, the names *neutrophils, eosinophils, and basophils* being derived from the staining characteristics of these specific granules.

Any elevation in Differential Leucocytes Count is indicative of blood dysfunction but during the present study no significant changes were observed in Differential Leucocytes Count. In animals treated with
chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These findings are in accordance with the findings of Babai et al. (2007) who reported no significant change in differential leucocytes count (DLC) on administration of aqueous extract of Cassytha filiformis in rats. Adedapo et al. (2007a) who observed no toxic effect in on administration of aqueous extract of leaves of Acacia karroo in rats.

These findings are similar to the findings of Adedapo et al. (2008) who reported no significant changes in differential leucocytes count (DLC) on administration of aqueous extract of extract of Acacia karroo stem bark in rats and mice. Sahoo et al. (2008) reported no changes in differential leucocytes count (DLC) caused due to Abrus precatorius.

But the findings are contradictory to the findings of Adedapo et al. (2005) who observed significant changes in the differential leucocytes count (DLC) caused due to the aqueous extract of the leaves of Phyllanthus amarus in rats. Savitha et al. (2008) reported decrease in the phagocytic index of neutrophil and increase in the percentage of neutrophils in differentials counts in the postoperative blood on administration of surgical stress.

Clotting Time (CT) is also known as Lee White Clotting Time. Presences of a circulatory anticoagulant, like heparin (used as a therapeutic drug), will cause abnormally long clotting time.
Any elevation in CT is indicative of blood dysfunction but during the present study no significant changes were observed in CT in animals treated with chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These findings are in accordance with the findings of Babayi et al. (2007) who reported no significant changes in Clotting Time (CT) on administration of aqueous extract of Cassytha filiformis in rats.

But the findings are contradictory to the findings of Sharma (2008) who have reported increase in clotting time on administration of Endosulfan and Diazinon in male albino rats. Sharma (2008) reported significant toxic changes in clotting time on administration of Malathion in male albino rats.

Prothrombin is synthesized in the liver under the influence of fat soluble vitamin K (Precursor). Prothrombin is related to factor VII which is also synthesized in the liver. Prothrombin is converted to thrombin which triggers the transformation of fibrinogen to fibrin. Prolonged PT suggests the possibility of deficiencies of factors II, V, VII and X.

Any elevations in Prothrombin time is indicative of blood dysfunction but during the present study no significant changes were observed in PT in animal treated with chloroformic, eluted alcoholic and aqueous fractions of Abrus precatorius seeds after 15 days as well as 30
days of treatment. These observations are in agreement with the observation of Babayi et al. (2007) who reported no significant change in Prothrombin time (PT) on administration of aqueous extract of Cassytha filiformis in rats.

However, the findings are contradictory to the findings of Sharma (2008) who have reported increase in Prothrombin time (PT) on administration of Endosulfan and Diazinon in male albino rats. Sharma (2008) reported an increase in Prothrombin time (PT) on administration of Malathion in male albino rats.

Packed cell volume or Haematocrit is the volume of erythrocytes/lit of whole blood indicating the proportion of plasma and red cells. Haematocrit is a reasonable index of the red cell population. As in the case of haemoglobin concentration is a decrease in Haematocrit value is a suitable measurement for detection of anaemia. Haematocrit may also rise from dehydration.

Any elevation in PCV is indicative of blood dysfunction but during the present study no significant changes were observed in PCV in animals treated with chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These findings are in agreements with the findings of Babayi et al. (2007) who reported no significant changes in packed cell volume (PCV)
on administration of aqueous extract of *Cassytha filiformis* in rats. 

*Adedapo et al.* (2007a) observed no toxic effect in packed cell volume on administration of aqueous extract of leaves of *Acacia karroo* in rats.

These findings are similar to the findings of *Abuelgasium et al.* (2007) suggested no changes in packed cell volume (PCV) on administration of water extract *Ambrosia moritima* in rats. *Gupta et al.* (2008) who reported no acute and sub-acute changes in packed cell volume (PCV) on administration of aqueous extract of *Rhodiola imbricate* roots in rats.

These observations are similar to the observation of *Jimoh et al.* (2008) who reported no toxic changes in packed cell volume (PCV) on administration of aqueous extract from the shoots of *Arctotis arctotoides* in rats and mice. *Adedapo et al.* (2008) reported no significant changes in packed cell volume (PCV) on administration of aqueous extract of *Acacia karroo* stem bark in rats and mice.

However, the present findings contradict the findings of *Coles* (1986) who reported some significant changes in packed cell volume (PCV) on administration of aqueous extract of *Acacia karroo* in rats. *Prasad and Rai* (1988) who reported decreased the Packed Cell Volume (PCV) caused due to the oral dose of non-nutritive sweetener *Saccharin* in albino rats.
These findings are contradictory to the findings of Bhargav (1998) reported Organochlorinated pesticides decline PCV fluctuations in albino rats. American Diabetes Association (2000) reported the higher value of packed cell volume (PCV) on administration of aqueous extract of Mangifera indica Linn. (mango) stem bark in rats.

These observations also contradict the observations of Adedapo et al. (2007) who reported decreased the packed cell volume (PCV) caused due to the aqueous leaf extract of A.precatorius. Nwinuka et al. (2008) who reported an increase in packed cell volume (PCV) on administration of the crude aqueous stem bark extract of Mangifera indica (mango) in albino rats.

The findings are contradictory to the findings of Yashowardhan et al. (2008a) reported decrease in packed cell volume (PCV) treated with Diazinon on albino rats. Sharma (2008) who reported increase in packed cell volume (PCV) on administration of Endosulfan and Diazinon in male albino rats. Sharma (2008) reported significant toxic changes in packed cell volume (PCV) on administration of Malathion in male albino rats.

Mean Corpuscular Haemoglobin (MCH) indicates the amount of haemoglobin in the red blood cells and should always correlate with the MCV and MCHC. An elevated MCH occurs in microcytic anaemia and in some cases of spherocytosis in which hyperchromic may be present.
Any elevation in MCH is indicative of blood dysfunction but during the recent study no significant changes were observed in MCH in animals treated with chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These observations are in accordance with the findings of Prasad and Rai (1988) who reported no changes the level of Mean Corpuscular Haemoglobin (MCH) due to oral dose of non-nutritive sweetener Saccharin in albino rats. Garg et al. (1992) observed not significantly toxic effect on Mean Corpuscular Haemoglobin (MCH) on administration of aqueous extract of silken styles of corn zea maize Linn.

These observations are similar to the observations of Adedapo et al. (2007a) observed no effect in Mean Corpuscular haemoglobin on administration of aqueous extract of leaves of Acacia karroo in rats. Babayi et al. (2007) reported no significant changes in Mean Corpuscular Haemoglobin (MCH) on administration of aqueous extract of Cassytha filiformis in rats.

However, these observations are contradict with the observations of Coles (1986) who reported some significant changes in Mean Corpuscular Haemoglobin (MCH) on administration of aqueous extract of Acacia karroo in rats. American Diabetes Association (2000) who reported the higher value of Mean Corpuscular Haemoglobin (MCH) on
administration of aqueous extract of *Mangifera indica* Linn. (mango) stem bark in rats. Adedapo *et al.* (2007) who reported decrease the level of Mean Corpuscular Haemoglobin (MCH) on administration of the aqueous leaf extract of *A. precatorius*.

However, the findings are contradictory to the findings of Sharma (2008) who reported an increase in Mean Corpuscular Haemoglobin (MCH) on administration of *Endosulfan* and *Diazinon* in male albino rats. Sharma (2008) reported significant toxic changes in Mean Corpuscular Haemoglobin (MCH) on administration of *Malathion* in male albino rats.

Mean Corpuscular Volume (MCV) indicates whether the red cells appear normocytic, microcytic or macrocytic. If the MCV is less than 80 fl, the red blood cells are microcytic. If the MCV is greater than 97 fl, the red blood cells are macrocytic. If the MCV is within the normal range, the red blood cells are normocytic.

Any elevation in MCV is indicative of blood dysfunction but during the recent study no significant changes were observed in MCV in animals treated with chloroformic and eluted methanolic and aqueous extract of *Abrus precatorius* seeds after 15 days as well as 30 days of treatment. These findings are in accordance with the findings of Prasad and Rai (1988) who reported no changes in level of Mean Corpuscular
Volume (MCV) caused due to the **Saccharin** in albino rats. Garg *et al.* (1992) who observed not significantly toxic effect in mean corpuscular volume (MCV) on administration of aqueous extract of silken styles of *corn zea maize* Linn. Babayi *et al.* (2007) who reported no significant changes in mean corpuscular volume (MCV) on administration of aqueous extract of *Cassytha filiformis* in rats.

These observations are similar to the observations of Abuelgasium *et al.* (2007) who suggested no changes in mean corpuscular volume (MCV) on administration of water extract *Ambrosia moritima* in rats. Gupta *et al.* (2008) who reported no acute and sub-acute changes in mean corpuscular volume (MCV) on administration of aqueous extract of *Rhodiola imbricate* roots in rats.

These findings are in agreement with the findings of Jimoh *et al.* (2008) reported no toxic changes in the mean corpuscular volume (MCV) on administration of aqueous extract from the shoots of *Arctotis arctotoides* in rats and mice. Adedapo *et al.* (2008) who reported no significant changes in mean corpuscular volume (MCV) on administration of aqueous extract of *Acacia karroo* stem bark in rats and mice.

However, the findings are contradictory to the findings of Bomford (1975); Varadaraj *et al.* (1993) and Prabhu (1997) who
reported increase level in mean corpuscular volume (MCV) in *Diazinon* treated rats.

*Prabhu et al.* (1997) who reported decreased the level of mean corpuscular volume (MCV) on administration of *Cybil* in albino rats.

These findings are contradictory to the findings of *Coles* (1986) who reported some significant changes in level of Mean Corpuscular Volume (MCV) on administration of aqueous extract of *Acacia karroo* in rats. *Prasad and Rai* (1988) who reported no changes in level of Mean Corpuscular Volume (MCV) caused due to the *Saccharin* in albino rats.

These observations also contradict the observations of *American Diabetes Association* (2000) who reported the higher value of Mean Corpuscular Volume (MCV) on administration of aqueous extract of *Mangifera indica* Linn. (mango) stem bark in rats. *(Adedapo et al. 2007)* who reported decreased the Mean Corpuscular Volume (MCV) caused due to the aqueous leaf extract of *A. precatorius*.

However, the findings are contradictory to the findings of *Sharma* (2008) who have reported increase in Mean Corpuscular Volume (MCV) on administration of *Endosulfan* and *Diazinon* in male albino rats. *Sharma* (2008) reported significant toxic changes in Mean Corpuscular Volume (MCV) on administration of *Malathion* in male albino rats.
Mean corpuscular haemoglobin contraction (MCHC) indicates whether the red blood cells are normochromic, hypochromic or hyperchromic. An MCHC below 32% indicates hypochromic and red blood cells with a normal MCHC are termed normochromic. MCHC about 38% is usually due to incorrect calculation of the MCHC or the patient red blood cells may be agglutinated (cold agglutinin), there by causing a falsely low red blood cells count.

Any elevation in MCHC is indicative of blood dysfunction but during the recent study no significant changes were observed in MCHC in animals treated with chloroformic and eluted methanolic and aqueous extract of Abrus precatorius seeds after 15 days as well as 30 days of treatment. These findings are in accordance with the findings of Prasad and Rai (1988) who reported not changed in Mean Corpuscular Haemoglobin Contraction (MCHC) on administration of Saccharin in albino rats. Garg et al. (1992) observed no significant toxic effect in mean corpuscular haemoglobin contraction (MCHC) on administration of aqueous extract of silken styles of corn zea maize Linn.

These observations are similar to the observations of Babayi et al. (2007) reported no significant changes in mean corpuscular haemoglobin contraction (MCHC) on administration of aqueous extract of Cassytha filiformis in rats. Adedapo et al. (2007a) observed no toxic effect in
mean corpuscular haemoglobin contraction (MCHC) on administration of aqueous extract of leaves of *Acacia karroo* in rats.

These findings are in accordance with the findings of Abuelgasium *et al.* (2007) who reported no changes in mean corpuscular haemoglobin concentration (MCHC) on administration of water extract *Ambrosia moriiima* in rats. Gupta *et al.* (2008) who reported no acute and sub-acute changes in mean corpuscular haemoglobin concentration (MCHC) on administration of aqueous extract of *Rhodiola imbricate* roots in rats.

However, these findings are contradict to the findings of Bomford (1975); Varadaraj *et al.* (1993) and Prabhu (1997) who reported increase level in mean corpuscular haemoglobin concentration (MCHC) cause due to the *Diazinon* in treated rats. Prabhu *et al.* (1997) who reported an increased the level of mean corpuscular haemoglobin concentration (MCHC) on administration of *Cybil* in albino rats. These observations also contradict the observations of Bhargav (1998) reported decline MCHC cause due to the Organochlorinated pesticides.

However, the findings are contradictory to the findings of Sharma (2008) who have reported an increase in mean corpuscular haemoglobin concentration (MCHC) on administration of *Endosulfan* and *Diazinon* in male albino rats. Sharma (2008) reported significant toxic changes in mean corpuscular haemoglobin concentration (MCHC) on administration of *Malathion* in male albino rats.