LITERATURE REVIEW:

Sivasankari K. Veerabathran et. al.,\textsuperscript{10} 2(2011) evaluated the antioxidant activity of ethanol and methanol leaf extracts of wild thorny shrub \textit{Caesalpinia bonduc} (L) Roxb., belonging to the family Caesalpinaceae. The assays include DPPH (free radical scavenging), FRAP (to assess reducing power of iron), superoxide radical scavenging (O2\textsuperscript{-}), nitric oxide scavenging and hydrogen per oxide scavenging. Ethanol leaf extract had exhibited 83.733±0.123\% of inhibition for DPPH assay which was measured spectrophotometrically. The corresponding IC50 values were also calculated. The results of four other assays when compared with standard have given better results thereby proving the antioxidant potential of leaves of the plant. Therefore the antioxidant activity of plant has proved to be evident the cytotoxicity assays can be carried out in future.

Aswar Prashant B et. al.,\textsuperscript{11} 1(2011) studied of hypoglycemic and antidiabetic effects of \textit{Caesalpinia bonduc} (L.)Roxb. seeds in alloxan induced diabetic rat and its phytochemical, microscopic, biochemical and histopathological.

Rajesh J. Mandade,\textsuperscript{12} 3 (2011) studied Hepatoprotective activity of aqueous ethanolic leaf extract of \textit{Caesalpinia bonduc} (L.) against paracetamol induced hepatic damage in albino rats was observed. In the present study the effect of ethanolic extract of \textit{Caesalpinia bonduc} (L.) on blood and liver glutathione, Na\textsuperscript{+} K\textsuperscript{-} ATPase activity, serum marker enzymes, serum bilirubin, glycogen and thiobarbutiric acid reactive substances against paracetamol induced damage in rats. The extract of \textit{Caesalpinia bonduc} (L.) functions as a hepatoprotective agent and this hepatoprotective activity of extract may be due to normalization of impaired membrane function activity.

R. Sambath Kumar et. Al.,\textsuperscript{13} 9 (2010) studied the Hepatoprotective and antioxidant effects of \textit{caesalpinia bonducella} on carbon tetrachloride-induced liver injury in rats. He has used different extract for evaluation of Hepatoprotective activity and extract shown better effect as compared to the standard.

Rajib Ahsan et. al.,\textsuperscript{14} 3 (2009) studied the Hepatoprotective Activity of Methanol Extract of Some Medicinal Plants Against Carbon Tetrachloride Induced Hepatotoxicity in Albino Rats.

Manoj Kumar Sagar et. al.,\textsuperscript{15} 1 (2009) evaluated for anti-inflammatory action by carrageenin-induced rat paw edema. The analgesic activity was tested by acetic-induced writhing response in albino mice and hot plate method in albino rats. The ethanolic extract of \textit{Caesalpinia bonduc} in
doses of 100, 200 and 500 mg/ml showed 70.3, 71.2 and 73.0% inhibition of paw edema respectively at the end of three hour and the percentage of protection from writhing was 45.5, 51.2 and 65.5 respectively. In the hot plate model, the ethanolic extract of *Caesalpinia* in the above doses increased the pain threshold significantly after 30, 60, and 90 min. of administration *Caesalpinia* showed dose dependent action in all experimental models. The plant had Saponins, flavonoids, glycosides, oils, phenols and tannins and significantly increased the reaction time of hot plate. The results of the present study confirm that *Caesalpinia bonduc* has potent analgesic and anti-inflammatory activities.

Km Monirul Islam et. al.,16 1 (2009) studied evaluation of Hepatoprotective Activity of Methanol Extract of Some Medicinal Plants Against Carbon Tetrachloride-Induced Hepatotoxicity in Rats. Biochemical parameters such as SGOT,SGPT,ALP and Serum bilirubin. The liver has shown change in weight so, we can say that the methanolic extract shown significant effect as compared to the standard.

D.K. Kulshreshtha et. al.,17 7 (2008) studied Antifilarial activity of *Caesalpinia bonducella* against experimental filarial infections

Nagaveni.P et. al.,18 2(2011) investigate preliminary photochemical characteristics and antipyretic effect of the Indian medicinal plant *Mangifera indica* which belongs to the family Anacardiaceae. The genus of this plant cited in Indian system of medicine, Ayurveda for the treatment of pain and fever associated various diseases. Naturally occurring terpenoids are unique phyto constituents of the genus *Mangifera indica*, but there is no scientific evidence has been demonstrated against the effect of this plant extract in pyretic *invivo* models. The ethanolic extract of mangifera indica bark shows potential antipyretic activity at a dose of 400 mg/kg.

Pitchaon M. et. al.,19 2(2011) studied that Antioxidant capacity of extracts and fractions from mango (*Mangifera indica* Linn.) The mango seed kernel (MSK) extracts prepared by shaking (SMSK) and acid hydrolysis (AMSK) including fractions. The MSK was dissolved in methanol and separated using a Sephadex LH-20 column with monitoring by UV absorption. The results showed that both MSK showed significantly (P<0.05) higher antioxidant capacity, assessed by the DPPH• and ABTS•+ scavenging assays and ferric thiocyanate test, than α-tocopherol. AMSK showed higher phenolic antioxidant activities than SMSK. The chelating efficiency of AMSK was greater than that of ascorbic acid. The chromatographic profile of MSK extracted by shaking
(5 fractions) and acid hydrolysis (2 fractions) was different. Fraction 2 of AMSK (93.68±1.24% yield, db) showed a remarkable antioxidant and chelating activity in comparison with tannic acid and methyl gallate. The present study demonstrated that mango seed kernel obtained from acid hydrolysis is a potential material for use as a natural phenolic antioxidant.

**Ramesh Petchi r et. al.,**\(^{20}\) **1(2011)** studied antidiabetic activity of leaves and kernel seeds extract of *Mangifera indica*. *Mangifera indica* leaves and kernel seeds were extracted with absolute alcohol and used for the study. The oral hypoglycaemic effect, glucose tolerance test and antidiabetic activity of the *Mangifera indica* kernel seeds extracts were studied at 100 and 200 mg/kg b.wt. The antidiabetic potential of *Mangifera indica* leaves and kernel seeds extract were compared with tolbutamide 500 mg/kg b.wt. The alcoholic extract of *Mangifera indica* leaves and kernel seeds at 200 mg/kg showed significant (p< 0.01) hypoglycaemic effect in the fasted normal rats after 3 h of drug administration, when compared with normal group. The *Mangifera indica* leaves and kernel seeds extracts were significantly increased insulin level at the dose level of 100, 200 mg/kg in aloxone induced diabetic rats.

**Doughari, J. H. and Manzara, S.**,\(^{21}\) **4(2008)** evaluated that antibacterial activity of crude leaf extracts of *Mangifera indica* Linn. The *Mangifera indica* L. in India commonly know as the Mango and which taste is sweet in that presence of glycoside,flavones,tannins due these constituents shown significant activity against gram positive and gram negative as well as standard drug.

**Nathalie Wauthoz et. al.,**\(^{22}\) **1(2007)** studied the its Main C-Glucosylxanthone, Mangiferin. This review details the vernacular names, origin, distribution, taxonomy and variety of *Mangifera indica* L. (Anacardiaceae), a medicinal plant traditionally used in tropical regions. Mangiferin, a major C-glucosylxanthone from *M. indica* stem bark, leaves, heartwood, roots and fruits occurs widely among different angiosperm families and ferns. The reported pharmacological activities of mangiferin include antioxidant, radioprotective, antitumor, immunomodulatory, anti-allergic, anti-inflammatory, antidiabetic, lipolytic, antbone resorption, monoamine oxidase inhibiting, antiviral, antifungal antibacterial and antiparasitic properties, which may support the numerous traditional uses of the plant.

**Farrukh AQIL et. al.,**\(^{23}\) **(2006)** determined the Antioxidant and Free Radical Scavenging find out the medicinal plants having antioxidant activity of Twelve Traditionally Used Indian Medicinal Plants.
F.O. Obumselu et. al.,\textsuperscript{24} 11(2011) studied phytochemical and antibacterial analysis of the leaf extracts of \textit{Ricinus communis}. I have done the phytochemical screening of the ethyl acetate, ethanol and aqueous extracts of the leaf, obtained by the cold maceration method, indicated the presence of alkaloids, saponins, phenols, flavonoids and tannins. Quantification of the metabolite were found to be: flavonoids (8.78%), alkaloids (1.54%), saponins (0.46%) and tannins (1.08 mg/ml). A thin layer chromatographic study showed two spots each for the ethanol and ethyl acetate extracts. Antibacterial activity of the aqueous leaf extract using four bacteria; two Gram-positive bacteria (Bacillus subtilllis, and staphylococcus aureus) and two Gram-negative bacteria (Escherichia coli and Pseudomonas aeruginosa) was also carried out, with zone of growth inhibition ranging between 14 and 24 mm. Atomic absorption spectrophotometric study revealed the presence of the metals Cu, Fe, Cr, Ca, Na, Co, Mg, and Cd in the decreasing order of their concentrations.

Rachhadiya Rakesh M. et. al.,\textsuperscript{25} 3(2011) studied the antiulcer activity of oil of \textit{Ricinus communis} seed using different models of gastric ulceration in rats.

Chaitanya Sravanthi Kota et. al.,\textsuperscript{26} 2(2011) evaluated the antibacterial activity of \textit{Ricinus communis} leaf extract using five bacteria; two Gram-positive bacteria (Bacillus subtilis and Staphylococcus aureus) and three Gram-negative bacteria (Escherichia coli, Proteus vulgaris, Pseudomonas aeruginosa). The concentrated ethanolic extract of the crude drug of concentration 5gm/ml was tested for antibacterial activity by determination of zone of inhibition. Gentamycin is used as standard. It was found that the concentrated extract of the \textit{Ricinus communis} leaves showed a better antibacterial activity in comparison with the standard.

Dnyaneshwar J Taur et. al.,\textsuperscript{27} 1(2011) evaluated the antinociceptive activity of the methanol extract of \textit{Ricinus communis} leaves (MRCL). Antinociceptive activity was evaluated using acetic acid induced writhing test, formalin induced paw licking and tail immersion method in mice at doses of 100, 125 and 150 mg/kg bw. The results indicated that MRCL exhibited considerable antinociceptive activity against three classical models of pain in mice. Preliminary phytochemical analysis suggested the presence of saponin, steroids and alkaloids. It can be concluded that MRCL.

Evan Prince Sabina et. al.,\textsuperscript{28} 2(2009) studied the protective effects of ethanol extract of \textit{Ricinus communis} L. leaves on carbon tetrachloride (CCl4)-induced liver damage were investigated in rats. Results were compared those for silymarin, a standard hepatoprotective drug. It was found
that an increase in the activities of serum transaminases and the level of liver lipid peroxidation, protein, glycogen and the activities of acid and alkaline phosphatase in liver induced by CCl4 were significantly inhibited by treatment with *Ricinus communis* ethanol extract (250/500mg/kg/b.wt). In addition, the depletion of glutathione level and adenosine triphosphatase activity observed in the CCl4-induced rat liver were effectively prevented by treatment with *Ricinus communis* ethanol extract (250/500mg/kg b.wt). Histopathological examination further confirmed the hepatoprotective activity of *Ricinus communis* ethanol extract when compared with the CCl4-induced control rats.

**Arvind Kumar Srivastava et. al.,**29 (2003) studied hepatoprotective activity of 3-bromo-6-(4-chlorophenyl)-4-methylthio-2*H*-pyran-2-one, an isostere of dimethyl ricinine, was evaluated in adult male albino rats intoxicated with carbon tetrachloride, paracetamol or thioacetamide. The test compound showed significant hepatoprotection at 6.0 mg kg–1 body mass daily dose, given to the rats for seven consecutive days. The carbon tetrachloride, paracetamol and thioacetamide were given, respectively, on days 3, 5, and 7, on day 6 and on day 6 post treatment with the test compound. The protective effect was evident in a battery of serum and liver biochemical parameters related to hepatotoxicity.

**Praveen Patidar et. al.,**30 (2012) evaluation of hepatoprotective agents and preparations to treat hepatic disorders. Polyherbal formulations F1 (Crude drugs formulation), F2 (Lab extracts formulation) and F3 (commercial extracts formulation) were developed by using well documented medicinal plants, *Cassia fistula*, *Coccina indica* and *Vigna mungo* for treatment of liver disorders by exploiting the knowledge of Traditional system of medicine and evaluated for hepatoprotective activity using acute liver toxicity models of CCl4 induced liver damage in rats. The rats were monitored for change in liver, biochemical parameters Alanine Amino Transferase (ALAT), Aspartic Amino Transferase (ASAT), Alkaline Phosphatase (ALP) and Total Proteins (TP). All of these formulations F2 and F3 showed significant hepatoprotective activity at dose of 500 mg/kg, p.o., when compared to the CCl4 control group II. Formulations F2 and F3 are effective in experimental liver damage. Biochemical parameters showed better results in lab extracts formulations.

**Ansar M. Patel et. al.,**31(2010), studied Hepatoprotective activity of herbal formulation (Hepjaun syrup) and Modified Formulations (HA-II and HA-III) were evaluated and compared statistically after inducing hepatotoxicity in rats by subcutaneous administration of carbon
tetrachloride (CCL$_4$). The liver damage was confirmed by estimation of elevated levels of Serum Glutamate Oxaloacetate Transaminase (SGOT), Serum Glutamate Pyruvate Transaminase (SGPT), Alkaline Phosphatase (ALP), serum bilirubin and liver weights. HA-I, HA-II, HA-III pretreatment (500mg/kg) significantly reduces the CCl4 induced elevated serum levels of SGOT, SGPT, SALP and Serum Bilirubin. 

K. Gurusamy et. al.,$^{32}$ (2010), reported that the ethanolic extracts of the polyherbal medicinal plants ($Asteracantha longifolia$, $Cyperus rotundus$ and $Bryophyllum pinnatum$) were evaluated for hepatoprotective activity in carbon tetrachloride induced liver damage in rats. The polyherbal formulation at 250 mg/kg b.w. shown that protective effect by lowering serum and liver activities of aspartate transaminase (AST), alanine transaminase (ALT), acid phosphatase (ACP), alkaline phosphatase (ALP), lactate (LDH), serum bilirubin, serum cholesterol and serum total protein when compared with standard silymarin. The hepatoprotective activity of the extracts may be increased regeneration of hepatocytes and inhibitory effects on microsomal enzymes.