2. LITERATURE REVIEW

I. *Erythrina Indica:*

Augustine E. et al., (2001) showed that *Erythrina indica* could suppress the high rate of bone turnover induced by estrogen deficiency and improve the biomechanical properties of bone in the lab rats.

Palanivelu M. et al., (2009) isolated five compounds of methanol extract of stem bark of *Erythrina Variegata* i.e. epilupeol, 6-hydroxygenistein, 3β, 28- dihydroxyolean-12-ene, epilupeol, and stigmasterol and showed varying degrees of Cytotoxicity.

Sakat S. et al., (2009) evaluated anthelmintic activity of leaves of *Erythrina indica.* Pheritima posthuma was divided into seven groups. Each group consists of six earth worms of same type and treated with any of the following. 50 milliliter of test solution containing 50 and 100 mg /ml of test extracts. Ethanol, Chloroform and Ethyl acetate extract of leaves of *Erythrina indica* and Piperazine citrate (10mg/kg). The Mean time of paralysis and death was recorded in minutes. The paralysis time was recorded when no movement of any sort could be observed except when the worms were shaken vigorously. Times for death of worms were recorded when worms were neither moved while shaken vigorously or when dipped in warm water (50°C).

Jesupillai M. et al., (2008) studied Antiulcer activity of methanol extract of *Erythrina indica* leaves in pylorus ligated and indomethacin induced ulceration in the albino rats. The methanol extract of *E. indica* leaves possess significant antiulcer properties in a dose dependent manner.

Runia H. et al., (2008) evaluated the diuretic activity of leaves of *Erythrina indica.* The animals were divided in to five groups (six in each) deprived of food and water for 18hrs. prior to the experiment. On the day of experiment, the Group I animals received normal saline (20 ml/kg. p.o.), the Group II animals received furosemide (20 mg/kg. i.p.), the Group III, IV and V animals received Ethanol, Chloroform and Ethyl acetate extracts (250 mg/kg) respectively. The total volume of urine was collected at the end of 5hr. The total volume of urine and the urine concentration of Na⁺, K⁺ and Cl⁻ the Na⁺ and K⁺ were measured by β ame photometry.
Chatterjee G.K. et al., (2008) studied the cardiovascular effect of leaves of *Erythrina indica*. The intravenous administration of the aqueous extract at a dose, varying from 0.1-0.4mg/kg produced a sharp and short lived fall in B.P., both in cats and rats in acute experiments. The cats were sensitive as regards the hypotensive action than rats, since a moderate fall was noted with 0.12 mg/kg while in rats the hypotensive response noted only after 0.4 mg/kg. On the isolated frog hearts the extract has no action in smaller dose but at a dose of 5 mg resulted a complete but reversible block of the heart.

Chatterjee G.K. et al., (2008) studied effect on smooth muscle of leaves *Erythrina indica*. The aqueous extract leaves *Erythrina indica* produced a contraction of intestinal smooth muscle in isolated guinea pig-ileum preparations at a dose of 1.3 x 10^-5 g/ml; it is abolished by retreating the ileum with dephenhydramine but not abolished by pretreatment with atropine.

Chatterjee G.K. et al., (2008) studied respiratory effects of leaves of *Erythrina indica*. In smaller doses, the extract did not affect the respiration in urethane treated guinea-pigs but at higher doses the rate of respiration increased but there was no change in its amplitude. The effect generally persisted for 15-20 minutes. At a very high dose (4.6 mg/kg, iv.) the respiration become shallow and in some cases even there was a short, lasting apnoea.

Chatterjee G.K. et al., (2008) evaluated CNS activity of leaves of *Erythrina indica*. The extract was administrated at a dose of 80 mg/kg im. Pretreatment of mouse with the extract neither potentiated nor reduced the pentobarbitone dose induced sleeping time. Similarly The extract failed to protect the mouse significantly from pentylenetetrazol induced convulsions.

Saraswathy A. et al., (2008) were investigated the antioxidant activity of ethanolic extract of the stem bark of *Erythrina indica*. In vitro antioxidant activity by Ferric thiocyanate (FTC) and thiobarbituric acid (TBA) methods were employed and it was found that the ethanolic extract of the stem bark of erythrina indica possess significant antioxidant activity.

**II. *Casalpinia crista*:**

Abdul J. et al., (2007) evaluated an anthelmintic activity of bark extract of *Caesalpinia crista* (L.) Anthelmintic activity is perform using adult earthworms, which exhibited a spontaneous motility (paralysis) With 50 mg/ml of aqueous extract the effects were compared with 3% piperazine citrate. There was no final recovery in the case of worms treated with aqueous extract.
in contrast to piperazine citrate, the worms recovered completely within 5 hrs. This result shows the anthelmintic nature of the extract.

Anthelmintic activity of *Caesalpinia crista* (L.) against trichostrongylid nematodes of sheep, study showed *C. crista* possess anthelmintic activity in vitro and in vivo, supporting its traditional use in Pakistan.

**Kalauni S. K. et al., (2006)** studied an antimalarial activity of the plant from Caesalpinia species. The Most of the isolated diterpenes such as 44 cassane- and norcassane-type diterpenes. showed antimalarial activity, norcaesalpinin E showed the most potent activity, more than the drug chloroquine.

**Mandal S. et al., (2010)** evaluated the methanolic extract of *Caesalpinia crista* has potent antioxidant activity and ROS scavenging activity as well as iron chelating property. (2) Ethyl acetate extract showed a maximum of 49% free radical scavenging activity at the end of 1 hr.

**Sarma G. et al., (2009)** evaluated Antidiabetic and Hypoglycemic activity of the plant from Caesalpinia species. The ethanolic extract (250mg/kg/day) lowered blood glucose level within 2 weeks in the alloxan diabetic albino rats confirming its hypoglycemic activity. β - sistosterol isolated from the stem bark was found to posses potent hypoglycemic activity when compared to other isolated compounds.

(1) The seed kernel of *Caesalpinia bonducella* has significant antidiabetic and hypoglycemic effects. Activity may be partly due to a positive effect on glycogen synthesis in the liver, skeletal muscle and heart muscle due to an insulin-like action of its constituents and partly due to stimulatory action on insulin release.

(2) The ethanolic and aqueous extracts showed significant blood sugar lowering effect of *C. bonducella*.

(3) The aqueous extract of *C. bonducella* seed shell showed very significant blood sugar lowering in glucose loaded STZ and alloxan diabetic models

N. Venkat Rao. et al., (2008) studied anxiolytic activity of seed extract of *C. bonducella* showed a significant and dose dependant anxiolytic activity.


R. Aruna Devi et al., (2008) evaluated analgesic activity of flower extract of *Caesalpinia bonducella* showed significant antinociceptive effect in the inflammatory phase of formalin-induced pain and acetic-induced parietal pain.


Shukla S. et al., (2010) evaluated immunostimulatory effect of aqueous extract of *Caesalpinia bonducella* seeds on cell mediated and humoral components of the immune system in rats produced an increase in hemagglutinating antibody titer and a change in delayed-type hypersensitivity suggesting that the extract could be a promising immunostimulatory agent.

Kshirsagar S. N. (2011) studied nootropic / memory enhancer activity. Dried seed kernels of *Caesalpinia crista* extract have a potential as a learning and memory enhancer. Results suggest *C. crista* can be beneficial in improving cognition in disorders like demential and other neurodegenerative disorders.