LITERATURE REVIEW

Hua-yew cheng et.al. (2006) extracted ent-Epiafzelechin-(4aR8)-epiafzelechin extracted from cassia javanica, inhibits herpes simplex virus type 2 replication.

Joshi C.S., et al. (2007), performed acute and subacute toxicity of diakyur, a herbal antidiabetic formulation, in experimental animal models. Diakyur contains aqueous extracts dry powder of Cassia auriculata, Gymnema sylvestre, Mucuna pruriens, Terminalia arjuna, and crude powder of Cassia javanica.

Mastura M., et al; (2006) carried out antimicrobial activity of Senna alata and cassia javanica. Supsp nodosa extracts against microorganisms related to skin infection

Sing V., et. al. (2010) reported microwave induced poly(acrylic acid) modification of Cassia javanica (CJ) seed gum furnished an efficient Hg(II) sorbent. Copolymer samples of different performances in terms of Hg(II) binding was synthesized by changing acrylic acid concentration at fixed microwave power and exposure time. The regeneration experiments revealed that the CJ-graft-poly(acrylic acid) can be successfully reused for six cycles without any significant loss in the sorption capacity.

Kumavat U.C., et. al.(2012) studied hypoglycemic activity of Cassia javanica Linn. In normal and streptozotocin-induced diabetic rats by acute and subacute studies. Leaves of cassia javanica macerated with water, ethanol, and chloroform separately. The preliminary phytochemical study revealed the presence of reducing sugar, flavonoids, glycosides, tannins, and saponin. The study proved that C. javanoica has hypoglycemic agent.

Ahemed M.B., et. al.(2008), demonstrated that extract of Phoenix dactylifera L. and ascorbic acid are effective agents in the treatment and prevention of thioacetamide induced hepatic cytotoxicity.

S.A.Padashetty et. al. (2007) investigated the effect of Tricholepis glaberrima DC the aerial parts in sexually active male rats. In addition, the effect of the extract on the testicular histology and on the activity of two antioxidant enzymes, viz. superoxide dismutase and catalase in testicular homogenate were determined. Administration of the methanol extract at 200 mg/kg body weight for 28 days altered significantly the various components of the sexual behaviour study. the extract increased significantly mounting
latency (ML) and intromission latency (IL) with a significant reduction in mounting frequency (MF), intromission frequency (IF), and post-ejaculatory interval (PEI). Examination of the testicular histology revealed that the extract favors spermatogenesis by enhancing the proliferation of the seminiferous epithelium. Further, a significant increase in the activity of superoxide dismutase and catalase was observed in rats treated with methanol extract of *T. glaberrima*. Therefore, current findings provide experimental evidence that the extract *T. glaberrima* possesses aphrodisiac properties.

*Nephade S.S., et. al.,* (2009) reported antioxidant activity by the FTC and TBA methods. The aerial parts of *Tricholepis glaberrima* DC extracted by methanol, chloroform, and water. Methanolic extracts showed higher antioxidant activity than the chloroform and aqueous extract. The result showed that the plants of *tricholepis glaberrima* DC are a potential source of natural antioxidants.

*Sharma H., et.al.,* (2011) Observed that in *C. tuberosum* and *P. daemia* low and moderate concentrations of IAA was found suitable for growth and productivity, respectively. In case of IBA, moderate and high concentrations was found suitable for growth and productivity in *C. tuberosum* and *P. daemia*, respectively. In case of GA3 treatment, high concentration was found suitable for flowering and growth in *C. tuberosum*. In case of NAA treatment, high concentration was found suitable for growth of both the plants. As far as chemical fertilizers are concern, high concentration of nitrogen in the form of urea was found suitable for growth and productivity in *C. tuberosum* and *P. daemia*. In case of superphosphate, moderate and low concentrations was found suitable for growth and productivity in *C. tuberosum* and *P. daemia*, respectively. As far as muraite of potash is concern, low concentration is found suitable for growth and productivity in both the.

*Somashekar A., et. al.,* (2007) reviewed that different plants are available on the market under the trade name Brahmadandi viz., roots of *Echinops echinatus* Roxb, and the aerial parts of *Tricholepis glaberrima* DC which are sold either in their crude or in powdered form. No analytical procedures appear to be available for quality control purposes. In the reviewed article authors report a simple HPTLC method for the quantification of the lupeol content in the aforementioned plant species. The method was validated for precision, repeatability and accuracy. Instrument precision and repeatability of the method was found to be 0.56 and 2.87 %RSD, respectively. Intra-day and inter-day
precision of the method was determined to be in the ranges of 0.71–2.02 and 1.03–2.02 %RSD, respectively. Accuracy of the method was evaluated by a recovery study conducted at three different levels. The mean percentage recovery was found to be 100.85%. The developed HPTLC method for estimation of lupeol was found to be simple, precise and accurate and may be useful for routine quality control of the commercial samples of Brahmadandi.

*Nephade S.S., et. al.,* (2009) reported neuropharmacological investigation of different dose of methanol, chloroform and aqueous extracts of aerial part of *Tricholepis glaberrima*. In the investigation of chloroform, methanol and aqueous extracts exhibited increase in discrimination index, muscle relaxation, increase in reaction time in analgesic activity and potentialtion in haloperidol induced catalepsy. The results suggest possible facilitation of dopaminergic transmission by the extraction which may be due to presence of phytoconstituents such as terpenoids and phenolic compounds.

*Bihari P. B. et al.,* (2009): Investigated the extract of aerial part of *Jatropha gossypifolia* was screened for its hepatoprotective activity in carbon tetrachloride induced liver damage in Wister albino rats.

*Gnanasekaran D. et al.,* (2012): Evaluated the hepatoprotective activity of the whole plant *Indigofera tinctoria* on the Chang cell line (normal human liver cells). The ethanolic extract tested for its inhibitory effect on chang cell line. The percentage viability of the cell line carried out. The cytotoxicity of Indigofera tinctoria on normal human liver cell evaluated by the SRB assay [Sulphorhodamine B assay] and MTT assay [(3-(4,5 dimethylthiazole –2 yl)-2,5 diphenyl tetrazolium bromide) assay]. The principle involved is the cleavage of tetrazolium salt MTT into a blue coloured derivative by living cells which contains mitochondrial enzyme succinate dehydrogenase.

*Sreevidya N., et. al.,* (2006), studied oxidation potential of Chlorophytum tuberosum. It had ability to scavenge 1,1 diphenyl picryl hydrazyl nitric oxide radical along with their capacity to reduce lipid peroxidation in rat liver homogenate, chelation of ferrous ion, radical scavenging potential using cheiluminecence and their total antioxidant capacity.

*Pattnayak S., et. al.* (2011), investigated the hepatoprotective activity of crude flavonoids extracts of *Cajanus scarabaeoides* in paracetamol intoxicated albino rats. The whole plant material was dried in shade dried, powdered, and crude flavonoids extract was extracted.
with various solvents by fractionation in separating funnel. Preliminary phytochemical studies showed presence of phenolic components and flavonoids. The hepatoprotective activity of crude assessed in paracetamol induced hepatotoxic rats.

**Wu-Yi Sun et al., (2008)**: Investigated the effects of *P. lactiflora* and *A. membranaceus* extract on immunological liver injury in mice induced by Bacillus Calmette-Guérin and lipopolysaccharide (BCG/LPS) and to explore a possible mechanism. After administration of *P. lactiflora* and *A. membranaceus*, the extract significantly reduced the degree of liver damage in BCG/LPS-induced liver injury, as well as the elevation of serum transaminase activities and level of nitric oxide in live injury mice. The *P. lactiflora* and *A. membranaceus* have a protective effect on BCG/LPS-induced liver injury mice, associated with the antioxidant properties, ability to reduce nitric oxide production and suppression of Kupffer cell activity and pro-inflammatory mediator and cytokines production.

**Patil V.N., et al.** (2010), investigated plant *chlorophytum tuberosum* showed the correct taxonomy which was helpful for the stadadization of drug, the morphological characters and histochemical study with double stainig of the roots, percentage extractive fluorescence and ash analysis and the phytochemical screening of the plant. After comparing the data with safed musali it can be used as a substitute for them.

**Sengupta P. et al., (2010)**: Studied Olanzapine-induced hepatopathy models in rats used for screening putative hepatoprotective agents and in this model silymarin has failed to provide any hepatoprotection. Hence Olanzapine-induced hepatopathy models in rats is one of the best model for screening.

**Md. Ragib Ahsan et. al.** (2009), Demonstrated the role of hepatoprotective activity of crude methanol extracts of plant materials of *Casuarina equisetifia, Bixa orellana, Glycosmis pentaphylla, Cajanus cajan* belonging to different family in carbon tetra chloride induced hepatotoxicity at different doses.

**Bhata T. et.al.,** (2001) observed the better liver protection action of the n-heptane extract of *Cassia fistula* against experimentally induced liver damage by paracetamol than carbon carbon tetrachloride induced liver damage in rats. C. fistula leaf extract contains steroids and triterpenoids. Thabrew and Huges have been reported that plants containing these compounds can control liver disease.
Srivastava S.K., et. al. (2005), patented the improved and economical process for the isolation of oleanolic acid from the roots of *Lanata camara*. Oleanolic acid is a hepatoprotective agent.

Verma P. et al., (2010): Investigated the hepatoprotective activity of alcoholic and aqueous extract of leaves of *Anisochilus Carnosus (L)* Wall against Rifampicin induced hepatotoxicity.