Mulla WA et. al [2010] reported antioxidant, antinociceptive and anti-inflammatory activities of ethanolic extract of leaves of *Alocasia indica* Schott. The antioxidant activity was evaluated by standard in vitro models like scavenging of 1, 1-diphenyl-2-picryl hydrazyl (DPPH) radical, nitric oxide radical, superoxide anion radical, and hydroxyl radical. The antinociceptive activity was tested by acetic acid-induced writhing response, hot plate method, and tail flick method in albino rats & for anti-inflammatory potential was determined by using carrageenan-induced paw edema assay, formalin-induced paw edema assay, arachidonic acid-induced ear edema assay, and xylene-induced ear edema assay. Their finding suggests that ethanolic extract of *A. indica* possess potent antinociceptive and anti-inflammatory activity possibly due to its free radical scavenging properties.

Mulla WA et. al [2009] demonstrated the effect of hydroalcoholic extract of *A. indica* leaves at various doses (250 and 500 mg/kg) for hepatoprotective activity against CCl4 and paracetamol induced hepatic damage. Test extract effectively inhibited CCl4 and paracetamol induced changes in the serum marker enzymes, cholesterol, serum protein and albumin in a dose-dependent manner as compared to the normal and the standard drug silymarin-treated groups. The results suggests that *A. indica* possess significant potential as hepatoprotective agent.

Wang H.X & T.B. Ng [2003] have isolated Alocasin, an antifungal protein from rhizomes of *Alocasia macrorrhiza*. The isolation protocol involved ion exchange chromatography on diethylaminoethyl (DEAE)–cellulose, ion exchange chromatography on sulfopropyl (SP)–Sepharose, and gel filtration on Superdex 75.

Mulla W A et. al., [2010] reported antimicrobial & antifungal activity of different extracts leaves of *Alocasia indica* Linn. using agar well diffusion method against gram positive, gram negative bacterial and fungal strains. Extracts were subjected for minimum inhibitory concentration assay by two fold dilutions method, bacterial and fungal growth rate assay. Gentamicin & Fluconazole were used as standard drug for antibacterial and antifungal assay respectively. Ethanol extracts was found to possess potent antimicrobial activity.
Hoque T., et. al., (2011) have investigated two Bangladeshi medicinal plants from Araceae family, *Alocasia indica* and *Steudnera virosa*, for their *in vitro* thrombolytic, membrane stabilizing antimicrobial activities and generalized toxicity. They have also determined the total phenolic content & expressed in gallic acid equivalent. The heat and hypotonic solution induced methods were used to evaluate membrane stabilizing activity. The carbon tetrachloride soluble fraction (CTCSF) of *A. indica* and aqueous soluble fraction (AQSf) of *S. virosa* demonstrated strong membrane stabilizing activity. Among the two plants, the methanoic crude extract and its chloroform soluble partitionate of *S. virosa* revealed moderate inhibition of microbial growth. In brine shrimp lethality bioassay, the pet-ether and carbon tetrachloride soluble fractions of *A. indica* and the crude extract and its pet-ether soluble fraction of *S. virosa* were found to be as lethal as Vincristine sulphate after 24 hours observation on shrimp nauplii.

Mulla W A et. al., [2009] screened hydro alcoholic extract of *Alocasia indica* Linn. for free radical scavenging potential using standard in vitro procedures like scavenging of 1,1-diphenyl-2-picryl hydrazyl radical, nitric oxide radical, superoxide anion radical, hydroxyl radical, iron chelating activity, total antioxidant capacity, non-enzymatic glycosylation of haemoglobin. The test extract showed promising result at higher concentration justifying the therapeutic applications of the plant in the indigenous system of medicine.

Mulla W A et. al., [2011] carried out antidiarrhoeal & antiprotozoal activities of ethanol & aqueous extracts of leaves of *Alocasia indica* using various pharmacological models. In vitro antidiarrheal activity was evaluated against *Escherichia coli, Salmonella typhimurium, Shigella flexneri* & *Staphylococcus aureus* by agar well diffusion method whereas antidiarrheal activity was studied against recinolic acid-induced diarrhea and magnesium sulfate-induced diarrhea. Both the extracts have exhibited significant antidiarrheal & antiprotozoal activities compared to the standard drug.

Mulla W A et. al., [2010] have designed an experiment to evaluate the anthelmintic potential of hydro alcoholic extract of *Alocasia indica* leaves along with its two fractions (petroleum ether & ethyl acetate) using Indian earthworm (Pheretima posthuma). Different concentrations of test extracts were evaluated, from which time of paralysis & death of the worms were determined. The
hydro alcoholic extract exhibited potent wormicidal activity at higher concentration of 50 mg/ml, as compared to standard reference Piperazine citrate.

- Frederick I. O & Anthony U. O [1978] have identified & studied the composition and concentration of each of the major lipids found in Alocasia tubers using a combination of chromatographic procedures. On a weight to weight basis, the neutral lipids, glycolipids and phospholipids comprised 60.5, 19.0 and 20.5% respectively while the total extractable lipids accounted for 0.6% of the dry weight. In addition to the conventional lipid classes of tubers, the presence of tri- and tetragalactosyl diglycerides was confirmed. The predominant fatty acid in each lipid class was linoleic acid with palmitic, oleic and linolenic acids being the other ones. In general, a high degree of unsaturation (66%), similar for most tuber lipids, was established for the component fatty acids of Alocasia.

- Jatinder Singh et.al, [1993] carried out purification of lectin from the tubers of *Alocasia indica* Schott by affinity chromatography on asialofetuin-linked amino activated silica beads. The bound lectin was eluted with 0.1 M glycine-HCl buffer, pH 2.5. The purified lectin yielded a single band on SDS-PAGE, pH 8.3, corresponding to M1 of 13 000. In polyacrylamide gel electrophoresis, pH 4.5, and gel exclusion chromatography, it also gave a single band and a single peak, respectively, with M1 of 55 000. However, in polyacrylamide gel electrophoresis at pH 8.3, it revealed three bands. As a haemagglutinin, this lectin was effective against animal but not human erythrocytes. The purified lectin is a glycoprotein with 1.47% carbohydrate content and has no metal ion requirement for its haemagglutinating activity. *Alocasia indica* was found to be mitogenic for human peripheral blood lymphocytes.

- Patil B.R et. al [2011] studied antioxidative and hepatoprotective efficacy of *Alocasia macrorrhiza* leaf juice using in vitro technology. In vitro liver slice model was used where in the hepatic damage was induced by the hepatotoxins CCl4 and Tylenol. The extent of hepatic damage caused as well as evaluation of hepatoprotective and antioxidative efficacy was measured in terms of leakage of marker enzymes of liver function viz AST, ALT and ALP in the surrounding incubation medium from the liver slices. The leaf juice of *Alocasia macrorrhiza* remarkably decreased the leakage of AST, ALT and ALP in the medium. The results obtained from TBARS and Glutathione...
assays were also supportive to conclude that the *Alocasia macrorrhiza* leaf juice as a potent hepatoprotective and antioxidative efficacy.

- Kihwan Bae., et. al., [2007] have discovered a new flavone glycoside, apigenin 5-O-α-L-rhamnopyranosyl-(1→3)-β-D-glucopyranoside (1), along with four known flavonol glycosides (2–5), from the leaf of *Cephalotaxus koreana*. The new glycoside 1 showed inhibitory activity in superoxide radical scavenging assay with IC50 value of 13.0 µM, while it showed weak activity in 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging assay. Compounds 2–5 exhibited antioxidant activity in scavenging DPPH and superoxide radicals with IC50 values ranging from 5.7 to 22.3 µM.

- Shahverdi A.R., et. al., [2005] carried out antibacterial activities of the chloroform and water extracts of *Ferula persica* var. persica roots using disk diffusion method. The chloroform extract showed significant antibacterial activity compared to water extract. By bioassay-guided fractionation of the chloroform extract of the roots by preparative thin layer chromatography a compound was found which was active against some bacteria. By conventional spectroscopy methods the active fraction was identified as umbelliprenin.

- Bose S., et. al.,[2010] have attempted to isolate flavonoids and to perform antioxidant & antimicrobial activity various extracts of the bark of *Polyalthia longifolia*. In vitro models such as DPPH radical scavenging assay, nitric oxide scavenging assay, metal chelating activity and reducing power was used to evaluate the antioxidant activity. In antimicrobial activity, six microorganisms were used, which included two Gram positive, two Gram negative bacteria and two fungi. Both the isolated flavonoids exhibited a concentration-dependant free radical scavenging capacity. Isolated compounds showed promising results against various micro-organisms in comparison with standard drugs. (Penicillin, Gentamicin and Ketoconazol).

- Cai W., Gu X. & Tang J. (2010) have attempted to extract, purify & identify the flavonoids contained in *Opuntia milpa* alta skin. The results show that the maximum yield of the flavonoids can be obtained with 80% ethanol (v/v), extraction temperature of 90°C, and the solvent to raw
material ratio of 25:1. After purification with AB-8 resin, the main components of the extract were characterised as isorhamnetin 3-O-(2,6-dirhamnosyl)glucoside and isorhamnetin 3-O-d-rutinoside by employing liquid chromatography-mass spectrometry and ultraviolet-visible spectrometry.

Orhana N., et. al., [2011] have designed an experimental protocol to evaluate antidiabetic activity of *J. oxycedrus subsp. Oxycedrus* berry extracts in normal & streptozotocin induced diabetic rats. Through in vivo bioactivity-guided fractionation processes, shikimic acid, 4-O-d-glucopyranosyl ferulic acid and oleuropeic acid-8-O-d-glucopyranoside were isolated from the n-butanol subextract by silica gel and reverse phase column chromatography as the main active ingredient of the active subfraction. After 8 days administration of the major compound shikimic acid, blood glucose levels (24%), malondialdehyde levels in kidney tissues (63–64%) and liver enzymes (AST, ALT, ALP) of diabetic rats were decreased.

Patil R., et. al., [2011] have isolated ten fractions (F1-F10) from hydro alcoholic extract of *O. sanctum* aerial part & screened for antidiabetic activity in alloxan induced diabetic rats by estimating serum glucose level and lipid parameters. The isolated bioactive component was elucidated on the basis of extensive spectroscopic data analysis. The bioactive fraction (F5) was found to be potent antidiabetic by ameliorating glucose and lipid parameters. The extensive spectroscopic data analysis reveals that, the isolated bioactive compound elucidated as tetracyclic triterpenoid.

Yesilada E. et. al., [2000] worked on isolation & characterization of free radical scavenging flavonoid glycosides from the flowers of *Spartium junceum* by activity-guided fractionation using in vitro electron spin resonance spectrometry, in order to explain the role of antioxidant principles in the potent antiulcerogenic activity of the extract. The possible superoxide dismutase-like activity of the extracts, fractions and constituents obtained through activity-guided fractionation were studied. The active antiulcerogenic constituent of the flowers was found almost inactive, the flavonoid-rich fractions showed potent antioxidant activity. Five flavonoid glycosides bearing catechol were isolated from the butanol extract and their structures were elucidated.
Patwekar F I., et. al., (2010). have attempted the activity guided separation of phytoconstituents from the flowers of *Ichnocarpus frutescens* L. and evaluation for antioxidant property using DPPH assay and by measuring the scavenging capacity of the hydroxyl radicals. In the studied models, ethyl acetate fractions & isolated flavonoids exhibited remarkable potency concentration dependent antioxidant activity compared to other test extracts and fractions. The results were comparable with standard ascorbic acid. Authors concluded that isolated pure flavonoids form *Ichnocarpus frutescens* L is exhibited potent antioxidant activity.

Guerrero-Analco JA., et. al., (2010), have reported bioassay-guided fractionation of a crude extract of stem bark of *Sorbus decora* for isolation of three new pentacycle triterpenes (compounds 1-3). The structures of 1-3 were established on the basis of spectroscopic methods as 23,28-dihydroxyursan-12-ene-3β-caffeate, 23,28-dihydroxylupan-20(29)-ene-3β-caffeate & 3β,23,28-trihydroxy-12-ursene, respectively. Compound 2 significantly enhanced glucose uptake in C2C12 cells, but compounds 1 and 3 did not. In addition, triterpenoids 4-8, catechin, and epicatechin were also isolated.

Islam MA., et. al., (2009) screened three different fractions of *Catharanthus roseus* extract to evaluate antidiabetic & hypolipidemic effects on normal and streptozotocin-induced diabetic rats. The ethyl acetate fraction exhibited the most significant activity & found to contain flavonoids and alkaloids. The mechanism underlying the antidiabetic activity is probably increased glycogenesis, decreased gluconeogenesis or decreased absorption of glucose from intestine.

Syamsudin et. al., (2010) conducted a study on antidiabetic test of active fractions of methanol extract from *Leucaena leucocephala* seeds using alloxan-induced rats. Fractionation was conducted on active fractions using column chromatography. The result findings show that methanol extracts have a greater antidiabetic activity; and 5 isolates resulted from the isolation of methanol extracts. The result of bioactive compound identification was glycoside compounds with monosaccharide galactose clusters and many other saccharides.
Mall GK., et.al., (2009) successfully investigated antidiabetic and hypolipidemic activity of aqueous leaf of *Gymnema sylvestre* extract at three different doses in normal and alloxan induced diabetic rats. The fasting blood glucose, cholesterol, HDL cholesterol and serum triglyceride content were estimated in both normal and alloxan induced diabetic rats. The study revealed that *Gymnema sylvestre* has significant antidiabetic & hypolipidemic activity.

Singh AK, Singh J (2010) have tested the efficacy of combination of *Flacourtia jangomas* leaf and stem (1:1) methanolic extract (MEFJ) in streptozotocin (STZ)-induced diabetic rats. Phytochemical analysis of MEFJ of leaves and stem revealed the presence of flavonoids, saponins, carbohydrates, steroids, tannins, and phenolic compounds. In acute toxicity study, no toxic symptoms were observed for MEFJ up to dose 2000 mg/kg. Test extract exhibited significant hypoglycemic activity.

Qiong Luo et. al., (2004), evaluated the hypoglycemic and hypolipidemic effects of *Lycium barbarum* fruit water decoction, crude polysaccharide extracts & purified polysaccharide fractions in alloxan-induced diabetic or hyperlipidemic rabbits through designed sequential trials and by measuring blood glucose and serum lipid parameters. Total antioxidant capacity was also assessed using trolox equivalent antioxidant capacity & oxygen radical absorbance capacity assay. It was found that the three *Lycium barbarum* fruit extracts/fractions could significantly reduce blood glucose levels and lipid profile concentrations and at same time markedly increase high density lipoprotein cholesterol. Hypoglycemic effect of LBP-X was more significant than those of water decoction and crude LBP. Total antioxidant capacity assay showed that all three *Lycium barbarum* extracts possessed antioxidant activity.

Hule AK et. al., (2011) have evaluated antidiabetic effects of *Elaeocarpus ganitrus* in streptozotocin induced diabetic rats model at three graded dose levels (250, 500 & 1000 mg/kg) of body weight. Fasting blood glucose and lipid profile were measured in experimental animals. The test extract showed a significant hypoglycemic effect & decreased the blood glucose level in a dose-dependent manner during the 30 days of treatment period. EGA modulated lipid profile changes in
STZ-diabetic rats in a dose-dependent manner. The present investigation shows that EAG seeds has potential antidiabetic effects.

- Kannur DM et. al., (2006) have evaluated seed extracts of *Caesalpinia bonducella* to screen antidiabetic activity in alloxan induced hyperglycemia. The extracts produced significant antihyperglycemic action as well as it lowered the BUN levels significantly. In the same study the action of the extracts on diabetes induced hyperlipidemia was analyzed where the extracts significantly lowered the elevated cholesterol as well as LDL level. The antihyperglycemic action of the extracts may be due to the blocking of glucose absorption.

- Verma L et. al (2010) have designed an experiment to evaluate the hypoglycemic activity of various (petroleum ether, chloroform and aqueous) extract of *Cassia occidentalis* in normal and alloxan-induced diabetic rats at the dose of 200 mg/kg. The changes in body weight, lipid profile and total protein levels, assessed in the ethanol extract-treated diabetic rats. Aqueous extract of *C. occidentalis* produced a significant reduction in fasting blood glucose levels in the normal and alloxan-induced diabetic rats. Apart from aqueous extract, petroleum ether extract showed activity from day 14 and chloroform extract showed activity from 7 days. Significant differences were observed in serum lipid profiles & changes in body weight by aqueous extract treated-diabetic animals.

- Ghule S. et al., (2010) have investigated the anti-diabetic hypoglycaemic properties of an ethanolic extract of the root of *Celosia argentea* & found to lower blood glucose in basal conditions and after a heavy glucose load in normal rats. Maximum reduction in serum glucose was observed after 90 minutes at a dose of 500 mg/kg (63.28%) of body weight, but petroleum ether and chloroform extracts (8.52% and 9.81%, respectively) did not reduce the serum glucose. Ethanolic extract of *C. argentea* was also found to reduce the increase of blood sugar found in streptozotocin-induced diabetic rats. The ethanolic extract was also found to reduce the increased levels of cholesterol, triglycerides and urea.
Bao-Ning Su et. al., (2003) studied activity-guided fractionation of an ethanolic extract of *Muntingia calabura* leaves, using an in vitro quinone reductase induction assay with cultured Hepa 1c1c7 (mouse hepatoma) cells, resulted in the isolation of a flavanone with an unsubstituted B-ring, (2R,3R)-7-methoxy-3,5,8-trihydroxyflavanone (5), as well as 24 known compounds, which were mainly flavanones and flavones. The structure including absolute stereochemistry of compound 5 was determined by spectroscopic methods. Of the isolates obtained, in addition to 5, (2S)-5-hydroxy-7-methoxyflavanone, 20,40-dihydroxychalcone, 4,20,40-trihydroxychalcone, 7-hydroxyisoflavone and 7,30,40-trimethoxyisoflavone were found to induce quinone reductase activity.

Selvamani P. et al., (2008) evaluated ethanolic extract of *Capparis sepiaria* leaves for possible hypoglycemic effect produced by single oral administration at various dose levels 100, 200 and 300 mg/kg in the streptozotocin induced diabetic rats and compared against normal saline control and the standard glibenclamide. A maximum fall of plasma glucose level was observed after 12 h of treatment when administered with test extract of *Capparis sepiaria*. The findings from the study suggest that the *Capparis sepiaria* leaves may be prescribed as an adjunct to traditional formulation and drug treatment for controlling diabetes mellitus.

A. Ludwiczuk A., et al., (2011). conducted a bioactivity-guided approach based on MTT assay for growth inhibition and quantitative real-time PCR for TNF-inhibitory activity to identify the active compounds in ethanol fraction of the methanol extract. From this active fraction, seven compounds have been isolated and four compounds have been examined for their dose–response effect on the viability of A549 cells and on TNF-inhibitory activity. Based on MTT assay, all of the four examined compounds inhibit growth of human lung cancer cells. Among four tested compounds only galangin significantly inhibited TNF-gene expression in A549 cells.

Han. T, et. al., (2007) carried out this study with the aim of fractionate an extract of *Xanthium strumarium* L. (EXS) and to investigate the anti-inflammatory and analgesic properties of the extract and its fractions. The ethanol extract of X. strumarium (EXS) was fractionated on the basis
of polarity. Among the different fractions, the n-butanol fraction showed the highest anti-inflammatory activity in the croton-oil-induced ear edema test and furthermore reduced the number of writhings induced by acetic acid in mice in a dose-dependent manner. Bioassay-guided fractionation of EXS led to the isolation and identification of ten caffeoylquinic acids and three heterocyclics by HPLC–DAD–MSn from the active n-butanol fraction.

Prabhakar KR., et al., (2006) worked on aqueous extract of whole plant of Coronopus didymus Linn. & fractionated on the basis of polarity and resulted fractions were evaluated for free radical scavenging ability. The most non-polar fraction (CDF1) was found to be more active than other fractions in scavenging DPPH, ABTSd, nitric oxide and hydroxyl radicals in steady-state conditions. Stop-flow spectrometric studies showed 58.13% inhibition of 100 mM DPPH at a concentration of 150 mg/ml of CDF1 in 1000 s and 32.31% scavenging of 960 mM ABTSd at a concentration of 300 mg/ml of CDF1 in 100 s. The reaction of CDF1 with hydroxyl radicals produced by pulse radiolysis showed a transient spectrum with absorption peaks at 320, 390 and 400 nm, indicating the presence of flavonoids/related components.

Erdemoglua N, et. al., (2008) evaluated anti-inflammatory & antinociceptive effects of Rhododendron ponticum leaves and attempted for isolation and chemical characterization of the biologically active constituents through bioassay-guided fractionation procedures. Carrageenan-induced hind paw edema model was used for anti-inflammatory activity and p-benzoquinone induced abdominal contractions model for the antinociceptive activity assessment. The ethylacetate fraction displayed marked anti-inflammatory and antinociceptive effects as compared to reference compounds. Through bioassay-guided fractionation and isolation procedures flavonol glycosides were isolated as the active ingredients of ethylacetate extract and their structures were elucidated by spectral techniques.

Edwin E. et al., (2007) have screened ethanol extract (100 mg/kg and 200 mg/kg) of Passiflora molliissima for anti diabetic activity in alloxan-induced diabetic rats. The activity was compared
with reference standard, phenformin and control. The plant extract at a dose of 100 mg/kg and 200 mg/kg significantly lowered the blood sugar level of hyperglycemic rats.

- Esra K, et. al., (2005) screened methanolic extract of *Veronica anagallis-aquatica* for vivo anti-inflammatory and antinociceptive activities & exhibited significant inhibitory activity against carrageenan-induced hind paw edema model and of p-benzoquinone-induced writhings in mice. Through bioassay-guided fractionation and isolation procedures eight compounds, were isolated and their structures were elucidated by spectral techniques.

- Kadmur S.V, Goyal R.K., (2005) carried out the present investigation to find out the concentration of 6-gingerol present in methanolic extract and ethyl acetate extract of *Z. officinale*. In oral glucose tolerance test, treatment with methanolic extract and ethyl acetate extract of *Z. officinale* was found to significantly decrease AUC glucose and AUC Insulin in diabetic rats. Treatment with methanolic extract produced greater reduction in elevated levels of glucose and AUC glucose compared to ethyl acetate extract. Treatment with methanolic extract and ethyl acetate extract of *Z. officinale* also produced decrease in serum cholesterol, triglyceride, LDL-cholesterol and VLDL-cholesterol levels in type 2 diabetic rats. In conclusion their data suggest methanolic extract of *Z. officinale* to have better antidiabetic activity in type 2 diabetic rats as compared to ethyl acetate extract.

- Viswanathaswamy AH. et al., (2011) investigated the antihyperglycemic and antihyperlipidemic effects of ethanol extract (200 mg/kg and 400 mg/kg) of *Plectranthus amboinicus* in normal and alloxan-induced diabetic rats. The daily oral treatment with ethanol extract of *P. amboinicus* showed a significant reduction in blood glucose. & serum contents of total cholesterol, triglycerides whereas HDL-cholesterol, total proteins and calcium were effectively increased. Histology examination showed ethanol extract of *P. amboinicus* exhibited almost normalization of damaged pancreatic architecture in rats with diabetes mellitus.