2. LITERATURE REVIEW

1. Raman et al., (1996), has described the Hypoglycemic chemicals of *Momordica Charantia* (MC) are a mixture of steroidal saponins known as Charantin, insuline like peptides and alkaloids.

2. Ali et al., (1994), have quoted that Charantin chemicals are concentrated in fruits of MC has shown more pronounced hypoglycemic/antihyperglycemic activity.

3. Day et al., (1990), differentiated two type of hypoglycemic substances in MC with different time dependent effects- one with fast antihyperglycemic activity of around 1 h present in the aqueous and the residue after alkaline chloroform extraction of aqueous extract and another with hypoglycemic activity in acidic wash of the chloroform extract remaining after an alkaline water wash.

4. Grover et al., (2001), have studied that MC shown promising effects in prevention as well as delay in progression of diabetic complication such as nephropathy, neuropathy, gastroapresis, cataract and insulin resistance.

5. Khan et al., (1998), has described that leaf extracts (water, ethanol, and methanol) and fruit extract of bitter melon have clinically as well as experimentally demonstrated broad-spectrum antimicrobial activity.

6. Grover et al., (2004), has state that fresh juice of MC fruit and petroleum extract revealed significant in vitro Anthelmintic activity against Ascaridia galli worms.

7. Lolitkar and Rajarama Rao, (1966), isolated charantin from MC fruits led to prolonged hypoglycaemia in varying dose. The pattern of blood sugar changes was similar when charantin was given by intravenous and oral routes. Equivalent doses of tolbutamide were less effective than charantin although the pattern of blood sugar changes was similar with both the agents.

8. Ahmed et al., (1998), has described that MC has been shown to enhance number of beta cells.
9. Higashino et al., (1992), MC was shown to act like insulin or promote insulin release.

10. Shibib et al., (1993), also studied that inhibition of glucose-6-phosphatase and fructose-1-6 bisphosphatase in liver and stimulation of red-cell and hepatic glucose-6-phosphate dehydrogenase activities of MC.

11. Miura et al., (2001), has studies that MC fruit has also shown the ability to enhance cells uptake of glucose, to promote insulin release and potentiate the effect of insulin.

12. Sun et al., (2001), has studies with crude MC extract and its various purified fraction-including MAP30 have shown anticancer activity against lymphoid leukemia, squamous carcinoma of tongue and larynx, human bladder carcinomas and Hodgkin’s disease.

13. Terenzi et al., (1996), have studies and reported that phytochemicals of MC to exert anticancer activity through inhibition of DNA, RNA and cellular protein synthesis.

14. Omoregbe et al., (1996), studied that Leaf extracts have broad-spectrum antimicrobial activity against E.coli, Salmonella paratyphi, Shigella dysteriae and against shown activity against Helicobacter pylori-organism.

15. Lee-Huang et al., (1996), has studied MC and several of its isolated phytochemicals, eg. α and β-momocharin, lectin and MAP30, have been documented to have in vitro antiviral activity against Epstein-Barr, herpes, HIV, coxsackievirus B3 and polio-viruses.

16. Matsuda et al., (1999), has evaluated M. charantia has been shown to have antiulcer observed against two different models of ulcer. In one, Momordin Ic (10 mg/kg) potentially inhibited ethanol induced gastric mucosal lesion. In another dried
powdered fruits in filtered honey showed significant and dose dependent anti-ulcerogenic activity against ethanol-induced ulcerogenesis in rats.


18. Choi et al., (2002), has examined Momordin Ic and its aglycone, oleanolic acid are active principles with antirheumatoid activity. Methanol extract of dried seed administered subcutaneously, 30 minutes before challenge, was active in mice and equivocal in rats.

19. Hayashi et al., (1994), observed mild hypotensive response with Momordin. In another study, MC prolonged prothrombin time by inhibiting activation of factor X by factor VIIa-tissue factor complex or factor IXa.

20. Ahmed et al., (2001), has studied *in vivo* studies, bitter melon fruit and/or seed has been shown to reduce total cholesterol and triglycerides in both the presence and absence of dietary cholesterol.

21. Lolitkar and Rajarama Rao, (1966), studies that charantin inhibits the sialogogue action of pilocarpine nitrate (15 mg/kg) given subcutaneously injection in rabbits.

22. Senanayake et al., (2004), studies Effects of three different varieties (Koimidori, Powerful-Reishi, and Hyakunari) of bitter melon (*Momordica charantia*) and those of methanol fraction extract of Koimidori variety on serum and liver triglycerides were studied in rats. The results show that bitter melon, especially Koimidori variety, exhibits a potent liver triglyceride-lowering activity.

23. Virdi et al., (2003), was found that aqueous extract powder of fresh unripe whole fruits at a dose of 20 mg/kg body weight to reduce fasting blood glucose by 48%, an effect comparable to that of glibenclamide, a known synthetic drug. This extract was
tested for nephrotoxicity, hepatotoxicity and biochemical parameters such as SGOT, SGPT and lipid profile. The extract did not show any signs of nephrotoxicity and hepatotoxicity as judged by histological and biochemical parameters.

24. Shih et al., (2008), examined the preventive effect of *Momordica charantia* L. fruit (bitter melon) on hyper-glycemia and insulin resistance in C57BL/6J mice fed with a high-fat (HF) diet.

25. Ojewole et al., (2006), has studied various morphological parts (roots, stems, leaves and fruits) of *Momordica charantia* Linn (family: Cucurbitaceae) are used traditionally in African folk medicine to manage, control and/or treat a plethora of human ailments, including diabetes mellitus and hypertension.

26. Patel et al., (2009), evaluate Antihyperglycemic, antihyperlipidemic and antioxidant activities of Dihar, a polyherbal formulation containing drugs from eight different herbs in streptozotocin induced type1 diabetic rats.

27. Bhise et al., (2009), study the clinical efficacy of antidiabetic polyherbal Ayurvedic formulation Madhujeevan Churna containing on 45 NIDDM patients. And the result reveals that Madhujeevan Churna can be a safe, acceptable and effective alternative or adjuvant to the conventional oral hypoglycemic.

28. Lolitkar and Rajarama Rao, (1966), reported that ethanolic extract of the defatted unripe fruit of MC yielded a non-nitrogenous neutral principle charantin, which gave a positive colour test for phytosterolins, and on hydrolysis yielded glucose and sterol.

29. Murakami et al., (2001), isolated many cucurbitane type triterpene glycosides have been isolated from bitter gourd or “goya” in Japan and identified eight new cucurbitane- type triterpene glycosides and three new oleanane- type saponins from the fresh fruits of “goya”. These were goyaglycosides-A, -B, -C, -D, -E, -F, -G and –H, and goyasaponins I, II, and III.
30. Nakamura et al., (2006), reported three new cucurbitane-type triterpene called karavilagenins A, B, and C five new cucurbitane-type triterpene glycosides called karavilosides I, II, III, IV, and V were isolated from the dried fruit of Sri Lanka Momordica charantia L.

31. Chen et al., (2008), reported five cucurbitacins, kuguacins A–E (1–5), together with three known analogues, 3b,7b, 25-trihydroxycucurbita-5, (23E)-diene-19-al (6), 3b,25-dihydroxy-5b,19-epoxycucurbita-6,(23E)-diene (7), and momordicine I (8), were isolated from roots of Momordica charantia.