Coronary Heart Disease (CHD) is the main clinical manifestation of atherosclerosis (plaque build up due to vessel injury) and is the major cause of death in modern days. Atherosclerosis affects the peripheral arteries (Fig 1.1) and the cerebral circulation, leading to life-threatening conditions. One of the major risk factors for atherosclerosis and coronary heart disease is hypercholesterolemia (high blood cholesterol) (Endo 2004). In western countries CHD and progression of atherosclerotic lesions, related to the primary risk factor of hypercholesterolemia, represent the most important causes of death (Manzoni and Rollini 2002). Thus the elevated cholesterol levels, a primary risk factor for coronary artery disease leads to major problem in developed countries which currently affects 64 million Americans (almost one-fourth of the population). Over 930,000 Americans die of cardiovascular disease each year, which amounts to one death every 34 seconds. Although these largely preventable conditions are more common among people ages 65 years and older, the number of sudden deaths from heart disease among people ages 15–34 has increased. Since coronary heart disease is a leading cause of premature, permanent disability in the U.S. workforce. According to WHO (2003) high blood cholesterol causes more than 4 million premature deaths a year and there are long differences between the countries when comparing deaths due to CHD for men and women (Fig 1.2 & 1.3). In India also it is believed that CDH is one of the leading causes for death (Fig. 1.4). Indians are three times more vulnerable for heart attacks than Europeans. Probably it is a genetic predisposition of Indians, which makes them more vulnerable (Devishetty 2002). Therefore, every fourth man in USA develops a heart attack before retirement and probably it is every third man in India (Padmavati 2002). High blood cholesterol causes more than 4 million premature deaths a year (WHO 2003).
Fig. 1.1: Clinical manifestation of Atherosclerosis
Fig. 1.2: Death rates for total Coronary Heart Diseases (CHD) (Men Age 35-74)
Fig. 1.3: Death rates for total Coronary Heart Diseases (CHD) (Women ages 35-74)
Fig. 1.4: Projected death rate for all cardiovascular disease (CVD) in India
The chances of acquiring the CHD is much higher among diabetics, smokers, alcoholics and those consuming more fatty acids derived from animal sources (Das 2003). The diabetes increases the chances of heart attack 2 to 4 times and smoking increases the chance of heart attack by many folds (Devisheetty, 2002).

The advent of 3-hydroxy-3-methylglutaryl coenzyme-A reductase (HMGR) inhibitors or statins has revolutionized the treatment of CHD. Statins are now regarded as the first line drug therapy for the prevention of CHD. The use of statins has been recently expanded to include acute coronary syndromes and the recent studies showed that early intervention with statins in acute coronary syndromes resulted significant reduction in mortality and morbidity (Yamamoto 2004). Therefore, statins are treated as first choice of drug for the treatment of hypercholesterolemia. Since the introduction of lovastatin into clinical use in 1987, the inhibitors of HMGR (3-hydroxy-3-methylglutaryl-coenzyme A reductase) have proved remarkable success in clinical use as safe and effective drugs (Istvan and Deisenhofer 2001). Therefore, now a day the statins, especially lovastatin are widely prescribed by physicians in cholesterol-lowering therapy. Since widespread use of lovastatin in the treatment of hypercholesterolemia, it created lots of demand for the production.

Conventionally lovastatin is being produced by submerged fermentation method using defined media. But this method of production and recovery of lovastatin involves expensive procedures and substantial yields. Hence, it is necessary to discover new cheaper raw materials and suitable fermentation process, so that economics of the production of lovastatin comes down.
As per the literature survey, there are few reports available on the production of lovastatin by using agricultural wastes under the solid state fermentation and especially there were no reports on the use of carob pod as substrate for the production of lovastatin. Therefore, in the present study attempts were made to use carob pod as substrate for the production of lovastatin employing Aspergillus terreus strain under solid state fermentation, which is simple and inexpensive (Szakacs et al., 1998 and Lingappa and Vivek Babu 2004).

1.1 AIM OF THE PRESENT STUDY

The aim of the present study is to evaluate the suitability and utility of carob pods as alternate substrate for the production of lovastatin employing locally isolated strain Aspergillus terreus. The carob pod contain about 50-87 % of sugars (sucrose) which can be easily converted into fermentable sugars and finally to lovastatin. Although the utility of other agricultural wastes or agro based materials have been studied, literature on the suitability of carob pods is scanty. Further, the use of carob pods for the production of lovastatin is no where reported. These carob pods are easily available and the costs of production are moderate when compared to other conventional substrates used for lovastatin production. Therefore, in the present study efforts have been made to use carob pods for the production of lovastatin by employing Aspergillus terreus strain under solid state fermentation.
1.2 OBJECTIVES OF THE STUDY

The present study has been undertaken to utilize carob pods for the production of lovastatin under the solid state fermentation with the following main objectives.

1. Isolation and screening of *Aspergillus terreus* species from soils of different regions of Gulbarga.
2. Analysis of physico-chemical composition of carob pods.
3. Study of kinetic parameters like moisture content, pH, temperature, Inoculum concentration, particle size, bed depth and biomass content for lovastatin production under solid state fermentation (SSF).
4. SSF process economization for lovastatin production by supplementing various nutrients such as carbon, nitrogen, phosphate, alcohols, metal ions and combination of all nutrients.
5. Down stream processes for extraction and purification of lovastatin from the fermented substrate through suitable standard methods.
6. Strain improvement programme to obtain enhanced lovastatin producing *Aspergillus terreus* strains.
7. Characterization of lovastatin obtained from SSF process using various spectral data like UV, IR, NMR and also through HPLC analysis.