

occurs in patients undergoing Orlistat therapy (Melia et al. 1996). Hence, researchers are interested in finding new natural substances that show potent inhibitory activity against pancreatic lipase, and have fewer side effects than the current ones.

Drugs that prevent weight regain appear necessary in obesity treatment. Thus, the development of natural products for the treatment of obesity is a challenging task, which can be launched faster and cheaper than conventional, single-entity pharmaceuticals (Moreno et al. 2006). Many medicinal plants may provide safe, natural and cost-effective alternatives to synthetic drugs. Currently, one of the most important strategies in the treatment of obesity includes development of inhibitors of nutrient digestion and absorption. For example, acarbose is an antidiabetic drug that inhibits carbohydrate digesting enzymes, thus preventing the digestion of complex carbohydrates and decreasing postprandial hyperglycaemia (Yamagishi et al. 2009). Similar compounds with α -amylase inhibiting activity that can be used for diabetes control are being isolated from different plants. The list includes valoneic acid dilactone obtained from banaba (*Lagerstroemia speciosa*) (Hosoyama et al. 2003), the ethanol extract obtained from chestnut astringent skin (Tsujita et al. 2008) or the purified pancreatic α -amylase inhibitor isolated from white beans (*Phaseolus vulgaris*), are able to reduce glycaemia in both non-diabetic and diabetic rats (Tormo et al. 2006). Now, extracts from hundreds of species of medicinal plants, vegetables and fruits (Slanc et al. 2009) are being screened for potential lipase inhibitory activity. Ideally, these treatments will be viewed as adjuncts to behavioural and lifestyle changes aimed at maintenance of weight loss and improved health.

Knowledge of herbs has been handed down from generation to generation for thousands of years. Herbal drugs constitute a major part in all traditional systems of medicines. Herbal medicine is a triumph of popular therapeutic diversity. Plants, above all other agents, have been used for medicine from time immemorial because they have fitted immediate personal needs, are easily accessible and inexpensive. In the recent past, there has been a tremendous increase in the use of plant-based health products in developing as well as developed, countries resulting in an exponential growth of herbal products globally.

7.2 ANTI-OBESITY POTENTIAL OF MEDICINAL PLANTS

Medicinal plants have been used as dietary supplements for body weight management and control in many countries. In this sense, the presence of pancreatic lipase inhibitors has been demonstrated in different plant species, although more research is needed for identifying and characterizing effective lipase inhibitors. Lipase inhibitors of plant origin include certain proteins, such as those from soybeans (Gargouri et al. 1984) and from wheat bran and wheat germ (Lairon et al. 1985). Other proteins that strongly inhibit hydrolysis of triglycerides are the basic protein protamine (Tsujita et al. 1996); ϵ -polylysine (Tsujita et al. 2003), which could act as several amphiphilic proteins like ovalbumin; and β -lactoglobulin by desorption of lipase from its substrate due to a change in interfacial quality (Gargouri et al. 1984).

Other lipase inhibitors from plant origins (Figure 7.4) are basic polysaccharides, especially chitosan oligosaccharides, water-soluble chitosan (46 kDa) and polydextrose when a basic group is introduced (Han et al. 1999); phytic acid and other