hydrocolloids are used to form gel, and also as a thickening and stabilizing agent, film-forming agent, and foam stabilizer, to control syneresis, to stabilize emulsion or suspension, to prevent crystal growth, encapsulation of cells, and bioactive compounds, to improve bake and freeze–thaw stability, and to retain water [1, 2]. The main reason behind the wide application of hydrocolloids is their ability to modify the rheology of food systems. The addition of hydrocolloids in food systems influences its flow behavior (viscosity) and textural property [1]. The commonly used hydrocolloids are alginates, carrageenan, xanthan gum, gum arabic, carboxy methyl cellulose, hydroxypropyl methyl cellulose, pectin, gellan gum, and guar gum. Alginate is one of the prevalently used hydrocolloids in the food and beverage industry.

Alginate is basically extracted from the cell wall of brown algae. The cell wall of brown algae comprises of laminaran, sulfated hexouronoxylofucans, cellulose, fucodian and alginate. Alginate is the major composition of brown algae that contributes to about 45% of the dry weight of the seaweeds. Alginates are commercially available in acid and salt forms. The acidic form of alginates is known as alginic acid, and it is a linear polyuronic acid. The alginate salts are the major cell wall components of the brown algae that constitute up to 40–47% of its dry weight [3, 4]. The alginates are widely used in food industry for their ability to cross-link with ions (Ca^{+}), gel formation, water retention, ability to modify the viscosity, and also the ability to stabilize. The other advantage of using alginates is their ability to form heat-stable gels even at room temperature. Sources of alginates, their extraction, and their various applications in beverage industry are discussed in detail in this chapter.

12.2 Alginate Source

Alginates can be derived from the cell walls of brown algae/seaweed and from few soil bacteria. The alginate occurs in the form of capsular polysaccharide in *Pseudomonas aeruginosa* [5, 6]. Though alginates are also produced by bacterial species, the commercial production of alginates is from brown seaweeds. The commercial extraction of alginates is from brown seaweed species such as *Laminaria hyperborea, Laminaria digitata, Durvillea antarctica, Macrocystis pyriera, Ascophyllum nodosum, Lessonia nigrescens, Ecklonia maxima*, and *Sargassum* spp. [6–9]. The high quality of alginates can be obtained from cultivated brown seeds. Table 12.1 represents the various grades of alginates extracted from different brown seaweed sources.