



Fig. 1.28 The structure of floridean starch, inulin, laminarin, and floridoside. (After Percival and McDowell, 1967.)

- b **Myxophycean starch:** Found in the Cyanophyta, myxophycean starch has a similar structure to glycogen. This reserve product occurs as granules (α -granules), the shape varying between species from rod-shaped granules to 25-nm particles to elongate 31- to 67-nm bodies.
- c **Starch:** In the Chlorophyta, starch is composed of amylose and amylopectin. It occurs inside the chloroplast in the form of starch grains (Fig. 1.12(e)). In the Cryptophyta, starch has an unusually high content of amylose and occurs as grains between the chloroplast envelope and the chloroplast E.R. (Fig. 1.12(b)). In the Dinophyta also, starch occurs in the cytoplasm outside of the chloroplast, but its structure is not known.
- 2 **β -1,3 Linked glucans**
- a **Laminarin** (Fig. 1.28): In the Phaeophyceae, laminarin consists of a related group of predominantly β -1,3 linked glucans containing 16 to 31 residues. Variation in the molecule

- is introduced by the number of 1 \rightarrow 6 linkages, the degree of branching, and the occurrence of a terminal mannitol molecule. The presence of a high proportion of C-6 interresidue linkages and of branch points seems to determine the solubility of the polysaccharide in cold water: the greater the number of linkages, the higher the solubility. Laminarin occurs as an oil-like liquid outside of the chloroplasts, commonly in a vesicle surrounding the pyrenoid.
- b **Chrysolaminarin (leucosin):** In the Chrysophyceae, Prymnesiophyta, and Bacillariophyceae, chrysolaminarin consists of β -1,3 linked D-glucose residues with two 1 \rightarrow 6 glycosidic bonds per molecule. Chrysolaminarin occurs in vesicles outside of the chloroplast and has more glucose residues per molecule than laminarin.
- c **Paramylon:** In the Euglenophyta, Xanthophyceae, and Prymnesiophyta (*Pavlova mesolychnon*), paramylon occurs as