Introduction

Plant proteins are important functional ingredients in many processed food products. Particularly globular proteins from various sources play an important role in many food products, due to their contribution to food texture (McClements and Gumus, 2016). The seed storage proteins have been traditionally classified through the sequential extraction of crushed and defatted seeds by a series of aqueous and non-aqueous solvents (Marcone et al., 2002). The fraction extracted with water is defined as albumins, the fraction with dilute salt as globulins, the fraction with ethanol as prolamines, and the fraction with acid or alkali as glutelins. In cereal grains the main storage proteins are usually the alcohol soluble prolamines, whereas, in non-cereal grains the more nutritiously balanced salt soluble globulins predominate (Ali, 2015; Fageer, 2015; Janssen et al., 2017). Globulins can be subdivided into two distinct classes termed 7S and 11S on the basis of their sedimentation coefficient (Czubinskiet al., 2015). Dicotyledonous
plants have been found to favors the presence of the 11S globulin form (Sharma et al., 2017; Vajravijayan et al., 2017). 11S globulins are found to occur in the 300 kDa range whereas 7S globulins are generally less abundant and found to occur in the 180 kDa range.

The globulins storage proteins are classified into two broad groups, on the basis of their sedimentation coefficients: 7S Vicilin-type and 11S Legumin-type. The majority of the storage globulin proteins are soluble in dilute salt solution but insoluble in water. The two main reserve proteins of soybean that are used in the food industry are 7S β-conglycinin and 11S glycinin globulins. The 7S globulin is a trimeric glycoprotein (141 – 170 KDa) composed of three subunits, α (57 kDa), α’ (58 kDa) and β (42 kDa), associated by hydrophobic interactions (Tan-Wilson and Wilson, 2012; Marambe et al., 2012; Bhushan and Dixit, 2012; Jyothi, 2007). Sesame (Sesamum indicum) is the most ancient oil seed known and used by humans as a food source and it is mainly cultivated for its oil, whole or dehulled seeds are used in confectionery foods (Sumaya Hassan Abdel Rahim, 2015). It is also known as gingely, beniseed, sim sim and til. This annual seed crop has been cultivated for centuries, in the developing countries of Asia and Africa, for its high quality oil and protein (Sediqi, 2012). Sesame oil is different from all other vegetable oils in many chemical, biological and physiological properties. These properties are due to the presence of endogenous unsaponifiable constituents viz, sesamol, sesamin, and sesamolin. Sesamin is reported to possess in vivo hypocholesterolemic activity and suppressive activity against chemically induced cancer (Kochhar, 2011).

Almond (Prunus dulcis), belongs to the Rosaceae family that also includes apples, pears, prunes, and raspberries. Almond is one of the most popular tree nuts on a worldwide basis and ranks number one in tree nut production (Esfahlan et al., 2010). They are typically used as snack foods and as ingredients in a variety of processed foods, especially in bakery and confectionery products (Monteiro et al., 2013). Extracts of whole almond seed, brown skin, shell, and green shell cover (hull) possess potent free radical-scavenging capacities (Sang et al., 2002). In addition, almonds, when used as snacks and in diets of hyperlipidemic subjects, significantly reduced coronary heart disease (Jamsheed et al., 2015) A long-term supplementation of almond showed spontaneous nutrient modification of an individual’s habitual diet that closely matched the recommendations to prevent cardiovascular and other chronic diseases (Abazarfard et al., 2014; Chen et al., 2015).

Pumpkin (Cucurbita maxima) belongs to the family cucurbitaceae. It is a leafy green vegetable (Kindinew, 2015; Olasantan, 2007). Fruits are variable in size, color, shape, and weight. Pumpkin has received considerable attention in recent years because of the nutritional and health protective value of the proteins from the seeds. Pumpkin seed proteins, beside their wide use as food ingredients, have pharmacological activities too such as antidiabetic (Chonoko and Rufai, 2011; Singh, 2012; Tomar et al., 2014), antifungal (Abdel-Rahim et al., 2015; Libo et al., 2014; Qian, 2013), antibacterial and anti-inflammation activities (Al-Okbi et al., 2017; Perez Gutierrez et al., 2016). Pumpkin storage proteins are 2S albumins and 11S globulins (cucurbitin) localized in the protein bodies (Gallardo et al., 2016; Hegedus et al., 2015; Shimada et al., 2017). Alpha amylase inhibitors have potential roles in controlling blood sugar levels. Alpha glucosidase inhibitors are used as oral anti diabetic drugs for treating type 2 diabetes mellitus. They act by preventing the digestion of carbohydrates such as starch. Carbohydrates are normally