

Looking at seed proteins as a bulk commodity

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Some proteins are studied in order to understand and exploit specific biological functions however many are used in applications for other purposes and investigations require a range of approaches to understand the behaviour. Recently we have been studying two different seed materials that are used as foods and for environmental applications. *Moringa oleifera* seeds are used as food in several regions but have come to prominence as they can be used in water purification processes where they act as effective and sustainable flocculating agents. The tendency of the protein to aggregate and to associate with many other materials is important for this application as seen in scattering experiments. Our recent studies have demonstrated that the albumin-like protein can reversibly bind significant amounts of fluorocarbon amphiphiles and thus might also be useful for remediation of perfluorocarbon pollutants (PFAS). Neutron reflectivity data will be presented to show these effects.

Alternatives to conventional dairy products are attracting attention as sustainable choices for a wide range of foods. Many vegetable proteins are now used to make emulsions as drinks, spreads, and textured foods. Studies of emulsions made with pea protein (*Pisum sativum*) reveal interesting behaviour and structures that change with composition and pH. The stability of the emulsions is not simply dependent on adsorption to the oil/water interface but related also to association of protein in the aqueous phase as revealed by small-angle scattering, microscopy and rheological measurements. The parallels between the different seed proteins will be discussed.