New, useful feature of Moringa seeds revealed

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Previous studies have shown that the extracts from seeds of the Moringa oleifera tree can be used for water purification. In a new study, researchers from Uppsala University show that the Moringa seeds can also be used for separation of different materials. Separation processes are very important in mining industries and the new knowledge could contribute to reduce the needs for expensive synthetic chemicals.

Moringa trees are known as 'miracle' trees because of their many uses as food and as a source of oil. Seeds from the trees are also used to purify water. The special properties of the protein in the seeds have been studied by a group from Uppsala University in collaboration with the Polytechnic of Namibia, Windhoek, and the Institut Laue-Langevin in Grenoble, France.

New results published in the *Journal of Colloid and Interface Science* suggest that Moringa seeds could be used for separation of different materials rather than just removal of all impurities. Separation processes are very important in mining industries to remove valuable material from waste. This further application of a natural product would reduce the needs for expensive synthetic chemicals.

Protein from crushed seeds of Moringa bind to particles in water and cause them to aggregate. They can then be removed easily by filtration or settling. Choosing the right quantity avoids leaving unnecessary protein in purified water. The amount that saturates the surface is markedly less for alumina than for silica.

"The results can help us to find the optimum amount of Moringa seeds to purify water", says Dr Maja Hellsing, one of the researchers behind the study.

Experiments with detergents added to the bound protein showed that the behaviour changes for different materials. A cationic detergent, widely used as a disinfectant, causes the protein to detach from the surface of alumina. This discovery allows control of aggregation and gives a way to separate different materials.

"Combining the protein with detergents offers new ways to use this natural material in mineral industries that are important in many countries where Moringa grows well", says Professor Adrian Rennie, who led the study.

More information: Adrian R. Rennie, Habauka M. Kwaambwa (2015) Interaction of Moringa oleifera seed protein with a mineral surface and the influence of surfactants, *Journal of Colloid and Interface Science*, DOI: 10.1016/j.jcis.2015.02.033, The paper is available on open access: DOI: 10.1016/j.jcis.2015.02.033

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