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Creating an emulsion from onions

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Image for thought

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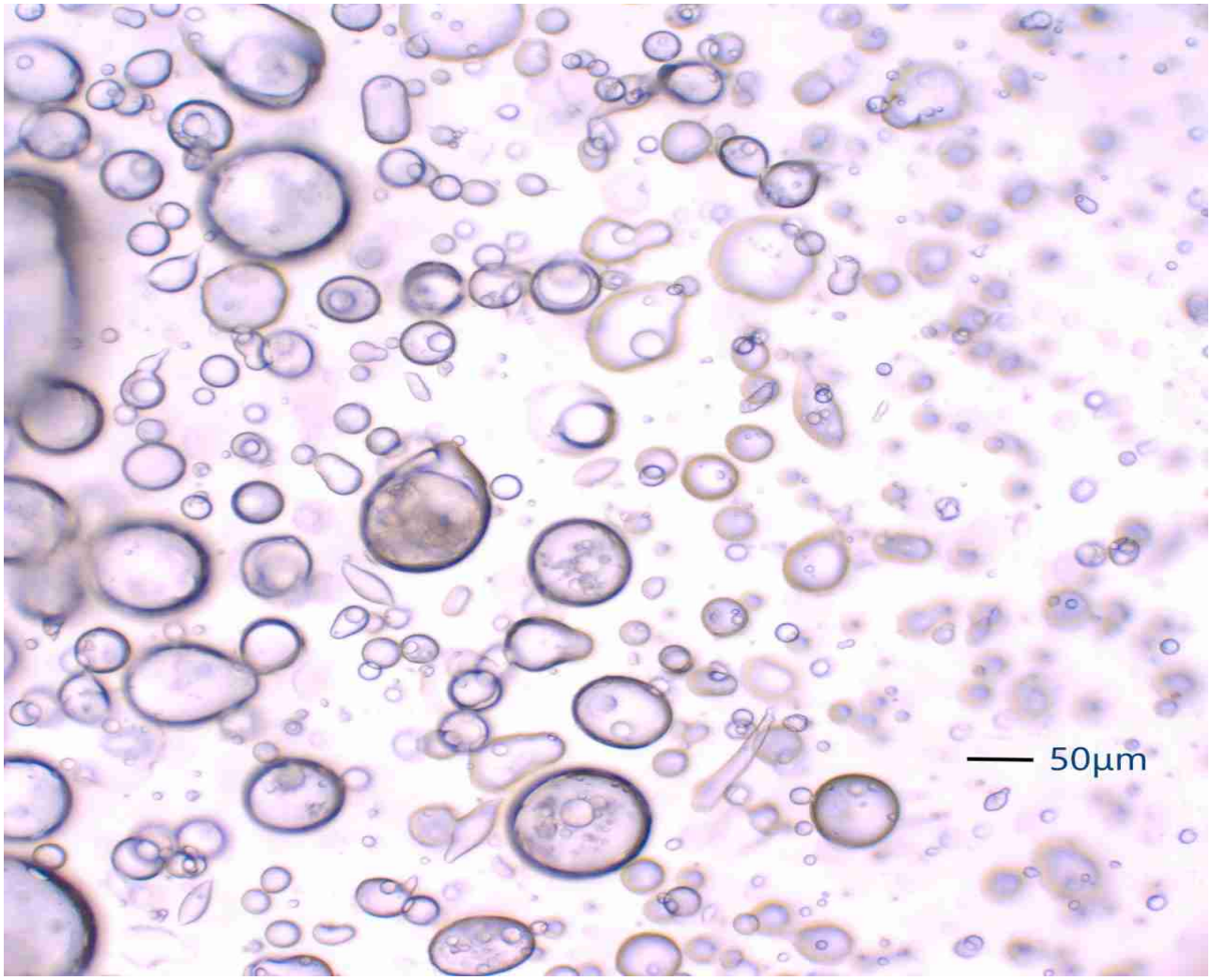

Figure 1. An onion based emulsion magnified 100 times using an Olympus BH-2 microscope and Pixelink M1 camera.

In response to the rising demands of sustainability, and the growing consumer interest in veganism, there is renewed enthusiasm for studying the functionality of plant proteins from different sources (Ningtyas *et al.*, 2021). Many researchers have reported the use of plant proteins as an alternative for animal proteins in non-dairy emulsion-based systems (Amiri Samani and Naji, 2019; Jeske *et al.*, 2019). However, due to low solubility in aqueous media, a significant number of plant proteins are still underutilized in food preparations because of their poor functionality (emulsifying, gelling, and foaming), limiting their effectiveness and therefore applicability in formulations (Kutzli *et al.*, 2021). Manipulating interfacial structures via solid particles provides a promising and green alternative to manufacture stable emulsions. The "surfactant-free" character makes them more suitable for various applications particularly in food, pharmaceutical and cosmetic formulations (Schrade *et al.*, 2013). There has recently been a substantial growth in the number of publications reporting the bridged Ramsden stabilization of high-volume-fraction emulsions stabilized by plant-based materials (Hu *et al.*, 2016; Tang, 2020; Xu *et al.*, 2019). Most of these emulsions are of the O/W type. Amiri Samanai and Naji (2019) note that the long-term stability of the Ramsden emulsion is enhanced by particle network formation within the continuous phase. This colloidal structuring inhibits (or retards) the various instability processes of liquid drainage, sedimentation (W/O systems) and cream layer formation (O/W systems).

The consumer's shift toward natural and superior foodstuffs for healthier lifestyles has become more popular, with a focus on whole-grain cereals, fruit, and vegetable consumption. Molecular cooking can be used to create new types of tasty and safe recipes that meet the demands of the modernist kitchen (Precup *et al.*, 2021). Co-founder of Molecular Gastronomy Hervé This observed (This, 2006) that an "an oinionolli can be made from onions" and any other plant or animal tissues: adding oil to such tissues results in the formation of emulsions. Therefore, it is possible to make plant-based emulsions which can provide tasty alternatives to mayonnaise.

For the picture (Figure 1), an "onionolli" was prepared by adding oil to crushed onion. It was spooned in a thin layer onto a microscope slide and visualized by magnifying it 100 times using an Olympus BH-2 microscope and Pixelink M1 camera. Figure 1 shows oil droplets dispersed in a continuous water phase.

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