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## Does the change in interfacial tension caused by rosemary extract and some of its active ingredients affect the stability of multiple emulsion?

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Nowadays, novel topical formulations loaded with natural functional actives are under intense investigations. We noticed that using low emulsifier (complex of sodium polyacrylate and polysorbate 20) concentration (0.5%) rosemary extract intends to form water/oil/water (w/o/w) type multiple emulsion directly, no additional ingredients or technological stage required. Addition of rosemary extract and some of its active ingredients (rosmarinic (RA), oleanolic (OA) and ursolic acid (UA)) into emulsion formulation had a significant influence on its parameters such as creaming index (CI), spreadability and dispersive phase droplet size. We decided to investigate if this effect occurs due to the surface and interfacial tension change caused by UA and OA that are saponins. The surface tension measurements were made using the Du-Nöuy ring taking into account the Zuidema Waters correction. Rheology modifier used to form emulsion decreased the surface tension of olive oil by 4.96%, of liquid paraffin - by 3.78% ( $p < 0.05$ ). We can hypothesize, that it is the reason why olive oil emulsions are more stable than those with liquid paraffin. The interfacial tension between ethanol (90%) - liquid paraffin and ethanolic rosemary extract-liquid paraffin differed insignificantly, though with vegetable oil the interfacial tension with ethanolic extract was 16.5% lower ( $p < 0.05$  vs. ethanol (90%)). All the other tested solutions of active ingredients from rosemary extract had no influence on the interfacial tension with olive oil. So we can conclude that the investigated active ingredients (RA, OA, UA) of rosemary extract did not decrease the interfacial tension as it was expected, therefore their emulsion stabilizing effect is not surfactant-like.

### Biography

Ugnė Čižauskaitė started her PhD in Biomedical Sciences at Lithuanian University of Health Sciences right after graduation. She worked as a scientist in the Drug technology laboratory ever since. She has published 1 paper in reputed journal and participated in many conferences.

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