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Changes of Bound Lipids and Composition of Fatty Acids in Germination of Quinoa Seeds

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Free (FL) and bound lipids (BL) of germinated quinoa seeds were extracted sequentially with *n*-hexane and hot water-saturated butanol (WSB), respectively. The total lipid contents containing these free and bound lipids were 8.4% (6.0 and 2.4%) for 0 hr (control), 8.1% (6.0 and 2.1%) for 24 hr, 7.2% (4.3 and 2.9%) for 48 hr and 8.8% (4.0 and 4.8%) in 72 hr of germination. The nonpolar lipids (NL), glycolipids (GL) and phospholipids (PL) in the bound lipids changed to: 50.0-61.0%, 23.4-30.4% and 26.5-8.7%, respectively. The ratio of NL to POL (GL + PL) was 1.04, 1.13, 1.56 and 1.56 for control, 24, 48 and 72 hr of germination, respectively. Linolenic acid (18:3) was the major fatty acid of GL for the control quinoa, but linoleic (18:2), and oleic (18:1) and palmitic (16:0) acids were the major fatty acid of NL, GL and PL during the germination. During germination, oleic acid increased, but linoleic acid decreased in NL, GL and PL. The ratio of saturated, monounsaturated and polyunsaturated fatty acids of NL, and PL approached 3:4:3. After 72 hr germination, the ratio of ω3/ω6 became 0.25 in GL.

Keywords: germination of quinoa, free lipids, bound lipids, nonpolar lipids, glycolipids, phospholipids