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Development of a High-Performance Liquid Chromatography Method to Determine the Fagopyrin Content of Tartary Buckwheat (*Fagopyrum tartaricum* Gaertn.) and Common Buckwheat (*F. esculentum* Moench)

[Kentaro Eguchi](#)¹⁾, [Tomohiro Anase](#)²⁾ and [Hideji Osuga](#)²⁾

1) National Agricultural Research Center for Kyushu Okinawa Region

2) Faculty of Systems Engineering, Wakayama University

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Abstract: Buckwheat contains fagopyrin, which induces photosensitization in light-skinned livestock when exposed to sunlight. Here, we developed a high-performance liquid chromatography (HPLC) method to measure the fagopyrin content of buckwheat. The HPLC profile of the fagopyrin extract purified from Tartary buckwheat 'Rotundatum' had 3 apparent peaks. The ultraviolet-visible (UV-vis) absorption spectrum of each peak yielded absorbance maxima (λ_{\max}) at 547 nm and 591 nm, indicating that these peaks

corresponded to fagopyrin and unidentified fagopyrin derivatives. We considered the total content reflected by the 3 peaks to be the fagopyrin content of buckwheat. We determined the fagopyrin content in the leaves of Tartary buckwheat 'Rotundatum' and common buckwheat 'Miyazakiootsubu' both by UV-vis photometric analysis and the newly developed HPLC method. The fagopyrin content is overestimated by UV-vis photometry because the extracts contain a considerable amount of chlorophyll. Thus, HPLC analysis is more efficacious for fagopyrin-content measurements than UV-vis photometric analysis. The HPLC analysis of fagopyrin is easy, quick and efficacious for screening buckwheat varieties with trace or no fagopyrin. There are only a few reports on the accumulation sites of fagopyrin in buckwheat. We revealed that in Tartary and common buckwheat, fagopyrin is present mainly in the leaves and flowers and slightly in the stems, hulls, and groats. The fagopyrin contents of the leaves and flowers of Rotundatum were approximately 2.6 and 2.8 times higher than those in Miyazakiootsubu, respectively.

Keywords: [Fagopyrin](#), [Fagopyrism](#), [High-performance liquid chromatography](#), [Thin-layer chromatography](#)

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