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Caffeoylquinic Acid Derivative Profile of Sweetpotato Leaves Harvested at Different Growth Stages

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[Introduction]

The sweetpotato (*Ipomoea batatas* L.) is an important crop plant in tropical countries because of its high efficiency in carbohydrate production. There is no doubt that the root is the most important product of sweetpotato. In comparison with the root, the leaf is almost completely neglected in commercial terms, although it have nutritional and health-promoting values for human beings such as phenolic compounds. Therefore, the aim for our research has been to compare the caffeoylquinic acid (CQA) profile of sweetpotato leaves harvested at different growth stages for future use in functional food applications.

[Materials and Methods]

Leaves of 4 sweetpotato cultivars (Bodeuremi, Hopungmi, Jinyulmi, Sodammi) were grown in the experimental greenhouse of the Bioenergy Crop Research Institute, NICS, RDA. The three leaf developmental stages samples were extracted with 80% ethanol and filtered through a 0.25 μm syringe filter. The caffeoylquinic acid derivatives were identified using ultra performance liquid chromatography with orbitrap mass (UPLC-Orbitrap-MS) and quantified in an extract and in the fresh matter of each growth stage.

[Results and Discussion]

Fourteen phenolic compounds were identified in the ethanolic extract of sweetpotato leaves including eight caffeoylquinic acids, three quercetin glycosides, one kaempferol glycoside and two hydroxycinnamic acids by using UPLC-Orbitrap-MS analysis. The individual and total caffeoylquinic acid contents were remarkably different, especially 3,5-CQA and 4,5-CQA which were the predominant compounds (>60%) in all sweetpotato cultivars. Additionally, Sodammi cultivar exhibited the highest CQA content (545.6 mg/100g), whereas the lowest was shown by Bodeurmi (188.7 mg/100g). Caffeic acid and 3,4-CQA contents were significantly ($p<0.01$) decreased in the leaves during the leaf development, while 3-CQA and 4,5-CQA contents were significantly ($p<0.01$) increased. Further studies are needed to examine other phenolic compounds in this plant species and determine their health benefits including antioxidant activities.

[Acknowledgement]

This research was supported by grant (PJ01726702) of the National Institute of Crop Science Project, RDA, Republic of Korea.

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