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Phytochemical screening and quantitative variation of some secondary metabolites in five cultivated rice varieties

Bocco Roland[1], Gandonou Christophe Bernard[1*], Gbaguidi Fernand[2] and Ahouansou Ayidé Coffi[2]
[1]Laboratoire de Physiologie Végétale et d'Etude des Stress Environnementaux. Faculté des Sciences et Techniques (FAST). Université d'Abomey-Calavi (UAC), 06 BP 1442 Cotonou, Bénin.
[2]Laboratory of Chemistry and Organic Pharmaceutical. Faculty of Health Sciences, University of Abomey-Calavi, 01 BP 188 Cotonou, Benin.
* Corresponding author: Courriel: ganchrist@hotmail.com , Tél. : (00229) 97 39 69 78

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ABSTRACT

Objectives: Rice is an important food crop in West Africa whose production is known to be limited by biotic and abiotic constraints. Plants contain many chemical compounds beneficial for the control of pests. This study aims to compare the secondary metabolites profile and content in five rice varieties in relation with their resistance against pests.

Methodology and results: This research makes qualitative and quantitative assessment of secondary metabolites present in leaves of five rice varieties (WAB56-104, ITA306, CG14, TOG5681 and RAM55) using standard methods. Phytochemical screening revealed the absence of alkaloids and the presence of many other molecules including reducing sugars and phenolic compounds. Some other molecules were noticed in specific varieties such as catechetic tannins (variety CG14), terpenoids (variety WAB56-104) and saponosides (variety CG14). Quantitative estimation revealed that total phenols, flavonoids and tannins contents varied significantly among varieties whereas total anthocyanins content was similar in the five varieties tested.

Conclusions and applications of findings: The present study revealed that rice leaves contain various types of secondary metabolites mainly in the groups of phenol (tannins and flavonoids), mucilages, heterosides and reducing compounds. There is a high variability of secondary metabolites profile and contents between rice varieties. Varieties WAB56-104, RAM55 and ITA306 contained more phenols, more flavonoids and more tannins than the others did. These results confirm the importance of secondary metabolites in plants and suggest that the presence and/or the concentration of a specific metabolite could play a key role in the resistance of rice against insects. The present findings could be used to establish the relationship between secondary metabolites profile/concentrations and the resistance to specific pest in rice varieties.

Keywords: Terpenoids, phenolic compounds, reducing sugars, alkaloids, heterosides, mucilages, rice, resistance, insects