Natural Products: Screening Capsicum Accessions For Antioxidants Content

Daddy Boateng¹, Yoon Hu¹, George Antonious¹, Tejinder Kochhar², and Robert Jarrett³

¹Department of Plant and Soil Science, Land Grant Program
²Department of Biology, Kentucky State University, Frankfort, KY 40601
³USDA/ARS Plant Genetic Conservation Unit, Griffin, GA 30223, USA

ABSTRACT

There is a growing interest in the enhancement of compounds in food which possess health-promoting attributes, and antioxidants are receiving special attention for their protective effects against cardiovascular disease, cancer, and other chronic diseases. Some species of Capsicum (paprika and pepper) are known to encompass, apart from widespread compounds like phenols, ascorbic acid, and capsaicin, important compounds. The objective of this investigation was to screen and select candidate accessions of hot pepper (Capsicum species) for use as a source of phytochemicals of antioxidant properties or as parents in breeding programs. Below is a summary of results from screening (Capsicum chinense (PI-633754, PI-633755, PI-633756, PI-633757, PI-633834), Capsicum annuum (Grif-14486, Grif-14487, and Grif-14513), and C. frutescens (PI-387833, PI-387834, PI-387836, PI-414729, PI-430490, Grif-14486, Grif-14487, and Grif-14513), and two accessions of C. pubescens (PI-678074 and Grif-032020)) were tested for their antioxidant activity.

INTRODUCTION

The role of phenols and other antioxidants with properties similar to vitamin C, E, and B is of growing interest in food science. Phenols are of widespread occurrence in higher plants and are known to provide a number of health benefits to human health. They have antioxidant effects by prolonging the degradation of prooxidant radicals and by scavenging free radicals (Hafez et al. 2005). Red pepper (Capsicum species) is a dietary source of phenols and other antioxidants such as ascorbic acid, and capsaicin. Capsaicin, the pungent principle that is characteristic of the genus Capsicum; contains considerable antioxidants activity and is correlated with human health. Total antioxidant capacity may play an important role in the prevention of chronic diseases (Hu et al. 2002).

RESULTS AND DISCUSSION

Total phenols, ascorbic acid, and capsaicin concentrations were greatest in accessions PI-438622 and lowest in PI-633754. Total capsaicinoids (capsaicin and dihydrocapsaicin) concentrations were greatest (1.3 mg g⁻¹ fresh fruit) in PI-438622 and lowest (0.002 mg g⁻¹ fresh fruit) in Grif-9320. Table 1 shows the concentrations of total phenols, reducing sugars and total capsaicinoids in the fruits of seventeen Capsicum accessions. Bars accompanied by different letter(s) for each compound indicate significant differences between accessions using Duncan’s LSD test.

CONCLUSION

The awareness among consumers of the relation between diet and health suggests that food producers will need to pay increasing attention to the health-promoting attributes of the products they make and sell. Data suggest that gene variability exists within and between Capsicum species for numerous phytochemicals with health-promoting attributes, and that these traits might be manipulated via plant breeding or other research approaches to produce fruit with value-added traits.

REFERENCES


