Poster presentation: 233

Effect of solid state fermentation by *Rhizopus oryzae* on rice bran bioactives, their bioactivity, bioaccessibility and bioavailability

G. Janarny* and K. D. P. P. Gunathilake

Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Sri Lanka
*gjanarny3@gmail.com

Rice bran is a rich source of bioactive compounds. It is an underutilized agro-industrial residue for human consumption. Solid-state fermentation has been employed as a processing technique to increase the content of functional components from rice bran. This study was carried out to examine the effect of solid state fermentation (SSF) by *Rhizopus oryzae* on the content of polyphenols and carotenoids, their bioactivity, bioaccessibility and bioavailability of rice bran of 4 different varieties (Bg 352, Bw 367, Bg 406 and H 4). *In vitro* digestion with dialysis was carried out and methanolic extracts and digested fractions of fermented and unfermented rice brans were analyzed for total phenolic (TPC), total flavonoid (TF), total carotenoids (TC), and total anthocyanin content (TAC). The antioxidant activity was evaluated using total antioxidant capacity, ferric reducing power and DPPH radical scavenging assays. Anti-inflammatory and anti-diabetic properties were assessed using protein denaturation and α-amylase inhibition assays respectively. The results indicated that TPC, TF, TC, TAC, total antioxidant capacity and ferric reducing power of Bg 352 and Bw 367 has increased with SSF. The radical scavenging ability and anti-inflammatory properties of all samples have increased with SSF whereas anti-diabetic properties of all samples have decreased with SSF. Among the unfermented rice bran samples, highest bioaccessible phenolic (93.32%) and flavonoids (40.8%) were observed in Bg 352, whereas highest bioaccessible anthocyanin (20.89%) and carotenoids (78.72%) were observed in Bw 367 and H 4 respectively. With fermentation, bioaccessible and bioavailable percentage of phenolic and flavonoid has increased in Bg 406 and H 4, whereas bioaccessible percentage of anthocyanin and carotenoid has increased in Bg 406, Bw 367 and Bg 352. With SSF, radical scavenging ability of digested fractions of all rice bran have decreased and the total antioxidant capacity of dialyzed fractions of all samples have increased. Among all samples, highest reducing power was expressed by fermented Bg352. Among unfermented samples, Bw 367 expressed highest anti-inflammatory and anti-diabetic property in all phases of digestion whereas with SSF, H 4 expressed highest anti-inflammatory property and Bg 406 expressed highest anti-diabetic property in all phase of digestion. The results of this study indicate that SSF can be used to enhance the phenolic content, carotenoid content, total antioxidant capacity, ferric reducing power, radical scavenging ability and anti-inflammatory property of Bg 352 and Bw 367.

Keywords: Bioacessibility, bioactives, bioavailability, *Rhizopus oryzae*, solid state fermentation