

Productivity, Phenolic Composition and Antioxidant Activity of Arrowroot (*Maranta arundinacea*)

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Abstract : Among Brazilian plant diversity, many species are used as food and considered minor crops (non-conventional plant foods) (NCPF). Arrowroot (*Maranta arundinacea*) is a NCPF from which starch is extracted from rhizome do not have gluten. Thus, arrowroot flower starch can be consumed by celiac people. Additional, some medicinal and functional proprieties are assigned to arrowroot leaves which currently are underutilized. In Brazil, it's cultivated mainly by small scale farmers and there is no specific recommendation for fertilization. This work aimed to determinate the best fertilization for rhizome production and to verify its influence in phenolic composition and antioxidant activity of leaf extracts. Two arrowroot varieties, "Common" and "Seta", were cultivated in organic system at state of Minas Gerais, Brazil, using cattle manure with three levels of nitrogen (N) (0, 300 and 900 kg N ha⁻¹). The experiment design was in randomized block with four replicates. The highest production of rhizomes in both varieties, "Common" (38198.24 kg ha⁻¹) and "Seta" (43567.71 kg ha⁻¹), were obtained with the use of 300 kg N ha⁻¹. With this fertilization, the total aerial part, petiole and leaf production in the varieties were respectively: "Common" (190.312 kg ha⁻¹; 159.312 kg ha⁻¹; 31.100 kg ha⁻¹) and "Seta" (207.656 kg ha⁻¹; 180.539 kg ha⁻¹; 27.062 kg ha⁻¹). Methanolic leaf extracts were analysed by HPLC-DAD. The major phenolic compounds found were caffeoylquinic acids, p-coumaric derivatives and flavonoids. In general, the production of these compounds significantly decreases with the increase levels of nitrogen (900 kg N ha⁻¹). With 300 kg N ha⁻¹ the phenolic production was similar to control. The antioxidant activity was evaluated using DPPH method and was detected around 60% of radical scavenging when 0.1 mg/mL of plant extracts were used. We concluded that fertilization with 300 kg N ha⁻¹ increased arrowroot rhizome production, maintaining phenolic compounds yield at leaves.

Keywords : antioxidant activity, non-conventional plants, organic fertilization, phenolic compounds

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