EFFECT OF DIGESTION OF CAMELLIA SINENSIS AND ASPALATHUS LINEARIS TEAS ON ANTIOXIDANT CONTENT AND ACTIVITY AND THEIR PROTECTION AGAINST OXIDATIVE DAMAGE

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Low antioxidant status of people due to not consuming adequate fruits and vegetable is currently a major concern. Despite this, tea remains the main source of antioxidants, particularly flavonoids. The ultimate antioxidant potential of these radical scavengers is dependent on digestion conditions that results in biotransformation of flavanols and other flavonoids in the stomach, small intestine and colon of the gastrointestinal tract. The effect that digestion of tea has on antioxidant content and activity, as well as protective ability against oxidative damage in a cellular environment was determined. The Folin-Ciocalteu and aluminium chloride assays were done to determine total polyphenolic (TPC) and flavonoid (TFC) content, respectively, whereas DPPH radical scavenging, TEAC and ORAC assays were used to determine antioxidant activity. Caco-2 cell models were used to measure oxidative damage. *Camellia sinensis* teas had higher antioxidant contents and activities than *Aspalathus linearis* teas, however on a cellular level they did not differ significantly in protection against oxidative damage. Pepsin (stomach) and pancreatin (intestines) digestion drastically reduced the TPC and radical scavenging ability, however TFC was minimally affected. Total antioxidant activity (TEAC) decreased with pepsin digestion and increased with further pancreatin digestion. After pepsin and pancreatin digestion, teas still had powerful protective effects against oxidative damage on a cellular level. Neutral and alkaline pH environments of the small intestine and colon cause polyphenolic compounds to oxidise. Oxidised products sometimes possess greater radical scavenging activity than their original flavonoids. Thus the value of tea as a potent antioxidant source should not be underestimated.