

Development of a Sensory Wheel for Green Rooibos and Determination of Stability of Quality Attributes During Shelf Life Storage

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Abstract

Introduction: Green rooibos herbal tea is considered a functional beverage due to its much higher aspalathin levels compared to the traditional product. In addition to aspalathin content, the sensory profile of green rooibos is an important quality consideration. Both these characteristics should remain stable during storage. A sensory wheel and lexicon are needed to fully describe potential changes in its sensory profile.

Methodology: Commercially processed green rooibos teas (n = 57) from the 2018 – 2022 production years were sourced. The herbal teas were analysed for colour, water activity and chlorophyll content. Descriptive sensory analysis was conducted on standardised infusions. Infusions were also analysed for the major quality parameters, namely soluble solids content, CIELab colour, turbidity and phenolic composition (HPLC).

The quality parameters, including the physicochemical characteristics and phenolic composition of the leaf tea and infusions, as well as the sensory profile of the infusions, of four randomly selected production batches were monitored over six months. Samples were stored at different storage conditions (25°C/65% relative humidity (RH) and 40°C/65% RH), packaged in moisture-impermeable pouches and moisture-permeable sachets.

Results and Discussion: A sensory wheel and lexicon consisting of 19 aroma, 14 flavour, 3 taste and 1 mouthfeel descriptors were constructed. The characteristic primary attributes were: 'hay/dried grass', 'cooked oats' and 'tobacco' aroma and flavour; 'honey' and 'caramel' aroma; astringent mouthfeel. Storage of the green rooibos leaf tea increased its moisture content and water activity only for the sachet treatments. The total chlorophyll content of the product was more affected by the storage temperature than by the packaging. The product reached a visible colour change for the sachet/40°C treatment after 12 weeks. The aspalathin and nothofagin concentration of the green rooibos decreased for the sachet/40°C treatment. The infusions from this treatment also had increased intensities of fruity, sweet-associated and 'rooibos-woody' aromas, while 'green grass' aroma decreased.

Conclusions: The sensory profile of a comprehensive set of green rooibos infusions was determined for the first time. Storage at 25°C in moisture-impermeable packaging is recommended to preserve the green colour, phenolic composition and sensory profile of green rooibos herbal tea.

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Prof Dalene de Beer holds a Ph.D. in Food Science and is employed as a specialist researcher by the Agricultural Research Council of South Africa. She is also an extraordinary Associate Professor at Stellenbosch University and acts as supervisor for MSc and PhD students at the Department of Food Science. The main focus of her research is on development of analytical techniques for quantification of phenolic compounds in South African herbal teas and fruits. These methods are also used to determine plant material variation, differences between varieties/cultivars and the effects of food processing.