Polarised Sensory Positioning and Polarised Projective Mapping: Application As Rapid Sensory Quality Classification Tools

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Abstract

The honeybush (*Cyclopia* spp.) herbal tea industry requires a standardised assessment method to prevent the trade in inconsistent and inferior quality products to a primarily export market. The efficacy of rapid sensory profiling methods to classify fermented (oxidised) honeybush tea products according to high, moderate, poor, and low sensory quality was investigated. Two reference-based methods, namely polarised sensory positioning (PSP) and an extension thereof, polarised projective mapping (PPM), were evaluated in which products are compared to a fixed set of reference samples or 'poles'. An advantage of PSP and PPM for application in quality control is that data can be aggregated over consecutive sessions for batch comparison over time. Two variations per method were compared, namely the use of 1) conventional physical poles, i.e., honeybush tea infusions (PSP-*p* and PPM-*p*), and 2) theoretical poles, i.e., descriptions of the key sensory attributes per sensory quality class (PSP-*t* and PPM-*t*). Descriptive sensory analysis (DSA) was performed on infusions of commercially processed batches of *C. intermedia*, *C. subternata* and *C. genistoides* of varying sensory quality. Four sensory quality classes, previously established for fermented honeybush tea, were pre-assigned to the respective samples based on their DSA data, and test samples and physical poles were selected accordingly. Product configurations similar to that of DSA demonstrated the validity of the method variations for broad quality classification of honeybush tea based on key sensory quality parameters. PPM-*p* indicated the highest discrimination ability. RV coefficients of ≥ 0.7 substantiated acceptable agreement between the sample configurations of the methods. Samples were classified into 'moderate to high', 'low' and 'poor' quality groupings. Indistinct classification for high and moderate sensory quality classes could be ascribed to overlapping of positive sensory attributes associated with the physical and theoretical poles. PPM-*t* was selected to test its discrimination ability by a panel of honeybush industry representatives. No distinct classification was obtained and the need for industry assessor training on honeybush sensory lexicon attributes to facilitate assessment was emphasised. Methodological factors highlighted such as pole selection, modality and assessors' expertise level could contribute to improving method efficacy for application within commercial and research context.

Biography: Brigitte du Preez

From a young age, Dr Brigitte du Preez was intrigued by the science of aromas and flavours. She completed her BSc degree in Food Science (Chemistry) at Stellenbosch University (SU) in 2002. After pursuing a career

as a research and development technologist at an international flavour house, Du Preez returned to the academic milieu. She participated in a research project on the value-addition of herbal teas at the Agricultural Research Council Infruitec-Nietvoorbij (Post-harvest and Wine Technology Division). Du Preez completed her MSc degree in Food science (cum laude) entitled 'Cyclopia maculata – source of flavanone glycosides as precursors of taste-modulating aglycones' at SU in 2014, after which she worked at the Sensory Research Facility of the Department of Food Science to further her expertise in sensory science. In 2020 she completed her PhD degree in Food Science entitled 'The development of a quality grading system for the honeybush (Cyclopia spp.) industry'.