



THE PROMISE OF HONEYBUSH

Lizette Joubert, ARC Infruitec-Nietvoorbij, Stellenbosch – Wentzel Gelderblom, PROMEC Unit, Medical Research Council, Bellville – Ann Louw, Department of Biochemistry, Stellenbosch University, Stellenbosch

The future could be bright for honeybush

Honeybush holds significant promise as a functional beverage and natural therapeutic agent for the future, but we still have a huge amount of work to do to deliver the scientific evidence required to verify and substantiate its health claims. We are currently exploring several exciting applications for honeybush and its compounds, including the treatment of menopause-related symptoms and skin cancer.

Trends and challenges around functional foods

Consumers are increasingly aware of the role that diet plays in maintaining overall health. Rising medical costs, an ageing population and the trend toward self-medication have stimulated consumers' interest in natural products and functional foods and beverages. They are looking for "extra" health benefits and products that can help to prevent disease. This created new opportunities, but also fierce competition, as more and more products are marketed for its health properties.

Antioxidants have become a buzz word, promising to slow down ageing and treat several ailments, as well as to prevent or slow down degenerative diseases. By now, the link between antioxidants and cancer-prevention is well established.

Investigating honeybush

Historically an extract of honeybush has been used for medicinal purposes, mainly as an expectorant to relieve respiratory difficulties and even to treat pulmonary tuberculosis. We are not sure when people started drinking honeybush as an everyday beverage purely for its taste and aroma.

As we learned more about the chemical composition of the honeybush (*Cyclopia*) plant, it stimulated our interest in investigating its health-promoting properties and potential as a functional beverage. Other teas, such as green, black and rooibos, are producing more and more evidence to substantiate health claims. For honeybush to compete internationally, it would have to deliver the same level of proof.

Past and current honeybush research at the Agricultural Research Council (ARC) and the Medical Research Council (MRC) focuses on its antioxidant activity and potential **ability to prevent cancer**. The polyphenols in honeybush are responsible for some of its health properties. Polyphenols are well-known antioxidants that are able to neutralize harmful free radicals, thereby preventing mutations (cancer induction) and uncontrolled cell growth associated with cancer.

However, clues found in the chemical composition of the plant suggest that honeybush extracts could have more health benefits, specifically **the alleviation of menopause-related symptoms**. Honeybush contains a number of known phytoestrogens (phyto = plant). These plant compounds bind to the estrogen receptor in the body and mediate biological effects similar to that of estrogen.

Phytoestrogens are potentially useful to treat menopausal symptoms and to protect postmenopausal women against cardiovascular disease and osteoporosis, without the risks associated with hormone replacement therapy (HRT). HRT has been used as an effective method of treating various menopause-related symptoms, but a number of studies, most notable the Women's Health Initiative, showed that long-term use of HRT causes an increased risk of breast cancer. This and the general increase in popularity of natural medicine have lent impetus to the search for and investigation into alternative treatments.

Challenging regulatory barriers

In spite of strong evidence supporting the beneficial role of dietary antioxidants in the prevention of cancer and cardiovascular disease, regulatory bodies, including those of the European Union and South Africa, do not allow food manufacturers to communicate these benefits to consumers on packaging. If these health claims are to be allowed at all in the future, they will have to be supported by rigorous scientific evidence. This is what the ARC, in collaboration with our research partners, is working towards.

Future honeybush research challenges

Our challenge now is to unravel the chemical composition of honeybush and its biological properties. We are working with *in vitro* models (eg tissue culture) and animal models to verify the potential beneficial health effects of the extracts and compounds.

In order to understand the effect of the bioactive compounds of honeybush in the human body, we have to confirm to what extent they are absorbed and metabolised. The body can only benefit from a substance that is absorbed, and its beneficial effect can also be influenced when the compound is metabolised (changed or broken down). However, such studies in people are expensive and difficult to interpret, due to many uncertainties and variables in people's diet and health. It is difficult to differentiate between the apparent healthy state of individual subjects consuming regular foods (and beverages) and the "even more healthy" state resulting from consuming health-promoting products.

New products from honeybush

Our findings that the traditional tea processing (an oxidation process) reduces the antioxidants, led to a demand for green (unoxidised) honeybush. We also use green honeybush when preparing antioxidant-enriched extracts from the plant for our research on health properties.

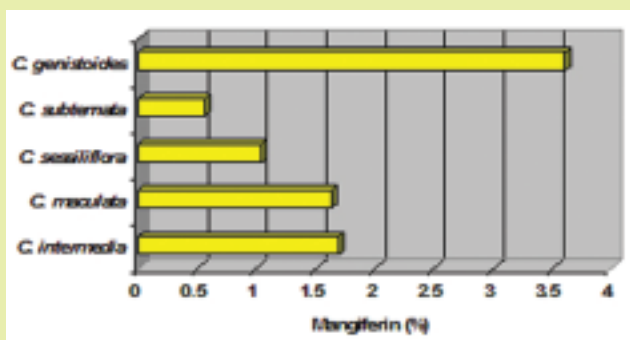
The major antioxidant in honeybush is mangiferin, a compound that is also found in mango, but otherwise not common in our diet. Because of its "novelty" value and the relatively high quantities in honeybush, in particular in *C. genistoides*, mangiferin-enriched extracts have significant future potential in the food, nutraceutical and cosmetic markets.

It is now possible to develop honeybush products for very specific markets, using selective extraction of specific constituents and fractionation to obtain a purer product. Specific examples include:

- An experimental product (prepared from honeybush) to slow down skin cancer
- An experimental nutraceutical based on the potent phytoestrogen properties in experimental extracts of *Cyclopia subternata*. We have demonstrated (with *in vitro* studies) that a honeybush-based product have a potency comparable with that of commercially available phytoestrogen products.

But not all honeybush is the same ...

We have found large variations in biological properties between honeybush species, as well as significant variations within species. This means that, for now, we cannot make any blanket claims about the proven activity for all preparations of honeybush. In future, plant breeders will have to include additional selection criteria to ensure plant material that consistently "perform" with the required biological properties.



Typical levels of the antioxidant, mangiferin, in the dry honeybush plant material of different species