Japanese and German studies validate rooibos' health properties

November 10, 2015/

Important scientific evidence that supports some of the health benefits associated with rooibos tea has emerged from studies in Japan and Germany.

A study carried out at the Tokyo University of Agriculture and Technology confirmed that aspalathin – the unique flavonoid in rooibos tea – is able to help lower raised blood sugar levels and improve the metabolism of glucose. The Japanese research team investigated the anti-diabetic action of aspalathin in living muscle cells and a diabetic mouse model which was able to shed light on the specific mechanisms involved at molecular and cellular level. Its results have been published in the December 2012 issue of the European Journal of Nutrition. (The abstract is available online at http://www.ncbi.nlm.nih.gov/pubmed/23238530.)

The team in Japan currently collaborates with South African rooibos researchers at the Medical Research Council and the Agricultural Research Council (ARC) as part of a scientific co-operation agreement between Japan and South Africa.

These latest results add further weight to a previous study by them, published in 2009, and a 2012 study by the South Africa researchers. The latter study found that an aspalathin-enriched extract of green Rooibos is able to lower raised glucose levels in the blood of diabetic rats. Further work to elucidate the mechanism(s) whereby the chemical constituents present in Rooibos can affect the metabolism is on-going.

In another study, this time at Heidelberg University in Germany, scientists demonstrated that rooibos tea has the potential to promote longevity in living organisms. Using roundworms (Caenorhabditis elegans) as a model, they produced evidence that rooibos decreased oxidative damage in their cells. They were also able to show that aspalathin played a major role in their survival rate by targeting stress and ageing related genes. Local researchers from the ARC and the University of Johannesburg are co-authors on the research paper published in the December 2012 issue of the scientific journal Phytomedicine. (The abstract is available online at http://www.ncbi.nlm.nih.gov/pubmed/23218401.)

"It is encouraging that international researchers are taking such an interest in South Africa's herbal teas and that their findings help to improve our understanding of the health properties of rooibos tea," says Professor Lizette Joubert, herbal tea expert at the Agricultural Research Council. "This should provide further impetus to our efforts to understand the chemistry and biological properties of rooibos and other herbal teas so that we will be able to advise people how to get the maximum health benefit from these unique South African teas."

https://www.ncbi.nlm.nih.gov/pubmed/23238530

Eur J Nutr. 2013 Sep;52(6):1607-19. doi: 10.1007/s00394-012-0466-6. Epub 2012 Dec 13.

Aspalathin improves hyperglycemia and glucose intolerance in obese diabetic ob/ob mice.

Son MJ[1], Minakawa M, Miura Y, Yagasaki K.
Author information

Abstract

PURPOSE:

Although several researches have demonstrated that rooibos extract has hypoglycemic effect, the role of aspalathin, a main polyphenol in the extract, remains unclear. Our aims were to find specific mechanisms for anti-diabetic action of aspalathin employing a rat skeletal muscle-derived cell line (L6 myocytes) and a rat-derived pancreatic β-cell line (RIN-5F cells) and to investigate its effect in type 2 diabetic model ob/ob mice.

METHODS:

We investigated in vitro the effect of aspalathin on the glucose metabolism through the studies on molecular mechanisms of glucose uptake using cultured L6 myotubes. We also measured the antioxidative ability of aspalathin against reactive oxygen species (ROS) generated by artificial advanced glycation end product (AGE) in RIN-5F cells. In vivo, ob/ob mice were fed 0.1 % aspalathin-containing diet for 5 weeks, and the effect of aspalathin on fasting blood glucose level, glucose intolerance, and hepatic gene expression was studied.

RESULTS:

Aspalathin dose dependently increased glucose uptake by L6 myotubes and promoted AMP-activated protein kinase (AMPK) phosphorylation. Aspalathin enhanced GLUT4 translocation to plasma membrane in L6 myoblasts and myotubes. In RIN-5F cells, aspalathin suppressed AGE-induced rises in ROS. In vivo, aspalathin significantly suppressed the increase in fasting blood glucose levels and improved glucose intolerance. Furthermore, aspalathin decreased expression of hepatic genes related to gluconeogenesis and lipogenesis.

CONCLUSIONS:

Hypoglycemic effect of aspalathin is related to increased GLUT4 translocation to plasma membrane via AMPK activation. In addition, aspalathin reduces the gene expression of hepatic enzymes related to glucose production and lipogenesis. These results strongly suggest that aspalathin has anti-diabetic potential.

PMID: 23238530

DOI: 10.1007/s00394-012-0466-6

https://www.ncbi.nlm.nih.gov/pubmed/23218401

Phytomedicine. 2013 Feb 15;20(3-4):380-6. doi: 10.1016/j.phymed.2012.10.006. Epub 2012 Dec 3.

Ameliorative effect of aspalathin from rooibos (Aspalathus linearis) on acute oxidative stress in Caenorhabditis elegans.

Chen W[1], Sudji IR, Wang E, Joubert E, van Wyk BE, Wink M.
Author information

Abstract

Rooibos leaves and fine stems (Aspalathus linearis; Fabaceae) are increasingly enjoyed as herbal tea, largely in fermented (oxidised) red-brown form, but also in unfermented (unoxidised) green form. Rooibos is rich in antioxidant polyphenols, with the dihydrochalcone, aspalathin, as a major active ingredient. We used Caenorhabditis elegans as model organism to investigate the effect of rooibos extracts against oxidative stress in vivo. In a high glucose environment, C. elegans treated with rooibos extract exhibited an extended lifespan. Furthermore, green rooibos was a more potent antioxidant than red rooibos, probably due to its substantially higher aspalathin content. In addition, rooibos decreased acute oxidative damage caused by the superoxide anion radical generator, juglone, with aspalathin playing a major role in improving the survival rate of C. elegans. Quantitative real-time PCR results demonstrated that aspalathin targets stress and ageing related genes, reducing the endogenous intracellular level of ROS. These findings suggest that rooibos increases stress resistance and promotes longevity under stress, probably mediated via a regulation of the DAF-16/FOXO insulin-like signalling pathway, supporting some of the health claims put forward for rooibos tea.

PMID: 23218401

DOI: 10.1016/j.phymed.2012.10.006