Sage and bitter apple: plant extracts as active agents for the treatment of chronic inflammatory bowel diseases

Researchers at Fraunhofer IZI demonstrate that plant extracts taken from sage and bitter apple have the potential to be used as active agents against chronic inflammatory bowel diseases.

In traditional medicine, sage and bitter apple have long been known as remedies for diarrhea as well as for their anti-inflammatory effect. To date, these medicinal plants have, however, played an extremely minor role in treating chronic inflammatory bowel diseases such as Crohn’s disease and ulcerative colitis despite there being an urgent need for the development of effective therapeutic agents that demonstrate minimal adverse effects, as opposed to some of the preparations used at present, which are associated with significant adverse effects.

Scientists at Fraunhofer IZI (Department of Therapy Validation) have been investigating the mode of action of a plant extract based on sage flowers and bitter apple fruit in the case of chronic inflammatory bowel diseases. In doing this, they used a specifically developed model, which depicts the chronic progression of bowel inflammation much better than previous models.

In evaluating their findings, the researchers determined that the plant extracts significantly reduced clinical symptoms and thus aided regeneration of the bowel tissue. It was able to be shown that pro-inflammatory immune cells (e.g. neutrophilic granulocytes) and chemical messengers (e.g. CXCL1/KC) are down-regulated in the affected tissue. Anti-inflammatory components of the immune system (e.g. interleukin 10), on the other hand, were strengthened after being treated with the plant extract. But these are just the first steps on the road to creating a new drug. The specific active agents held within the extracts now have to be identified and investigated further. The scientists published their findings in the journal Nature Scientific Reports.

Links to the original publications:

- [A refined and translationally relevant model of chronic DSS colitis in BALB/c mice.](#)
- [Therapeutic efficacy of a combined sage and bitter apple phytopharmaceutical in chronic DSS-induced colitis.](#)
The Fraunhofer Institute for Cell Therapy and Immunology IZI investigates and develops solutions to specific problems at the interfaces of medicine, life sciences and engineering. One of the institute's main tasks is to conduct contract research for companies, hospitals, diagnostic laboratories and research institutes operating in the field of biotechnology, pharmaceuticals and medical engineering. The Fraunhofer IZI develops, optimizes and validates methods, materials and products for the business units Cell and Gene Therapy, Drugs, Diagnostics and Biosystems Technology. Its areas of competence lie in cell biology, immunology, drug biochemistry, biomarker, bioanalytics and bioproduction as well as process development and automation. In these areas, research specifically focuses on the indications oncology, neuropathology, autoimmune and inflammatory diseases as well as infectious diseases and regenerative medicine.

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