



In vitro Plant-tech

New Powerful Actives from Medicinal Plants

- Discovery and Production of Novel Actives without Depleting the Natural Resources

Medicinal plants for the discovery of novel actives

Plants are complex organisms with an impressive ability to produce a wide range of active substances. Some of these have skin beneficial, rejuvenating and wound healing properties, whereas others prevent growth of microorganisms. There is a large potential in the discovery of novel active substances from medicinal plants for the cosmetic, pharmaceutical and food industries. However, many medicinal plants are produced by destructive harvesting resulting in endangerment and depletion of natural populations. *In vitro* Plant-tech provides an alternative by producing pure plant raw material of high quality and with full traceability in a sustainable way.

Plants as producers of active substances

The origin and evolution of land plants started about 480 million years ago. Land plants evolved from a simple plant body consisting of only a few cells to complex organisms with developed organs and tissue systems. These have the ability to produce a wide range of complex chemical substances, for example to protect against UV-radiation, to attract pollinators or to repel predators. Some of these substances have interesting biological activities that can be used to develop future generations of cosmetic, skin and hair care products.

Active substances can be produced in various plant organs, such as flowers, leaves and roots. A large portion of plant raw material is still collected from wild populations. At present about 800 plant species are used in the industry. Of these very few are under commercial cultivation. It is estimated that about 70% of plant collections are performed by destructive harvesting¹. This has led to endangerment and depletion of some plant species.

In vitro based production of plant raw material

Alternative cultivation methods, such as *in vitro* based methods, can be used to promote sustainable produced plant raw material. *In vitro* culture, also called micropropagation, is a way to mass propagate genetically identical plants. The technique is based on the fact that every part of a plant has all the genetic information to form a new plant if the appropriate conditions are met. Micropropagation of plants is based on cultivation of plants on nutrient medium under sterile conditions. Their growth can be controlled by altering components in the nutrient medium and the plant cells can be directed to form shoots, roots or undifferentiated cells (plant stem cells, callus).

In vitro Plant-tech has developed a bioreactor based cultivation platform for large scale production of plant cell cultures and active substances. Since the production takes place under sterile conditions with disease free plant material, no pesticides are needed. The plants are grown in a controlled, clean environment and are not exposed to pollution. Clean and high quality plant raw material can thereby be produced. Our production is GMO free and takes place continuously, with full traceability. Through cultivation in bioreactors cell cultures are often produced much faster than traditional cultivation in field. Moreover, modification of the culture conditions can increase levels of active substances and thereby yield the highest quality of plant raw material.

In vitro Plant-tech provides *in vitro* produced botanical extracts and offers contract assignments for client exclusive extracts.

¹ Report of the Task Force on Conservation & Sustainable use of Medicinal Plants, Government of India, Planning Commission, 2000

For more information on how *In vitro* Plant-tech can help you:

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