

Doctrine of Signatures – Mystic Heritage or Outdated Relict from Middle-Aged Phytotherapy?

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Editorial

In times of evidence-based medicine, where a drug is only estimated as being active, if the molecular mechanism has been unraveled and the efficacy has been proven in double-blind, placebo-controlled, and randomized studies, traditional ways of healing are getting more and more forgotten. One such example is the doctrine of signatures, which traces back to antiquity. Most, if not all, traditional medicines are rooted in experience-based healing practices, which also contain non-rational and mystical elements. This is also true for European phytotherapy, which developed the doctrine of signatures. Although outdated from a scientifically oriented point of view of medicine, the doctrine of signatures still attracts scholars and the general public alike until to date [1-9].

Definition

The doctrine of signatures dates back to the ancient physicians Dioscurides and Galen and states that herbs with similarity in shape or color to various parts of the body can be used to treat ailments of these parts of the body. The basic principle of the doctrine of signatures is that all creatures are correlated to each other. Based on these associations, they form inner systems of relationships independent of biological taxa. Analogies between creatures in nature and human beings exist in form, color, smell, but also in humoral, pathological and astrological aspects. They are allocated to categories such as *elements*, *planets* or *features*. Plants and animals or parts of them belonging to the same category as a disease can be used to treat it, e.g., beans are beneficial for kidney ailments because of the similar shape of beans and kidneys. The doctrine of signatures is clearly a pre-modern, non-scientific explanatory model of the world.

To give some illustrative examples of the potential medical value of the doctrine of signatures, the walnut may be mentioned. According to the doctrine of signatures, the walnut (*Juglans regia* L., Juglandaceae) has been recommended to treat brain diseases because of its similarity to the human brain, and indeed it contains a lot of fatty acids, which are valuable for the brain. Another example is the Autumn Crocus (*Colchicum autumnale* L., Colchicaceae). The bulb of this plant looks like gouty toe and was therefore used as a remedy against gout. Indeed, the active ingredient colchicin is an inhibitor of tubulin in the mitotic spindle and suppresses monocyte proliferation and migration. Monoctes are a main reason for the development of inflammation and pain in gout. Even nowadays, the proponents take examples such as these as evidence for the validity of the doctrine of signatures. Further examples of plants used according to the doctrine of signatures which are still used as medicinal plants today and with scientific evidence for their pharmacological activity are:

- Common Figwort (*Scrophularia nodosa* L., Scrophulariaceae) reveals node-like thickenings of the roots. The plant is still in use to act in a beneficial manner on the lymph node system.
- Eyebright or Euphrasia (*Euphrasia rostkoviana* Hayne, Orobanchaceae) has eye-like blossoms. The plant is active against conjunctivitis and blepharitis.

- The yellow-colored latex of the Greater Celandine or Swallowwort (*Chelidonium majus* L., Papaveraceae) inspired its use against bilious complaints. It is still used today, but the usage is critically discussed because of the plant's hepatotoxicity.
- Mistletoe (*Viscum album* L., Santalaceae) is a parasite detracting host plants water and nutritional salts. It is frequently used today in cancer therapy under the assumption that mistletoe preparations also detract tumors the nutritional basis to grow.

Of course there are also negative examples, where the signature disproves the therapeutic value. Common Lady's Mantle (*Alchemilla vulgaris* L., Rosaceae) has no activity against gynecological ailments (strong menses, menopause ailments). Also, the Common Lungwort (*Pulmonaria officinalis* L., Boraginaceae), which has been used against lung diseases because of its spotted leaves, is inactive against pulmonary diseases. Opponents of the doctrine of signatures argue that valid signatures do not exist and that is a matter of chance, whether or not a signature coincides with a pharmacological activity. Further plants belonging to the doctrine of signatures but without scientific evidence for pharmacological activity represent:

- Viper's Bugloss (*Echium vulgare* L., Boraginaceae). The blossom reminds to a head of a viper and the split styli to the tongue of a viper. The plant was believed to cure snake bites.
- Liverwort (*Hepatica nobilis* (L.) Schreb., Ranunculaceae). The liver-like shape of the leaves was reason to use is against liver ailments.
- Great Burnet (*Sanguisorba officinalis* L., Rosaceae). Because of the blood-red blossom heads, the plant was recommended for hemostasis.
- Common Tormentill (*Potentilla erecta* (L.) Raeusch., Rosaceae). The cutting site of the root rapidly turns from white to red. Therefore, it was also used for hemostasis.
- Lesser Celandine (*Ranunculus ficaria* Huds., Ranunculaceae). The axillae of the caulis leaves contain breeding nodules. Therefore, it was used against warts and hemorrhoids.
- Bladder Senna (*Colutea arborescens* L., Fabaceae). The bladder-

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like shape was the reason to use this plant against bladder ailments.

- Meadow Bistort (*Polygonum bistorta* Delarbre, Polygonaceae). This plant was used against snake bites, because of its snake-like roots.
- Quaking Grass (*Briza media* L., Poales) was used against tachycardia, because of the plant's heart-shaped spicae fluttering in the wind.
- Maidenhair Spleenwort (*Asplenium trichomanes* L., Polypodiales). After the drop down of leaves, the frond shafts look like a hair bunch. This is why the plant has been used against hair loss.

Valid or not valid, plant interpretation according to the doctrine of signatures attracted people of all countries and through all ages, as can be seen by the example of orchids. The name orchid was coined by Theophrastus (~372-288 BC). The tubera of the orchids have the shape of two testicles, which was the reason to name the entire plant family orchids (The Greek word for testicle is orchis). In accordance with the doctrine of signatures, Theophrastus mentioned the medicinal use of orchids as aphrodisiac and promoter of virility and this advice was in practical use for several hundred years, as documented by Paracelsus (1493-1551) and Linnaeus (1707-1778) [9]. Nowadays, orchids play an important role with tremendous economic impact as ornamental plants, especially the orchid genera *Phalaenopsis*, *Cattleya*, *Dendrobium*, *Paphiopedilum* and *Cymbidium*. Orchids for ornamental purposes are also subject of genetic research to improve breeding and cultivation conditions. Some orchids also play a role as agricultural plants, e.g., the vanilla orchid (*Vanilla planifolia* Jacks. Ex Andrews, Orchideaceae).

Doctrine of Signatures in Medieval Europe

The doctrine of signatures has been applied since antiquity and was widely distributed in the medieval world. The written description traces back to Paracelsus (Theophrastus Bombastus von Hohenheim, 1493-1541) and Giambattista della Porta (1538-1615), a physician and alchemist from Naples, Italy. Paracelsus developed the concept in *Nature marks each growth*. Della Porta explained the contextual system between plants, animals and the universe in his book *Phytognomonica* [10]. Andreas Libavius and Heinrich Khunrath graduated at the Basle Medical Academy in 1588. Libavius supported the Galenic allopathy, while Khunrath favored the signature-related medical ideas of Paracelsus [11]. Jakob Böhme (1575-1624) believed that God gave specific objects a signature. Plants, animals, or other natural objects reminding to parts of the human body bear specific meanings for these human organs. The term "doctrine of signatures" traces back to the title of Boehme's book from 1621 *The Signature of All Things* [10]. The medieval world was dominated by religious concepts covering almost all areas of daily life and science. It was a wide-spread belief that God made herbs for the use by man. Therefore, he gave them specific signatures so that man can recognize the right usages. As the world was created by God with the peak of creation believed to be the human being, so-to say as theological end point of creation, the task of man is to recognize God's signs and to correctly use them. The "Doctrine of signatures" played an important role in botany and medicine since the 16th century [12]. This point of view was written down by the botanist William Coles (1626-1662) in his book *The Art of Simpling and Adam in Eden*. The graphical and scriptural treatment of signatures by Oswald Crollius (~1560-1609), Giovanni Battista Della Porta (1534-1615) and Wolfgang Ambrosius Fabricius (1653) interpreted the signatures by

graphics and scripts, which facilitated the practical and systematic use based on the correspondences between plants and organs [13].

Doctrine of Signatures Worldwide

Mystic believes in the relevance of signatures of plants and animals are not only documented for medieval Europe, but also for other parts of the world. Traditional Chinese medicine (TCM) and Indian Ayurveda have elaborated systems of assignment according to signatures. In TCM, taste, smell, color, day time, seasons, elements, sensory organs and other parts of the human body are unified to a comprehensive diagnostic concept. This allows the facilitated choice of suitable remedies for specific diseases, which are also compiled in a complex system of assignments [7,8].

The Emperor Shen-Nung (3500-2600 BC) is widely considered as the father of TCM, and his treatise 'Shen Nung Benchau Jing' reached popularity until today. Shen Nung recognized a sexually pleasurable feeling after chewing ginseng and advocated this root to treat erectile dysfunction and as sexual stimulant. The use of ginseng as aphrodisiac is related to the doctrine of signatures due to the phallic shape of the root [14].

The doctrine of signatures was brought by medieval and Ottoman physicians from Europe to the Levant, where it was practiced. As reported by Lev [15,16], historical sources mention 23 substances with medicinal uses based on this doctrine, i.e., Common Agrimony, Common Balm, Common Snapdragon, Coral Peony, Corn Gromwell, Lebanon Barberry, Mullein, Orchid, Panther Strangler, Red Horned Poppy, Rhubarb, Rose of Jericho, Southern Maidenhair Fern, Spiny Broom, Sumach, Walnut, Wild Dog Rose. Animals used were Firefly, Red Coral, White Cuttle Fish and finally the minerals used were Red Chalk (Haematite), Sea Urchin, White Clay. They correlated these substances to human organs based on their similarity in shape and color (in case of plant substances) or behavior (in the case of animal substances). The similarities between the substance and the disease symptoms of the patients may cause symptoms of a particular disease in healthy subjects, but curing effects in patients suffering from the same symptoms. This appears to be a clear similarity to the principles of homeopathy nowadays.

Symbolism has a century-long tradition in Africa. The majority of the population in developing countries depends on herbal medicine as primary health care and still nowadays people in Africa consult traditional healers. In a recent survey, Williams and Whiting [17] interviewed 20 traders from South Africa's largest traditional medicine market, the Faraday Street market in Johannesburg. Animals were mostly used for 'strength' (physical or overcoming fear), but also warding off bad luck or bad spirits or improving one's luck. Only around one third of his usages were related to medicinal purposes, e.g., headaches, skin problems, swollen feet, etc. Although there is apparently no direct historical relationship to the European doctrine of signatures, the relevance of symbolism for medicinal purpose can also be recognized.

Evaluation Today: From Mysticism to Rational Phytotherapy

The medieval phytotherapy has been increasingly replaced in Europe along with the emerging modern chemistry, pharmacology, and medicine. Thereby, the doctrine of signatures disappeared from the official curriculum of academic medicine. It is living on, however, in extra-academic herbalism and alternative medicine and is a basic

principle of Samuel Hahnemann's (1755-1843) modern homeopathy (*similia similibus curentur*).

Rational phytotherapy as scientific discipline of modern pharmacy went a different way comparable to academic medicine. One may say that scientifically driven, modern phytotherapy has been secularized and liberated from mystic and superstitious elements. The quest for signatures as curative principle is outside the ordinary principles of scientific research and treatment. The traditional pillars of ethnobotanical field studies, i.e., input to drug discovery and conservation of cultural heritage are also incompatible with this process [18].

The signatures are valuable from a historical perspective to describe and understand medieval medicine in Europe and elsewhere. There is considerable scientific scepticism that plant shapes and colors help in the discovery of medical uses of plants. However, once a medicinal use with curative effectiveness for a particular plant coincides with its shape or color, selective perception may promote the living-on of the doctrine of signatures. As Bradley C. Bennett put it: "In this way, it could be argued that such superstition is practically self-fulfilling, and that the observed similarities are indeed "signatures" not of the plant's creator, but of its caretakers" [19].

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