

Herbal active substances in space and time

(Herbal mother tinctures providing optimum efficacy thanks to careful production methods)

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More and more frequently, medical-scientific papers and lectures present herbal preparations as medicinal products that are effective in the treatment of mild to moderate diseases and malfunctions and that provide the additional benefits of greater degrees of safety and compliance compared to conventional medical preparations. They often refer to the fact that currently many medicinal plants have already undergone clinical trials using the most recent Good Clinical Practice (GCP) standards and been shown to be effective. Often, these papers qualify this by stating that successful treatment requires a sufficiently high dose of such preparations, in other words, a specific amount of the extract or active substance per individual dose, an amount which is often much greater than is contained in traditional preparations such as a tincture prepared from the same plant. Such medicinal products are called high-dose preparations.

Normally, the content of the major/active substance of the source plant is subject to large variations; therefore, these preparations are standardized. Thus, high-dose standardized phytopharmaceuticals represent the tools of the trade of rational, in other words, scientific phytotherapy.

Criteria of rational phytotherapy

Rational phytopharmaceuticals contain dry extracts

The high dosage provided by rational phytopharmaceuticals is achieved primarily by using dry extracts, because they are the only source containing high concentrations of these herbal active substances. Dry extracts are prepared by processes involving two or more steps. First, a liquid extract is prepared from the plant using a suitable extraction agent (normally ethanol/water, methanol or acetone). Then, most of the extraction agent is removed by evaporation and the extracted plant substances are dried. This process results in powdered substances. Then, the dry extract is processed to achieve a suitable pharmaceutical form (most common are dragées or capsules).

Dry extracts constitute the highest possible concentration of herbal active substances unless special concentration or isolation methods are used to obtain even higher concentrations. Such processes remove other constituents, i.e. substances without pharmacological action, to a varying, but generally great extent. However, the development of preparations enriched with active substances has become increasingly uncommon, because scientific phytopharmacologists have come to understand that secondary active substances – i.e. substances not active in the major efficacy spectrum of the plant – as well as accompanying substances, are also important for the modulation of action and resorption. Therefore, the native, non-enriched extract is considered the optimum principle of action of most plants.

Determination of the effective dose

Dose-response studies – normally performed with preparations from dry extracts – allow the determination of the optimum dose and are therefore a keystone in the development and production of rational phytopharmaceuticals. They also allow the determination of the threshold dose, i.e. the minimum amount of active substance needed to achieve a therapeutic effect in humans. Below their plant-specific threshold doses, active substances have no detectable efficacy.

Underdosed preparations?

When herbal preparations that are not prepared from dry extracts are administered, such as tinctures or mother tinctures, the amounts of active substances involved are far smaller than is the case with rational phytopharmaceuticals; thus the threshold dose is not reached. On average, a normal single dose of 20–30 drops of a phytotherapeutic tincture (prepared from dried plants in a plant:extract ratio of 1:5) contains 10 times less active substance than a single dose of a rational preparation. The difference is even greater in the case of a homeopathic mother tincture prepared from fresh plants (in which the ratio of drug, converted into dry matter equivalent, to extract is around 1:10): they contain on average 20 times less active substance. Of course, such doses fall far short of the threshold doses established with dry extract preparations. If dry extract preparations were to contain such low doses, or to put it another way, if only one tenth or one twentieth of a dragée were to be administered, no efficacy could be established. For this reason, some phytopharmacologists and phytotherapists claim – contrary to all therapeutic experience – that what they call “underdosed preparations” of this kind (tinctures and mother tinctures) could not be effective.

Should we ignore the therapeutic experience of centuries?

Papers referring to rational phytotherapy often emphasize that it has only become possible to use herbal drugs reliably in the last decades, asserting that this is due, firstly, to the availability of high-dose preparations and, secondly, to the efficacy demonstrated by clinical studies. However, a closer look into the question of the extent to which modern research has provided new knowledge of relevance for therapeutic treatments, leads to disillusionment. Undoubtedly, a great deal of information regarding the structure of herbal active substances and their molecular mechanisms of action has been gathered recently. With respect to their practical use, though, modern research has essentially done no more than confirm already well-established facts.

The author is not aware of a single plant for which the previously known indications have been either contradicted or extended by a clinical study using rational phytopharmaceuticals. Clinical studies only confirm well-known indications: they never detect new indications. This shows that it is not double-blind studies, but experience and observation that uncover and render useful the efficacy of medicinal plants. Experienced physicians and therapists with trained observation skills were in the past and continue today to be reliably capable of determining the efficacy of a preparation administered to patients or in by experimenting on themselves. Let us consider what type of preparations would have been used to acquire traditional knowledge of this kind about the effects of plants. Obviously, it could not have been high-dose preparations. What else, if not traditional preparations, such as medicinal teas and tinctures? Now if we ask ourselves how the effects could have been detected with preparations that, according to today’s wisdom, are “underdosed” and thus ineffective? This is an obvious contradiction that needs no extended discussion.

Rational phytotherapy and the basic principles of natural science

As strange as the allegation of inefficacy of underdosed traditional preparations may be, it is actually based on scientific studies, the dose-response studies involving dry extracts mentioned above. Are the results of these studies incorrect? No, but it is wrong to extrapolate their results to other systems, and it entails a lack of precision in the application of the scientific method.

Natural science is based on well-defined basic methodological principles. René Descartes (1596–1650) is considered one of the principal founders of the scientific method, which remains valid without changes to this day. He recognized that in order to evaluate the influence of a specific parameter acting on a system, all other parameters needed to be kept constant.

The assertion that tinctures or other traditional phytotherapeutics are ineffective due to their relatively low dosage violates this basic scientific principle. When dose-response relationships that are valid for dry extracts are applied to other preparations, such as tinctures, two parameters are changed, which is impermissible: both the active substance content and the concentration of the active substances, i.e. their density. As long as we consider only dry extracts, only one parameter is changed, i.e. the dose of active substance, and we are measuring its impact on efficacy. However, if we consider a specific amount of active substance in dry extracts vs. tinctures, we changed the volume of the space containing the active substances, i.e. a second parameter. Thus all previously established data become invalid.

The space – or the volume – occupied by a mass, i.e. a specific amount of substance, determines its concentration or density, respectively.

Together with mass and time, space represents one of the three basic principles of the universe. Thus, the amount of space occupied by a specific amount of X active substance molecules cannot be neglected. While the space occupied by amount X is small in a dry extract, the occupied space is around 25 times larger in a tincture. (Explanation: the extraction agent – and in the case of mother tinctures also the water originally contained in the plants – is present and therefore the molecules are so-to-speak spread out within the space. The molecules occupy a specific space, a volume. On the other hand, the molecules in the dry extract occupy only a small space and are compressed, compact, concentrated and dense.)

The fundamental importance of space suggests that such a difference will have a major impact on efficacy. The following study provides evidence validating this assumption.

Space as a principle of action

A study investigating preparations of various densities

As already discussed above, one cannot simply take the dose of an active substance that has been identified as the optimal dose regarding an extract and apply it to other preparations, such as tinctures, because this involves the change of one parameter too many – the density of the active substances, or the space occupied by the substances. To assess the impact of this parameter on efficacy, a clinical-pharmacological study was performed involving two preparations differing with respect to the space occupied by the substances, or their density [Kalbermatten 1990].

The diuretic effect of two different *Solidago* preparations and a placebo was examined in 3x22 healthy volunteers. One *Solidago* preparation was a mother tincture, the other a fluid extract prepared by raising the concentration of the mother tincture ten-fold. The space was, thus, compressed. A fluid extract is a somewhat less concentrated preparation than the already mentioned dry extract because some extraction fluid is still present so that the fluid extract is still liquid in order that the preparation remains fluid and capable of forming drops. The two preparations were chemically analyzed, and – as expected – the spectrums of the substances proved to be identical within the limits of analytical detectability. Thus, only the concentrations of substances were different in the two preparations, specifically, by the factor 10. In other words: A specific amount of X of *Solidago* active substances in the mother tincture occupied a space ten times as large as that occupied by the same amount in the fluid extract.

A group of 22 healthy volunteers arranged to spend three sets of two successive days as similarly as possible, above all with respect to volume and timing of fluid intake. The volunteers agreed to refrain from the consumption of alcohol, sausage products or cured meat, not to drink coffee after 6 p.m., and to refrain from intensive physical exercise and sauna use. They also agreed to eat dinner at the same time on both days. The volunteers all drank 30 ml of boiled lime blossom tea at 8 p.m. This was the last fluid consumed until the next morning, with the exception of the quantity of water specified for taking the drug. They emptied their bladders at 10 p.m. and immediately afterwards drank 10 ml water. On the first evening, the water contained neither one of the drugs nor of a placebo, on the second evening either 3 ml of one of the two drugs or of a placebo. The total volume of urine passed between the time of taking the drug (or water alone) and 7 a.m. the next morning was measured. The volume passed during the night of the first day was the baseline, and the increase in diuresis was measured in the night of the second day.

The results were as follows: the mother tincture increased diuresis by 38.3%, the fluid extract by 17.8% and the placebo by 2.9%. The study was performed in a double-blind approach and the results were analyzed according well-accepted statistical criteria. The increase in diuresis caused by the mother tincture relative to the placebo was highly significant statistically but that of the fluid extracts relative to the placebo was not significant.

The results therefore were paradoxical: The effect of the mother tincture was twice as high as that of the 10-fold concentrated fluid extract. Therefore, the efficiency of the mother tincture was about 20 times as high as that of the extract. This study was repeated with a smaller group of subjects using 2 other doses (double dose and half dose) of the preparations specified above and additionally with a dry extract

(processed into tablets) without statistical analysis. A clear dose-response relationship for each individual preparation was demonstrated. The effect was increased by about 40% both for tincture and fluid extract when the dose was doubled, while the half dose of both preparations achieved no detectable effect under these experimental conditions.

Considerations regarding space as a principle of action

The results of the studies demonstrate that – as expected – a relationship exists between the dose of the active substance of an individual preparation and its effect: the higher the dose, the greater the effect. However, a comparison of dose and effect across preparations with different concentrations results in inverse results. The smaller amount of active substance contained in the less concentrated preparation, has a greater effect than the larger amount contained in the concentrated preparation. The amount of active substance needed to achieve an effect with a tincture is 1 to 20 times smaller than that needed to achieve a comparable effect using a fluid extract. Thus, fluid extracts are identified as inefficient preparations. Although fluid extracts permit the administration of significantly higher amounts of active substances than do tinctures, the resulting effect is not better, because the concentration of active substances leads to a major reduction in their efficiency/effectiveness. These findings obtained with fluid extracts apply to an even greater degree to dry extracts, which have been subjected to even greater compression, while, on the other hand, tinctures can be considered efficient preparations, because with them a smaller number of active substance molecules suffice to achieve a strong effect.

The results strongly suggest that the space between the active substance molecules filled and structured by aqueous alcohol has the function of a principle of action.

It is well known that aqueous liquids, including water/alcohol mixtures, are structured by hydrogen bonds. Multiple water molecules come together in assemblies called clusters and form liquid-crystalline phases in the water. Water structures of this kind are influenced by various factors, including dissolved molecules. Findings in the field of coordination chemistry indicate that substances dissolved in water surround themselves by a coating consisting of specifically arranged H₂O molecules (hydration shell) which in turn affect the arrangement of more distant molecules. Thus, it is possible to envisage that the structured liquid-filled space between the active substance molecules in biological organisms may elicit a response similar to that triggered by the active substance itself.

It has long been well-known in homeopathy that structured interspace has the function of a principle of action, and this knowledge is systematically applied in the production of homeopathic medicinal products.

Time as a principle of action

So far, we have established that two of the three basic principles of the universe represent the basis of a principle of action of herbal remedies: Mass or matter is the substrate of the chemically active substances of the plant and structured space the prerequisite for information. Information is known as the homeopathic principle of action. As we saw above, this principle of action is also vitally important when it comes to undiluted, not potentized herbal medicinal products and must not be ignored.

There is still the third fundamental principle of the universe to be discussed, i.e. time, and it seems only natural to ask whether time also represents a non-obvious principle of action.

Let us cast our gaze back to the past and note the following experience.

Industrial manufacturing technology leads to reduced efficacy

As discussed above, the efficacy of tinctures in itself is a fact. On the other hand, there have been indications in the past of a decrease in the efficacy of traditional preparations. This started a discussion about the correct dosage of phytotherapeutics in the seventies of the last century that still continues today. I personally witnessed the emerging discussion regarding dosage and efficacy almost from its beginning. For example, the well-known Swiss naturopath Dr.h.c. Alfred Vogel told me about his experiences with dosage and effect of fresh herbal tinctures (mother tinctures). When he started to treat patients with his own preparations in the thirties, he achieved optimum therapeutic outcomes with a dosage of 5 drops 2–3 times a day. The increasing demand for his mother tinctures forced him to increase production capacity, which he did by switching to a more efficient machine to chop the fresh medicinal plants (chopping the plants was and remains the most time-consuming process involved in the preparation.). When using the mother tinctures produced with the larger-scale machines, Vogel discovered that the previous dosages were no longer sufficient. Therefore, dosages needed to be increased to 10 drops 3 times a day. In the course of time, the production capacity was increased again twice – by switching to even larger machines – and each time, it was necessary to increase dosages in order to achieve the original efficacy. Finally, in the eighties, a dose of 20 drops 3 times a day was necessary. Other physicians and therapists also reported similar findings. They observed decreasing efficacy rates in phytotherapeutic treatments, making correspondingly higher doses necessary for a successful outcome. At that time, it appeared likely that the decrease in efficacy was due to a decrease in the concentration of active substance(s). In the end, this assumption led to the development of high-dose preparations in rational phytotherapy.

However, my own analyses of the depletion of active substances resulting from more intensive machine chopping demonstrated that the extent of depletion was not large enough to explain the necessity of a fourfold dose increase within 5 decades. Thus the decrease in efficacy cannot be explained by a reduction in active substance alone.

Increase in frequency of chopping is the cause of the efficacy reduction

The above example clearly demonstrates that the use of larger production machines leads to a decrease in efficacy that cannot be explained by a reduction in active substance. It should be noted that the underlying manufacturing technique has not changed: the fresh plants are chopped, alcohol is added, and the plants are allowed to macerate for 10-20 days, during which they are stirred daily. Finally, the material is pressed. But what is the change introduced by the larger chopping machines? The frequency of processing has been increased; therefore, the factor of time has been changed. Rhythm, or rather frequency has a purely temporal dimension. It is defined by the number of movements or periods per time unit.

A chopping machine acts on the plants with a specific frequency determined by the rotational speed of the blades, but also by their number and their length. Larger chopping machines are used in order to increase the plant throughput rate. The aim is to speed up production. This is accomplished by cutting plants in larger machines with higher cutting frequencies. It appears that the higher frequency is the cause of the reduction in efficacy.

The increase in frequency causes a decrease in order

Proceeding on the suspicion that such a correlation existed, my team and I performed studies in the late eighties with a variety of mechanical procedures involved in the processing of fresh medicinal plants. First, the plants were cut with chopping machines with various frequencies. The resulting tinctures were then chemically analyzed and – most importantly – analyzed with Kirlian high-frequency photography. Under specific conditions, this method can generate an image that allows conclusions on the structure of a liquid. We were able to show that the increase in cutting frequency results in a decrease in the order of the liquid structure. Thus, we established a correlation between the decrease in efficacy discussed above and the decrease in the order of the liquid structure by showing that the latter is associated with the increase of the frequency of the chopping process.

Stabilization of the order by processing with an adequate frequency

When the cutting process is performed without a clear rhythm, i.e. without a specific frequency, by which I mean exclusively through manual processing, such as cutting herbs in the kitchen, the resulting tincture has a state of high order when fresh. But there is a serious limitation: this order is not stable. A great decrease in the order is seen as soon as such tinctures are exposed to stress factors such as heat, ultrasound, and strong EM fields or even just prolonged storage periods.

Therefore, our research team conducted a broad series of investigations to search for a process based on mechanical processing of the fresh plants in appropriate rhythms (or frequencies, respectively) that would result in the stabilization of the structure. Plants were pounded, crushed and ground by hand, using a wide range of equipment, some commercially available but primarily equipment of our own invention, and by hand. The analyses of the resulting products with Kirlian photography demonstrated that pounding, crushing or mortar grinding in suitable rhythms leads to a sustainable stabilization of the order. We considered rhythms corresponding to calm but straightforward manual work to be appropriate.

Considerations on time as a principle of action

One cannot address the factor of time in the same way that one does mass and space. The latter can be established in the finished product by the determining the amount of the active substances and the space they occupy, whereas time cannot be determined on the basis of the product alone but is a parameter of its production process. How much time is needed for production; does production involve fast machines or slow manual processing? Thus, time is reflected in the creation of the products.

Analogous thinking allows one to sense the dimension of this new principle of action, which is determined by the factor time in production.

The status of a purely physical body is influenced by neither the route nor the time taken to transport it from A to B. Likewise, it makes no difference for the energy content of a chemical substance what synthetic route has been taken and how much time passed (Hess's law).

In biological organisms, however, how a status change occurs and how much time it involves are of major importance.

The season and the amount of time in which a specific food plant grows to maturity impact its biological quality. Is growth speeded up through the provision of artificial nutrients in a greenhouse or does the plant grow more slowly but under natural growth conditions? Do we consume a meal standing up, while under stress, without chewing properly or do we sit down at a neatly set table and take enough time? The invested time will be amply rewarded by considerably improved wholesomeness of the food and higher energetic quality.

The time a person takes to travel across a given territory influences his or her emotional and mental energy upon arrival. Did the person travel by plane, by train or on foot? This will certainly affect how a person processes the space and the landscape internally. Slower movement will result in an experience of superior quality: the way is no longer an impediment to be overcome as fast as possible but instead a source of internal experience and energy, provided that the traveler invests sufficient time.

Could it be that the spiritual-energetic quality of medicinal plants, i.e. their essence, also be preserved through processing with appropriate rhythms? The outcomes of more than 25 years of therapeutic work with mother tinctures prepared according to the CERES process described below suggest that this conjecture is true.

A new approach in phytotherapy by the inclusion of matter, space and time as principles of action

Summary of results

The considerations above allow three major insights.

1. Not high-dose preparations, but mother tinctures prepared from fresh plants are the most efficient phytotherapeutics.
2. High-frequency chopping of plants reduces efficacy.
3. Pounding and rubbing the plants in appropriate rhythms preserves the dimension of the plants' effects on the psyche and thus leads to increased efficacy.

Careful production methods at CERES

These insights are cornerstones of the careful production methods used by CERES, methods which have formed the foundation for highly efficient mother tinctures since 1992. The preparations are produced in Kesswil by Lake Constance, Switzerland, in the production laboratory of the author. In detail, the production process involves the following steps:

1. Only organically grown fresh plants or fresh plants harvested from carefully selected wild habitats are used. The plants are manually harvested at the most opportune time.
2. After harvesting, the plants are thoroughly cleaned.
3. The plants are cut by hand.
4. Together with added organic alcohol, the hand-cut plants are rhythmically processed in the CERES mortar grinder in the absence of air. The CERES mortar grinder is a grinding device specially designed by my research team to allow optimum processing of plants and parts thereof (European Patent No. 0672449). The mortar grinder processes the plant material in a special gentle and rhythmic manner. The CERES mortar grinder consists of a hermetically sealable glass container for extraction medium and plants. The grinding mechanism is inside the glass body and comprises two counter-rotating spirals. Each of the interlocking spirals is made up of seven granite blocks.

The rotation of the spirals creates grinding chambers. The specific shape of the stones makes alternately one stone a mortar and the opposing stone a pestle. The grinding chambers open and close rhythmically and crush and grind the plants gently and slowly, like in a mortar. The counter-rotation of the two spirals brings the content (plants and alcohol) into a rhythmically pulsating lemniscate movement.

5. The preparation is left in stoneware vessels for 10-20 days and stirred by hand every day.
6. Then the preparation is pressed and filtered.
7. After pressing, the mother tinctures are allowed to mature for 2-3 years at a constant temperature. The maturing process allows the tinctures to develop their full therapeutic potency.

Properties of CERES mother tinctures

- Active substances, the material principle of action
- Information, the spatial principle of action
- Life energy, the temporal principle of action

Due to this combination, the preparations develop a high therapeutic potency and require very low dosages: The average dosage is 3 drops 2-3 x times a day. This is not the principal characteristic of these preparations however.

The major aspect determining the therapeutic outcome is the dimension of the effect associated with the psyche, with mental, spiritual and emotional energy. CERES preparations act on patients on all three levels: The active substances act on the biochemical level, information acts on the regulation level and life energy on the level of the psyche. It is recommended for optimum work with these preparations to become familiar with the essence of these medicinal plants.

Plant essences are described in the books “Wesen and Signatur der Heilpflanzen” and “Herbal mother tinctures – Essence and use” by the author.

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