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The significance of pharmaceutical methods illustrated in the case of silicea

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English

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English by A. R. Meuss, FCIL, MTA. Potencies are given in the English notation, e.g. 6 x where the German notation would be D6.

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■ Abstract

With the examples of Quartz and Equisetum it is shown how many manufacturing methods are available for the production of anthroposophical medicines. The differences in efficacy are not due to differences in the composition of the products. In many cases they can only be explained as resulting from the different manufacturing methods used. These examples stress that the physicians using anthroposophical medicines prescribe not merely a substance but also a manufacturing method.

■ Keywords

Silicea
Quartz
Equisetum arvense
Manufacturing methods
Anthroposophical medicines
Composition
Potentizing substances together
Binding agents

Introduction

Pain management takes its orientation in the different expectations of patients. These relate to the need to control symptoms, possibilities of treating pain “causally” and “transform” it, the psyche (connection between pain and suffering, depression) and its spiritual dimension. Integrative, multi-modal pain management therefore calls for comprehensive insight into the nature of pain. An anthroposophical and a homoeopathic medicine differs from a conventional medicine mainly in that the manufacturing method plays a major and even crucial role. Surprising at first sight, we can understand this if we consider higher potencies in homoeopathy. Without the method of potentization, Arnica 30x is nothing but solvent (water, alcohol) and hence of course not medicinally active.

In both schools, potentization is only one—important—method. In classic homoeopathy, only 4 methods were known for processing fresh plant material and 5 to 7 other methods, but today the *German Homoeopathic Pharmacopoeia* (1) (GHP) includes more than 200 different manufacturing methods (56 “main” ones, with sometimes more than 20 (Method 12) variations). Nine of these have been part of the *European Pharmacopoeia* from 2007.

No single substance is processed according to all the methods given in the *GHP*, but many provide a number of medicines produced by different methods. Let us consider one such substance, for this can provide the basic insights on which a physician may decide whether to prescribe a substance or rather a pharmaceutical process *and* a substance.

One special method of potentization to be mentioned here is combined potentization. Two or more lower potencies (e. g. 0.5 parts each of a 5 x and a 7 x) are combined, diluted with 9 parts of the medium and succussed (in this case to the 6 x/8 x). The method is given in the *GHP* (ref. 1, Method 40 a–c). In anthroposophical pharmacy the method is, however, often used in order to combine several (potentized) substances. The original potencies are often combined in different proportions (1 part each of original potency, medium to make 10 parts) than those given in the *GHP*, so that it is not possible to declare the potentization.

Tab. 1

Product	Raw material	Pharmaceutical process	Potentiation	Examples
Quartz	Quartz	Grind	+/-	Quartz - trituration from 4 x - dilution from 8 x - injection from 6 x
Opal	Opal	Grind	+	- injection from 8 x
Silicea	Quartz	Dissolve, precipitation	+	Silicea - trituration from 4 x
Ferrum Quartz (Biodoron, Kephaldoron)	Quartz	Roast, combine with iron sulphate using binding agent (composition)	+	Kephaldoron® 5 % - tablets Ferrum Quartz - capsules - trituration from 4 x
Solutio Siliceae comp.	Quartz	Dissolve (keep in solution, combining with other principles (composition))	+	Solutio Siliceae comp. - dilution from 3 x - injection from 6 x
Equisetum limosum Rubellite	1. Equisetum 2. gemstone silicate	Express Equisetum limosum, combine mother tincture with rubellite 6 x	+	Equisetum limosum Rubellite - dilution from 4 x
Cinis Equiseti arvensis	Equisetum	Ash	+	Cinis Equiseti arvensis = trituration from 3 x
Carbo Equiseti arvensis	Equisetum	Carbonize	+	Carbo Equiseti arvensis - trituration from 3 x - injection from 6 x
Equisetum cum Sulfure tostum	Equisetum	Roast, with sulphur	+	Equisetum c. Sulf. tost. - trituration from 1 x - dilution from 8 x - injection from 6 x
Equisetum arvense ex herba	Equisetum	WALA process	+	- injection from 6 x - coated pilules from 3 x
Equisetum arvense Silicea cultum	Equisetum/quartz	Pharmaceutical process Grow with SiO ₂ treatment, maceration of fresh plant	-	Equisetum arvense Silicea cultum - dilution from 2 x
Equisetum arvense Silicea cultum Rh	Equisetum/quartz	Grow with SiO ₂ treatment, Rh method	-	Equisetum arvense Silicea cultum Rh - Aqu. dilution 3 x - injection from 2 x
Equisetum arvense, ethanol. decoct.	Equisetum	Dry, ethanol <i>decoct.</i> of dried plant	+/-	Equisetum arvense, ethanol. decoct. - dilution from 1 x - 10 % tincture for ext. use
Equisetum arvense Rh	Equisetum	Rh method	+	Equisetum arvense Rh - aqu. dilution from 3 x - injection from 3 x
Equisetum arvense, glycerol extract	Equisetum	Extract dried plant with glycerol	-	Equisetum arvense - 10 % ointment
Equisetum arvense, oil extract	Equisetum	Dry, extract dried plant with oil	-	Equisetum arvense H - 10 % massage oil
Agate water	Agate geodes	Potentize	+	- injection from 6 x
Equisetum arvense dest.	Equisetum	Steam <i>destillation</i> of dried plant	-	Special preparation

It should be stressed that the manufacturing method plays an important role also for non-homoeopathic medicines in anthroposophical medicine. The methods used to produce herbal or traditional medicines may be largely the same (e.g. maceration or decoction) as in anthroposophical pharmacy. With some such preparations (Crataegus, Hypericum) it is true, therefore, that the differences lies not so much in the technology used but rather in the specific aim and the way the process is run. We can only speak of an “anthroposophical” medicine in the narrower sense when the pharmaceutical process was chosen with reference to the medicinal action to be achieved and in accord with anthroposophical insight into nature and the human being. A special posi-

tion is held by the “compositions”, which are peculiar to anthroposophical pharmacy and not identical with combinations or mixtures. A composition is made by subjecting a number of substances or semi-finished products to one or more pharmaceutical processes together (e.g. temperature changes, mixing processes), thus arriving at a new whole, the composition. Binding agents¹ play a particular role in producing compositions. These are substances or also processes the only purpose of which is to bind other constituents together.

The aim of this paper is to show the wide range of pharmaceutical processes and not to describe or explain them. They have been described in numerous publications (for selection, see References).

Note

1) Rudolf Steiner used the term “binding agent” at least five times in his lectures, e.g. in ref. 4.

Silica and Equisetum

If we consider that Rudolf Steiner spoke of silica² as the major constituent of horsetail (ref. 2, lecture of 21 Apr. 1924 (3, 4)), it is reasonable to take the two together. For the sake of completeness let us say that horsetail accumulates those large amounts of silica not in form of quartz but in an amorphous, aqueous form, which is opal. This is deposited in the outer epidermis in a wide variety of shapes, some of the species or plant-part specific, e.g. as granules or thorns. Horsetail also contains unusually high amounts of sulphur compounds. Meier gives a review of present knowledge on the silica and sulphur compounds in *Equisetum* (5). For the sake of completeness we might add that the aerial parts (herbage) of the “sterile” (as distinct from generative) shoot are generally used.

Table 1 lists the Weleda and WALA preparations of quartz and *Equisetum*. The order in which these are considered has been chosen to make the different groupings evident: 1) according to original substance (quartz or *Equisetum*) and 2) according to the pharmaceutical process used (exposure to different temperatures in the solid state, cultivation, media for extraction with and without connection with the silica principle).

Quartz

Quartz or rock crystal is the most insoluble form of silica and after the feldspars the most common mineral in the earth’s crust. Crystals may be up to 2.5 metres high (Switzerland). Chemically it is crystallized anhydrous silica. Quartz occurs as crystals which are colourless or transparent in many different colours. Pharmaceutical processing consists in grinding and then trituration (potentization) with lactose. In my opinion this step-by-step trituration is definitely necessary to open up a substance which has come to rest in an extreme form in quartz, and move it towards process quality, substance in a state of change. Dilutions, solutions for injection and eye drops can also be made from the triturations (from the 8x and 6x resp. onwards). Non-potentized preparations are made for external use (ointments, gel, oil), for here the aim is not for the active principle to be taken up into the organism but to act via the sense organs. As to the indication for quartz, see the relevant section in ref. 6, and the rationale for the use of natural substances in their final, stable state, see section 2.3 in ref. 7.

Opal

Opals are compact, generally nodular, milky, translucent stones with glassy or waxy lustre. They may be white or show different colours due to mineral additions. Chemically opal is amorphous silica with a water content of normally 4–9 %, which places it between the quartz mineral and plants with opal deposits (see *Equisetum*). This water-insoluble substance can be processed like quartz. WALA offer solutions for injection (from the 8x onwards).

Silicea (precipitata)

Silicea is precipitated, amorphous, hydrous silica obtained by “dissolving” (chemical conversion) of quartz

melted down with alkalis and precipitated by neutralization. Rock crystal was thus taken to the next higher state of aggregation, i.e. into the process state, and then taken back into the solid state. S. Hahnemann chose rock crystal processed by this method as the basic substance for the homoeopathic *Silicea*³. Further processing is as for quartz.

Ferrum with Quartz (Kephaldoron®/Bidor)

According to a suggestion made by Rudolf Steiner, quartz is roasted (not letting it melt). The crystalline form changes reversibly and the density decreases reversibly (9). This takes the quartz back to a process stage and so exposed again to cosmic influences (9). After this, the quartz (“silica”) and sulphur (“sulphates”) are combined, as suggested by Rudolf Steiner (4). “Apart from other binding agents of secondary importance” (4) the iron process serves as a binding agent in this. At Weleda, iron sulphate is produced from siderite (iron carbonate) with sulphuric acid (obtained by roasting ores containing sulphur). In numerous stages quartz and iron sulphate are then made into a new whole (a composition) with the aid of honey and wine as further binding agents (method described in ref. 10). Rudolf Steiner called this an animalized *Equisetum* process (4). The product (basic substance or starting material) is not completely water-soluble, and further processing such as potentization can therefore only be done in the solid state, as for quartz. This most important medicament is, however, given in substantial doses (0.2–150 mg of the basic substance per tablet or capsule). It is immediately obvious that a simple mixture (combination) of quartz, iron sulphate and honey would have no effect on migraine. *Equisetum* would be equally ineffective, as Rudolf Steiner noted (4). It needs the pharmaceutical process to create a new whole in which we can perceive threefold nature (Sal, Mercury, Sulphur, or neurosensory and rhythmical system and metabolism and limbs). Rudolf Steiner put it like this: “One has now animalized the whole process in *Equisetum arvense*, and one gets a preparation where it really matters how it is produced. For in the way the process is done, ultimately resulting in the preparation, you see, as it were, that it is the outcome of a process between silica, iron and sulphur” (4). In my view, the animalization lies in using iron, a substance characteristic of the animal and human worlds, as a binding agent for the silica and sulphur compounds, which are characteristic *Equisetum* constituents. The process is the active principle. Understandably, a preparation which has been created as a composition in the manufacturing process can be given in substantial form, unlike quartz. For the indication for Ferrum cum quartz see the relevant section in ref. 6, for the rationale of using new basic substances created pharmaceutically section 2.4 in ref. 7.

Solutio Siliceae comp.

Rudolf Steiner suggested making preparations on the model of medicinal plants in a number of lectures (e.g. second lecture on 28 Oct. 1922). Solutio Siliceae comp. is one such composition of minerals, with *Equisetum*

Notes

2) The term “silica” is an umbrella term for chemical compounds of silicon and oxygen in a spectrum ranging from water-soluble silica (H₄SiO₄) to hydrous opal and the solid, water-insoluble anhydride of silica which is silicon dioxide (SiO₂). Coloured “quartzes” such as amethyst, onyx, cornelian and heliotrope were and are also used as medicinal agents by Weleda—as well as a whole number of complex silicates among the precious stones: beryl, topaz, emerald, chrysolith, etc.

3) The method is still given in the GHP, with reference to S. Hahnemann’s Chronic Diseases. It is listed under *Acidum silicicum*.

arvense as the model. Quartz is melted down with potassium carbonate, which results in potassium silicate. Further steps lead to a liquid basic substance containing c. 10 % of SiO_2 (theoretically; it is, of course, no longer SiO_2 but potassium silicate). Liquid potencies from the 3 x upwards are made with this (dilutions, solutions for injection). The question is, of course, the ranking value of potentization with a 3x; one might perhaps also use an 0.1 % solution instead. Concerning the indication of *Solutio Siliceae comp.*, see the relevant section in ref. 6, and for the rationale section 2.4 in ref. 7.

Equisetum limosum Rubellite

The expressed juice of water horsetail herb, a plant tending to have even higher levels of silica than field horsetail (5), is used to produce an ethanolic mother tincture acc. to GHP/Eur P. (ref. 1, Method 1a). Rubellite, red tourmaline, a gemstone containing silica, is ground and then triturated with lactose to give the 4 x, which is then potentized with water and ethanol 15 % to obtain the 6 x. Two parts of the mother tincture (equiv. to 1 part of the plant), 1 part of rubellite 6 x and 7 parts of ethanol 15 % are then potentized together. The product is called the 1 x with ref. to *Equisetum* it is a 1 x in the terms of the GHP. Liquid potencies are then made from it dilution, solution for injection 30 x). The process may be seen as combined potentization, even if the relative quantities and declaration differ from those mentioned in the Introduction. The preparation was originally suggested by Dr Leonhard Schenk (Nuremberg, d. 7. Aug. 1954) in 1951. His directions were to cut the shoots in the mornings, remove the fluid which is in the stems, and place them in an aqueous Rubellite 6 x solution. Crumble the shoots in the evening, express, and potentize the extract to 30 x. According to Weleda manufacturing records, the method was abandoned in 1979 at the latest.

Cinis Equiseti

The ash is produced by combustion of dried horsetail herb. *Equisetum* is very rich in minerals and the yield of ash is c. 10–20 %, containing c. 50–70 % of SiO_2 . The ash is largely insoluble and therefore processed like quartz. Concerning the indication, see the relevant section in ref. 6, and the rationale in section 4.7.3 in ref. 7.

Carbo Equiseti

The charcoal is produced by heating dried field horsetail under exclusion of air or with controlled aeration. The SiO_2 content is, of course, slightly less than for the ash, perhaps c. 10 %. The charcoal is insoluble and processed like quartz. For the indication see the relevant section in ref. 6, and the rationale in section 4.7.2 in ref. 7.

Equisetum cum Sulfure tostum (11)

Dried field horsetail is roasted with 1 % of sulphur added. Toasting removes water, aromatic compounds develop, and the beginnings of carbohydrate degradation (dehydration causing browning). The product is largely insoluble, and further processing is as for quartz. For the indication see the relevant section in ref. 6, and the rationale in section 4.7.1 in ref. 7.

Equisetum arvense ex herba ferm 35 b

Water and a little honey are added to the dried herb which is subjected to a ripening and fermentation process using exposure to warmth and cold in rhythm. The mixture is expressed and the solids are ashed. Part of the ash is added to the expressed liquid. The mixture is stored for at least 6 months before it is ready for use as mother tincture (1. Method 35 b). This processing method results in more intensive interaction between aqueous extract and silica in the case of *Equisetum*. The mother tincture is potentized using water and used to produce solutions for injection and coated pilules (WALA).

Equisetum arvense Silicea cultum (maceration of fresh plant material)

Field horsetail is grown in soil which has been treated with a quartz preparation. The plant (herb) is composted and the compost added to soil in which further horsetail plants are grown. These are also composted, and only plants given this compost are used. They are macerated (cold extraction) in 30 % of ethanol (GHP/ Eur.P. Method 3 c) (for use of alcohol, see ref. 12). The silica content cannot be expected to be higher than in plants grown in the normal way. This vegetabilization (in this case of quartz) can be considered from different points of view; from that of quartz, it is transferred to the plant medium in three stages (analogous to potentization). This explains why no further potentization by the Weleda method (13) is done. The preparations (dilutions) are, however, diluted and succeeded in stages, as per GHP, and may therefore be declared to be the 3 x or 2 x (concentration of 0.1 or 1 %).

Equisetum arvense Silicea cultum Rh

The plant is grown as above. The mother tincture is made by the Rh method after boiling the vegetable mass for one hour. Boiling releases more silica than maceration. The GHP monograph (*Equisetum arvense Rh*) (1) therefore calls for the material to be boiled for an hour for Rh mother tinctures (ref. 1, Method 21), in contrast to the general method for producing mother tinctures. Further processing is as for *Equisetum arvense Silicea cultum*, but purely aqueous (dilution 3 x, ampoules 2 x, 3 x). For the indication see the relevant section in ref. 6.

Equisetum arvense, ethanol. Decoctum (from dried herb)

The mother tincture is made by boiling the dried herbage of normally grown plants for four hours in 30 % ethanol. Boiling for four hours demonstrably releases more silica than maceration or boiling for just 30 min. which is the usual way. Boiling thus releases the silica, which is why the GHP (1) has been giving a 4-hour boiling period from 2003. The concentration in the decoction is c. 50 mg/kg, calculated as silicon, i. e. 0.005 % of Si (14), or 0.01 % of SiO_2 . Further processing consists in potentization with dilute ethanol (dilutions 1 x to 30 x), or the undiluted preparation is on offer as a tincture (10 %) for external application.

Equisetum arvense Rh

The mother tincture is made from normally grown plants (minced herb boiled for one hour), using the Rh method. Boiling releases more silica than maceration does. The mother tincture is potentized with water (dilutions, ampoules). For the indication see the relevant section in ref. 6, and the rationale of the Rh method in section 4.1.1.3 in ref. 7.

Equisetum arvense, glycerol extract

Normally grown plants are dried and extracted with two parts of glycerol 85 %. The extract is used to make a 10 % ointment.

As an extractant, glycerol is similar to mixtures of ethanol and water. Quantitative comparison of charges has not been done, however.

Equisetum arvense; massage oils

Massage oils are made by extracting the dried horsetail herb with vegetable oil. The temperature, time and concentration may vary (ref. 1, Method 12d, f, f) and the method must therefore be declared (example: Equisetum arvense H 10 %, massage oil). With Method 12d (declaration: H 10 %), extraction is for 4 h at 60–70 °C, with Method 12f (declaration W 10 %) and 12 g (declaration W 5 %) 7 days at 37 °C (W) in a ration of 1 : 10 and 1 : 20 resp. Oil will exclusively extract lipophilic (sulphuric) compounds, only small amounts of which are found in horsetail. Silica is insoluble in oil, and so these preparations will at most have traces of SiO₂. They are not potentized.

Agate water

Agate water is water which occurs naturally in some intact catalinites (agate geodes). Agate being a variety of quartz, agate water is a substance which has been in contact with quartz for a long period of time. Silica content is not determined. WALA offer solutions for injection (from the 8x).

Equisetum arvense dist. (drops)

This special preparation was developed to bring out the sulphur process in horsetail herb. It is produced by steam distillation over an extended period, as for the extraction of volatile oils. The product contains small amounts of some volatile, i.e. sulphuric compounds, some of which have been identified (14), is free from SiO₂, and has a pungent odour and taste.

Conclusion

It is evident from the above that almost all pharmaceutical processes are available to physicians wanting to prescribe silica or *Equisetum*—warmth in the fluid and the solid states, solubilizing quartz through the plant (vegetabilization), a mineral composition based on *Equisetum arvense*, “animalized” *Equisetum* process, and the Rh and the WALA process (ref. 1, Method 35 b). Quartz is solubilized in five different ways—by potentization e.g. Quartz 6x), fusion with alkalis (Silicea, Solutio Siliceae comp.), roasting (Ferrum Quartz), producing fertilizer in the laboratory (for vegetabilization) and by producing opal through the plant, possibly followed by de-

coction (*Equisetum arvense* ethanol. decoct.). The existence of the two compositions *Equisetum cum Sulfure tostum* and *Equisetum limosum Rubellite* is particularly fascinating, for they may be seen as an enhancement of the sulphur and silica component respectively.

Almost all formulations are also available. External applications contain the active principles in material amounts, whereas preparations for internal and parenteral use are available in concentrated and potentized form except in the case of insoluble ones like quartz which are produced almost exclusively in potentized form.

Readers may have noticed that with three of the methods the process was optimized to extract silica as completely as possible. Again it is not a question of maximizing the concentration of an active principle, the silica content being much lower than in preparations made from quartz, but rather of transferring the plant's characteristic constituents as vehicles for processes as fully as possible to the preparation.

Many physicians may find it difficult to see the distinction in clinical use between all the products listed, but in anthroposophical medicine it can be claimed that such distinction is possible. The paper also shows that possible differences in action cannot be explained by the composition but only by the different pharmaceutical processes used. More detailed descriptions of the pharmaceutical processes (e.g. ref. 13, 15–23) help one decide, though some are in need of revision. Work on new descriptions is ongoing. Brief ones were published in 2005 (24).

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