

## HOMEOPATHIC AND BIOCHEMIC MEDICINE BLESSING FOR PLANTS AND AGRICULTURE

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### ABSTRACT

Disease is ultimately an affair of the reaction of protoplasm, considering only the behaviour of protoplasm; cells especially in need of a stimulus, that stimulus will be found in a small dose of agent. This in large dose can damage or destroy precisely those particular cells. In 1986, V.D Kaviraj first used Belladonna (Kaviraj, 2011) successfully to treat a diseased apple tree. Here he opened a new door to agricultural research. Agro-homeopathy do not replace the compost in the agroecosystem. The homeopathic treatment to plant gives strong but temporary stimulation to restore system mineral deficiencies and to improve absorption and mineral metabolism in plants. It can change phytochemical profile and soil health to bring back normal health of

the plants. Nano-scale concentration of homeopathic drug works for plant health also. Constitution or plant biotype depends on nutritional condition, phenotype, genotype, reproduction type, phenological stage, epigenetic factor and their interaction with the environment.

### INTRODUCTION

The homoeopathic drugs were designed to treat humans later applied on animals, but in plants, it was curiously attempted without any expectations of good result and surprisingly Kaviraj got the right hit with the potency of drug counter to the disease. In different words we can say that Hahnemann principles are universal and can be applied to many biological systems (Lorenzo et al., 2021). It is important to note that homeopathy remedies can be easily deactivated whenever necessary, which makes it far safer than the use of pharmaceuticals or agrochemicals (Boff, 2009; Moreno, 2017; Savian et al., 2018).

Homeopathic drug is known to be safest and innocuous therapeutic method (Ortiz-Cornejo et al., 2017). It is evolved in 1796 by Sameual Hahnemann (1755-1843) and believed to be depend on principle of similarity (like treats like), individualization and cases (Lorenzo et al., 2021). The homeopathic dynamizations follow the principles of disintegration of matter and radiation without nuclear rupture, through the mechanical action on the smaller particles and addition of inert substances with dynamic activity, following the laws of electromagnetic waves: frequency, length and amplitude (Bonato, 2008; Abasolo Pacheco et al., 2020c; Cukaci et al., 2020).

In the recent study in this area has concluded that homoeopathic drug has great impact on plants also (Sen et al., 2018). Potentized homoeopathy drug can alter physiological response of plants (Sen et al., 2018). The homeopathic dilution preparation can influence the label of bioactive compounds up or down and because of that primary and secondary metabolism modifies its phytochemical profile (Capra et al., 2014; Verdi et al., 2016). The application of nosodes and biotherapeutics are the most applied techniques in agrohomoepathy (Ruíz Espinosa, 2001; Jäger *et al.*, 2010; Meneses Moreno, 2017; Moreno *et al.*, 2018). Biotic and abiotic factors are related to plant growth, the physiology and biochemical plants response (Capra, 2014). The dilution or preparation can be applied to any part of the plant or into soil (Santos et al., 2011, Andrade et al., 2012). The application of proper dose and dilution of homeopathic preparation on the soil and/or on the leaves can change the phytochemical profile such as increase or decrease secondary metabolite of plants (Castro, 2002b; Duarte, 2003; Armond et al., 2005; Goncalvez, 2010; Santos et al., 2011; Andrade et al., 2012; Capra et al., 2014).

Last decade study has significant contribution of homoeopathy on agroindustry and up to some extent it has also overcome biotic (i.e. fungal infection, microbial infection and insecticidal) and abiotic stress (i.e. salt, drought, cold, metal toxicity etc) of plant (Sen et al., 2018). The Similia principle of Christian Friedrich Samuel Hahnemann has successfully applied to abiotic stress of plan model (Sen et al., 2018). Highly diluted homoeopathic drugs are used these days for better seed germination, betterment of soil, growth of seedling, flowering, fruiting, protection against diseases and to overcome environmental stresses (Sen et al., 2018). An appropriate selection of drug, proper selection of potency can give very efficient and cost-effective alternative for chemical fertilizer and insecticides that can increase formers income (Ortiz-Cornejo et al., 2017, Sen et al., 2018). It is also used to

cultivate medicinal plants. They are very important and considered as affordable therapeutics for plant and animal health, used by 80% of the population (Moreira, 2010). It is important to use homeopathic drugs for cultivation of medicinal plants, to make it agroecological (Andrade et al., 2011; Nelson et al., 2019), without use of chemical to avoid environment, soil and therapeutic plant from contamination (Willer et al., 2010; Santos et al., 2014; Monzon et al., 2020). It is used in different dynamization by fulfilling the guidelines of Hahnemann's (proposed in 1810) 'Homeopathic Pharmacopoeia' (Hahnemann, 2013). It is believed that dilution of drug between 1:500 to 1:1000 with water is more effective than concentrated drugs and wrong drug can give detrimental effect on plants (Sen et al., 2018).

Many researchers across the world found that some homeopathic drugs can increase the rate of seed germination of different plant species. But they functionally vary according to their potency and dilutions. Changes in the environmental conditions in response to the application of homeopathic preparations can redirect metabolic pathways with influence on the production of secondary metabolites, fresh and dry biomass production, yield and chemical composition of the essential oils in medicinal plants (Carvaho, 2004; Bonato, 2009; Andrade, 2012; Capra, 2014; Verdi, 2016).

Biotic and abiotic factors influence plant growth, its biochemical response and its physiology (Capra, 2014) and it directly influences the production of metabolite, chemical composition of plant and its biomass yield (Carvaho, 2004; Bonato, 2009; Andrade, 2012; Capra, 2014; Verdi, 2016). All physiological process such as photosynthesis and respiration make an organic compound i.e. sucrose. They provide energy for growth and act as precursor for secondary metabolites (through shikimate, melvalonate and DXP (1-Deoxy-Dxylulose 5-phosphate) pathway) such as alkaloids, terpenoids, tannins, flavonoids, phenolic compounds and others.

Application of Justicia Isothermic coumarin content on the leaves and stem of Justicia pectoralis Jacq. This result reaffirms that at the principle of similitude there is a response from the plants vital energy that canalize its energy for the production of secondary metabolites with pharmacologic activity (Andrade, 2012) such as antioxidant, antiasthmatic (Cameron et al., 2015; Moura et al., 2017), anti-inflammatory (Nunes et al., 2018).

Homeopathic drug on plant which has medicinal values, enhances its medicinal value by similima effect. Also it increases essential oil yield used as medicine for human health

(Almeida, 2002; Castro, 2002a; Duarte, 2003; Duarte, 2007; Bonato et al., 2009; Verdi, 2016). Carvalho et al. (2003) and Armond et al. (2003) first observed that in *Tanacetum parthenium* L. and *Bidens Pilosa* L., there was reduction in secondary metabolite and no change was observed in peroxides and catalase enzyme production for these plants, respectively.

### **Homeopathy and its principle**

Homeopathy is a clinical-therapeutic method developed in 1796 by Samuel Hahnemann (1755-1843) and depends on three principles: the similarity, the individualization of cases, and the infinitesimal. In particular, the principle of similarity (treat likes by likes) is generally considered to be one of the pillars of homeopathy and states that a patient should be treated with substance which, in healthy person, cause symptoms similar to those presented by the affected person (Aversa et al., 2016).

Agro-homeopathy medicines have greater advantage over chemical drugs as they alter the physiological activities of plants which is a result of altered enzyme concentration and activity, total sugar, protein and chlorophyll content in plants. It also manages abiotic and biotic stress, can be cost effective and very efficient in terms of abiotic stress tolerance. It can be used safely for various purposes such as seed germination and have the potential to regulate growth and treat a variety of plant diseases.

Rout, preparations, potency and dose:

This is the absolute necessity of administering only one remedy at a time. In chemical agriculture, the substance is used to restore “Material Imbalance” administered in physical doses. But in homoeopathy the mode of action of small, but potentize substance is to stimulate the organisms. Re-establish the balance of vital forces.

### **Preparation of Homeopathic Dilutions**

Direct use of homeopathic drugs may lead to negative outcomes in agriculture. To elaborate further, the mother tincture is generally produced in anhydro-alcoholic solution of 87%. Dynamizations use 87% alcohol as a solvent, which if applied to the plant as is, would be toxic. That is why in agro homeopathy we use distilled, boiled, tap or irrigation water in the two last dynamizations. Drugs must be diluted with water and mixed properly before application. Drugs can be diluted with water at various ratios-1: 100, 1:200, 1:500, 1:1000, 1:5000 etc. it was reported that at higher dilution there is no effect of vehicle(alcohol)

remains. So only the effect lead compound of drug can be studied. Sukul *et al.*, (2012) reported that at 1:1000 dilution the effect of alcohol was eliminated but the main component of homeopathic drug was active. This helps guarantee that there is no toxicity to the plant. The therapeutic effect is due to the initial substance of the mother tincture and the process of dynamization. This also reduces the costs.

### **Routs of administration of homoeopathic drug in plants**

Two rout of administration are mainly considered in terms of plant treatment i.e. leaves and roots. Roots take water and nutrients from the soil, so roots is the good route for the administration of medicine. But homoeopathy influence may lose effect if administrated through roots due to contamination with soil and energetic forces present within the soil. Leaves could be considered as to be the tongue of the plants. As plants too are made of cell this could get stressed and become diseased. The remedy is better sprayed compare to irrigation. Many study has shown that it can be applied to seed for early germination. Marques *et al.*, (2012) worked on Sorghum seed germination treated with Arsenicum album and showed that different potencies of homeopathic drugs can influence the rate of seed germination both positively and negatively. Phosphorus 6cH can increase the rate of seed germination of Brassica oleracea (Barbosa *et.al.*, 2012). Sanchez (2008) studied the effect of different homeopathic drugs on flowering and fruit in chilli plants of a specific variety. Bonato and de Silva (2003) find out that homeopathic Sulphur can affect the growth and productivity of radish. Sanchez (2008) studied the effect of different homeopathic drugs on flowering and fruit in chilli plants of a specific variety. Bonato and de Silva (2003) find out that homeopathic Sulphur can affect the growth and productivity of radish.

Agro homeopathy can also reverse damage already present in the ground because of the use of fertilizers or pesticides, or excessive salinity. There is already scientifically verified evidence supporting the relevancy of applying dynamizations to plants before and during sowing, or directly on the ground.

Ultra high dilution of homeopathic medicines can be used safely for various purposes (Seed germination, betterment of soil health, growth of seedlings, flowering, fruiting, protection against diseases and to overcome environmental stresses). But precautionary measures (proper selection of homeopathic drugs and its potency, proper dilution of drug with water) must be taken before use of these drugs.

### **Nano tech in homeopathy**

Homeopathy, a holistic system of medicine, uses its very diluted doses of substance and reaches to the site as minute or sub-molecular level. That's why it is perceived as 'nanomedicine'. They both works at nanoscale. Homeopathy, preserved potentized energy from 'attenuated' versions of those substances, to cure disease and discomforts. Homeopathy has occasionally been 'lambasted' in published literature for using dosages considered too small to have an effect.

Nanotechnology is not a complete, self-contained science or healing approach, but mainly represents opportunities to improve medical diagnostic techniques. As an experimental field, it creates potential through technology. With the help of nanotechnology the drug can be delivered to the site.

Agro homeopathy has emerged to retain environmental biodiversity and avoid extremity of loss of natural resources. It uses ultrahigh dilutions that are safe for plants and the farmers and have no ecological side effects (Lorenzo et al., 2021).

### **Homeopathic drug used to treat plants**

The substance used for plant nourishment, protection or cure that must be safe for people, animal and environment. It should follow organic agriculture principle which is health, ecology, care and fairness which helps in sustaining and enhancing the human, animal, plant and soil health. Use of homeopathic drug for plants could be an integrative approach to promote organic agriculture since homeopathic drug treatments, because of its ultra-high dilutions have null ecological side effects. That makes it gentle and protective towards natural resources of our surrounding. Using different plant models have shown the potential of homeopathic drug on plants by influencing growth parameters increasing germination rate, defensive substance and strengthening plants against pathogen and pest attacks (Pulido 2014, 2017; Betti et al., 2009; Toledo et al., 2015; Trebbi et al., 2016).

Recently in last decade scientific community have shown interest in studying effect of homeopathic treatments on plants in different mode such as by taking different plant model, by taking different dilutions of drug, in vitro germination and growth, healthy, impaired and Phyto pathological plant models, in application research i.e. agricultural field trials (Betti et al, 2009; Majewsky et al., 2009; Jager et al., 2011). Doctor of plants and father of agrohmeopathy, Vaikunthanath Das Kaviraj author of the book 'Homeopathy for farming

and garden' set out to systematically test homeopathy remedy on garden plants. He reported his experiences of using belladonna to treat apple tree rust, effect of helix tosta on snails and slugs.

Ultra high dilution of homeopathic medicines can be used safely for various purposes (Seed germination, betterment of soil health, growth of seedlings, flowering, fruiting, protection against diseases and to overcome environmental stresses). It was observed, that homeopathic drug doesn't kill or fight bacteria, pathogen or harmful pests but it strengthens the plant or organism in such a way and to the extent that vital energy help living organism or plant to achieve its full potential to heal itself. But precautionary measures (proper selection of homeopathic drugs and its potency, proper dilution of drug with water) must be taken before use of these drugs. Previous many studies have shown that phytochemical profile of plants with homeopathic preparations. For example-Castro (2002a) observed geraniol and neral phytochemical change after applying Sulphur and isotherapeutic.

Agro-homeopathy do not replace the compost in the agroecosystem. The homeopathic treatment to plant gives strong but temporary stimulation to restore system mineral deficiencies and to improve absorption and mineral metabolism in plants (Lorenzo et al., 2021).

Agro-homeopathy identifies 'biotype' and 'pathogenesis level' of the agroecosystem to evaluate the nutritional status of the plant. By evaluating morphological and physiological characteristics of plant and its interaction with environment, where subject lives, makes it unique. Constitution or plant biotype depends on nutritional condition, phenotype, genotype, reproduction type, phenological stage, epigenetic factor and their interaction with the environment. It is not associated with any particular family or species, but it displays different unique pattern of behavioural and morphological plasticity.

The pathogenic symptom or bioindicators related to excess or deficiency of chemical element that shows pathogenic level such as pathogenic ammonia is because of excess or deficiency of nitrogen. The ammonia level is known by presence of insects with a stinging and sucking buccal apparatus, nitrophilic weeds, and pathologies caused by bacteria and fungi that affect the root and/or foliar apparatus. Plants parts with abnormal symptom and their environmental stress indicates the disease of the biotype with pathogenesis level and can be cured by agro-homeopathic remedy. Generally, the homeopathic drug was explored between 6 to 30 cH



dilution range in previous studies and most effective and frequently found dynamization are 6 to 12 CH.

The substitution of pesticides with homeopathic treatments has also been shown to improve the performance of rice plants and to increase grain yield ( $\geq 2,000$  kg/ha) (Verdi et al., 2020). Research has also explored the use of homeopathy in pest management of tomato under field conditions (Mododon et al., 2012). For example, the control of bean weevil has been demonstrated by Deboni et al. (2017). In orchards, insect traps to which *Ac. tannicum* 30CH was added attracted 20% more *Anastrepha fraterculus* (South American fruit fly) than the control. This assisted in the reduction in the numbers of fruit flies, and it is a method that can be used in organic orchards (Brilinger et al., 2018). Giesel et al. (2012), using a high dynamised dilution (nosode) of *Acromyrmex* species (leafcutterants) and *Belladonna* 30CH, reduced the foraging activity of two species – *A. laticeps* and *A. heyeri* – without causing colony collapse or recolonization elsewhere. Portales (2020) observed that when comparing homeopathy with the conventional treatments in dairy farms, homeopathy was more effective at keeping the SCC (somatic cell count per millilitre) below the 250 threshold. Prior to homeopathy treatment, only 22%, 25% and 27% of the samples from each farm had an SCC below 250. Once homeopathy treatment was started, these farms reached 66%, 56% and 46% (respectively) of days with SCC below 250.

Using different plant models have shown the potential of homeopathic drug on plants by influencing growth parameters increasing germination rate, defensive substance and strengthening plants against pathogen and pest attacks (Pulido 2014, 2017; Betti et al., 2009; Toledo et al., 2015; Trebbi et al., 2016).

Homeopathic drugs Arsenicum album and Sulphur can increase essential oil content in mint (Bonato et al., 2009). Andrade et al., (2006) worked with 18 different drugs on soil microbes where Solumunum was found to effective to increase microbial efficiency and Magnesium carbonicum was responsible for decrease in microbial efficiency. Homeopathic drugs are cost effective as compared to chemical fertilizers and its required in very less amount. For that reason agrohmeopathy can be a good alternative to traditional agriculture and pest control methods in India. Agrohmeopathy can also be practiced by combining with other biofertilizers. It can reduce the dependency on chemical fertilizers and pesticides.



Title of research paper	Drug and potency	Plant	Author and year
Evaluation of the effects of homeopathic medicines on the seed germination of <i>Brassica oleracea</i> L. var. <i>italica</i>	phosphorus and gibberelic acid (6cH, 30cH and 200cH)	<i>Brassica oleracea</i> L. var. <i>italica</i>	Marina das Neves Gomes; Isadora Simões Barbosa; Tayná Sequeira Valério; Camila Monteiro Siqueira; et al. (2012)
Homeopathic preparations in carrot, sugar-beet, lemongrass and chamba plants	Sulphur, Humic acid (200c), <i>Ageratum conyzoides</i> L (2c, 6c, 30c)	<i>Justicia pectoralis</i> Jacq. And <i>Ageratum conyzoides</i> L.	Castro (2002b) and Duarte (2003)
Characterization of essential oil and effects on growth of <i>Verbena gratissima</i> plants treated with homeopathic phosphorus	Phosphorus (9cG)	<i>Verbena gratissima</i>	Santos et al., 2011
Homeopathic preparations and crop environments through production and yield of quercetin on carqueja plants [ <i>Baccharis trimera</i> ]	Silicea 6cH, 7dH and <i>Equisetum</i> 7dH	<i>Baccharis trimera</i>	Capera et al. 2014
Basil ( <i>Ocimum basilicum</i> L.) response homeopathic treatments	Phosphorus 30cH	<i>Ocimum Basilicum</i>	Almeida (2002)
Regrowth of Yerba Mate Plants ( <i>Ilex paraguariensis</i> A. St. - hill.) Submitted to Dynamized High-dilution Preparations	<i>Arnica montana</i> 30CH and <i>Calendula officinalis</i> 30CH	yerba mate ( <i>Ilex paraguariensis</i> )	Domingues et al., 2019
Germination of <i>Lactuca sativa</i> under different dynamization levels of <i>Arsenicum album</i>	<i>Arsenicum album</i> 7CH	lettuce	Faedo et al. (2009)
Effects of the phenological stage, type of cutting and plant growth regulators on the propagation by stem cutting of <i>Poiretia</i>	<i>Calcarea phosphorica</i> 20CH	erva- de- touro ( <i>Poiretia latifolia</i> )	Verdi et al. (2020)

<i>latifolia</i> Vogel, a Brazilian native medicinal plant.			
Feasibility in seed germination of <i>Hypericum perforatum</i> L. submitted at different temperatures and treatments with high dilutions	<i>Kali carbonicum</i> 12CH	<i>Hypericum perforatum</i>	Nunes et al. (2019)
Homeopathy for Farms and Gardens	Natrum muriaticum 200C	beans	Mondal <i>et.al.</i> , 2012 Sepia 200C (Sukul <i>et.al.</i> , 2012). Lensi <i>et al.</i> , (2010)
Homeopathy for Farms and Gardens	Belladonna	plants	Kaviraj, 2011

## CONCLUSION

Agro-homeopathy do not replace the compost in the agroecosystem. The homeopathic treatment to plant gives strong but temporary stimulation to restore system mineral deficiencies and to improve absorption and mineral metabolism in plants (Lorenzo et al., 2021).

The ethical and social potential of homeopathy lends itself well to the toolkit of alternative agricultural movements (Kohler and Negrao, 2018), and homeopathy in agriculture is recognised as an effective social technology (Andrade and Casali, 2011). Social technologies need to be simple, cheap, effective and accessible to all farmers without causing dependency on costly inputs.

The rate of seed germination can be increased under salt stressed condition by the use of Natrum muriaticum 200C (Mondal *et.al.*, 2012) and Sepia 200C (Sukul *et.al.*, 2012). Lensi *et al.*, (2010) reported that Nactrummuriaticum 6CH have higher capability to increase the growth rate of common beans compared to Nactrummuriaticum 30CH.

In Agrohhomeopathy it can be added to soils where plants are not thriving. It can be added into water at times of sowing crops to increase the strength of their epidermis. It can be used against mildew, mold and during transplanting. It can also be applied at time of germination to expedite growth and avoid straggly plants.

Homeopathic effectiveness relies on the 'energy' of substances prescribed, to interact with and stimulate individuals' vital energies, in contrast to material forms of a substance which create a broadly-predictable response. Homeopathy requires only very small quantities of medicine for prescribing, making it an economic therapy choice for low-income communities. Application of homeopathic preparation or dilution on soil or any part of plant, changes the rate of seed germination, plant growth, secondary metabolite production, phytochemical profile of plant. The right drug with nano-scale dilution gives optimum growth and health of plant. This makes economic for application of homeopathic drug in large area in agriculture.

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