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An Extensive Scoping Review on the Potential of Agrohomoepathy in Agricultural Evolution

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ABSTRACT

A scoping study was conducted to evaluate the potential of agrohomoepathy, an innovative agricultural approach introduced by Dutch homoeopath Dr. V. D. Kaviraj in 1986. This method employs homoeopathic principles to promote organic farming and eliminate chemical inputs in crop production. The study reviewed 76 research articles published from 1994 to the present, focusing on their impact on crop development, pathogenic diseases, and stress conditions. Only English-language articles with experimental designs were included. The findings indicate that agrohomoepathy has demonstrated considerable promise in enhancing crop yield, managing pests and diseases, and enhancing soil quality. However, the review also identified several limitations such as methodological flaws and a lack of standardization across studies. Despite these challenges, most of the studies reported positive effects. One of the key recommendations arising from the study is the establishment of standardized practices and guidelines for conducting agrohomoepathy experiments. This would not only address the noted limitations but also facilitate the transition from conventional to agroecological farming practices. Such a transition holds the potential for significant cost savings and positive impacts on human health. The study contributes valuable insights to the scientific discourse surrounding organic and eco-friendly approaches in agriculture. By laying the groundwork for further research and implementation, it paves the way for the widespread adoption of agrohomoepathy as a sustainable agricultural practice.

Keywords: Homoeopathy, High dilution, Organic farming, Agroecology, Homoeopathy in agriculture.

INTRODUCTION

Organic farming, which eliminates pollutants and promotes environmental, social, and economic preservation, has become increasingly important due to the use of hazardous chemicals and pesticides

[1, 2]. The World Health Organization recommends Good Agriculture Practices (GAP) and Good Agriculture and Collection Practices (GAPC) for crop collection, propagation, germination, cultivation, harvesting, and post-harvest procedures [3, 4]. GAP offers professional guidance on plant

care, while GACP ensures appropriate raw material collection for herbal medicines and encourages the preservation of medicinal plants in danger of extinction [5, 6]. These practices restrict the use of harmful pesticides for farmers and consumers [7]. The new era of homoeopathy to treat plants is known as Agrohomoepathy. Dutch homoeopath and father of agrohomoepathy Dr. V. D. Kaviraj, in 1986, first used Belladonna successfully to treat a diseased apple tree. He created a brand-new avenue for agricultural studies with the aid of homoeopathy [8]. Agrohomoepathy is based on the principle of similarity and minimum doses, and uses ultrahigh dilutions of medicines for various purposes, including soil health, plant growth, secondary metabolite synthesis, and overcoming environmental obstacles. This approach allows for chemical-free and safe crop production, making it a viable alternative to conventional farming [9, 10]. Homoeopathic preparations can influence growth, secondary metabolite production, essential oil yield, and phytochemical profile when applied to the growth of medicinal plants [11]. The need for this extensive scoping review is to resolve knowledge gaps and offer a thorough overview of the possible advantages and difficulties connected with agrohomoepathy. The purpose of this assessment is to assist evidence-based selection of agrohomoepathic medicine and guide future researchers for sustainable agrohomoepathic farming practices. The objectives of this scoping review are to compile the body of information to help practitioners and researchers who are interested in the relationship between homoeopathy and agriculture and to research the basic concepts of homoeopathy concerning farming.

METHODOLOGY

Inclusion criteria (Figure 1):

- Experimental studies on plant models with Homoeopathic intervention,

- The *In vitro*, *In vivo*, and Field studies related to agrohomoepathy,
- Full article available in the English language,
- Articles published in various journals from the year 1994 to till date.

Exclusion criteria:

- Articles not in English,
- Full text was unavailable,
- Duplicate publications,
- Review articles.

Search engines:

In order to explore the potential of agrohomoepathy in agricultural evolution, the authors have conducted a comprehensive scoping review of agrohomoepathic experiments till date. The data were collected from various databases such as *Scopus*, *Web of Science*, *Science Direct*, *Research Gate*, and *Google Scholar* to know the effects of agrohomoepathy on the development of crops and their secondary metabolites, against antifungal toxicity, crop development against various stress conditions. Several traditional comprehensive search methods have been tried based on Medical Subject Headings (MeSH) as well as words in the title, abstract, and keywords in *PubMed*. In addition, searches in *Scopus*, *Science Direct*, *Web of Science*, *Research Gate*, and *Google Scholar* were conducted using pertinent terms connected by "OR" and "AND." 150 published research articles related to plant model experiments were initially identified. These articles underwent a selection process that involved excluding those for which full text was unavailable, review articles, duplicated publications, and articles not in English. After this screening, a total of 76 research articles remained and were included in this scoping review (Table 1). The included research papers for this comprehensive scoping review were segregated as per the different activities in plants (Table 2).

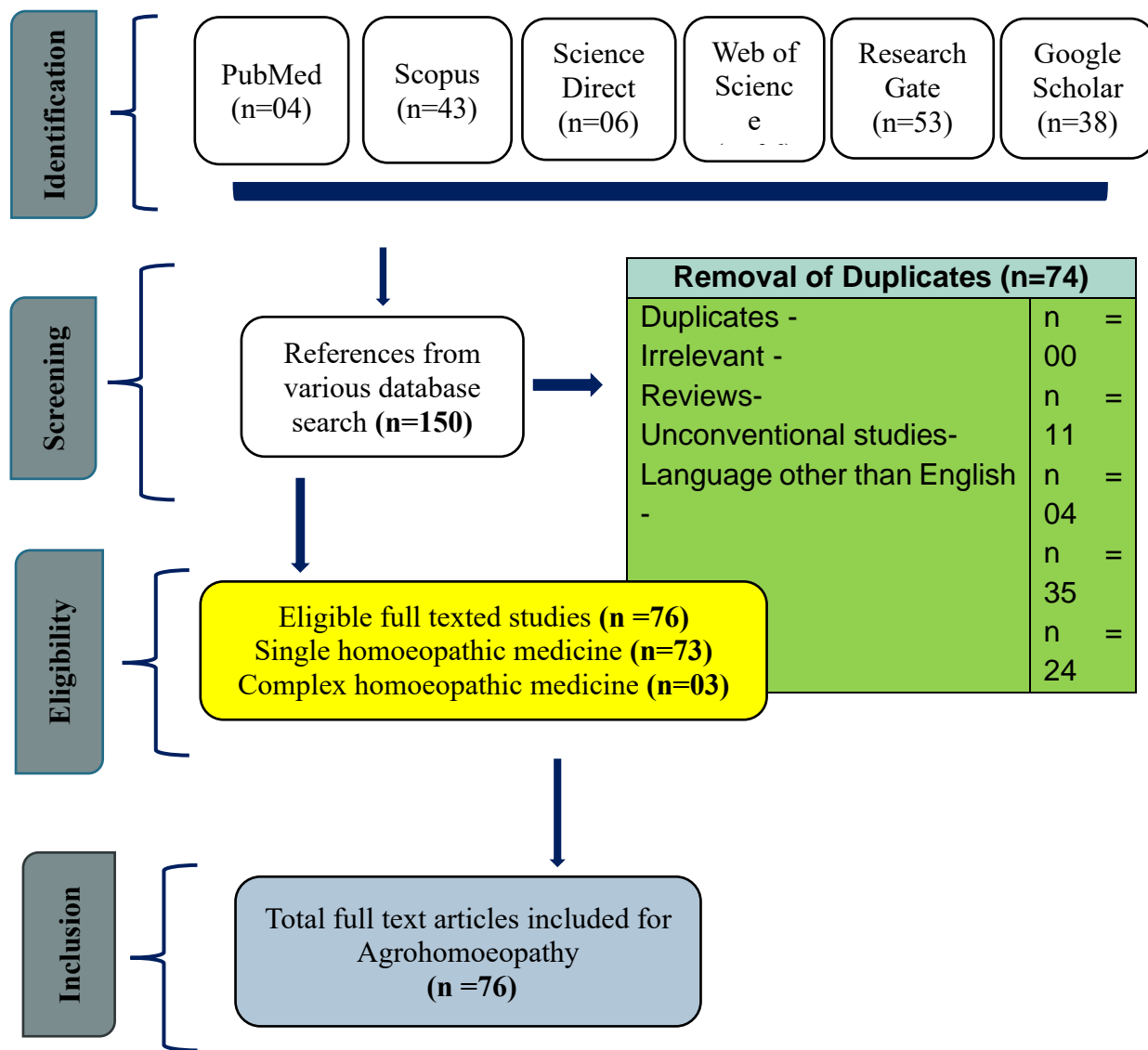


Fig. 1: Inclusion flowchart

RESULTS

A scoping review of 150 published research articles on plant model experiments was conducted, excluding those with unavailable full text, duplicated publications, and non-English articles. After screening, 76 articles were included in the review, which were categorized based on plant activities. The studies showed more

positive results towards lower potency, with only 5 showing negative results after the homoeopathic intervention. [12, 19, 62, 80, 87]. However, some studies found limitations in the experiment, such as non-relevant or difficult-to-follow studies [25, 58, 62, 83], sub-standard methodology, lack of replication [13-15, 22, 25, 29, 32, 34, 35, 37,

39, 42, 49, 53, 56-58, 60, 78, 79, 81-87], lack of negative controls [37, 49, 61], and no use of statistical analysis [21, 33, 42, 57, 78, 86]. The authors found no standard operating procedures or specific guidelines for agrohomoepathic experiments were followed. The details of the agrohomoepathic studies are presented in *Supplementary material*, and individual papers are critically appraised in the discussion section.

The authors emphasize the importance of adhering to standard procedures in agrohomoepathy research to enhance the quality and applicability of review papers in this field. The authors suggest common practices such as “experimental design, the inclusion of control groups, replication, appropriate sample sizes, statistical analysis, standardization of procedures, and thorough record-keeping with an illustration of standard statistical design which includes randomization, blinding, power analysis, and pre-planned data analysis, etc.” Adhering to these protocols can improve the validity and reliability of agrohomoepathic investigations, advancing our understanding in this area.

Table no. 1: Screening and identification of Agrohomoepathic research articles.

Sl. No.	Name of the Database	Total publications	Included	Excluded				
				Duplicate	Irrelevant	Review	Language other than English	Unconventional
1	Scopus	43	41	00	00	00	02	00
2	Science Direct	06	06	00	00	00	00	00
3	Web of Science	06	06	00	00	00	00	00
4	PubMed	04	01	00	00	00	00	03
5	Research Gate	53	20	00	05	04	12	12
6	Google Scholar	38	02	00	06	00	10	20

Table no. 2: Number of publications for different conditions with various activity in the plant model.

Sl. No.	Condition	Activity	Total no. of Publications
1	Biotic stress	Antibacterial	01
		Antiviral	01
		Antifungal	16
		Pest control	04
		Pathogenetic trial of plants	01
2	Abiotic stress	Salt	03
		Temperature: Cold and Heat DEM	12
		Heavy metals	08
3	Plants yield	Plant growth and production	27
4	Phytochemical models	Secondary metabolites study	03

DISCUSSION

From planting seeds to harvesting crops, homoeopathic medicine can be applied in agriculture for a wide range of reasons. Homoeopathic preparations can influence growth, secondary metabolite production, essential oil yield, and phytochemical profile when applied to the growth of medicinal plants [11]. So, this scoping review was conducted by the authors to evaluate the potential of agrohomoepathy in agricultural evolution. This scoping review analysed the experiments conducted for enhancing soil health and plant growth, increasing the synthesis of secondary metabolites, preventing bacterial and viral infections, and overcoming biotic and abiotic environmental obstacles.

1. Biotic stress

Anti-bacterial activity: The study was conducted in 2009 to determine the antibacterial activity of 30 homoeopathic medicine in *Arabidopsis thaliana* plants infected with *Pseudomonas syringae* bacteria. This study reflects that Biplantol 30x was approximately 50 percent higher than the positive control, Bion. Thus, this result showed a significant result of homoeopathic intervention for antibacterial activity [25].

2. Anti-viral activity: The study was conducted in 2003, to check the effects of As_2O_3 (5c, 45c, 5x, 45x) and succussed water H_2O (5c, 45c, 5x, 45x) on tobacco plants infected with tobacco mosaic virus (TMV). The results showed that the upper side leaf had high resistance levels, and treatment with homoeopathic As_2O_3 (5x and 45x) showed higher resistance to the TMV virus and reduced variability [14].

Anti-fungal activity: A total of 16 studies were conducted on antifungal activity, out of which 2 studies [80, 87] showed negative

results for the management of fungus. An *in vitro* experiment was conducted in 2010 to test the effect of the biotherapeutic *A. solani* to prevent tomato plant early blight disease. Water and ethanol were used as control. The authors observed that the biotherapeutic of *A. solani* reduced the severity of early blight in tomato plants but had no direct impact on the fungus development [27]. The antifungal effects of *A. album*, *Nitric acid*, and *Staph* were tested against *A. solani* in 2014, applying the treatment in two different ways. The result showed more mycelium reduction when treatment was applied over the PDA medium rather than dissolving into it. In comparison to the control, *Arsenicum album* 80cH, *Nitric acid* 80cH, and 100cH, and *Staphysagria* 6cH, 30cH, and 60cH reduced the number of *A. solani* colonies on the PDA medium [48]. Another study was conducted in 2015, the study showed significant suppression for root rot fungus with the treatment of *Arnica montana* 30c, *Thuja* 30c and with *T. harzianum* [50]. A biphasic study was conducted in 2016 to test the effectiveness of homoeopathic medicine *Arnica montana* and *Thuja occidentalis* in different concentrations against root rot fungi in crops. *In vitro* and *in vivo* studies showed significant inhibition of root rot fungi and an increase in plant growth [54]. The As_2O_3 was found to be the most effective in 2016, reducing spore germination and infection of *A. brassicicola* in cauliflower plants both in lab settings and on the field [55]. Two separate studies in 2016 on bean plants showed that *Phosphorus* inhibited mycelial growth and *Calcarea carb* decreased plant deaths caused by *S. sclerotiorum* fungus [56]. In tomato plants, *Propolis*, *Isotherapeutic*, *Sulphur*, *Silicea*, *Staph*, and *Ferrum sulph* inhibited spore production of *A. solani*. In the field, bentonite, copper oxychloride, and water were applied to plants in both *in vitro* and field experiments. All three studies in 2016 showed homoeopathic interventions were effective in inhibiting mycelium growth and reducing plant deaths [60]. A study was conducted to

investigate the antifungal properties of various plants in 2017, including 72 homeopathic plants, against the *C. gloeosporioides* fungus, which causes anthracnose in mango fruits. The study used different concentrations of *Arsenicum album* mother tincture and *Selenium*, *Nux vomica*, *Belladonna*, and *Calcarea fluor*. The authors also observed that *Selenium*, *Nux vomica*, *Belladonna*, and *Calcarea fluor* (Q, 3x, 200x, and 30x), were significantly efficacious against fungus [62]. In a biphasic study, *Sepia* and *Arsenicum album* were tested against charcoal rot in soybean plants caused by *M. phaseolina* fungus in 2017. The results showed that *Sepia* inhibited fungal growth by up to 32%, while *Sepia* 24cH and *Arsenicum album* 24cH inhibited fungal growth for the area under the disease progress curve [63]. *In vivo* studies from 2013 to 2014 examined the effects of *Thuja occidentalis* and water on root-knot nematode caused by *M. incognita* in tomato plants. The results showed that *Thuja occidentalis* 100cH inhibited *M. incognita* growth, while 24cH and 200cH enhanced plant growth [66]. A study was conducted to check the antifungal activity of *Phosphorus* and *Calcarea carb* on *S. sclerotium*, which causes white mold in common bean plants in 2018. The results showed that treatment with *Phosphorus* and *Calcarea carb* reduced disease progression by 83%, reduced the number of dead plants by 90%, and completely prevented the development of sclerotia [69]. A study was conducted in 2019 to check the effects of *Cina* 1000c and *Aakashmoni* 1000c in the treatment of root-knot nematodes in mulberry plants and the effects of *Aakashmoni* 1000c on foliar diseases. The experiment area was divided into 3, namely untreated field, one with *Cina* 1000c, and one more with *Aakashmoni* 1000c with naturally occurring root-knot disease. For the mortality test, three sets of cavity blocks containing 1 ml distilled water and 50 *M. incognita* larvae J2 were used with five repetitions. For the development of the silkworm test, 180 larvae were fed with

leaves from each plot. The result showed that *Cina* 1000c and *Aakashmoni* 1000c considerably stimulate plant growth, photosynthesis and lowers environmental CO₂ levels which leads to enhancement of silk production [76]. The antifungal effects of *Pyroligneous* extract 3, 9, 15, 21, 27, and 33cH and the three controls distilled water, 30 hydroalcoholic solution, and mother tincture on *C. gloeosporioides* were used to regulate fungus growth on cashew leaves in 2020. The treatment potencies were added to the BDA culture medium and then a 10 mm disc of culture was placed in the Petri plate. The plates were then covered with plastic film and stored in the incubator for 48 hours. The result showed that *Pyroligneous* extract had no antifungal effects against *C. gloeosporioides* fungus [80]. A study was conducted in 2021 to check the effects of homeopathic medicine and bioproducts on the growth of passion fruit seeds and to control the *Lasioidiplodia* rot fungus. The 10 treatment (T) groups were saprobic fungi isolate T5, T6, and T7, Rizos *Bacillus subtilis* T9, and yeast *Pichia* sp. T8, *Calcarea carb* 12cH T3, the nosode of rosemary green propolis in 6cH T4, distilled water T1, PD media T2, and extract of propolis T10. A pathogens mycelium disc 5 mm in diameter was inserted into the hole of the stem and taped in place, then before and after the pathogen inoculation, the treatments were applied. The result showed that the passion fruit plant development was greater with the application of *Calcarea carb* 12cH, filtrates from *Pichia* sp., *Gonytrichum* sp., and *B. subtilis*, with an increase in the primary morphological characteristics of plants [83]. The study was conducted in 2022 to check the effects of *Ferrum sulph* against the *Powdery mildew* in tomato seeds of 2 varieties. The result of the study showed that all potencies of *Ferrum sulph* decreased the *Powdery mildew* disease and promoted the tomato plant growth of both genotypes, and the 24cH potency increased the chlorophyll index of the plant [86]. The study was conducted in 2023 to check the effects of the

antifungal activity of *Secal cor* against *Claviceps purpurea* fungus in wheat plants. The outcome of the study showed that the formation of Ergot in all treatment groups except crapton and honeydew appears in all groups which indicated that *Secal cor* does not have antifungal activity against *C. purpurea* [87].

Pest control: Four studies have been conducted to evaluate the effectiveness of homeopathic interventions in pest control management for plants. The first study in 2010 examined the effects of *Lycopodium* and the nosode of the rosy apple aphid on apple seedlings affected by the pest. The results showed that *Lycopodium* and the nosode of the aphid significantly reduced the number of juvenile aphids [28]. Later in 2011 second study evaluated the effect of homeopathic dilution on the disease *S. lycopersici*, which causes septoria leaf spots in tomato plants and pest management of large and small borers causing fruit damage. The results showed that *Sulphur* 12cH significantly lessened the harm caused by the little borer and enhanced tomato production [34]. The third study in 2012 observed the effects of medicated globules *Cina* 200c, *Aakashmoni* 200c, and ethanol 90% as a control in mulberry plant disease. The results showed that *Cina* 200c and *Aakashmoni* 200c efficiently treated mulberry disease and increased silk production [38]. Whereas the fourth study found the effects of *Cina* on *M. incognita* a rootworm in tomato plants. The results showed that *Cina* increased root volume and promoted root development, while *Cina* 100cH stimulated the growth of the plant stalk diameter in 2014 [47].

Pathogenetic trial of plants: The homeopathic pathogenetic trial (HPT) was conducted in 2011 with *Boric acid* 6cH dilution and a ponderable dose of boric acid on tomato and bean plants. There was a total of seven treatment groups according to the number of sprays received. For group 1 boric

acid was sprayed once on the plant, group 2 was sprayed twice, and so on till the 6th treatment group, as the 7th group was a control group purified water. The plants were planted in vases, one plant in each vase and the treatment dilutions were sprayed after the third leave fully developed and the Honeys classification was used for the evaluation of symptoms that were seen on necrotic leaves. The study showed that plants treated with boric acid had necrotic symptoms whereas plants treated with *Boric acid* 6cH had no symptoms [33].

2. Abiotic stress

Salt stress: The study investigated the effects of *Sepia* 200cH in distilled water on cowpea seeds under salt stress in 2012. The study involved four treatment groups: seed in sterile water, seed in NaCl solution, sterilized seed with 90% ethanol, and seed treated with *Sep* 200cH. The results showed that seedling growth, sugar, chlorophyll, protein, and water content significantly improved when treated with *Sepia* 200cH [35]. Another study proved the effects of *Nat mur* (3cH, 5cH, 7cH, 9cH, 11cH, and 13cH) and distilled water on tomato plants with saline stress. The results in 2019 showed that pelleted seeds with *Nat mur* 5cH and 7cH treatments enhanced plant growth [74]. The study demonstrated in 2020, the effects of *Nat mur* (7cH, 13cH, and 7cH +13cH) and distilled water on common bean plants with NaCl-induced stress. The results displayed that *Nat mur* (7cH and 7cH+13cH) enhanced root length and fresh leaf biomass even when the plants were under salt stress. The study concluded that homeopathic medicines are effective against salt stress in plants [77].

Temperature (Cold and heat): The three experiments were conducted in 2011, to analyse the effects of cold and heat stress on sorghum seed, wheat grain, and maize seeds germination and plant growth. The results showed that *Arsenic album* 9x, 9cH, and 12cH reduced the effects of premature aging,

Gibberellic acid 30x showed more stalk lengths, and showed that the fresh substance (FS), root and shoot length, and redox capacity increased significantly with the treatment of succussed 2, 4-D, with 4.5c resulting in longer roots and shoots [31, 32, and 43]. The study conducted in 2018 to check the effects of *Cantharis* 200c, ethanol 200c, water 200c, and unstressed seeds (control) against heat stress in cowpea seed germination were examined. The results showed that *Cantharis* 200c reduced heat stress and increased total chlorophyll content compared to the control group. These experiments demonstrate the potential of homoeopathic interventions in reducing stress and promoting plant growth [68]. The study was conducted in 2019 to check the effects of homoeopathic medicine on *Hypericum perforatum L.* growth at different temperatures. The first study reflects that the percentage of seeds that germinated was higher at 25 °C (63%), while in the second study seed germination tests demonstrated that *Kali carb* 12cH (70.75%) was most effective as compared to the control treatment (62.75%). In the third study, *Kali carb* 12cH showed the most significant result on the germination rate of seeds in comparison to the control group [73].

Droplet evaporation method (DEM): The study focuses on the effects of homoeopathic dilution on wheat seed germination and the development of a biocrystallization assay. Six experiments were conducted to analyse the formation of polycrystalline structures inside the droplet residues. A total of fifteen experiments were conducted to check the effects of homoeopathic dilution on cress seedlings and the development of a biocrystallization assay in 2012. The results showed significant improvements with *Stannum met* 30x on every texture analysis variable and the biocrystallograms of the homoeopathically treated cress revealed specific features [36]. The study witnessed the effects of the number of strokes (NS) on

wheat seed germination in 2013. The results revealed that the local connected fractal dimension of DEM patterns grew significantly along with the rate of seeds germinated with *Arsenic* 45x (NS) 8, 32, 70, and W45x with (NS) 70 [40]. The effectiveness of homoeopathic dilution by a droplet evaporation method (DEM) on wheat seed leakages was evaluated in 2014 and 2015 to test the effects of As_2O_3 45x and distilled water, determined that treatment with As_2O_3 45x increased degrees of bilateral symmetry and local connected fractal dimensions in polycrystalline structures [46, 51]. The experiment compared the effects of *Zincum metallicum* 30c, lactose 30c, and water on the polycrystalline structure of wheat seeds by droplet evaporation method in 2015. This study demonstrates that compared to lactose 30c and water, *Zinc met* 30c reduced the complexity of the structures in stressed seedlings although no significant alterations were noticed in non-stressed seedlings [52]. The two biological experiments observed the impact of *Arsenic* on wheat seed germination in 2016. The first experiment involved *Ars* 45x and water 45x treatment groups, with varying strokes and pure water as control. The second experiment involved *Ars* 45x and W45x treatment. Results showed that treatments with more succussion strokes were more effective, leading to higher fractal complexity and increased seed germination rates [59].

Heavy metals: Eight experiments were conducted to analyse the effects of heavy metal stress on seed and soil. Seven experiments showed significant results in reducing heavy metal stress. The study was conducted to determine the significance of As_2O_3 (45x) and distilled water as a control on MEC wheat seed germination and growth in 1997. The results showed that seeds stressed with As_2O_3 significantly inhibited seedling growth, but stress seeds treated with As_2O_3 45x (P+T) resulted in longer stem growth compared to water (P+0) [13]. The effects of As_2O_3 dilution on the growth and

variability of MEC wheat seedlings were examined in 2005. The results showed that treatment with As_2O_3 and agitated water induced a significant increase in seedling growth and decreased variability [18, 19]. An in-vitro study was conducted to investigate the effects of *Arsenic* low dose on pollen germination of kiwifruit in 2013. The pollen was stressed with As_2O_3 and treated with As_2O_3 (5x and 45x), pure water, and water as a control. The result showed that the stressed pollen germination rate was increased when treated with As_2O_3 5x and 45x [41]. The study determined the effects of different dilutions of *Nux vomica* on wheat plant growth in soil contaminated with cadmium and lead in 2017. The results showed that treatment with *Nux vomica* 12cH reduced soil contamination, increased plant height and stem diameter, and reduced metal concentrations in soil [61]. The study investigated the effects of *Nux vomica*, *Carbo veg.*, and *Arsenicum album* on cucumber plant growth and soil contamination in 2019. The researchers found that *Nux vomica*, *Carbo veg.*, and *Arsenicum album* reduced the toxicity of cow dung contaminated with picloram +2.4-D but did not eliminate the herbicide's impact on cucumber plants' early growth [72]. In a similar study, *Nux vomica* and a control group were tested on soybean plant growth and soil contamination in 2019. The results showed that *Nux vomica* enhanced soybean plant height, stem diameter, and CO_2 assimilation but had no effect on metal bioavailability [75]. The *Zincum metallicum* was tested in 2022 for the toxicity of zinc in *Lepidium sativum* plant growth and development. The results showed that *Lepidium sativum* was highly sensitive to zinc stress, leading to reduced growth. However, *Zincum metallicum* 15cH slightly decreased zinc toxicity and increased proline and polyphenols, as well as antioxidant enzyme activities [85].

3. Plant yield

A series of 27 experiments were conducted to investigate the effects of homoeopathic interventions on plant growth and production. The effects of As_2O_3 on wheat seed germination were evaluated in 1994 and results presented that As_2O_3 completely inhibited seed germination [12]. To examine the effects of *Sulphur* on radish growth and production the assessment was done in 2003, which revealed that *Sulphur* 5cH, 12cH, 30cH, and 1McH were significantly better for radish production and improved plant growth [15]. The effects of homoeopathically prepared gibberellic acid (HGA3) on barley seed germination rate and seed quality were assessed in 2003. The results showed that HGA3 increased the germination rate of barley seeds and showed biphasic action on seed size and root development [16]. The agitated plant hormones and acetone, agitated distilled water, and distilled water were tested in 2004 on dwarf pea plant shoot growth. The results showed a growth stimulation effect with gibberellin 17x [17]. The two experiments examined the effects of *Arnica montana* on rosemary and white lippia plant rooting and growth in 2008. The results showed that *A. montana* 6cH had a stimulatory effect on rosemary, while *A. montana* 3cH, 6cH, and 12cH promoted root growth in white lippia plants [20]. In 2008, a study was conducted to examine the effects of *Cymbopogon winterianus*, gibberellic acid, water, and water as a control on the growth and germination of *Sida rhombifolia* plant species. The results showed that *C. winterianus* stimulated root and shoot growth, while 24cH inhibited shoot growth. Dilution 12cH had the highest germination percentage and germination speed index, while 24cH showed the lowest [21]. The gibberellic acid (17x and 18x) and water were tested in 2008 on dwarf pea shoots. Two seed batches from 1997 and 1998 responded significantly to the homoeopathic treatment, resulting in an 11.2% increase in shoot length and increased glucose and

fructose content [22]. A total of 27 experiments were conducted to screen 12 substances and one negative control experiment with water in 2009. Four substances were selected for further study on the growth of *Lemna gibba* (duckweed). The results showed that high dilution of gibberellic acid had the most significant impact on frond growth rate compared to other treatment groups [24]. The study was conducted on lettuce seed germination and vigour, which were evaluated in 2010 using pelleted seeds with homeopathic medicine *Alumina* and *Calc. carb* and synth-inert pharmaceutical talc. The results showed a significant positive effect on GSI and RL samples treated with homeopathic medicine, suggesting that pelleting seeds with homeopathic preparation could be an alternative to using dilutions in plants [26]. In 2010, a study was conducted to check the effects of *Nat. mur* (6cH and 30cH), 5.0% NaCl solution, and 30% ethanol as a control on the growth of common beans. The results showed significant enhancement in plant growth and increased relative growth rate (RGR) of the beans [29]. The hypothesis was tested in 2013 for pre-treatment of wheat seeds with high gibberellic acid concentrations would increase the growth-inhibiting effect of the plant hormone. The study involved wheat grains pre-treated with gibberellic acid 10^{-5} , 10^{-4} , and 10^{-3} , and then treated with G30x, water, and water as control groups. The results showed that pre-treatment with Ge^{-3} produced the greatest growth, followed by Ge^{-4} , and Ge^{-5} . The treatment with G30x slowed down the stalk length, rejecting the hypothesis [39]. The study was conducted in 2013 to check the effects of *Arsenicum album*, *Baryta carbonica* on Pea seedling growth, and photosynthetic activity. The result showed that several photosynthetic pigments like chlorophyll-a, b, and total chlorophyll were increased [42]. In 2014, a study was conducted to check the effects of gibberellic acid, agitated, and non-agitated water on the growth of duckweed after gibbosity appeared on plants. The

results showed that the growth rate was increased with third series GA3 compared to the control groups [44]. The investigation was done in 2014 to test the effects of wheat seeds stressed with a sublethal dose of As_2O_3 or unstressed seeds on gene expression. The results showed a substantial decrease in gene expression levels in stressed seeds treated with As_2O_3 45x but increased shoot and root growth [45]. The study was conducted to check the effects of *Zinc sulph* and MS basal agar medium and 2 different methods of application on *Bacopa monnieri* plant growth in 2014. The result showed that *Zinc sulph* 6x promoted the growth of the *Bacopa monnieri* plants [49]. In 2015, a study was conducted to check the effects of silver nitrate on the growth of wheat seeds of the Capo variety. The study involved silver nitrate 24x and water, with water 24x used as a control. The results showed relative variations in stalk lengths, indicating that the development was enhanced by the silver nitrate probe compared to water [53]. The comparative effects of silver nitrate, agitated *Silver nitrate*, and distilled water on wheat seed germination were tested in 2016. The results showed that agitated *Silver nitrate* increased germination rates compared to silver nitrate [57]. The Beauvais's hypothesis was tested in 2016 using a quantum-like model of homeopathy, which involved randomized placebo-controlled trials. The study found significant differences in p values between in situ and central groups, outcome of the study supports Beauvais's hypothesis. The authors also observed that *Sulphur* significantly increased growth and germination (more than equal to 1 mm) compared to placebo [58]. The experiment was conducted in 2017 to examine the effects of homeopathic medicine on lettuce seed growth. The study involved various treatment groups, including *Arnica montana*, *Calcarea carb*, *Carbo veg.*, *Silicea*, *Phosphorus*, *Pulsatilla*, and the homeopathic preparation of acai waste. The results showed that the dilution of *Carbo veg*, *Calcarea carb*, *Silicea*, *Phosphorus*, *Pulsatilla*, and homeopathic

acai significantly improved all parameters compared to the control group [64]. The effects of homeopathic dilutions on broccoli seed growth showed that *Silicea* 30cH, *Carbo veg* 30cH, and *Sulphur* 30cH all increased plant height in 2017 [65]. The homeopathic dilutions were tested on eucalyptus seed growth in 2018 and the study interpreted that *Kali mur* 12cH increased root length by about 55% compared to the control, and *Phosphorus* 3cH increased the total fresh mass [67]. The study was conducted to explore the effects of various treatments on chamomile growth and flower production in 2018. *Phosphorus*, 70% alcohol, and water were used as control and treatment dilutions. Results showed that *Phosphorus* 30cH enhanced flower production and diameter and height. *Thuja occidentalis* treated tomato plants infected with *Meloidogyne incognita* nematode, resulting in increased photosynthesis and carboxylation. *Thuja* 24cH reduced CO₂ fixation, resulting in similar behavior to healthy plants [70, 71]. In 2020, *Zincum metallicum* 6cH and water were used as a control for radish plant development. *Zincum Metallicum* 6cH increased plant length and mass. *Calendula* 30c, *Arnica montana* 200c, and placebo were used as controls for rice plant development. Results showed that carbohydrate, protein, and chlorophyll content were enhanced with homeopathic treatment [78, 79]. The *Zincum metallicum* (6 and 12cH) and water were used as a control for bhindi plant growth in 2021. Outcomes showed that *Zincum* 6cH was more effective than 12cH in all aspects of growth. *Paraquat* 30cH was also tested on rice plants, showing that it enhanced growth, chlorophyll content, and rice yield by 19.35% compared to the control [81, 84].

4. Phytochemical models

The investigation was carried out in 2009 to test the effects of *Arsenicum album*, *Sulphur*, and water on the growth and volatile oil content of mint plants. The researchers

interpreted that *Sulphur* had a greater effect on increasing fresh and dry biomass than *Arsenicum album*, and both drugs increased plant height in all dilutions. *Sulphur* 6cH significantly increased the volatile oil content of mint plants [23]. The effects of *Phosphorus* on *Verbena gratissima* plant growth and essential oil content were evaluated in 2011. The authors found that *Phosphorus* treatment had a significant impact on essential oil content and plant growth, with plants treated with *Phosphorus* having the highest amount of β -pinene, *trans-pinocamphone*, *trans-pinocarveol*, and *trans-pinocarvyl acetate* compared to the control groups [30]. The experiment was conducted to investigate the effects of *Ocimum basilicum* on tomato plant quality in 2012 and the result interpreted that beta-carotene increased with *Ocimum basilicum*, and 6x, 200cH raised the amount of lycopene present in tomatoes [37].

CONCLUSION

Agrohomoepathy is a promising new era for researchers, offering cost-effective farming and improved human health. The gathered evidence suggests that agrohomoepathic medicine has the potential to enhance crop yield, mitigate pests and diseases, and promote soil quality. While further research is required to improve standardized agrohomoepathic practices. This extensive scoping review underscores the importance of exploring organic and eco-friendly approaches in agriculture. Standard operating procedures should be developed for agrohomoepathy experiments, enabling the transition from conventional to agroecological farming and promoting a healthier lifestyle.

Abbreviations

WHO: World Health Organization, GAP: Good Agriculture Practices, GACP: Good Agriculture and Collection Practices, HPT: Homeopathic pathogenetic trial, DEM: Droplet evaporation method.

Author contributions

Ragini Ajay Chintalwar: Acquisition of data; Drafting the article; Final approval of the version to be submitted. **Anupam Mukherjee:** Conception and design of the study; Revising the article critically for important intellectual content; Drafting the article; Final approval of the version to be submitted. **Suresh Jagtap:** Revising the article critically for important intellectual content; Final approval of the version to be submitted. **Arulmozhi S:** Revising the article critically for important intellectual content; Final approval of the version to be submitted. **Varsha Umesh Ghate:** Conception and design of the study; Acquisition of data; Analysis and interpretation of data; Revising the article critically for important intellectual content; Drafting the article; Final approval of the version to be submitted.

Conflict of interest

The authors declare no conflict of interest in the entire study.

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Supplementary material: Studies on agrohomoepathy [12-87]

S/N	Name of Author/s	Year of publication	Species	Condition	Study setup	Homoeopathic intervention	Vehicle control	Standard control	Duration of study	Sample size	Randomization	Blinding	Methodology	Replication	Statistics	Result	Ref. no.
1	Shah-Rossi D., et al.	2009	<i>Arabidopsis thaliana</i>	Anti-bacterial	Pots	30 standard homoeopathic medicines 30x, metals, nosode (potentized extract of infected plant tissue), 30x dilution, salicylic acid 30x, <i>Biplantol</i> 30x	Water	Bion	Not mentioned	Not mentioned	No	No	For the pre-treatment 20 mL of homoeopathic solutions were applied and on the next day plant was dipped into 20 mL of bacterial suspension for 30 seconds and then the plants were covered for 4 days with plastic foil. For the post-treatment 1 mL homoeopathic dilution was applied to the center of the rosette of every plant.	Not mentioned	The results were analysed using the LSD test and 2-way ANOVA.	This study reflects that only <i>Biplantol</i> significantly reduced the bacterial infection rate. The treatment effect of <i>Biplantol</i> 30x was approximately 50 percent higher than that of the positive control, Bion.	[25]
Antibacterial																	
Antiviral																	

3	2
Solange M. T. P. G. C., et al.	Betti L., et al.
2010	2003
Tomato seeds (Santa Clara varieties)	<i>Nicotiana tabacum</i> L. (Samsun cultivar- had gene N27)
Anti- fungal	Anti-viral
Petri plate	Petri plate
Biotherapy of <i>Alternaria solani</i> 26cH to 30cH	As_2O_3 (5cH, 45cH, 5x, 45x),
Water and ethanol (diluted)	Merck distilled water, H ₂ O (5cH,
Not used	No
Not mentioned.	Not mentioned
Not mentioned.	9 Plants leaves
Complete randomization	Yes
Not mentioned	Yes
Plants with six leaves were isolated with <i>Alternaria solani</i> and a mixture was prepared in V8 culture medium with corresponding treatment dilution and poured in a Petri plate for analysis of the mycelia growth of fungus.	The 3rd and 4th fully mature leaves were taken from 9 tobacco plants inoculated in 200 microliters of TMV suspension applied on each leaf then 10 discs of leaves 20 mm in diameter were cut out by using a cork borer and placed in a Petri plate containing 15 ml of the respective treatment solution then flatbed scanner at 600 dots per inch of resolution a semi-automated method of counting lesions was used.
2 replications	Not mentioned
The results were analysed using the SAS software and Tukey's test with a 5% probability.	The results were compared by using the Wilcoxon rank sum test and Student's t-test.
The outcome of the study demonstrated that the 26cH, 27cH, and 28cH reduced the early blight disease compared to the control but had no significant effects on spore germination or on the fungus colonies.	This study result demonstrates that younger or the upper side leaf had high resistance levels and treatment with <i>Arsenic album</i> (5x, 45x) showed higher resistance to TMV virus, and reduced variability.
[27]	[14]

4

Modolon T. A., et al.

2014

Tomato Plants

Anti-fungal

Petri plate

Arsenicum album, *Nitric acid*, and
Staphysagria (6cH, 12cH, 25cH, 30cH,
50cH, 60cH, 80cH, and 100cH)

distilled water and no intervention

Not used

Not mentioned.

Yes

Not mentioned

A disc of activated *A. solani* was placed in
the center of the Petri plate, with PDA or V8
media then the treatment solution was
poured or mixed with media then applied to
the fungus disc.

3 replications of treatment, and 5
replications of 12 bioassays

The results were analysed using the
ANOVA.

The outcome of the study demonstrated that
Arsenicum album 80cH, *Nitric acid* 80cH,
and 100cH, and *Staphysagria* 6cH, 30cH,
and 60cH reduced the number of *A. solani*
colonies in comparison to the control. The
result showed more mycelium reduction
when treatment was applied over the PDA
medium rather than dissolving into it.

[48]

Hanif A., et al.

2015

Seeds of okra, sunflower, mung bean and mash bean

Anti-fungal

Pots

Arnica montana 30c and *Thuja* 30c in concentrations of 75 and 50%

Distilled water

Trichoderma harzianum, *Paecilomyces variotii*, *Bacillus subtilis* and

Not mentioned

25 Seeds

No

Not mentioned

The *in vitro* study 5 ml of each suspension of cultures of antagonistic fungi (5 days old), and antagonistic bacteria (48 hours old), was poured on soil and each treatment was applied. The soil which was naturally contaminated by *R. solani*, *M. phaseolina*, and *Fusarium spp* was taken for the experiment then seeds were sowed in pots with 300 gm soil.

3 replications

The results were analysed using the One-way ANOVA.

The outcome of the study showed significant suppression of root rot fungus with the treatment of *Arnica montana* 30c and *Thuja* 30c in concentrations of 75% and 50% and the soil soaked with *T. harzianum* (antagonistic fungi). The authors also observed that soil soaked with microbial antagonists increased plant growth.

7	6
Trebbi G., et al.	Hanif A., et al.
2016	2016
Cauliflower plants, seed	Mung bean, mash bean, okra, and sunflower
Anti-fungal	Anti-fungal
Petri plate, pots, field	Petri plate and pots
As ₂ O ₃ (35x and 45x), <i>Cuprum met</i> (35x and 45x), nosode (35x and 45x)	Exp.1- <i>Thuja occidentalis</i> and <i>Arnica montana</i> (30c) in concentrations of 100, 75, and 50%, Exp.2- <i>Thuja occidentalis</i> and <i>Arnica montana</i> (30c) in concentrations of 75, and 50%
Distilled water	Water, non-medicated globules
BABA, bentonite, copper oxvchloride	Not used
Sep. to Dec. 2006 (field)	Not mentioned.
Exp.1- 13 plants in each	25 plants
Complete randomization	No
No	Not mentioned
The negative control experiment was done in triplicates to assess the stability of the experimental setup. The plants were sprayed with the treatment dilution before and after fungal inoculation, treatments were compared against negative control.	Each <i>rot</i> root fungus was incubated over a week and the growth inhibition percent was calculated according to Edington et al. (1971).
3 replications	3 replications
The results were analysed using the z-test, one-way ANOVA, Dunn's, and Kruskal-Wallis tests.	The results were analysed using Two-way ANOVA.
This study reflects that As ₂ O ₃ was found to be the most effective in decreasing the <i>in vitro</i> spore germination and infection of <i>A. brassicicola</i> in cauliflower plants.	The authors confirmed that in both <i>in vivo</i> and <i>in vitro</i> studies, there was significant inhibition of root rot fungi and an increase in plant growth of all species. The authors further suggested that this study can be supported for only non-luminous plants and not luminous plants as they did not show any nodule formation.
[5]	

8

Rissato B. B., et al.

2016

Common bean (*Phaseolus vulgaris*) of IPR
Tuiuiu cultivar

Anti-fungal

Pots

Calcareo carb and *Phosphorus* (6cH, 12cH,
24cH, 36cH, and 48cH)

Water and hydroalcoholic solution, 30%

Not used

Not mentioned.

Not mentioned

Complete randomization

Not mentioned

When plants were in the V2 stage (development of trifoliolate leaf) a 7 mm disk of *Sclerotinia sclerotiorum* was inoculated in the base of plants and then the treatment dilutions at 0.1% were applied in soil on the day of inoculation (0 day), 3, 7, and 17th days after inoculation.

Not mentioned

The results were analysed using the ANOVA.

This study reflects that number of colonies of white mold on bean plants was decreased by *Phosphorus* (6cH, 12cH, 24cH, 36cH, and 48cH) and with *Calcareo carb* (6cH). The authors also observed that percentage of plant deaths caused by the white mold disease was decreased by the *Calcareo carb* (12cH and 24cH) treatment.

9

Toledo M. V., et al.

2016

Tomato plants

Anti-fungal

Petri plate

Propolis, *Isotherapic* of *A. solani*, and *Isotherapic* of ash of leaves (6cH, 12cH, 30cH, and 60cH) and *Sulphur*, *Silicea*, *Staphysagria*, *Phosphorus*, *Ferrum sulph*, and *Kali iodatum* in (6cH, 12cH, 30cH, and 100cH)

Distilled water and 30% ethanol (6cH, 12cH,

Not used

Not mentioned.

Not mentioned

No

Not mentioned

For the *in vitro* bioassays, 3 tests were performed namely mycelium growth inhibition, spore production, and spore germination tests.

Not mentioned

The results were analysed using the ANOVA and Scott-Knott test at 5%.

The outcome of the study showed that *Sulphur* and *Staphysagria* in 100cH, and distilled water (60cH and 100cH) inhibited mycelial growth. The *Propolis* (6cH, 30cH, and 60cH) and *Ferrum sulph* (6cH and 30cH) inhibited spore production and the spore germination was reduced with *Ferrum sulph* 30cH, *Isotherapic* of *A. solani* 6cH, and *Isotherapic* of ash 6cH.

Alam A., et al.

2017

Mango fruit (*Mangifera indica* L.)

Antifungal

Petri plate

72 homeopathic medicine were *Acid nitrate*, *Acidium phosphoricum*, *Aconite napellus*, *Antium caude*, *Apis meliphica*, *Argentum metallicum*, *Arnica montana*, *Arsenicum album*, *Aswagandha*, *Bacillium*, *Baptisia tinctoria*, *Belladonna*, *Blattaori*, *Borax*, *Bryonia alba*, *Baptisia*, *Calcareo*, *Calcaria carbonica*, *Calcaria fluorica*, *Calcaria phosphoria*, *Calendula*, *Carbo vegetabilis*, *Argentum metallicum*, *Chamomilla*, *Chelidonium majus*, *Cina*, *Colchium*, *Colocynth*, *Cybopodium*, *Ferrum metallicum*, *Ferrum sulphuricum*, *Graphites*, *Heper sulp*, *Iris versicolor*, *Kali bich*, *Kali iodatum*, *Kalium phosphoricum*, *Lathyrus sativus*, *Lycopodium clavatum*, *Magnesium carbonicum*, *Methyl jasmonate*, *Mezerium*, *Natrum muriaticum*, *Natrium sulphoricum*, *Nux vomica*, *Oscillo coccinum*, *Petroleum*, *Phosphorus*, *Rhus toxicodendron*, *Salicylic acidum*, *Salicylic nigra*, *Sanguinaria canadensis*, *Selenium* with their 5 potencies (Q, 3x, 30x, 200x, and 1Im)

only oatmeal agar

Not used

Not mentioned.

5 fruits

Yes

Not mentioned

The fungal suspension was poured into Petri plates containing 5 healthy mango fruits and 3 replications were done. The OMA agar was melted and before the agar solidified, each homeopathic medicine and all potencies were added and placed in different test tubes and one test tube without medicine as a control and applied with 5 replications.

Exp.1- 3 replication, Exp.2- 5 replication

The results were analysed using the duncan's multiple range test (DMRT).

The outcome of the study showed that *Arsenicum album* Q potency at 10000 ppm strongly inhibited *C. gloeosporioides* development (96.40%). The authors also observed that *Selenium*, *Nux vomica*, *Belladonna*, and *Calcareo fluorica* in (Q, 3x, 200x, and 30x), were significantly efficacious against *C. gloeosporioides*.

11

Lorenzetti E., et al.

2017

Soybean plant (NK 412113 cultivar)

Antifungal

Pots

Sepia and *Arsenic album* (6cH, 12cH, 24cH, 36cH, and 48cH)

Distilled water and ethanol 30%

Not used

Not mentioned.

3 plants in each pot

Yes

Not mentioned

Spraying was used to deliver treatments 3 days prior, on the same day of inoculation, and after 3, 10, and 17 days of inoculation.

5 replications

The results were analysed using the regression analysis.

The authors observed that *Arsenic album* had no impact on the area under the mycelial growth curve (AUMGC), but *Sepia* inhibited fungal growth by up to 32%. Both *Sepia* 24cH and *Arsenic album* 24cH inhibited fungal growth for the area under the disease progress curve (AUDPC).

[63]

12

Mioranza T. M., et al.

2017

Tomato seeds (Santa clara cultivar)

Plant growth and anti-fungal

Polystyrene trays and pots

Thuja occidentalis (6, 12, 24, 50, 100, 200, and 400cH)

Water

Not used

From Oct. to Nov. 2013 and from Sep. to Oct. 2014

Exp. 1- 4,850 eggs, Exp.2- 5,050 eggs

Complete randomization

No

The seeds were sowed in polystyrene trays and the seeds were dipped in a 0.1% treatment solution and then transferred to plastic pots. For the 2013-year experiment, nematodes (J2) were inoculated 3 days after transplantation and in the 2014 experiment, seeds were treated with 1.2 mL of suspension of nematodes and then weekly spraying of a treatment was done.

4 replications

Tukey test was used for statistical analysis.

The result showed that *Thuja occidentalis* 100CH (2013 study) reduced the amount of J2 present in the roots and *Thuja occidentalis* 200cH increased root length and the weight of the first cluster's fruits and the J2 levels in the soil were reduced (2014 study) with *Thuja occidentalis* 100cH. The authors also observed that the activity of several defense enzymes in the plant was enhanced.

13

Rissato B. B., et al.

2018

Common beans

Anti-fungal

Petri plate and pots

Phosphorus and *Calcareo carb* (6cH, 12cH, 24cH, 36cH, and 48cH)

Water

Not used

From June to July 2015 and Nov to Dec 2015

3 plants in each pot

Yes

NO

The healthy seeds were selected and sowed in pots and when plants produced their first leaf and then *S. sclerotiorum* mycelia was inoculated. The treatments (0.1%) were applied to the soil 3 days prior to the inoculation, on the day of the inoculation, and at 3, 10, and 17 days thereafter. The area under the disease progress curve (AUDPC) was determined by the size of the disease lesion.

5 replications

For statistical analysis, ANOVA and Tukey test was used.

The result showed *Phosphorus*, and *Calcareo carb* (12cH, 48cH) treatments slowed the disease progression by 83% and reduced the number of dead plants by 90%. The treatments with *Phosphorus* (12cH, 48cH) and *Calcareo carbonica* 48cH reduced mycelial growth and completely prevented the development of sclerotia, based on *in vitro* experiments.

15	14		
Rodrigues C., et al.	Datta S. C.		
2020	2019		
Cashew leaves	Mulberry plants		
Anti-fungal	Anti-fungal		
Petri plate	Plots		
<p><i>Pyroligneous</i> extract (3, 9, 15, 21, 27, and 33 CH)</p>	<p><i>Cina</i> 1000c and <i>Aakashmoni</i> 1000c</p>		
Distilled water, 30%	Untreated field		
Not used	Not used		
Not mentioned.	Not mentioned.		
5 Petri plates in each	Exp.1- 160 plants, Exp.2- 180 larvae		
Yes	No		
No	No		
<p>The treatment potencies were added to the BDA culture medium and then a 10 mm disc of culture was placed in the Petri plate. The plates were then covered with plastic film and stored in the incubator for 48 hours and the colonies diameter was measured daily.</p>	<p>In the mortality test, three sets of cavity blocks containing 1 ml distilled water and 50 <i>M. incognita</i> larvae (J2) were used with five repetitions. The spraying was done on plants (10 ml/plant, once daily for 15 days) after 76 days of harvesting. The TLC was performed for analysis of residue and in the development of the silkworms test, 180 larvae were fed with leaves from each plot.</p>		
4 replications	3 replications		
<p>The results were analysed using the ANOVA and Tukey test.</p>	<p>The results were analysed using the T-test.</p>		
<p>The result showed that the percentages of mycelial development (PRD) decreased by 7% in 33CH and increased sporulation up to 70% in 3cH and 21cH.</p>	<p>The result showed that <i>Cina</i> 1000c and <i>Aakashmoni</i> 1000c considerably stimulate plant growth, which immediately speeds up photosynthesis and significantly lowers environmental CO₂ levels. The authors also observed that it enhances silkworm development.</p>		
[80]	[76]		

16

Trento R. A., et al.

2021

Passion fruit seeds

Plant growth and Antifungal

Polyurethane bags

Calcareo carb 12cH, nosode of rosemary green propolis in 6cH

Distilled water and PD media

Saprobic fungi isolate (*Brachysporiella* sp., *Gonytrichum* sp. and *Ellisembia*

Not mentioned.

Not mentioned.

No

No

The passion fruit seeds were planted in 200 cells of Styrofoam trays and after 37 days of planting transplanted to polyurethane bags. A pathogen's mycelium disc (5 mm in diameter) was inserted into the hole of the stem and taped in place. Prior to the pathogen inoculation, the treatments were applied four times at intervals of 15 days. After the inoculation, treatments were applied three times at intervals of 7 days with a 200 ml solution volume.

Not mentioned

For statistical analysis, ANOVA and the Scott–Knott test were used.

The result showed that the passion fruit plant development was more with the application of *Calcareo carb* 12cH, filtrates from *Pichia* sp., *Gonytrichum* sp., and *B. subtilis*, with an increase in the primary morphological characteristics of plants.

[83]

17

Toledo M. V., et al.

2022

Tomato seeds (Cedro and Santa Clara varieties)

Antifungal activity

Polyethylene tray, pots

Ferrum sulphuricum (6cH, 12cH, 24cH, 48cH, 72cH, and 96cH)

Distilled water and 30% ethanol

Not used

May to June 2013

Not mentioned.

Split plot randomized block

No

The tomato seeds were sowed in the polyethylene tray and at 4 leaves stage plants were transferred into the pots. A total of 3 sprays of treatment dilution were applied to the plants and for evaluation of *O. neolycopersici* sporulation was evaluated by counting *Powdery mildew* lesions and fungus colonies then the number of spores was counted with the help of a Neubauer chamber.

Not mentioned

Not mentioned

The result of the study showed that all potencies of *Ferrum sulphuricum* decreased the *Powdery mildew* disease and promoted the tomato plant growth of both genotypes.

[86]

Mondal B. et. al.

2023

Wheat seeds LOK-1 variety

Antifungal activity

Plastic trays

Secal cor (Q, 30CH, 200CH, 1M)

Ethyl alcohol and water

Crapton fungicide

Not mentioned.

210 seeds

No

No

Treatment was given 2 times a day for the next 14 days. For inoculation of the pathogen, 50 millilitres of 1 optimum density were created from the mother culture and set to 600 nm UV. Then this mixture was sprayed on all seven trays over the fully developed wheat kernel after being combined with 500 ml of distilled water. The honeydew glume that emerges on the kernel's edge is the first indication of infection seen after fifteen days of inoculation.

No

For statistical analysis, one-way ANOVA was used.

The result of the study showed that, there was formation of *Ergot* in all treatment group except crapton and honeydew appears in all groups.

19		Pest control	
Wyss E., et al.	2010	Apple seedlings of golden delicious	Pesticide plastic tube
<i>Lycopodium clavatum</i> , nosode		<i>rosy apple aphid</i> (6cH, 15cH, and 30 cH)	
Tap water and	Not used	From 21 April to 19	100 plants
Yes	Yes	The plants with five to six leaves were used in each experiment and then 20 mL dilution (10 globules in 250 mL water) was poured on the seedlings.	
Exp. 1- 10	replications. Exp. 2- 2	The results were analysed using the LSD, F, and Chi-square tests.	
The outcome demonstrates that treatment with <i>Lyco.</i> 15cH and nosode 6cH significantly reduced the number of juvenile aphids.		[28]	

Modolon T. A., et al.

2011

Tomato plants of Santa Cruz Kada cultivar

Pesticide

pots.

Exp.1 -*Staphysagria*, *Arsenicum album*, and Sulphur (12cH). Exp.2- *Solanum lycopersicum*, *Solanum aculeatissimum*, *Arnica montana*, and Sulphur (12x and 24x).

Non-intervention area.

Bacillus thuringiensis, Bordeaux mixture at 0.3%, cupric formulation

From 2008 to 2010

10 plants in each unit.

No

Double blinding

The large borers (*Spodoptera frugiperda*, *Helicoverpa zea*, and *Spodoptera eridania*) and small borer (*Neoleucinodes elegantalis*) which cause fruit damage in tomato plants were managed and the leaves with *S. lycopersici* disease were placed in the pots and the intensity of the disease was analyzed by the number of leaves with *S. lycopersici* and damaged fruits by the pest.

Not mentioned

The results were analysed using the Tukey test at 5%.

The result of the field study showed that Sulphur 12cH, which is like bacillus thuringiensis (pesticide), significantly lessened the harm that the little borer did and *Arnica montana* 12x enhanced tomato production. Whereas the greenhouse experiment result demonstrates that, *Solanum lycopersicum* treatment eliminated the *septoria* leaf spot at 12x and 24x significantly lowering the disease.

22		21	
Swarowsky R. A., et al.		Datta S. C. et al.	
2014		2012	
Tomato Plants (Santa clara 5800)		Mulberry plant	
Pesticide		Pesticide	
pots, plastic		field	
<i>Cina</i> (12cH, 24cH, 50cH, 100cH, 200cH, and 400cH)		<i>Cina</i> 200c and <i>Aakashmoni</i> 200c	
Ethanol 70%, distilled water		Ethanol (90%)	
carbofuran		Not used	
Not mentioned.		76 days	
Exp.1- 2500 eggs Exp.2- 450 eggs		Not mention	
complete randomized block		No	
Not mentioned		No	
The <i>in vivo</i> assay <i>Meloidogyne incognita</i> 2 ml suspension was poured into five holes of 1 cm depth in each pot when plants had 3 to 5 fully developed leaves and the carbofuran pesticide was sprayed in soil 0.5 mL in each pot then the first treatment dilution was applied then the <i>in vitro</i> assay was conducted for J2 hatching, mortality, and motility of <i>Meloidogyne incognita</i> J2.		The mortality test was conducted with 5 repetitions and the TLC was performed to analyse residue. For the rearing of silkworms, larvae were fed with 3 treatment groups of leaves.	
Exp.1- 6 replications Exp.2- 5 replications		5 repetitions	
The results were analysed using the ANOVA, Dunnett test at 5%.		The results were analyzed using the student's t-test.	
The result showed that root volume was more with <i>Cina</i> and promoted root development of tomato plants. <i>Cina</i> 100cH stimulated the growth of the plant's stalk diameter.		The authors observed that <i>Cina</i> 200c and <i>Aakashmoni</i> 200c efficiently treated mulberry disease and increase silk production.	
[47]		[38]	

23		Solange M. T. P. G. C., et al.		2011		Tomato and bean plants (carioca cultivar)		Homoeopathic		Vase		Boric acid 6cH		Boric acid		Not used		Not mentioned.		Not mentioned.		Yes		Not mentioned		The plants were planted in vases, one plant in each vase and the treatment dilutions were sprayed after the third leave fully developed and the Honey's classification was used for the evaluation of symptoms that were seen on necrotic leaves.		4 repetitions		Not mentioned		The study showed that plants treated with boric acid had necrotic symptoms whereas plants treated with <i>Boric acid</i> 6cH had no symptoms.		[33]	
24		Sukul S., et al.		2012		Cowpea seedlings		Abiotic stress (Salt stress)		Petri dish		Sepia 200cH (1:100 and 1:1000)		Water, 50 mM NaCl		Not used		Not mentioned.		160 seeds		No		No		The seeds were placed in the Petri plates with filter paper, and 10 mL of respective dilution was poured and then placed in the germinator at room temp for seed growth. Then seeds were transferred to new Petri plates for 96 hours for further growth of seeds.		Not mentioned		The results were analysed using the Student's t-test and ANOVA.		The authors observed that seedling growth, sugar, chlorophyll, protein, and water content all significantly improved when seedlings were treated with <i>Sepia</i> 200cH in 1:100 and 1:1000 dilution.		[35]	
Pathogenetic trial of plants																																			
Salt stress																																			

26	25
Mazon-Suastegui J. M., et al.	Bonfim F. P.G., et al.
2020	2019
Common bean plants	Tomato seeds (Santa clara cultivar)
Stress tolerance	plant growth
Pots	Plastic trays
<i>Natrum muriaticum</i> (7cH, 13cH, and 7cH +13cH)	Pelleted seeds with <i>Nat mur</i> (3cH, 5cH, 7cH, 9cH, 11cH, and 13cH)
Distilled water	Distilled water with Pelleted
Not used	Not used
Not mentioned.	Not mentioned.
3 seeds in each	80 seeds
Yes	Yes
Not mentioned	No
The seeds were sterilized then dried on filter paper; then respective treatment was applied then sowed in a plastic pot. Then the saline (NaCl 0 mM and 75 mM) was applied gradually once the plants developed.	The seeds were placed in a petri dish containing a mixture of pharmaceutical talc with homoeopathic medicine and distilled water to create a white paste. Then the seeds were transferred in phenolic foam blocks which had been previously soaked with the nutritional solution and 50 mM of saline NaCl solution and placed in plastic trays.
5 replications	4 replications
The results were analysed using the Tukey's test.	For statistical analysis, Tukey's test, F-test was used.
The result showed that <i>Natrum muriaticum</i> (7cH and 7cH+13cH) enhanced photosynthetic rate and morphometric variables. The authors also observed that root length and fresh leaf biomass were greater even when the plants were under salt stress (75 mM NaCl) conditions.	The result showed that pelleted seeds <i>Nat mur</i> 5cH and 7cH treatments enhanced plant growth.
[77]	[74]

Cold and heat stress

	27
Endler P. C., et al.	Marques R. M., et al.
2011	2011
Capo variety wheat grains	sorghum seeds
Seasonal variation	Plant growth and
Glass dishes	Germination paper,
Gibberellic acid 30x (G30x)	<i>Arsenicum album</i> (9x, 12x, 18x, 24x, 30x, and 9cH, 12cH, 18cH, 24cH, 30cH)
Water 30X, water	Distilled water
Gibberellic acid (10-4, 10-6)	Not used
7 days	Not mentioned.
Exp. 1- 217 dishes and	200 seeds
Stratified randomization	Completely
Independent solution	Double-blinding
For the treatment, the seeds were placed on two layers of filter paper inside the glass dishes and then 5mL of each dilution was pipetted into the dishes and then covered with aluminium foil.	The seeds were placed in the BOD chamber for 96 hours then the germination test was performed by placing 50 seeds on germination paper and then paper was rolled and placed in the BOD chamber for an accelerated aging test.
Not mentioned	4 replications
The results were analysed using the chi-square tests, one-way ANOVA, and post hoc tests.	The results were analysed using the ANOVA and Scott-Knott test.
The outcome demonstrates that, shorter stalk lengths in the G30x group compared to the control group.	The outcome of the study showed that dilution 9x, 9cH, and 12cH reduced the effects of premature aging.
[32]	[31]

30	29
Sarkar T., et al.	Dragicevic V., et al.
2018	2013
Cowpea seed	Maize seed
Seed germination against	plant growth and aging stress
Petri plate	Filter paper+ germination chamber
<i>Cantharis</i> 200c	2,4-dichloro phenoxy acetic acid (3c, 3.75c, 4.5c, 5.25c, and 6c)
Ethanol 200c, water 200c	Distilled water
Not used	Not used
Not mentioned.	Not mentioned.
200 seeds	100 seeds
Yes	No
Yes	No
For 5 minutes seeds were treated with respective treatment and then were rinsed with water and then placed in the BOD chamber (at 45°C for 8 hours) to produce heat stress.	The seeds were placed on filter paper which was soaked with distilled water and respective treatment dilution and kept in the germination chamber.
10 replications	4 replications
The results were analysed using the ANOVA and the Chi-square test.	The results were analysed using the ANOVA, T, and LSD tests.
The results showed that the total chlorophyll contained was more in pre-treatment with <i>Cantharis</i> 200c (88%) and in the water group (88%) as compared to other treatment groups.	The result showed the least significance for germination but the fresh substance (FS), root and shoot length, and redox capacity significantly increased. The authors also observed that FS accumulation was most significantly impacted by the 3c potency, while 4.5c grew longer roots and shoots.
	[43]

31

Nunes A., et al.

2019

*Hypericum perforatum L.*Plant growth in temp. stress
polystyrene boxesExp.1- 20, 25, and 30°C, Exp.2-*Kali carb*,
Natrum mur, *Phosphorus*, and *Silicea* in
12cH Exp.3- *Kali carb* (6, 12, 20, and 30
cH)

Distilled water

Not used

August 2017 and January 2018

50 seeds in each

Completely randomized

Double blinding

The first study tested the effects of different temperatures at 20, 25, and 30°C. The fifty seeds were placed in polystyrene boxes with the germitest paper moistened with respective treatment solution. Then polystyrene boxes were moved from the trays into the germination chamber. For the second and third study germination chamber temperature had been set to 25°C.

Exp.1- 20 replications, Exp.2- 4
replications, Exp.3- 4 replicationsFor statistical analysis Tukey's test, F-test,
Bartlett's test, Shapiro–Wilk test was used.

The study reflects that the percentage of seeds that germinated in the first study at 25 °C was 63%, while at 20 °C it was 26% and 18% at 30 °C. In the second study seed germination tests demonstrated that *Kali carb* 12cH (70.75%) was most effective as compared to the control treatment (62.75%).

[73]

Mirzajani F., et al.

2021

Ornamental plant (*Salvia officinalis*, *Rudbeckia hirta*, *Portulaca grandiflora*, and *Catharanthus roseus*)

Plant growth abiotic stress

Petri plate

Calendula officinalis 30c and *Arnica montana* 200c

Placebo

Not used

Not mentioned.

10 seed in each group

No

Not mentioned

The efficacy of plant germination was studied statistically in two dimensions were (A) temperature and (B) irrigation and for three dimensions, both temperature and irrigation parameters considered. The *Calendula officinalis* 30c dilution was used in the initial stage of seed germination. Before putting the Petri plates in the sunlight, 1 ml of *Arnica montana* 200c dilution was administered. The *Rudbeckia hirta* and *Salvia officinalis* were selected for hormone and enzymatic study because of their higher biomass levels and were analysed with HPLC.

Not mentioned

The results were analysed using the ANOVA.

The result showed that homeopathic treatment enhanced the ability of certain ornamental plant seeds to germinate at extremely low or extremely high temperatures, as well as under excess water or a shortage of water circumstances. The quality of the primary metabolite production, particularly the generation of proteins and carbohydrates, is improved under the treatment with *Calendula* 30c and *Arnica montana* 200c.

Droplet evaporation method (DEM)

34	Betti L., et al.	2013	wheat seed of cv. Pandas	plant growth stress (DEM)	Petri plate	Arsenic 45x	Water 45x, and water.	Not used	Not mentioned.	216 seeds	No	No	The seeds were placed in the Petri plates and then 20 ml of respective treatment dilution was poured. After 96 hours non-germinated seeds were calculated. The droplet evaporation experiment was performed in 3 replicates 5 drops in each replicate.	Exp. 1- duplicated 3 replicates	The results were analysed using the Poisson test, Tuckey test, ANOVA, and ImageJ software.	The result showed that the local connected fractal dimension of DEM patterns grew significantly along with the rate of seeds germinated with Arsenic 45x (NS) 8, 32, 70, and W 45x with (NS) 70.	[40]
33	Baumgartner S., et al.	2012	Cress seedlings	Biocrystallization assay	Glass plates	Aurum met, Stannum met, Cuprum met, Copper sul, gibberellic acid all in 30x	lactose 30x, distilled water 30x,	Not used	Not mentioned.	Not mentioned.	Yes	blinded with coding to the	The seed was placed on chromatography paper that had been soaked in treatment dilutions and allowed to grow in hanging plastic bags for 96 hours. For the formation of biocrystallisation CuCl2 solution was added to the 310 mg of seed extract and then pipetted on glass plates. An electronic camera (textural image analysis) was used to record the evaporation process.	6 replications	The results were analysed using the ANOVA.	The result showed significant improvements with Stannum met 30x on every texture analysis variable and the biocrystallograms of the homeopathically treated cress revealed specific features.	[36]

35

Kokornaczyk M. O., et al.

2014

wheat seeds

plant growth, DEM (stress seed)

Filter paper and test tube

As₂O₃ 45x

Water

Not used

Not mentioned.

560 Seeds

No

Not mentioned

For the droplet evaporation method by Kokornaczyk et al. was used and the experiment was replicated 4 times for collecting 240 droplet residues. The seeds were placed on filter paper and placed inside a polyethylene envelope and kept in a black cardboard envelope then polycrystalline structures were evaluated for local connected fractal dimensions and fluctuating asymmetry by Image J software.

4 replications

The results were analysed using the 2-way, ANOVA.

The results showed that treatment with As₂O₃ 45x increases degrees of bilateral symmetry and local connected fractal dimensions in polycrystalline structures.

[46]

36

Kokornaczyk M. O., et al.

2015

Wheat seed

Force-like effects (DEM)

Polyethylene falcon tubes

As₂O₃ 45x

Water

Not used

Not mentioned.

Not mentioned.

No

Not mentioned

A total of 3 experiments (E) were performed in two different-sized polyethylene falcon tubes and the tubes were connected to each other. In E1 the inner tube was filled with water and the outer tube with As₂O₃ 45x or water, and in E2, E3 inner tube contained seeds and outer As₂O₃ 45x or water. And E3 the seeds were wrapped or not wrapped in aluminium foil and after a week 5 wheat seeds were placed in the inner tube of E1 whereas in E2 seeds were transferred to a new tube with fresh water and As₂O₃ 45x.

6 replications

The results were analysed using the Bartlett test and two-way ANOVA.

The authors observed that in E1 and E2, the As₂O₃ 45x effect could be transferred to water and seeds. Whereas in E3, the As₂O₃ 45x still penetrated the wheat seedlings despite the foil protection.

[5]

37

Kokornaczyk M. O., et al.

2015

Wheat seed (*Triticum aestivum*
L)

Polycrystalline structures (DEM)

Tube

Zincum metallicum 30c

Lactose 30c, and water

Not used

10th Feb. to 03rd March 2014

24 tubes

No

Blinding with coding to

The formation of polycrystalline structures inside the seed leakage droplet residues with their local connected fractal dimensions were analyzed for their complexity using ImageJ software.

3 replications

The results were statistically analysed using ANOVA.

This study concluded that compared to lactose 30c and water, *Zinc met* 30c reduced the complexity of the structures in stressed seedlings although no significant alterations were noticed in non-stressed seedlings.

[52]

Betti L., et al.

2016

Wheat seed (*Triticum aestivum* L. of Pandas variety)

Seed germination (DEM)

Petri plate glass tube

Exp. 1- As 45x, W 45x with number of strokes (4, 8, 16, 32, and 70) Exp.2- As 45x (16, 20, 24, 28, 32, 40, 70, and 100), W 45x (32, 40, 70, and 100)

Pure water

Not used

Biological experiment (Oct 2009 to Jan 2010, Nov 2010 to May 2011), and

Exp. 1- 36 plastic Petri plates, Exp.2- 5 seeds

Allocated randomly

Not mentioned

The 20 ml of treatment solution was poured into the plates then they were allocated randomly in the germination box, which was rotating at 90 rpm, and after 96 hours the non-germinated seeds were calculated.

Exp.2- triplicated

The results were analysed using the Poisson, 2-way ANOVA, and Wilcoxon tests.

The result showed that, increased germination rate at Ns at 32 for both treatment dilutions.

Betti L., et al.

1997

Wheat seed MEC variety

Plant growth under stress

Filter paper, cardboard envelope.

Arsenicum album (As₂O₃) 45x

Distilled water

Not used

November 1993 to February 1994

360 seeds

No

Single blinding

The unbroken and uniform-sized seeds were selected and were stressed with the sublethal quantity of As₂O₃ 0.02% to 0.20% exposed for 30 to 120 minutes. Then placed in a cardboard envelope.

Not mentioned

The results were analysed using Student's t-test.

The study results showed that seeds stressed with As₂O₃ significantly inhibited seedling growth however, the stress seeds treated with the As₂O₃45x (P+T) resulted in longer stem growth compared to the group treated with water (P+0) whereas the roots showed similar results in both (P+T) and (P+0) treatment groups.

Brizzi M., et al.

2005

Wheat seeds MEC variety

Seedlings growth with stress

Filter paper

As₂O₃ (5x, 15x, 25x, 35x, 45x)Agitated water (5x, 15x, 25x, 35x, 45x), water (C1, C2, C3), and the diluted As₂O₃ (10⁻⁵, 10⁻¹⁵, 10⁻²⁵, 10⁻³⁵, 10⁻⁴⁵)

Not used

9 weeks

Not mentioned

No

Yes

The seeds were placed on filter paper and inserted into the cellophane envelope then kept inside the cardboard envelope for natural growth of the shoots and roots.

3 replications

The results were analysed by the Mann-Whitney test and the Kruskal-Wallis test.

The outcome of the study demonstrates that treatment with As₂O₃ (45x) and agitated water (45x) induced a significant increase in seedling growth.

Heavy metal stress	
41	
Binder M, et al.	
2005	
MEC and Pandas variety wheat seed	
Plant growth under stress	
Filter paper	
<i>Arsenicum album</i> 45x	
water 45x, and water	
Not used	
February 2001 to December 2001 and	
Not mentioned	
Yes	
Yes	
The seeds were placed over filter paper and kept in cardboard envelopes which were placed in cardboard boxes and eight separate experiments were conducted.	
Yes	
The result of the study was analysed by the LSD test, Levene test, Kolmogorov-Smirnov test, Chi-square test and Kruskal-Wallis ANOVA test	
The <i>Arsenicum album</i> 45x significantly inhibited wheat shoot length growth by -3% compared to control groups.	
	[19]

42

Betti L., et al.

2013

Kiwifruit

Plant growth and stress

Petri plate

As₂O₃ 5x and 45x

Water

Not used

Not mentioned.

5,000 pollens

No

Yes

The pollen was suspended in a growth medium solution (rehydration phase) then 3ml was poured into each Petri plate then to check the stability of this experiment they performed the germination test with negative control which were non-stressed pollens and stressed with As₂O₃ 150 or 200 µM then transferred to a tube and centrifuged, and the pollen germination rate was analysed with image detection method by Betti et al. on germinated and non-germinated pollens.

3 independent repetitions with coding

The results were analysed using the Z test.

The result showed that the stressed pollen germination rate was increased with *Arsenicum album* 5x and 45x.

[41]

43

Goncalves A. C., Jr. et al.

2017

Wheat plant of cultivar CD150

Plant growth in contaminated soil

Pots

Nux vomica (0, 12, 24, 48, 96, 200, and 400 cH)

Not used

Not used

6 seeds in each pot

Complete randomized block

Not mentioned

The plants were grown in pots filled with soil which was contaminated with 3 concentrations of cadmium salt ($\text{CdCl}_2\text{H}_2\text{O}$) from 0, 1.5, and 3 mg kg^{-1} of dry soil and lead (PbCl_2) from 19, 90, and 180 mg kg^{-1} of dry soil. The soil Liming and fertilization were done before 60 days of planting then the soil was incubated for 30 days. After the incubation period, six wheat seeds of cultivar CD150 were sowed in each pot and after germination three plants were kept per pot.

4 repetitions

The results were analysed using the Tukey test and Scott knott test.

The authors observed that treatment with *Nux vomica* 12cH, reduced soil contamination by lowering concentrations of metal in soil, and the plant height and stem diameter also increased.

[61]

Felito R. A., et al.

2019

Cucumber plants

Plant growth in contamination with herbicide

Cow manure

Nux vomica, *Carbo veg*, and *Arsenicum album* (6cH, 12cH, 18cH, 24cH, and 30cH)

Cow manure with contamination and without contamination

Not used

July to December 2016

Not mentioned

Yes

Not mentioned

The cow manure was fermented and then contaminated with the herbicide (picloram +2.4-D), and then treatment dilution was applied based on the similia principle to the seeds, and evaluation was done after 10 days.

4 replications

For statistical analysis, the F-test and Tukey test were used.

The result showed that *Nux vomica*, *Carbo veg*, and *Arsenicum album* reduce the toxicity of cow dung contaminated with +2.4-D picloram, and showed significant results on all variables analysed.

45

Goncalves A. C. Jr. et al.

2019

Soybean plant (cultivar NIDERA 5909)

plant growth and soil contamination

Pots

Nux vomica (12cH, 24cH, 48cH, 96cH, 200cH, and 400cH)*Nux vomica* 0cH

Not used

Not mentioned.

7 plants per pot

No

Not mentioned

Spraying of treatment dilution on soil was done seven days before and after seeds were sowed, for every 14 days until the cycle was complete. The soil was contaminated with 3 concentrations based on CONAMA Resolution No. 420 resolution of the research values for cadmium salt (CdCl₂H₂O) 0.0, 3.0, and 9.0 mg kg⁻¹ and lead (Pb) 89.0, 180.0, and 540.0 mg kg⁻¹.

4 replications

For statistical analysis, the Tukey test and ANOVA were used.

The result showed that *Nux vomica* enhanced soybean plant height, stem diameter, net photosynthetic CO₂ assimilation, stomatal conductance, and absorption but had no effects on the metal bioavailability in plants.

[75]

47	Plant yield										46																						
Betti L., et al.	Ghazwa boudali et.al.	1994	2022	Wheat seed MEC variety	<i>Lepidium sativum</i> plant	Seed germination	Plant growth under zinc toxicity (stress)	Petri dish	Pots	Exp.1- As ₂ O ₃ (Q, 23x, 30x), Exp.2- As ₂ O ₃ (23x, 25x, 30x, 35x, 40x, 45x),	<i>Zincum metallicum</i> (9 and 15 cH)	Exp.1- distilled water	Zinc 0.05	Not used	Not used	From 1991 to 1992 and	Not mentioned.	Exp.1- 4000 seeds. Exp.2-	Not mentioned.	Yes	Yes	Yes	No	The seeds were randomly placed inside the germination box and then the plates were rotated at 90 rpm for homogeneity of the experiment.	The plants were kept in a growth chamber at 22°c then they were treated with the different concentrations of zinc in 0.5, 1, 1.5, and 2 mM in the form of ZnSO ₄ , and zinc 0.05 was used as a control. The tissue zinc levels were measured by atomic absorption spectrophotometer.	Exp.1- duplicated	Not mentioned	The results were analysed using Poisson distribution and one-way ANOVA.	The results were statistically analysed by one-way ANOVA and the mean was calculated with Duncan's multiple-range test at 5%.	The results showed that t As ₂ O ₃ completely inhibited seed germination however treatment with agitated As ₂ O ₃ did not significantly affect germination compared to the control group.	The treatment with <i>Zincum metallicum</i> 15cH slightly decreased the toxicity of zinc and increased proline and polyphenols, and increased the activities of antioxidant enzymes, and by the restoration of pigment quantities, the inhibition of MDA content leads to plant biomass production.	[12]	[85]

48	Bonato C. M., et al.
49	Hamman B., et al.
2003	2003
Radish seeds	Barley seeds
Plant growth and Yield	Seed germination and plant growth
Vase	Petri plate
Sulphur (5 cH, 12 cH, 30 cH, 200 cH, 1 McH)	HGA ₃ (4cH, 15cH, 30cH, and 200cH)
water	Distilled water
Not used	GA3 at a concentration of 0.5 g/l
3 September to 25 October 2002	Not mentioned.
Not mentioned	Exp. 1- 500 seeds, Exp. 2- 200
Yes	No
Double-blinding	No
The dilution of 1.5 mL Sulphur was added to 1 L of water then 100 mL of this solution was poured into each vase every seven days.	The seeds were placed in a Petri plate for application of treatment dilution, then the germination rate was counted every 4 hours and the Gompertz equation was used to examine the cumulative germination data.
Not mentioned	3 replications
The results were analysed by the t-test for quantitative data and the Scott-Knott test for qualitative data.	The results were analysed by the least significant difference procedure.
The authors observed that Sulphur 5cH, 12cH, 30cH, and 1McH were found to be significantly better for radish production and improved plant growth whereas the 200cH showed negative results on radish growth and production.	The outcome of this study showed that HGA ₃ in all dilutions showed biological response as it increases the germination rate of the barley seeds and the GA ₃ showed biphasic action on seed size and root development.
[15]	[16]

51	50
Bonfim F. P. G., et al.	Baumgartner S., et al.
2008	2004
Rosemary and white lippia	Dwarf Pea
Plant growth	Plant growth
Trays filled with soil mixture	Petri plate, pots, PP Tray
<i>Arnica montana</i> (3cH, 6cH, 9cH, and 12cH)	Plant hormones (abscisic acid, gibberellic acid, indole-3-acetic acid, and kinetin) 1x to 30x
Distilled water and ethanol 70%	Agitated distilled water, and
Not used	Not used
Rosemary species- from 15 April to 30	Not mentioned.
10 stakes	25 seeds
Completely randomized	No
Double-blinding	No
The symbols were used to identify each treatment to avoid bias and 10 stakes of both plants were placed in trays and then treatment dilutions were applied daily for 45 days.	The unbroken seeds harvested in 3 different years (1997, 1998, and 1999) were selected and 100 ml of respective treatment dilutions were poured into Petri plates left for one day then well-swollen 25 seeds were taken from each plate and sowed into 5 different pots.
4 repetitions	6 independent replications
The results were compared by Tukey's test at 5% and ANOVA.	The results were analysed by the F test.
The outcome of the study showed that <i>Arnica montana</i> 6cH had significantly higher mean values for QUALY and PROOT, indicating a stimulatory effect on root growth and quality of rosemary. Whereas <i>Arnica montana</i> 3cH, 6cH, and 12cH promoted root growth in white Lippia plants.	The outcome of the study showed that certain potency levels of gibberellin and kinetin significantly enhanced pea shoot growth compared to control. The authors observed a growth stimulation effect with gibberellin 17x.
[20]	[17]

53	52
Baumgartner S., et al.	Marques R. M., et al.
2008	2008
Dwarf Pea	Sida rhombifolia
Plant growth	Plant growth
Pots	Filter paper
Gibberellic acid (17x and 18x)	<i>Cymbopogon winterianus</i> (3cH, 6cH, 12cH, 24cH, and 30cH)
water, and water 1x	Water
Not used	Not used
Not mentioned.	Not mentioned.
200 seeds	600 seeds
Completely randomized	Yes
Yes	No
Eight independent experiments were conducted, for testing four batches of pea seeds harvested in 1997, 1998, 1999, and 2000 years. The 200 seeds were immersed in respective treatment dilutions for a day, then swollen seeds were sowed in pots.	The seeds were placed on Whatman no.1 filter paper soaked with 5 mL of treatment dilutions.
Not mentioned	5 replications
The result was analysed by 4.1 for Mac and 2-way ANOVA.	Not mentioned
The study outcome showed that two seed batches of the years 1997 and 1998 responded significantly to the homeopathic treatment. Seed batch 1997 exhibited a reproducible reaction to gibberellic acid 17x, resulting in an 11.2% increase in shoot length and its glucose and fructose content was more as compared to other batch seeds.	The <i>C. winterianus</i> stimulated the root and shoot growth of <i>Sida rhombifolia</i> while 24cH inhibited shoot growth. Dilutions 6cH, 12cH, 24cH, and 30cH resulted in greater fresh mass production than 3cH.
[22]	[21]

54	Scherr C., et al. 2009 <i>Lemna gibba</i> (duckweed)	55	Filipe Pereira Giardini Bonfim et al. 2010 lettuce seeds (<i>Lactuca sativa</i> L. of Isla brand)
Plant growth	Beakers	Plant growth	Germitest paper
Kinetin, <i>Argentum nitricum</i> , gibberellic acid, and <i>Lemna minor</i> (14X-30X)	Unsuccused and succused water	<i>Alum</i> (6cH, 12cH), and <i>Calc. carb</i> (6cH, 12cH)	Not used
Not used	Not used	Non-pelleted seeds and	Not mentioned.
from January 2003 to January 2004.	from January 2003 to January 2004.	Not mentioned.	Not mentioned.
2700 beakers	2700 beakers	Absolute randomization	Absolute randomization
Fixed blocked randomization plots	Fixed blocked randomization plots	Double blinding	Double blinding
Coding of treatment	Coding of treatment	Seeds were placed on the germitest paper, which had been wet with 8 ml of the aluminium solution then seeds were placed in the germination chamber.	Seeds were placed on the germitest paper, which had been wet with 8 ml of the aluminium solution then seeds were placed in the germination chamber.
The duckweed was grown in soil and then into Steinberg liquid medium then beaker experiment conducted with healthy samples.	The duckweed was grown in soil and then into Steinberg liquid medium then beaker experiment conducted with healthy samples.	4 replications	4 replications
5 replications	5 replications	The results of the study were analysed by F-test and two-way ANOVA.	The results were analysed using the SAEG software and Tukey's test at 5%
The outcome of the study showed that gibberellic acid had the most significant impact on the frond growth rate of all the treatment groups. The authors also observed that in the negative control experiment, no yield occurred thus it excludes the false positive result of the study.	The outcome of the study showed that gibberellic acid had the most significant impact on the frond growth rate of all the treatment groups. The authors also observed that in the negative control experiment, no yield occurred thus it excludes the false positive result of the study.	The outcome of the study showed a significant positive effect on germination speed index (GSI) and radicle length (RL) samples treated with homeopathic medicine.	The outcome of the study showed a significant positive effect on germination speed index (GSI) and radicle length (RL) samples treated with homeopathic medicine.
[24]	[24]	[26]	[26]

57	Marko S. H., et al.	2013	wheat seed	Plant growth and test hypothesis	Glass dishes	Gibberellic acid 30x (G30x)	Water 30x, water	Gibberellic acid 10 ⁻⁵ , 10 ⁻⁴ and 10 ⁻³ (Ge-5, Ge-4, Ge-3)	7 days	500 to 1000 seeds	No	No	The grains were placed on glass dishes with one layer of filter paper inside each dish, with the germination furrow facing downward.	Not mentioned	The results were analysed using the one-way ANOVA.	The result showed that pre-treatment with Ge-3 produced the greatest growth, followed by Ge-4, and Ge-5. The treatment with G30x slowed down the stalk length.	[39]
56	Lensi M. M., et al.	2010	Common bean (<i>Phaseolus vulgaris</i> L.)	Plant growth	Vase	Nat. mur (6 cH and 30 cH)	5.0% NaCl solution and	Not used	6 weeks, from September	25 plants	No	Not mentioned	The continuation of the treatment was done at intervals of 5 days for 6 weeks and 1 plant from each pot was randomly removed after 6 weeks of planting and plants dried at 100 to 105°C for one hour then the relative growth rate (RGR) of the bean was calculated.	Not mentioned	The results were analysed using the ANOVA.	The outcomes of the study showed that compared to the control group, both potencies of Nat. mur 6cH and 30cH produced significant enhancement in plant growth.	[29]

59	58
Majewsky V., et al.	Panda S. S., et al.
2014	2013
Duckweed seed	Pea seed
Plant growth	Plant growth and
Flask	Petri plate
Gibberellic acid (14x to 30x)	<i>Arsenicum album</i> , <i>Baryta carbonica</i> (8cH, 32cH & 202cH)
Agitated, and non-agitated water	Distilled water
Not used	Not used
Not mentioned.	Not mentioned.
In each experiment 100 flasks	60 seeds
Yes	No
19 coded samples	Not mentioned
Three series of five systemic negative control and test control experiments were carried out. The duckweed was grown in a solid modified Steinberg medium in an Erlenmeyer flask and then transferred to 1.8L glass vessels.	The seeds were placed in a Petri plate and individual treatment solution was applied then germination % was calculated after 2 leaves stage. The photosynthetic activity was calculated after extraction of the chlorophyll pigment by Porra et al. and Arnon 1949 method then the absorbency was measured by UV-spectrophotometer.
5 replications	Not mentioned
The results were analysed using Statistic version 6 and two-way ANOVA.	Not mentioned
The outcome of the study showed that the growth rate was increased with GA3 16x, 18x, 20x, 22x, 23x, and 26x in the third series. The authors also observed that there is no significant difference between treatment with succussed and unsuccussed water.	The outcome of the study showed that all growth variables have a positive effect on both <i>Arsenicum album</i> and <i>Baryta carbonica</i> (8cH, 32cH, and 202cH).
[44]	[42]

60

Marotti I., et al.

2014

Wheat seeds of pandas cultivar

Plant growth and Gene expression

Filter paper and cardboard envelope

As₂O₃ 45x

water

Not used

Not mentioned.

140 seeds

Complete randomization

No

The seeds were placed on filter paper then transferred to a polyethylene bag and then kept in a cardboard envelope for the natural development of the plant. The RNA extraction was performed on the frozen substance with a nucleospin RNA plant kit, and the RNA concentration was determined spectrophotometrically. Whereas the gene analysis was done by linear modelling approach (Limma) and empirical Bayesian method and by quantitative RT-PCR. A 55 set of genes was analysed depending upon their stress-related function for quantitative RT-PCR.

7 replications

The results of the study were analysed by Pearson's correlation coefficient.

The outcome of the study showed a substantial decrease in gene expression levels in stressed seeds treated with As₂O₃ 45x, but the shoot and root growth were increased.

[45]

61	Gupta V. K., et al.	2014	<i>Bacopa monnieri</i> Plant	Plant growth	Tube	<i>Zinc sulph</i> (1x to 6x)	Not used	1 ml MS basal agar medium	2007-2010	Not mentioned	No	No	Exp.1- <i>Zinc sulph</i> 100 microliter was mixed with 900 microliter of MS basal agar medium then this mixture was poured into a micro-centrifuge tube and the 2.5 cm thin terminal branch (twigs) of <i>Bacopa monnieri</i> plant was inoculated in it whereas in Exp.2 twigs were treated in triplication with respective treatment groups for a night and then inoculated in the MS basal agar then these media were poured into a micro-centrifuge tube without <i>Zinc sulph</i> .	Not mentioned	ANOVA was used for statistical analysis.	The result showed that <i>Zinc sulph</i> 6x potency promoted the growth of <i>Bacopa monnieri</i> plant.	[49]
62	Pongratz W. S., et al.	2015	Wheat (<i>Triticum aestivum</i>) seed Capo variety	Plant growth	Glass plates	<i>Silver nitrate</i> 24X	Water and water 24x	Not used	1989 and 2014	5000 grains per group	Stratified randomization	Independent Dilution coding	Thirty experiments in the years 1989 and 2014 along with 5 different researchers were conducted and the seeds were placed in glass plates with the germination furrows were observed for a period of one week.	Not mentioned	Statistically, the standard deviation of the mean was analysed, and results were confirmed.	The outcome of this experiment showed relative variations in the stalk lengths, thus clarifying that the development was found to be enhanced by the probe <i>Silver nitrate</i> 24x as compared to that of water.	[53]

63	Kraus C., et al.	2016	Wheat seed (Triticum aestivum)	Seed germination	Glass dishes	Silver nitrate ($10e^{-2}$ to $10e^{-10}$) and agitated <i>Silver nitrate</i> ($10x^{-2}$ to $10x^{-10}$)
64	Thieves K., et al.	2016	Wheat seed (Triticum aestivum L., of Florida	Plant growth and test	Glass lid of a glass jar	<i>Sulphur</i> Im (VI)
					Placebo globule and water	Water
					Not used	Not used
					1 Month	Autumn 2015
					20 grains in each group	2000 seeds
					Meta, in situ, and central	No
					Coding of treatment	Yes
					The authors conducted a total of 5 experiments which included one test phase, after the successful result of the test phase other 4 experiments (in 4 weeks) were conducted which formed the base for statistic evaluation. Then 20 grains were placed in each glass jar with a lid which was covered with a piece of filter paper.	The seeds placed on the glass dishes then treatment dilution was poured with the blinding method then dishes were covered by lids and placed in drawers.
					Not mentioned	Not mentioned
					The results were analysed using the regression model, odds ratio 95%, and SAS 9.4.	Not mentioned
					The authors observed that <i>Sulphur</i> significantly increased growth and germination (more than equal to 1 mm) compared to placebo.	The outcome of the study reflects that potentized <i>Silver nitrate</i> ($10x^{-2}$ to $10x^{-10}$) increased germination rate (K1) compared to silver nitrate.
					[58]	[57]

65

Riss J. S. P., et al.

2017

Lettuce seeds (Veronica cultivar)

Plant growth

Polystyrene trays

Amica montana, *Calcaria carb*,
Carbo veg, *Silicea*, *Phosphorus*,
Pulsatilla, and homeopathic
preparation of acai waste (6cH,
12cH, and 30cH)

Water and alcohol 30%.

Not used

From 10th November to 29th

128 seeds in each

No

Coding of treatment with double

The homeopathic acai mother
tincture was prepared with 100g of
waste acai (waste of skins and
seeds) blended with 1000 ml
distilled water. The treatment
dilutions were applied one week
after seedling development for 28
days (three times a week).

4 replications

The results were analysed using
the Scott knott test at 5%.

The authors observed that the
dilution of *Carbo veg* 6cH,
Calcaria carb 12cH, *Silicea* 12cH,
Phosphorus 12cH, *Pulsatilla* 12cH,
and homeopathic acai 12cH,
significantly improved all
parameters evaluated as
compared to the control group.

[64]

67	66
Atz de Vilhena Moraes L. C. C., et al.	Pulido E., et al.
2018	2017
Eucalyptus seed (urophylla S.T. blake	Broccoli seed (Piracicaba precocious hybrid variety)
Plant growth	Plant growth
Pots	Polystyrene trays and in field
<i>Phosphorus, Calcareo carb, Kali mur, and Magnesia carb</i> (3cH and 12cH)	<i>Arnica montana, Silicea, Carbo veg, and Sulphur</i> (6cH and 30cH)
Water and alcohol 3cH	Water
Not used	Not used
From 30 April to 23	2011 to 2012 Exp. 1- from 30/09/2013 to
50 pots in each test	Exp. 1-128 plant in each tray
Yes	Complete randomization
Double-blinding	Double blinding
The seeds were sown in pots each containing one seed and then treatment was given three times in a week for three months.	For the greenhouse study, a total of 3 experiments were carried out and treatment dilutions were applied every 4 hours till the transplantation (phenological stage V ₀). For the field study, 2 experiments were carried out and ten plants were transplanted in double lines on each plot. A week after the transplantation till harvesting, treatment dilution was administered every fifteen days.
5 replications	4 replications
Tukey or Dunnett test was used for statistical analysis.	The results were analysed using the ANOVA and Tukey test.
The result showed that <i>Kali mur</i> 12cH increased root length by about 55%, and <i>Phosphorus</i> 3cH increased the total fresh mass as compared to controls.	The authors observed that the stem diameter, root length, and dry mass of the shoot and root were all increased by <i>Silicea</i> 30cH and fresh and dry mass increased with <i>Sulphur</i> 6cH. The authors also observed that in field studies, <i>Silicea</i> 6cH, <i>Carbo veg</i> 30cH, and <i>Sulphur</i> 30cH all boosted plant height.
[67]	[65]

69	68
Mioranza T. M., et.al	Ubessi C., et al.
2018	2018
Tomato plants	Chamomile
plant growth	Plant growth
Pots	Pots
<i>Thuja occidentalis</i> (6cH, 24cH, and 50cH)	<i>Phosphorus</i> (3cH, 6cH, 12cH, and 30cH)
Water and nematode free	70% alcohol and distilled water
Not used	Not used
Not mentioned.	136 days (Aug to Dec)
4350 eggs and 700 J2	Not mentioned
Randomized block	Complete randomization
No	Double-blind
The seeds were sowed in a polystyrene tray, and after 25 days plants were moved to plastic pots. The plant roots were dipped in 0.1% treatment dilution prior to transplantation to pots and then plants were infected with a suspension of <i>M. incognita</i> . The gas exchange was evaluated with an infrared gas analyser (IRGA) and portable photosynthetic system.	The seeds were planted in pots that contained H. Decker substrate and then placed on tiles packed with crushed stones. Then treatment dilution was sprayed over the apical section of the plants twice a week and continued for 136 days.
4 replications	4 replications
For statistical analysis, Tukey test and linear regression were used.	For statistical analysis, Scott knott test ANOVA was used.
The authors observed that treatment with <i>Thuja</i> 24cH reduced the rise in CO ₂ fixation in tomato plants inoculated with <i>M. incognita</i> , resulting in behavior comparable to that of healthy plants.	The result showed that <i>Phosphorus</i> 30cH enhanced flower production per hectare and <i>Phosphorus</i> 3cH enhanced flower diameter and height.
[71]	[70]

Jain S., et al.

2021

Bhindi (*Abelmoschus esculentus* L.)

Plant growth

Field

Zincum metallicum (6 and 12cH)

Water

Not used

60 days

90 plants

No

No

On alternate days, the treatment dilutions were administered. The study design was a prospective experiment with a parallel arm-controlled study.

Not mentioned

The results were analysed using the ANOVA.

The result showed groups that received Zincum 6cH and 12cH, there were 335 and 267 fruits respectively, and 159 fruits in the control group. For plant heights treated with Zincum 6cH (48.4 cm) and Zincum 12cH (40.1 cm) whereas in the control group (31.6 cm). Plants receiving Zincum 6cH (13.3 cm) and 12cH (10.3 cm) had pods that were substantially longer than those receiving regular water (8.9 cm).

Banerjee S. S., et al.

2021

Rice plant

Plant growth

Plots

Paraquat 30cH

Water

Not used

June to July 2019

Not mentioned

Yes

No

Plants were transferred from the nursery plots to the test plots after development. Then herbicide, insecticide, fungicide, and insecticide were sprayed on the test plots. The *Paraquat 30cH* was sprayed with foliar on rice plants three times, with a week gap.

Not mentioned

For statistical analysis, an independent t-test was used.

The result showed that *Paraquat 30cH* enhanced the growth, chlorophyll content, and rice yield by 19.35% in comparison to the control.

Phytochemical models

74	Bonato C. M., et al.
2009	Mint plants (<i>Mentha arvensis</i> L.)
Enhancing secondary	Vases
<i>Arsenicum album</i> and <i>Sulphur</i> (6cH, 12cH, 24cH, and 30cH)	
Distilled water	Water
Not used	Not used
6 months	98 days
Not mentioned	144 homogenous units.
Yes	Yes
No	No
The components of the essential oil were determined using gas chromatography-mass spectrometry (GC-MS).	The seeds were cut into 3 cm pieces and distributed into 144 homogenous units then 4 rhizomes were sowed in each of 4 L vases and the fresh and dry mass weight was calculated with an analytic scale (GEHAKA AG200) and total essential oil by hydro-distillation with the Clevenger apparatus.
	4 replications
The results were analysed using the one-way ANOVA and	The results of the study were analysed by the Scott-Knott test at 5%.
The authors observed that plants treated with <i>Phosphorus</i> had the greatest amount of β -pinene, trans-pinocamphone,	The outcome of the study demonstrates that <i>Sulphur</i> had a greater effect on increasing fresh and dry biomass compared to the <i>Arsenicum album</i> whereas both drugs increased plant height in all dilutions.
[30]	[23]

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Sakalauskiene S., et al.

2012

Tomatoes plant (vytenu
and balciai cultivars)

Secondary metabolites

Pots

Ocimum basilicum (6x,
30cH, 200cH, and 11m)

Not used

Not used

1 month

Not mentioned

No

No

The treatment dilution was sprayed once a week on each plant a total of 4 sprays were applied and spectrophotometry was used for the analysis of the firmness, dry soluble solids, dry matter, beta-carotene, and lycopene whereas titratable acidity was analysed by potentiometer.

Not mentioned

The results were analysed using the one-way ANOVA.

The outcome showed that beta-carotene content increased with every dilution of *Ocimum basilicum*, and 6x, 200cH raised the amount of lycopene present in tomatoes.

[37]