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Beneficial Developmental and Yield-Enhancing Results of Scallop Shell Powder Applications in Plants and Chickens Against Climate-Changing

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ABSTRACT

Background and Aim: Heated scallop shell powder exhibits strong antimicrobial activity to vegetative bacteria, spores, fungi,and even viruses. Alkaline effects caused by the hydration of calcium oxide are considered one of the primary mechanisms of the antimicrobial action of heated SSP. The scallop shell powder nanoparticles (SSPNP) probably have a different isotope than the ca++ isotope 42. In this study, we aimed to investigate whether the beneficial effects of Scallop shell powder nanoparticles on plants with and without Scallop shell powder nanoparticle treated and chickens fed and watered with Scallop shell powder nanoparticles.

Methods:

a) Application for Plants: 200 grams of scallop shell powder is added to 400 liters of water and mixed. Tomatoes are watered with this solution twice, once every 20 days. Application for chickens 5 grams of Heated SSP (Calcarea) is put into 16 liters of water. A total of 90 chickens met their water needs from this solution. In addition, 150 gr. Heated SSP was mixed as a powder into daily nutrition menus. There was no heating or lighting in the henhouse in the evenings.

Results: Tomato seedlings with adjuvant HSSP had larger and healthier tomatoes. Their taste was natural. They were resistant to temperatures of 50 degrees Celsius. They have a longer shelf life and become more durable. Tomato seedlings were regrowth from the same root and bearing fruit. The fruits of tomato seedlings not treated with HSSP were small and soft and susceptible to early spoilage Figures (1&2) (Video 1). HSSP-treated peppers were also firm, well developed, and flavorful. 40 root pepper seedlings emerged from the seeds of this pepper sprayed with heated SSP (Figure 3). It is also noteworthy that grape clusters form again in grape seedlings. Insects also stayed away from the plant. Eggs of hens fed with HSSP were larger and more robust. Daily egg production increased from 90. chickens to 40 to 85 eggs (Figures 4A-4D).

Conclusion: For these reasons, Heated SSP can be a harmless breakthrough agent when used properly to increase plant and animal products in our world that may face starvation in the coming years.

Introduction

Scallop shells are waste products of scallop harvesting in the district of Korea and Japan. Large numbers of shells are heaped near the seaside, creating problems such as offensive odors and soil pollution from heavy metals contained in the viscera. Therefore, new applications for scallop shells need to be developed. Scallop shells contain calcium carbonate ($CaCO_3$) as the main component when scallop shells are heated to >700^{0}C is converted to calcium oxide (CaO). Scallop shell powder produced by calcination process-the average diameter of the powder particles being 20 μm (SSP)-can be further ground into nano-sized particles, with an average diameter of 500nm, Heated scallop shell powder (HSSP) exhibits strong antimicrobial activity to the vegetative bacteria cells, spores, and fungi [1-4]. Alkaline effects caused by the hydration of calcium oxide are considered one of the primary mechanisms of the antimicrobial action of heated SSP. CaO has been utilized mainly as an acidity regular and food additive [1,2]. The scallop shell powder nanoparticles (SSPNP) probably have a different isotope than ca++ isotope 42. In this study, we aimed to investigate whether the beneficial effects of Scallop shell powder nanoparticles on plants with and without Scallop shell powder nanoparticle treated and chickens fed and watered with Scallop shell powder nanoparticles. The study was performed in compliance with the ethical standards laid down in the 1975 Declaration of Helsinki.

Methods

Application for Plants

200 grams of scallop shell powder is added to 400 liters of water and mixed. Tomatoes are watered with this solution twice, once every 20 days.

Application for Chickens

5 grams of Heated SSP (Calcarea) is put into 16 liters of water. A total of 90 chickens met their water needs from this solution. In addition, 150 gr. Heated SSP was mixed as a powder into daily nutrition menus. There was no heating or lighting in the henhouse in the evenings.

Results

Tomato seedlings with adjuvant HSSP had larger and healthier tomatoes. Their taste was natural. They were resistant to temperatures of 50 degrees Celsius. They have a longer shelf life and become more durable. Tomato seedlings were regrowth from the same root and bearing fruit. The fruits of tomato seedlings not treated with HSSP were small and soft and susceptible to early spoilage Figures (1&2) (Video 1). HSSP-treated peppers were also firm, well developed, and flavorful. 40 root pepper seedlings emerged from the seeds of this pepper sprayed with heated SSP (Figure 3, Video 2). While there was early softening in Razak grapes before, it was observed that the grapes became hard after using comb powder. It looks very healthy, durable, and productive as the farmer stated. It is also noteworthy that grape clusters form again in grape seedlings. Insects also stayed away from the plant (Video 3). Eggs of hens fed with HSSP were larger and more robust. Daily egg production increased from 90 chickens to 40 to 85 eggs (Figures 4A-4D).

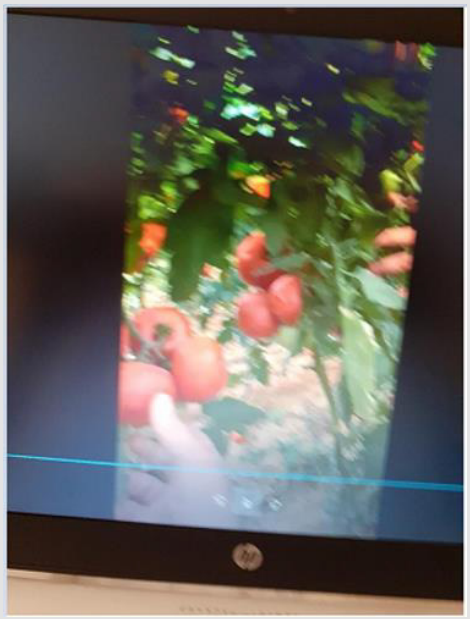

Figure 1: Heated Scallop shell powder treated tomotoes were also firm, well developed, and flavorful.

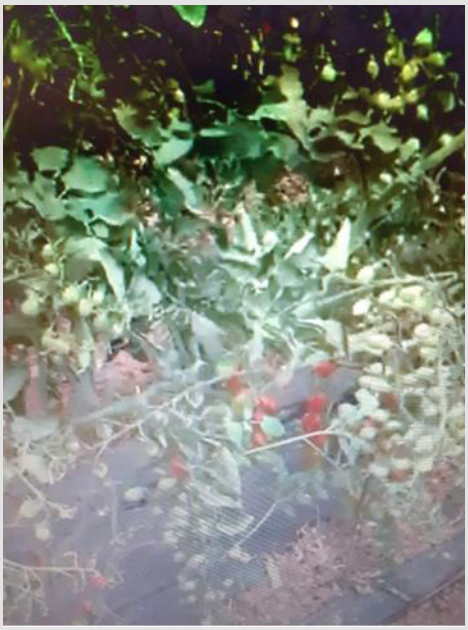

Figure 2: The fruits of tomato seedlings not treated with HSSP were small and soft and susceptible to early spoilage.

Figure 3: Heated Scallop shell powder treated peppers were also firm, well developed, and flavorful.

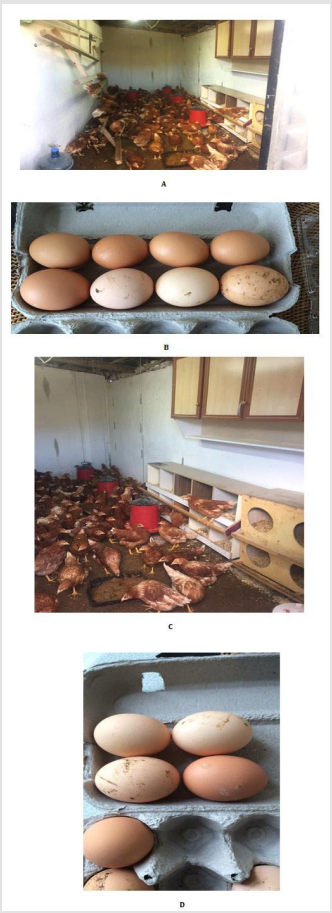

Figure 4: Chickens and their eggs with heated scallop shell powder added to their daily diet.

Discussion

In Japan, SSP has licensed as a food additive, which means if domestic animals eat SSP by accident, they are in a safe state. HSSP is classified as an existing food additive to fortify calcium in the Food Sanitation Law in Japan [2]. Therefore, the use of HSSP in food processing is expected to extend the shelf life of foodstuffs as well as provide a source of minerals and reduce pollution. There are many studies on the shelf life of foodstuffs and antimicrobial actions of HSSP [1-4]. Moreover, there are no studies on beneficial developmental and reproductive results of scallop powder applications in plants and chickens. We investigate whether the beneficial effects of Scallop shell powder nanoparticles on plants with and without Scallop shell powder nanoparticle treated and chickens fed and watered with Scallop shell powder nanoparticles. We observed the following results in our own study: Tomato seedlings with adjuvant HSSP had larger and healthier tomatoes. Their taste was natural.

They were resistant to temperatures of 50 degrees Celsius. They have a longer shelf life and become more durable. Tomato seedlings were regrowth from the same root and bearing fruit. The fruits of tomato seedlings not treated with Calcarea were small and soft and susceptible to early spoilage (Video 1). Calcarea-treated peppers were also firm, well developed, and flavorful. 40 root pepper seedlings emerged from the seeds of this pepper sprayed with heated SSP (Figure 1, Video 2). It is also noteworthy that grape clusters form again in grape seedlings. Insects also stayed away from the plant. Eggs of hens fed with Calcarea were larger and more robust. Daily egg production increased from 90 chickens to 40 to 85 eggs. In our opinion, HSSP was effective in all developmental stages of plant seeds from the embryo stage. Hairy stem cells, xylem, phloem, and stoma of plants become more active. Moreover, presumably, plants are also protected from the harmful effects of plant bacteria, spores, fungi, viruses, and harmful chemicals and insects thanks to HSSP. HSSP cleans the transmission paths without changing the genetics of the plant, opens new flowers. Necessary nutrients, water, and minerals easily reach the plant's extreme point.

The Chicken eggs also become thicker and stronger with the effect of cao. According to Tsijumara et all, When the powder was spread on containers or on a chicken farm, its antiviral activity lasted more than 8 months. Scallop-shell powder seems to be a good candidate of materials for the enhancement of biosecurity in farms (2). CaO has been mainly used as an acidity regular and food additive [2-4]. Calcium (20Ca) has 26 known isotopes, ranging from 35Ca to 60Ca. Calcium consists of a mixture of 6 isotopes in nature. It is the lightest first element naturally with 6 isotopes. These isotopes are Ca-40 (96.94%), Ca-42 (0.647), Ca-43 (0.15%), Ca-44 (2.09%), Ca-46 (0.006%), and Ca-48 (0.187%)) is. 97 percent of

its occurrence in nature is the Ca-40 isotope. A total of 25 isotopes have been characterized. Some of its isotopes are radioactive. The scallop shell powder nanoparticles (SSPNP) probably have a different isotope than the ca++ isotope 42 [5].

Conclusion

In conclusion that, for these reasons, Heated SSP can be a harmless breakthrough agent when used properly to increase plant and animal products in our world that may face starvation in the coming years. We tought that considered to possess different isotope mechanisms in addition to alkalinity on beneficial developmental and reproductive results of scallop powder applications in plants and chickens, and soilless agriculture.

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Conflict of Interest

None to declare.

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