Q-Bacter and Fungi-Q: Properties and Advantages

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Abstract

Out of the line of Quimcasa products, Q-Bacter and Fungi-Q posses pronounced antagonistic properties against pathogenic microorganism. They exhibit a high antibiotic activity against fungi and bacteria, due to production of very broad-spectrum antibiotics.

Introduction

The line of products Quimcasa is unique in the market; when applied periodically, our line of products will reduce cost and increment productivity. Our products have the means to prevent many illnesses caused by bacteria, mold or virus. The purpose of this paper is to explain the properties and advantages of two of our products, **Q-Bacter (QB) and Fungi-Q (FQ).** FQ consists of different strains of *Bacillus subtilis,* while QB consists of different strains of *Acetobacter lovaniensis*; both exhibit a very broad and at the same time degree varying antibiotic and anti-fungal spectra of activities against microorganisms; they act as an antagonist for many pathogens, suppressing their growth in both in vitro and in vivo (Todorova ,2009). They are recommended to be used separately and specifically, QB for bacteria and FQ for fungi.

FQ is effective against *Alternaria solani, Aspergillus fumigatus, A.nigger, Botrytis cinerea, Fusarium colmorum, F. Graminearum, F. Oxysporum, Rhizoctonia sp., rhizopus stolonifer, Pythium aphanidermatum, Sclerotinia sp and Mycosphaerella fijiensis.* QB is effective against *Erwinia amylovora, Pseudomonas savastanoi, Ps. Syringae, Xanthomonas sp* and *Clavibacter sp.*

Due to the nature of QB and FQ, both products are able to mix with the rest of the Quimcasa products. Such combinations depend sorely on the kind of treatment: sanitation, nutrition, regeneration, ect... On example is the combination of ether FQ or QB with **Q Algy** or **Q Amino**; this combination will not only result in an increment of bacterial growth and colony size, but also in better results.

As mentioned before, the intention of this paper is to elucidate all the different advantages and capabilities our products posses.

In order to test the antibacterial and anti-fungal properties of our products, we conducted several in vitro studies. The results were as follow.

Methodology

The Spectra of action of the products were studied in vitro from a cultural medium and sterile filtrate. Moulds and bacteria were used as test-microorganisms (Todorova, 2009). Disc diffusion method of Bauer was used. The variation consisted in the reversal of pathogenic placement (Dhanapathi,

2009). Both products were applied at their recommended dose; 4 ml per liter.

Preparation and maintenance of the test-microorganisms.

All Thermophilic and mesophilic bacteria were maintained by periodical reinoculation in test-tubes or on a Petri dish containing Nutrient Agar. The fungi were maintained on a Petri Dish containing Potato Dextrose Agar. All were incubated at 37ºC for 24 hrs and at 28ºC for 48 h. All cultures were stored at room temperature and re-enaculated at an interval of 1-3 months (Todovora, 2009).

Bacteria

We used a nonselective media, Nutritive Agar, to test the antibacterial action of QB. The pathogens utilized were: *Clavibacter sp, Xanthomonas sp and Pseudomonas sp.* .5 ml of QB were poured in to each sterile Petri dish, along with 20 ml of Nutritive Agar. The Petri dishes were placed on a leveled surface and allowed to cool at room temperature. After the nutrients medium´s solidification the pathogens were inoculated on its surface, by means of a sterile circle of filter paper, grade 3, with a radius of 1.25 cm. Each circle was inoculated with a pathogen bacteria and positioned at the center of the Petri dish. The spectra of antibiotic action was determined by the outward growth of the pathogen in the treated Petri dishes and the growth of our test group. The diameters of the growth zones were determined in Cm.

Mould fungi

Potato Dextrose Agar was used to test the anti-fungal action of FQ. The pathogens utilized were: *F. Oxysporum, Sclerotinia sp and Rhizoctonia sp.* .5 ml of FQ were poured, along with 20 ml of Potato Dextrose Agar , in to each sterile Petri dish. The petri dishes were places on a leveled surface and allowed to cool at room temperature. Once the medium solidified, the fungi were inoculated by means of a 19mm circle of the previous cultivated fungi. The circles were placed at the middle of the Petri dish. The spectra of anti-fungal action was determined by the outward growth of the pathogen in the treated dishes and the growth of our test group. The diameters of the growth zones were determined in Cm.

Results

Bacteria

The results from the screening are presented in Fig. 1. QB exhibit an inhibitory action against all the tested bacteria. The antibacterial action was pronounced, demonstrated in Fig. 2, where the difference in growth is 2.5 cm. The data for Fig.1 and Fig 2 was collected after 96 hrs of the initial incubation.

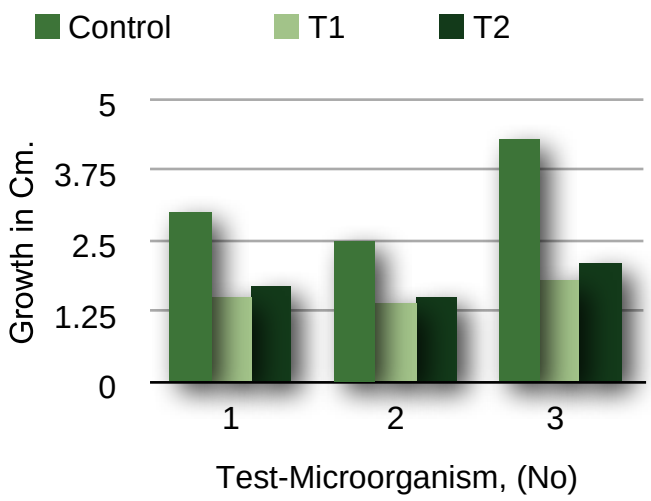


Fig. 1 in vitro screening of QB for antagonism against pathogenic bacteria: 1, *Clavibacter sp; 2, Pseudomonas sp; 3, Xanthomonas sp.*

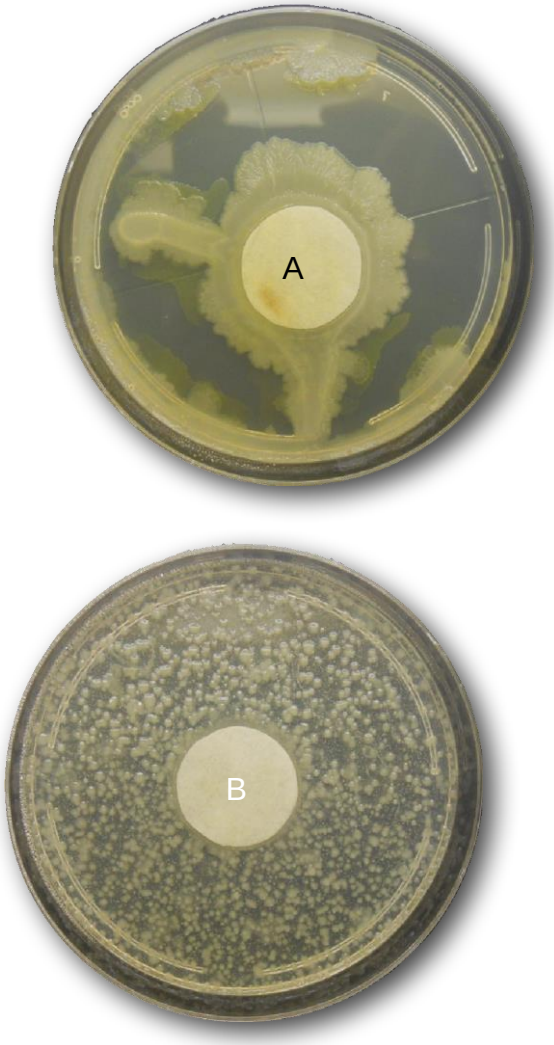


Fig. 2 Inhibition effect of BC on *Xanthomonas sp. Image A* is our control group (3.8 cm in radius) the pathogen has covered the entire dish. Image B is T1 (1.3 cm in radius), the pathogen has barely grown, all the little white colonies present are from our product QB.

Mold fungi

FQ antimicrobial action is fungicidal as the inhibition zones were very pronounced, demonstrated in Fig.3 , with out visible growth of the fungal mycelium, shown in Fig.4. FQ exhibited a most pronounced antagonism against pathogenic fungi. The data for Fig. 3 and Fig. 4 was collected after 96 hrs of the initial incubation.

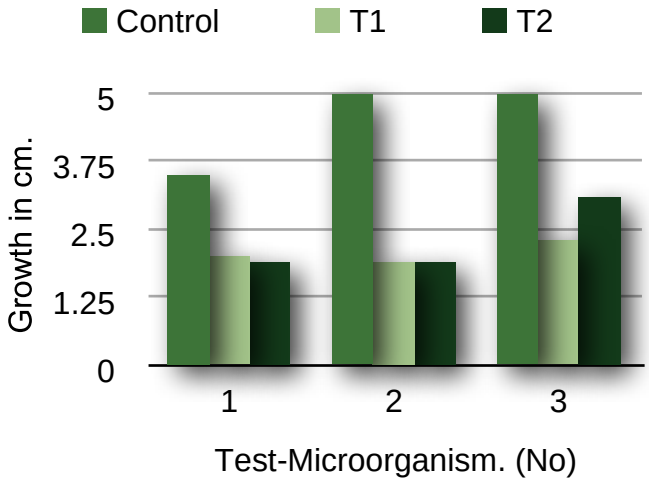
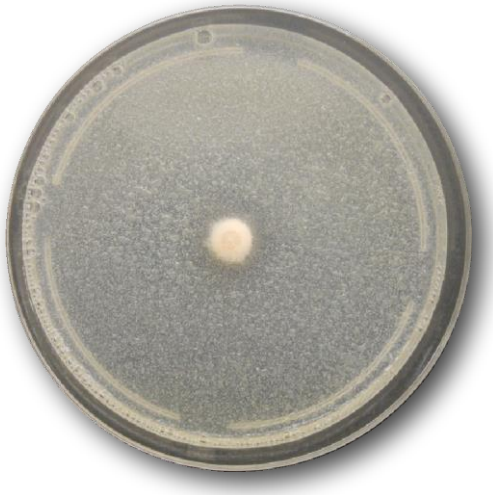


Fig.3 In vitro screening of FQ for antagonism against pathogenic fungi: 1, *F. Oxysporum; 2, Sclerotinia sp; 3, Rhizoctonia sp.*

A



B

Fig.4 Inhibition effect of FQ on *F. Oxysporum. Image A* is our control group (2.8 cm in radius) the pathogen has covered the entire dish. Image B is T2 (1.9 cm in radius), the pathogen has barely grown, all the little white colonies present are from our product FQ.The development was completely stopped, the color of the control group is vibrant pink, while the color of the fungi in the treated box is more subdued.

Conclusion

Both products manifested the ability to inhibit the growth of a great number of microorganisms, including soil, leaf and post harvest pathogens, that cause diseases of economic significance (Todovora, 2009). The inhibition zones of fungi and bacteria were very pronounce and clear which determines the fungicidal and bactericidal effect of QB and FQ. We continued to monitor the zones after the treatment; the inhibition effect was preserved and enhanced. The mycelium and bacterial mass in the zones was highly reduced.

Our objective is to create quality products that encourage better health and production. The line of Quimcasa products have a high efficiency in the control of agricultural pathogens.

References

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