LABORATORY SCREENING OF BOTANICALS AGAINST DISEASE-CAUSING MICROORGANISMS IN DRAGON FRUIT

Research Study

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A Research Study Presented to the Faculty of the
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ABSTRACT

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Laboratory screening of 10 botanical plants against two fungi, namely: *Fusarium sporotrichioides* and *Colletotrichum gloeosporioides,* and two bacteria, namely; *Enterobacter cloacae* and *Serratia marcescens* was conducted using Inhibition Zone Technique. Chives (*Allium schonoeprasum*), garlic (*Allium sativum*), lemon balm (*Melissa officinalis*), lemongrass (*Cymbopogon citratus*), mugwort (*Artemisia vulgaris*), oregano (*Coleus amboinicus*), parsley (*Petroselinum crispum*), rosemary (*Rosmarinus officinalis*), tarragon (*Artemisia dracunculus*), and thyme (*Thymus vulgaris*) were evaluated. Commercial fungicide, bactericide and distilled water served as controls.

Results showed that botanical extracts contain fungicidal and bactericidal properties that inhibited the growth *in vitro* of the test pathogens. Lemongrass and parsley were the most effective against *Fusarium sp.* while garlic and mugwort were the most effective against *Colletotrichum sp.* Lemongrass and garlic were the most effective against *Enterobacter* sp. and *Serratia* sp., respectively.

The above botanicals can control the diseases caused by the respective microoorganism, therefore, could possibly be used as an alternative for both commercial fungicide and bactericide. The mechanism of action of a particular botanical seems to be specific to a particular organism. Thus, it is suggested to use the botanicals to a specific disease and corresponding causal organism.

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INTRODUCTION

Dragon fruit (*Hylocereus undatus*) is a vine-like cactus with a stunningly beautiful fruit with intense color and shape, magnificent flowers, and a deliciously refreshing taste. It is known by different names as Pithaya, Strawberry pear, Belle of the Night, Chaca, and many others. Dragon fruit is a native plant from Mexico and Central America but is cultivated mainly in Southeast Asian countries. Introduced by the Spaniards in 1900, the fruit recently become a popular commodity in the Philippines particularly among farmers in Cavite because of its production and commercial value such as food, beverage, dessert, wine, and amazingly health benefits (Flores, 2007).

Dragon fruit diseases have been reported to be due to a number of causes affecting its production. The soft rot bacterial pathogen, *Erwinia carotovora,* was reported threatening dragon fruit plantation in Malaysia (Cheah & Zulkarnain, 2008). Likewise, the fungus, *Fusarium oxysporum,* infecting the fruit and stem, was reported in Columbia where plantation is severely affected (Ganasena et al., 2006). In the