

Allelopathic Effects of Vanilla Essence on Seed Germination & Root Length of *Hordeum Vulgare* (Barley) Seed

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ABSTRACT: A major use of vanilla is in flavouring ice cream. The most common flavour of ice cream is vanilla, but it may be allelopathic for germination of seeds and root length. An experiment was conducted to determine the effect of vanilla essence on *Hordeum vulgare*. Vanilla planifolia essence were prepared by using acetone, methanol, and distilled water as solvent. Different concentration (0.1ml, 0.2ml, 0.3ml & 0.4ml) were used for the treatment of seed for different duration. The treated seeds were then taken on to test their germination by using blotting paper method (Agarwal,1980). The well germinated seeds in each concentration were counted after day-1, & day-3 treatment and expressed. The experimented data analyzed that the vanilla essence has significant effect on germination of *Hordeum vulgare* seeds and their root length. Interaction of different biochemicals to seeds of different dose level has been resulting the allelopathic effect on seed germination and their root length. As a result the vanilla essence interacts to seeds in the form of allochemicals and showed allelopathic properties that can inhibit the seed germination and their root length.

Key words: Allelopathy, Root Length, Seed Germination, Barley Seeds, Vanilla essence.

Objectives

A major use of vanilla is in flavouring ice cream. The most common flavour of ice cream is vanilla, but it may be allelopathic for germination of seeds and root length. An experiment was conducted to determine the effect of vanilla essence on *Hordeum vulgare*.

The experimented data analyzed that the vanilla essence has significant effect on germination of *Hordeum vulgare* seeds and their root length.

INTRODUCTION

The Vanilla Orchid is a member of the Orchidaceae and is also called *Vanilla planifolia* or *Vanilla fragrans*. This species is among an assortment of vines found in abundance in Mexico. Although commercial cultivation of vanilla is done outdoors, this plant grows best indoors along with other houseplants. Hernan Cortes, the well known navigator, was the first to discover this vine in Mexico and carry the vanilla plant to Europe. Before Cortes discovered this aromatic plant, the Aztecs made use of vanilla to add essence to a popular chocolate drink. Edmond Albius was the first to grow vanilla domestically or non-commercially during the middle of the 19th century. A major use of vanilla is in flavoring ice cream. The most common flavor of ice cream is vanilla, and thus most people consider it to be the "default" flavor. By analogy, the term "vanilla" is sometimes used as a synonym for "plain". Although vanilla is a prized flavoring agent on its own, it is also used to enhance the flavor of other substances, to which its own flavor is often complementary, such as chocolate, custard, caramel, coffee, cakes, and others.

The food industry uses methyl and ethyl vanillin. Ethyl vanillin is more expensive, but has a stronger note. Cook's Illustrated ran several taste tests pitting vanilla against vanillin in baked goods and other applications, and, to the consternation of the magazine editors, tasters could not differentiate the flavor of vanillin from vanilla however, for the case of vanilla ice cream, natural vanilla won out. A more recent and thorough test by the same group produced a more interesting variety of results; namely, high-quality artificial vanilla flavoring is best for cookies, while high-quality real vanilla is very slightly better for cakes and significantly better for unheated or

lightly heated foods. Vanilla is used as a flavoring agent in ice cream, but it may be Allelopathic for germination of seeds and their root length. The aim of the present study was to determine the effect of vanilla essence on barley seed germination and their root length

MATERIAL AND METHODS

In order to determine the effect of Vanilla (*vanilla planifolia*) essence on *Hordeum vulgare* and seedling growth and their root length. The factor included different concentrations of the vanilla essence (0.1ml, 0.2ml, 0.3ml & 0.4ml) including control.

In this experiment, 20 seeds were soaked with different concentrations for 24 hours. After 24 hours, the treated seeds were placed on petriplates. The ratio of 4 different concentrations were added to each petriplates. Their solution were applied where required during the course of experiment. Then, petriplates were incubated at 20°C and germinated seeds and their root length (protrusion of radical by 2mm) were counted every day upto three days. Their percentage of seed germination and their root length was also determined. At the end of test the length of roots were measured.

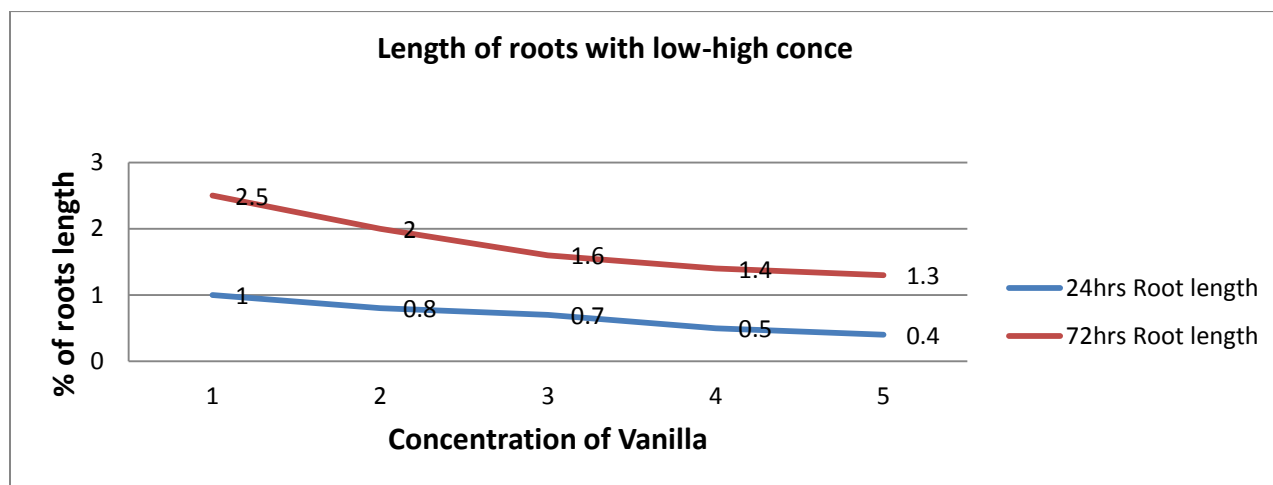
RESULTS AND DISCUSSION

Percentage of root length of *Hordeum vulgare* seeds in control (Vanilla essence concentration of 0%) was significantly higher than that of rest of the concentration of Vanilla essence treatments. While, root germination of *Hordeum vulgare* were stimulated in, 0.1%, 0.2%, 0.3%, and 0.4% of Vanilla essence concentrations. However, highest concentration of this essence (0.4%) has inhibitory effect on root germination of all barley species (Tab. 1). Difference of mean germination time of *Hordeum vulgare* among control and Vanilla essence treatments were not significant. However, with increasing these essence concentrations, mean germination time of *Hordeum vulgare* was significantly increases vanilla essence treatments were significantly reduced root germination rate of *Hordeum vulgare* seeds, compared with control. In contrast, difference in germination rate of *Hordeum vulgare* in control and vanilla essence treatments was statistically variable. (Table-1).

Tabel 1. Seed Germination Table Of Barley (*Hordeum Vulgare*) On The Effect Of Vanilla Essence (1st And 3rd Day Of Germination)

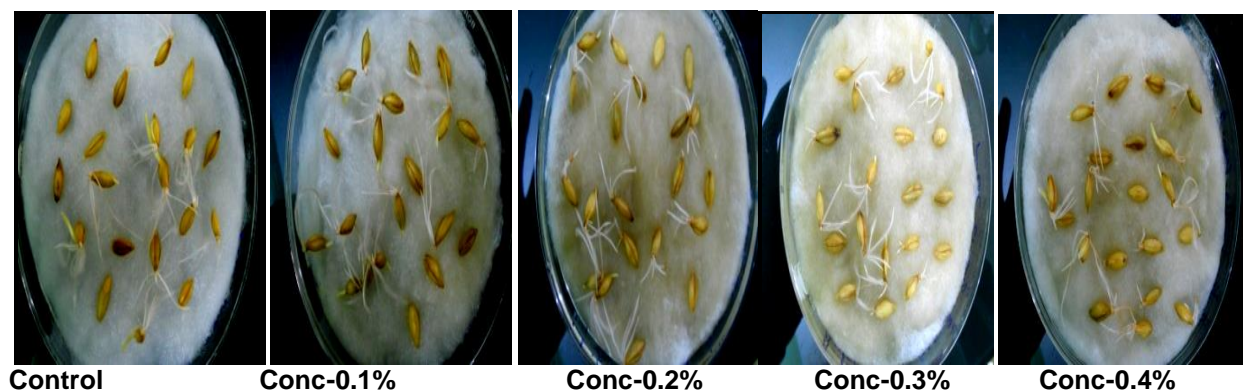
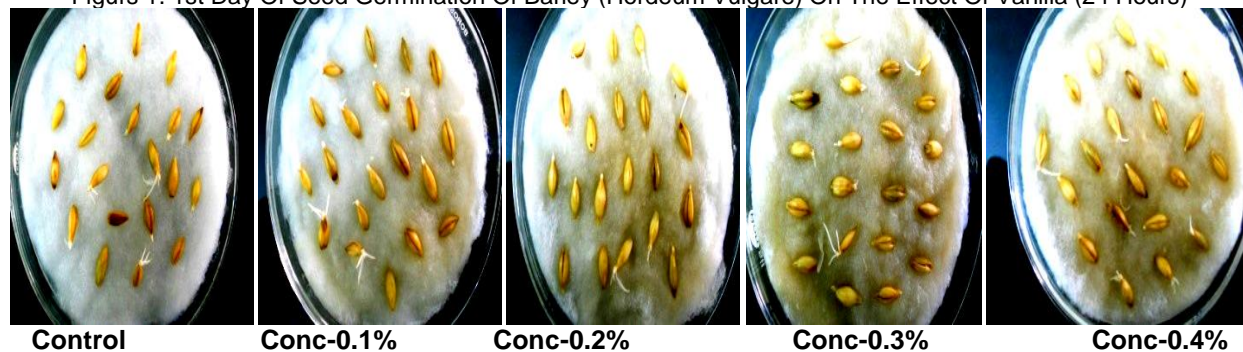
Name of Plant	Conc. In percentage	Percentage of germination	Early Seed Growth	
			24hrs Root length	72hrs Root length
<i>Hordeum vulgare</i>	Control	85.00	1cm	2.5cm
	0.1ml	80.00	0.8cm	2cm
	0.2ml	80.00	0.7cm	1.6cm
	0.3ml	80.00	0.5cm	1.4cm
	0.4ml	70.00	0.4cm	1.3cm

Graph Of Barley (*Hordeum Vulgare*) On The Effect Of Vanilla With Different Interval Of Time



Graph 1. Showing different concentration levels with different interval of time

Figures 1. 1st Day Of Seed Germination Of Barley (*Hordeum Vulgare*) On The Effect Of Vanilla (24 Hours)



Figures 2.-3rd Day Of Seed Germination Of Barley (*Hordeum Vulgare*) On The Effect Of Vanilla Essence (72 Hours)

CONCLUSION

The seed germinability and root length of *Hordeum vulgare* were increased when we decreased the Concentration of vanilla essence and vice versa.

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