

Comparative *in vitro* initial development of *Cattleya cernua* in different culture media

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Workshop Information

I Workshop of Plant Biology (I Workshop de Biologia Vegetal) was held in the Bioscience Institute – UNESP, campus of Rio Claro, Brazil, during August 20 and 21, 2012. Workshop was a scientific event organized by Post-graduate students from that Institute aiming to integrate Post-graduate and Graduate students from different areas related to Plant Biology (Anatomy, Ecology, Evolution, Morphology, Physiology, and transitional areas) from different Universities. Workshop Organization offered a large number of speaking activities, scientific discussions, and extra short-courses to improve the knowledge and formation of students in Plant Biology.

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INTRODUCTION

In nature, germination of orchid seeds yields very few individuals compared to the number of seeds a plant can produce (Stoutamire 1964), this feature had led to the production of plants by *in vitro* germination in nutritive medium which is the method still currently used (Knudson 1922).

Cattleya cernua Lindley is an epiphytic or rupicolous orchid present in Brazil and Argentina (Govaerts et al. 2010). There is a lack of information concerning *in vitro* germination of this plant.

In Brazil, nitrate salts used in culture media are controlled by the Army (Brasil 2000) and methods that could facilitate the making of media would be useful for agricultural purposes.

Many works have been made to evaluate which media is better for *in vitro* culture of many orchid species. Many of those works use variations of Murashige and Skoog (1962) proposed media and/or Knudson (1946) some of them use commercial fertilizers as nutrients to elaborate a medium (Bilce and Karsburg 2009, Moraes et al. 2009, Rodrigues et al. 2012).

The present work aims to compare the initial development of *C. cernua* in commercial fertilizer, Murashige and Skoog (1962) and Knudson (1946) media with and without banana pulp.

MATERIAL AND METHODS

The experiment consisted of six different media. Three types of media were complemented with 30 g L⁻¹ of sucrose. They were complemented as following: Murashige and Skoog (1962) (MS), Knudson (1946) (KN) and composed of 3 g L⁻¹ of Hyponex commercial fertilizer (N-6 P-6 K-19) (HP). Other three media based on the previous formula described, received 150 g L⁻¹ of banana pulp and 15 g L⁻¹ of sucrose instead of 30 g L⁻¹ (MSB, KNB and HPB, respectively). 1.5 g L⁻¹ of activated charcoal was added in all media. The pH of the solutions was adjusted to 5.8 ± 0.1 and 4.5 g L⁻¹ of agar were added for gelling purpose prior to sterilization in autoclave at 1.5 atm for 15 minutes at 127 °C.

The experiments were conducted as following described: *C. cernua* seeds were sterilized with 0.6 % sodium hypochlorite solution for 10 minutes. Then 1mL

of the solution with seeds was readily deposited in each of the 10 flasks of HPB medium. After 120 days protocorms grown in this medium were transferred to the six different media each type of media were represented by three flasks. For each flask 10 protocorms were deposited performing 30 individuals per treatment.

The experiments were conducted under controlled conditions at 25 ± 2 °C, 16 h photoperiod and illumination by white fluorescent lamps.

After 240 days of culture, it has been performed measures of growth parameters such as leaves and roots number and major leaf and root.

Data were submitted to analysis of variance (ANOVA) followed by Duncan test with 5% significance.

RESULTS AND DISCUSSION

The protocorms were ready to be transferred to the six different media within 120 days of culture and after 240 days the biometrical data were collected. The comparison between these data concerning different media is shown in Figure 1.

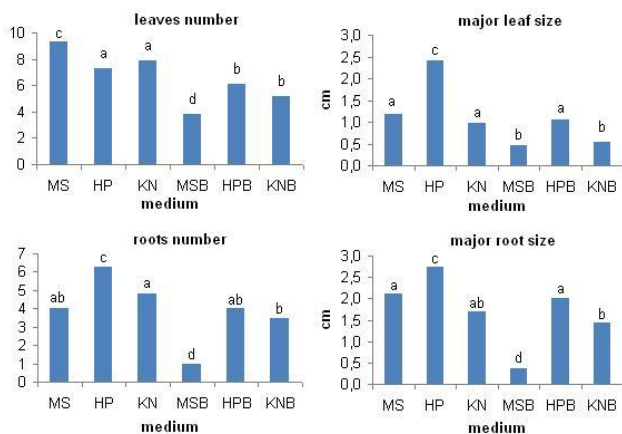


Figure 1. Effects of different media in the initial development of *C. cernua* seedlings after 240 days of culture. Bars followed by different letters present significant variance between treatments as predicted by Duncan test ($P < 0,05$).

In general HP medium showed the best results and would be the more suitable among the others for the initial development of the *C. cernua*, on the other hand MSB medium was the one with the worst results in all analyzed parameters (Figure 1). Moraes et al. (2009) tested different media to evaluate *in vitro* development of *Cattleya tigrina* and medium containing Hyponex

commercial fertilizer generated better parameters than MS. It is not easy for orchid plant growers to obtain nitrate MS salts (Brasil 2000) so, commercial fertilizer Hyponex as a ready to use formula can be an advantageous.

Studies using banana pulp and/ or coconut water in the medium obtained good results on *in vitro* growth *Cattleya loddigesii* (Araújo et al. 2006, Pasqual et al. 2009). In the present work it has been verified that banana pulp in all media retarded the *C. cernua* development (Figure 1).

CONCLUSIONS

The medium containing commercial fertilizer that lacks banana pulp showed better results than the others for the initial development of this orchid. *C. cernua* does not develop well in media containing banana pulp.

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