Inspirational and Ideological Education for College Students
Enlightened by the Problem Solutions of Plant Tissue Culture

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Abstract: Ideological health education of college students is very important to their healthy growth and psychological development. The main problems in the ideological health education of college students are the three aspects including delinquent students, psychological problems and fragility/incapacity. Our analytical result suggested that the three problems are very similar to the three especial difficult problems, including contamination, browning and vitrification, during the experiments of plant tissue culture. The reasons and solutions of difficult problems of plant tissue culture were analyzed and discussed, and its corresponding result was applied to analyze and solve the ideological health education of college students concerning delinquent child, psychological problems, fragility and incapacity. Moreover, corresponding methods were presented to settle these especial problems of ideological health education of college students.

Keywords: ideological health education; college students; plant tissue culture; enlightenment

1. Introduction

The plant cell has a very important characteristic of totipotency which will impel the cell to develop into a complete plantlet by the experiments of plant tissue culture, which is defined as the culture on nutrient media of plant seeds, organs, explants, tissues, cells, or protoplasts under sterile conditions [1]. This special totipotency may be suitable for the ideological health education of college students because that the educational potentiality of students is also very large and comprehensive. What kind of person will a college student become is tied up with the education and training, especially the appropriate inducement from the period of adolescent. Because of the alikeness and resemblance of life, the three difficult problems concerning contamination, browning and vitrification in the experiments of plant tissue culture are similar interestingly and stupendously to ideological health education and training of college students, especially the three problems concerning delinquent students, psychological problems and fragility/incapacity [2]. Therefore, the similarity of problems of plant tissue culture and ideological health education of college students was analyzed by analogy and control method, and special methods to solve the problems of ideological health education were provided referring to the solutions of difficult problems of plant tissue culture, presenting a new thinking for the improvement of ideological health education of college students.

2. Contamination and delinquent students

2.1 Contamination and solutions

The contamination is frequently happened during the experiments of plant tissue culture. The reasons is complicated and consists mainly of the following: Bacteria/fungi carrying explants, incomplete sterilization of media and vessels, not normative operation of experimental personnel, and the most important one, high content of microbe in the room of plant tissue culture laboratory [3].

According to the contamination reasons, some useful preventive measures are: 1) pre-culture. Cultivate the shoot in sterile water and urge the branch development, or cultivate the shoot by dark culture. Using this new branch as explant can obviously reduce the microbe contamination. 2) Avoid taking the explant in rainy days from outdoors. The optimal time of taking explants is the afternoon of sunshine day for solarization can kill part bacteria and fungi in the surface of explants. 3) Add proper antibiotic into media to inhibit the microbe contamination.
2.2 Delinquent students and preventive measures

A college student can be easily impacted by multicolored world. Moreover, young students lack the enough capability of distinguishing right and wrong, and hence often make mistakes such as drug use, fraud and pilferage. Especially, under the relatively complicated social situation at present, the problem of delinquent students always is the social difficulty. The reasons of delinquent students consist mainly of experiences of students themselves, harmful effects from environment, unsuited education from teachers, etc. All the reasons will result in kinds of big or small faults; moreover, some mistakes are fatal. It is necessary to avoid mistakes as soon as possible if college students wish to get the non-detoured teaching.

Basing on the enlightenment from the problem solutions of plant tissue culture, three preventive measures for delinquent college students are presented here as: 1) early entrance education. College students should grow in a relatively pure environment, which will decrease the influence from adverse population and can bring students good psychology and mentality from the entrance. 2) Spending more time in enjoying the resorts with good landscape and ethos. This will effectively avoid the contact with malefactor or subversive. 3) Providing the standard of distinguishing right and wrong to young college students during the teaching program.

3. Browning and psychological problems

3.1 Browning and solutions

Browning of explants is often happened during the experiments of plant tissue culture. Explant browning has become the knotty problem for browning can bring the lethal browning matter which will result in the corresponding browning of media, culture failure, and hence adverse influence on the dedifferentiation and organ differentiation of explants. The reason of browning is that most plants contain rich phenolic compounds, which are normally compartmentalized from polyphenol oxidase in intact plant cell. However, when explants are incised, phenolic compounds and polyphenol oxidase are released together, and then phenolic compounds are oxidized into brown quinones by polyphenol oxidase. Quinones will inhibit the cell growth and finally result in the explant death. Many factors, including genotype, physiological state and picking condition, can influence the browning degree of explants.

According to the browning reasons, some useful preventive measures are: 1) Using liquid media. Many researches had showed that liquid media can effectively conquer explant browning, and the effect will be better if filter paper bridge is added over the liquid. The reason is that the deleterious quinines are diffused into liquid media, which will reduce the harm to explants. 2) Adding antioxidant directly into media to inhibit the oxidization of phenolic compounds into quinines. 3) Adding adsorbents such as active carbon or polyvinylpyrrolidone to directly adsorb the deleterious substance around the explants, moreover, active carbon also can reduce the light intensity and hence decrease the browning degree.

3.2 Psychological problems and solutions

Ill mental health will result in the education failure of college students. The main psychological problems of young students consist of pessimism and negative, thinking little about progress, depression and sentiment, vanity and jealousy, etc. Under normal situation, the factors triggering these psychological problems won’t work, and then the psychological symptom is not obviously exhibited. However, when encountering intractable difficulty, these psychological problems of college students will be distinctly revealed. Moreover, with the age rise, the character of students will become more obstinate, and this will aggravate the psychological problems.

Basing on the enlightenment from the browning and the corresponding solutions of plant tissue culture, three preventive measures for psychological problems of college students are presented here as: 1) Enhance emotional communication. Avoid accumulating psychological problems, duly evacuate the unhealthy emotion, and especially often practice the removal of psychological toxin. 2) Be more positive. Adopt active attitude towards those bad things and repel unhealthy emotion. 3) Do something
beneficial and interesting to disperse the attention from unhealthy emotion.

4. Vitrification and fragility/incapacity

4.1 Vitrification and solutions

Vitreous shoots are the translucent and malformed tube plants arisen in the experiments of plant tissue culture \(^{[10]}\). Vitreous shoots are usually characterized by translucent leaves, dwarfish trunk, chlorotic leaf, no functional stomata, high water content \textit{in vivo}, low capability of differentiation. Therefore, vitreous shoots cannot be survived after transplanting for the function lack of photosynthetic organs. The reason of vitrification is that the psychological abnormality of explants is the inadaptation to moisture status of media. Some factors, including high concentration hormones in media and unsmooth gas exchange between inner and outside, will urge the happening of vitrification \(^{[11]}\).

Several measures are useful to inhibit vitrification of explants. 1) Decrease the osmotic potential of media. This will bring water stress and hence reduce the water content of explants. 2) Reduce the concentration of cytokinin in the media. 3) Enhance the natural illumination or treat by temperature stress (heat shock or low temperature). The vitrification of vitreous shoots will be gradually disappeared after days of natural illumination. Temperature stress can banish the vitrification of regenerated plantlet. 4) Improve the gas exchange situation of culture dish by using cotton plug or good-ventilation film to seal culture dish.

4.2 Fragility/incapacity and solutions

Because of the increasingly severe competition at present society, most parents of college students expected their children to be successful in their futures. Therefore, parents used to give young students too much nutrition which greatly exceeds the need of children \(^{[12]}\). Moreover, in order to enhance the comprehensive capability of college students, parents or teachers provide extra teaching classes, such as piano class Monday, dancing class Tuesday, calligraphy class Wednesday, foreign language Thursday, painting class Friday, and sport class weekend. This is not beneficial to the normal growth and development of college students, even results in the deformity students, which is similar to the “vitreous shoots” derived from vitrification for overfull water and cytokinin in the media. Unfortunately, many parents are still practicing this thinking. On the other hand, frequently obturated and coddled students do not experience any life frustration and social puzzledom \(^{[13]}\). Therefore, these college students lacks practical ability, independent ability and living ability very much, and has become a kind of specious “vitreous shoots children”, which are quite fragile and incapable, and obviously cannot withstand a single blow from social difficulty.

Basing on the enlightenment from the vitrification and the corresponding solutions of plant tissue culture, four useful measures for fragility/incapacity problems of college students are presented here as: 1) Abate the dependence of college students. Parents should not coddle their children excessively, and guide them to form a good habit of independent living. 2) Do not provide overmuch extracurricular education. The education catalog should be selected according to the character of college students. 3) Offer students more opportunities of social practice and contact with nature. College students will foster their independent capability from practice, obtain mature character, and consummate their personality. 4) Do not obturate children. It is very important to direct college students to learn exchange, to acquire useful something from other persons, and to form amplitude breast.

5. Conclusions and prospects

Cell or tissue can grow normally inside plant; however, kinds of problems will occur after cut from plants and cultured \textit{in vitro} during the experiments of plant tissue culture. The ideological health education of college students is similar to this. Actually, the optimal education method is not the aborative nourishment and superabundant care, but to place college students themselves in the society and to encourage them to face the normal growth positively, and finally to foster them into the independent, personality-perfect, psychology-healthy, and capable college students.
However, more researches and investigations should be carried out, especially concerning the applicability of newly found mechanism of plant tissue culture to the ideological health education of college students. Moreover, the effectiveness of applying the enlightenment from plant tissue culture to the ideological health education of college students should be further considered.

References


Acknowledgments

This work was supported by 2007 issue of young backbone teachers of Hunan province of China and teaching research program “experiment system of plant tissue culture” of Central South University of Forestry and Technology.