Tissue culture and some of the factors affecting them and the micropropagation of strawberry

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Abstract: The plant tissue culture refers to the cultivation of different part of the plant, I both single cell organ tissue and under sterile circumstances at the media and industrial expansion in several controlled circumstances. The method of the plant tissue culture plays a pivotal role in the second green revolution that gene modification and biotechnology can be used for improving the crop harvest and also superiority. Through using plant tissue culture methods plants can be attained from several explants over direct or indirect morphogenesis and by somatic embryogenesis. Direct morphogenesis refers to the manufacture of shoots from explants deprived of passing over callus (unorganised tissue) stage while indirect morphogenesis relates to the generation of shoots over the callus stage. The culture in which an organized form of growing may be incessantly got is mentioned to as an organ culture. The most significant types of organ cultures used for micropropagation are meristem cultures, shoot cultures, embryo cultures and isolated root cultures. Callus cultures, suspension or cell cultures, protoplast cultures or other cultures are clustered as unorganised tissue cultures. The method that was used was the plant tissue culture in the circulation of several plants, that is also the most significant way for strawberry production, to get the plants disease-free viral and harvest plants like the mother plant or the manufacture of new kinds with good potentials that help the turnout for the cultivation of this plant, that is considered by its high fruits nutritional value. Most plants are affected by the micropropagation strawberry essential basics of the media, like hormones, vitamins, amino acids and physical state and the power source to the media. This paper is a summary of the classic and new technology plant tissue culture and the effect of some features, like the media and development managers (hormone plant), vitamins, amino acids and the physical case of the media. It frequently affects most of these features in the circulation of plants using the tissue culture over the effect in the creation of callus or embryos or vegetative emergence and development of roots, as well as in the fraction development of branches and roots as well as the development highlighted in the influence of these influences on the micropropagation of plants.
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1. Introduction

Tissue culture considered as an *in vitro* aseptic culture of cells, tissues, organs or whole plant below exact nutritional and ecological circumstances (Thorpe, 2007). that can be used for manufacturing clones of plants. The resulting clones are true-to kind of a selection of genotype. The organized circumstances often offer the culture of the environment helpful for their development and development. These circumstances have complete quantity of nutrients, pH medium, suitable temperature and complete gaseous and liquid condition. Plant tissue culture method can function for large amount of plant production. In addition to their usage as an instrument for several researches, during the recent years; plant tissue culture methods, have been used as an important industrial circumstances for the plant propagation, disease removal, plant development and manufacturing the secondary metabolites. Small bits of tissue (termed explants) are usable for manufacturing hundreds and thousands of plants in a nonstop procedure. One explant may be multiplied into different thousand plants in fairly short while period under controlled circumstances, regardless of the season and climate on a year round base (Akin-Idowu at all, 2009). Endangered, threatened and rare types have positively been grown and preserved by micropropagation as high number of development and small loads on number of preliminary plants and space. Additionally, plant tissue culture recognized as the most effective method for improving the crops by producing somaclonal and gametoclonal variations. The micropropagation method has a huge potential for manufacturing the plants with higher quality, separated from efficient variations in

well-adapted high yielding genotypes that has well disease confrontation and stress acceptance dimensions.(Brown and Thorpe, 1995). Which leads to the development of commercially important improved varieties? Commercial manufacture of plants over micropropagation methods has different benefits comparing with traditional systems of propagation by seed, cutting, grafting and air-layering etc. It considered as fast propagation procedures that can happen to the manufacture of plants without any virus (Garcia-Gonzales at all, 2010). *Coryodalis yanhusuo*, an important medicinal plant was transmitted by somatic embryogenesis from tuber-derived callus for producing tubers that may not cause any disease (Sagare at all, 2000). Meristem tip culture of banana plants without from banana bunchy top virus (BBTV) and brome mosaic virus (BMV) has been manufactured (El-Dougdoug and El-Shamy, 2011). Developed yields have been obtained by culturing pathogen without germplasm *in vitro*. Growth in yield up to 150% of virus-free potatoes was attained in special circumstances (Singh, 1992).

2. Tissue culture in agriculture

Plant tissue culture has unlimited effect on both agriculture and manufacturing, by providing plants desirable for the ever enhancing world request.

It caused important assistances to the progress of agricultural sciences during the recent years and nowadays they establish a vital instrument in the modern agriculture (Chatenet at all, 2001). Biotechnology was introduced into agricultural rehearsal at a degree without precedent.

Tissue culture permits manufacturing genetically similar, without disease plant material (Marinoand Battistini, 1990). Cell and tissue *in vitro* culture is a valuable instrument for producing somaclonal kind (Garcia-Gonzales at all, 2010). Genetic variability induced by tissue culture is useful as a good method for variability to get new steady genotypes. Interventions of biotechnological methods for *in vitro* renewal, mass micropropagation methods and gene transfer trainings in tree types have been encouraging. *In vitro* cultures of mature and/or immature zygotic embryos are usually used for recovering the plants that were gotten from inter-generic crosses that do not manufacture productive seeds (Ahmadi at all, 2010). Genetic engineering can produce several developed crop kinds that has high yield potential and resistance in contradiction of pests. Genetic transformation expertise depends on the practical features of plant tissue culture and molecular biology for:

- producing better crop diversities
- producing different types of disease and also virus free plants
- Genetic change
- producing secondary metabolites
- producing the variations tolerant to salinity, deficiency and heat pressures

3. Tissue culture of strawberry (*Fragria ananassa* Duch)

Biotechnological methods considered as efficient method for implementing strawberry development as importing mother plants is not economically logical. Healthy stocks used for propagation by conventional approaches are not obtainable. In vitro methods are significant equipment for modern plant development programs for introducing new traits into particular plants, to reproduce elite choices and to grow appropriate cultivars in the minimum procedure (Taji et al. 2002).On the other hand; the propagation of particular strawberry trees has special importnace as it is very expensive for importing the mother plant. Seed propagation is not very prevalent as some of its precise types can be gone according to genetic unpredictability. The traditional vegetative approach of Strawberry propagation was by root runners. Though, because of the uselessness of this technique; low occurrence of rooting, ecological hazards, labour intensive, disease prone, etc. (Sakila et al., 2007; Gautam et al., 2011), other techniques of propagation like micropropagation has a better substitutions. Several relative reserches reflected that micropropagation is a better technique of strawberry propagation (Karhu and Hakala, 2002; Mahajan et al., 2001; Mohan et al., 2005). These researches observed that characters like crown dimension, flowering procedure and harvest, and quantity of runners were better in micropropagated strawberries once associated against their conventionally propagated complements. (Gomes and Canhoto. 2003) mentioned that the position of micropropagation is best respected when it is difficult to attain spread over conventional approaches, persistence of rejuvenation difficulties and when under heaviness to meet request by enhancing the amount of growth. Among several methods of micropropagation that flourish, axillary shoot proliferation considered as the most favored technique used for Ericaceae clonal propagation (Jain and Häggman, 2007).In the past, strawberry is cultivated by runners (Sakila et al., 2007), that is very labour exhaustive; time consuming and happens to transmission of viral sicknesses (Gautam et al., 2011). A shoot renewal scheme is useful for developing transgenic plants following genetic conversion of plant cells and for identifying or inducing somaclonal variations. The in vitro culture of nodal cutting has been fruitful in the micropropagation of strawberry products (Karhu and Hakala, 2002; Ghaderi and Siosemardeh, 2011). (Nehra, et al. 1994) mentioned that different strawberry plants may be duplicated in a year from different mother plants by

applying tissue culture method. This method has been found appropriate to introduce modern cultivars. Propagation of strawberry can be done by runners and also in vitro micropropagation. Micropropagation of strawberry dissimilar the traditional root runner technique of propagation has been described to be operative in producing large amount of disease free plants (Moradi et al., 2011). Micropropagated strawberry plant presented to avoid majority of plant and also soil transmissible illnesses. Micropropagation varies from all related conventional propagation approaches in those aseptic circumstances for achieving success.

4. The consequence of different issues on the micropropagation of strawberry (*Fragria ananassa* Duch)

4.1. Media

Sources specify that the kind of food centre- is powerful "big" in the achievement of the agriculture of plant chunks for Schleck and given that "most investigators have used parts of the plant are very tiny" (Almrstim apical), they pointed to the necessity for care to the modules of the centre as they are essential for balancing the nutrients in it. The media has touched the most widely used in the cultivation of strawberries with the tissue that was used by a total of researchers of this centre for various purposes of them (Paredes and Enrique 1990) in their research of the kinds of strawberry. (Fragaria Chiolensis), investigators (Bustos and Alejandra, 1993) while working the right way to save genetic incomes for four kinds related to the wild kind as well as to the previous ones (Aranda at all., 1994).

While some used the other medium for developing approaches of the multiplication board of Schleck by benefiting both, some shared the views of the plant as varied as Sorvari at all., 1993) in their two types of research of(Jonsok and Hikn. Lopez et al1., 1994 was found to compare to different kinds of loops of food used in the micropropagation for Schleck and (Mahmood at all., 1994) while he designated the way the growth of racialist Schleck (Monticelli at all., 1995). Or by adding several components for developing of the centre, like food (Jeong et al, 1996 and Malodobry, 1997 and Badawi, 1997) in their research with lots of flour different diversities of strawberries.

He found (Jammali at all., 2002) that numerous diversities of strawberries, which were established in the external vivo formed buds cross from the atria Stipular buds throughout duplication by applying the central constituent of salt Grand Central Knop and salts, trace factors to the centre of MS, vitamins and amino acids with 2.22 micromoles BAP and 2.46 micromoles IAA and 0.29 micromoles Gibberellin.

Active branches were used (Mereti at all 2002) in the development and resultant from plants of Schleck Arbutus unedo and established in containers inside the glass house for the upbringing of farms and the planting of shares of these branches to the centre of WPM contain 11.1 micromoles BA. The best doubling of the branches were received at the agriculture centre of WPM Hawi vitamins and glucose amid MS Walker and 22.2 micromoles BA.

And (Tahmatsidou at all 2002) four dissimilar media were tested for rooting and acclimatization. The microshoots for two commercial strawberry cultivars, Elvira and Selva, were grown on different media.

The media used are: -

-a MRA: - amid MS Toughened Pal Agar with 30 g / l sucrose and development regulators.

-b MR XA: - the centre of the liquid MS with 30 g / l sucrose and development regulators.

-c MSYA: - amid MS Toughened Pal Agar with 15 g / l sucrose deprived of development regulators

-d ENSHI: - amid Enshi liquid that have just inorganic salts.

It was found that the rooting and localization has not meaningfully been affected in the four loops of laboratory consequences, which presented rooting among MSYA and ENSHI that do not need cultivars to develop regulators for Tgazirha, and gave the plants in the central ENSHI number developed despite the fact that this medium does not cover organic components.

He found (Kischbaum at all2004) when grown-up seeds amounting to Strawberry Fragaria x ananassa, the central MS is prepared with 2.22 micromoles BA, that 36% of the seeds established are germinated and shaped rootlet and deprived of going over this stage of callus fact buds cross near the end, and a low number of these buds-shaped branches and established that the adding of development regulators caused the transformation of the values rooted in the principles of radicle branches.

For getting Zruat can be kept separate to vivo in capsules of Calcium alignate before developing the outskirts of the branches of Schleck and Alrazibra, the circles doubled from the centre of Boux that comes with 2.2 micromoles BAP and 2.46 micromoles IBA and Central MS decreased the quantity of NH4NO3 and KNO3 that were enhanced 50% and Comes With 3 0.55 micromoles BAP and 0.4 micromoles IBA (for Razibra) has been providing the two mediums with 10 g / l of mannitol and Paclobutrazo (absorption of 1.7 micromoles of Schleck and 3.4 for Razibra) and noted that the degree of duplication of the branches are kept afterward in the first re-farming for both kinds compared to non-supply (Lisek and Orlikowska, 2004). Mathur et al., 2008 reported in their study that the best rooting response was observed on MS basal media containing 40 or 80 mg/L adenine sulphate. It was

observed (Mostafa at all, 2010) on PGR-free medium. Proliferation was more successful on MS than on the B5 medium. On both media, the most successful proliferation was obtained using Zeatin as a Cytokinin type. Rooting was tested on the MS medium containing different concentrations of Auxin. It was found in Hasan at all, 2010 that concentration of Cytokinin/Auxin is from 1.0-3.0 mg/L and 0.1-0.3 respectively. GA3 1.0 mg/L, adenine 120.0 mg/L additives, like coconut water 150 ml.L-1, were also used with the combination of Cytokinin -Auxin. The addition of adenine sulfate, gibberellic acid and coconut water was insignificant than the combined concentration of Cytokinin and Auxin regarding usable shoots. All the treatments produce usable shoots. The highest number of usable shoot was observed at the concentration of 1.0 mg/L BA with 0.1mg/L NAA. The highest shoot length was observed at the concentration of 2.0 mg/L BA + 0.2 mg/L NAA +120 mg/L adenine. Shoot length was the highest (2.4 cm), which is significantly different than that of the gibberellic acid and coconut water. Preferably further research on the impact of media on micropropagation of several varieties of strawberries.

4.2. Growth regulators

Known growth regulators as organic mixtures of non-food substances are built naturally in a plant or produced commercially in several laboratories or particular organizations by low concentrations, which affect the development and expansion of the plant that result in over stimulated or reserved or alteration procedures in vital physiological plant tissue. A longer use of plant development regulators of the basic necessities for the achievement of agriculture in vitro, as stated by Pierik, 1987, that farming in vitro is nearly deprived of development regulators.

Included are plant development regulators, a variety of types, like Auxins and Cytokinins and Gibberellins acid Alabcisc and ethylene and the amines multi Polyamines, that were measured as growth devices in the conference of higher plant development regulators in 1982 (Davies, 1987) also was assumed as other vehicles as organizations grow where there were Brassinosteriods and Salicylates and Jasmonate (Maas, 2002). One of the most extensively used kinds of development regulators in the plant tissue culture are Auxins and Cytokinins, whch are added to the external of the circles of Agriculture vivo in the several phases that Gibberellins can be used.

Auxins is usually used in the circles of agriculture in the external living body of the IAA and the IBA and NAA and NOA and 2.4-D, In addition, Auxins leads to the loops of agriculture in vitro to stimulate the separation and cell elongation and branches and to stimulate diversity into tissue bark and wood, and the rise of roots -offs and callus creation (Tran Thanh van, 1981).

The Cytokinins stimulate cell division and the emergence of branches of callus tissue and organs and the development of buds by finishing the sovereignty of the apical buds terminal. Cytokinins is applied in the agriculture loops of the external living body of the BAP and kinetin and 2-ip)Gaspar at all. 1996).

Gibberellins, which infrequently are used amongst the tissue culture and are perceived by some as needless, is added occasionally to stimulate the elongation of internodes or development of the Almrstim apical or to break dormancy in embryos and seeds cultivated outside the body, inhibit the development of roots -offs and development of branches offs and is the most extensively used between Gibberellins (Pierik, 1987).

Sorvari at all., 1993 investigated about the influence of the transactions of agriculture to two kinds of strawberry, Fragaria x ananassa Duch, on the degree of reproduction of leafy branches of tablets taken and the farming of the plant at the midpoint of the mother propagation by or deprived of hormones. The farming of the mother plant at the average covering BAP 0.5 mg / L + IBA mg / L + GA3 0.2 mg / L) for stimulating the breeding branches of discs of paper taken for the two types considered and it was the supreme amount of imitation branches 9.9 for class when farming amid MS axis covering 200 mg / l KNO3, CH 400, BAP 3 and IBA 0.1 while the maximum degree of imitation of regeneration branches of the diversity Jonsok 12.8 Norwegian branch of agriculture at the midpoint of the axis covering MS (mg / l CH 600 and BAP 3 and IBA0.1). Mostafa at all, 2010 discovered a protocol for micropropagation of the Arbutus andrachne from seeds that were developed. Results indicated that none of the seeds cultured on Murashige and Skoog (MS) medium, with or without plant growth regulators (PGRs), germinated. Seeds soaked in 250 mg l-1 gibberellic acid (GA3) at 4 C for 3 days, then cultured on water-agar medium containing 2.0 mg l-1 GA3 exhibited 80–100% germination and developed into usable seedlings. Shoot proliferation was tested on MS or B5 medium containing different concentrations of cytokinin. No shoot proliferation was observed on PGR-free medium. Proliferation was more successful on MS than on B5 medium. On both media, the most successful proliferation was obtained using zeatin as a cytokinin type. Rooting was tested on MS medium containing different concentrations of auxin. Rooting failed on PGR-free medium and on medium containing indole-3-acetic acid (IAA), 0.25 or 0.5 mg l-1 indole-3-butyric acid IBA), or 0.25, 0.5 or 2.0 mg l-1 a-naphthaleneacetic acid (NAA). The use of 15 mg l-1 silver nitrate in medium significantly increased the percentage of androgenic anthers and embryogenesis in

cultivar Camarosa(Shahvali-Kohshour, 2013). It has been emphasized by (Adel and Sawy2007; Biswas et al. 2007; Sakila, et al. 2007; Harker et al., 2000) who showed BAP that regeneration of strawberry is important. Hu and Wang reported that it was carried out to examine the effects of different combinations of plant growth regulators in vitro micropropagation of strawberry. The study showed that the procedure for propagation of Fragaria by using nodal segments from in vitro germinated plants. The best concentration of BAP for bud induction was 0.5 mg/l plus KIN 0.2 mg/l. The maximum number of roots per plant was obtained in elongation medium in MS combined with BAP 0.1 mg/l with auxin IBA 0.2 mg/l. In this medium (Moradi, 2011), it was found (Malodobry et al 1997) by different of classes of Schleck syriusz by planting two kinds of plant shares. The maximum degree for the amount of branches of 5.2 was received when the agriculture in central MS was prepared with 0.5 mg / l IBA 0.1 mg / L AB. It was discovered (Litwińczuk at all, 2009) that as gibberellic acid applied in doses higher than usually used (0.1 mg dm-3), it stimulates the proliferation of axillary crown shoots or runners and concurrently reduces the growth of callus as well as the formation of roots and the development of adventitious shoots, a new method of strawberry micropropagation, which lowers the risk of domination of in vitro cultures with adventitious shoots, might be elaborated. Must conduct more studies on growth regulators to determine the best focus for the purpose of use in micropropagation of strawberry.

4.3. Vitamins

Vitamins are necessary compounds synthesized and utilized in plants. In tissue culture media, vitamin addition is not always common; since the amount needed by plants is relatively unknown and varies. Vitamins, in combination with other media constituents, have been shown to have direct and indirect effects on callus growth, somatic growth, rooting, and embryonic development. For example, different studies have shown that thiamine is associated with Cytokinin and has a role in inducing callus growth and rooting. Moreover, thiamine was essential in facilitating the production of more secondary metabolites such as proteases in pineapple. Both biotin and riboflavin play a role in callus develop-ment as well. Specifically, riboflavin exerts different effects on plant rooting either positively and negatively. Vitamin D known to cause uptake of calcium in animal tissue, exerts a similar effect in plants. In addition, vitamin D causes cell elongation and meristematic cell division. Vitamin C, known for its anti-oxidative properties, has also enhanced shoot growth and rooting (Abrahamian and Kantharajah,2011). In tissue culture, some plants can become defi- cient in vitamin synthesis (George at all, 2008) Hence, supplementing plant tissue with sub-optimal levels is essential to obtaining vigorous growth. Plant cell requirements for vitamin con-centration vary according to the plant species and type of culture doxine and myo-inositol found in (Murashige and Skoog,1962) (MS) medium at 0.1 mg•l–1, 0.5 mg•l–1, 0.5 mg•l–1, and 100 mg•l–1 respectively are the most commonly used, while the addition of other essential vitamins to media is uncertain. Myo-inositol remains a controversial compound being either classified as a water-soluble plant vitamin or as a sugar alcohol (George at all 2008). In the presence of 25 mg•l–1 of vitamin D3 micro propa-gated potato plantlets absorbed Ca2+ efficiently (Habib and Donnelly,2003). However, vitamin D3 concentrations higher than 25 mg•l–1 i.e. 50 mg•l–1 did not stimulate higher absorption levels. On the other hand vitamin D2 suppressed Ca2+ uptake. It was concluded that combining both vitamins D2 and D3 did not improve calcium absorption hence claiming the superiority of vitamin D3 for calcium ion uptake (Habib and Donnelly,2003).Some plants are able to synthesize the essential requirements of vitamins for their growth. Some vitamins are required for normal growth and development of plants, they are required by plants as catalysts in various metabolic processes. They may act as limiting factors for cell growth and differentiation when plant cells and tissues are grown In vitro (Torres, 1989). The vitamins most used in the cell and tissue culture media include: thiamin (B1), nicotinic acid and pyridoxine (B6). Nicotinic acid is used at a concentration range 0.1-5 mg.l-1 and pyridoxine is used at 0.1-10 mg.l-1. Other vitamins such as biotin, folic acid, ascorbic acid, pantothenic acid, tocopherol (vitamin E), riboflavin, p-amino-benzoic acid are used in some cell culture media however, they are not growth limiting factors. It was recommended that vitamins should be added to culture media only when the concentration of thiamin is below the desired level or when the cells are required to be grown at low population densities (Murashige, 1974). Although it is not a vitamin but a carbohydrate, myo-inositol is added in small quantities to stimulate cell growth of most plant species (.Vasil and Thorpe, 1998). Myo-inositol is believed to play a role in cell division because of its breakdown to ascorbic acid and pectin and incorporation into phosphoinositides and phosphatidyl-inositol. It is generally used in plant cell and tissue culture media at concentrations of 50-5000 mg.l-1. Vitamins in culture media should be further studied in order to justify their addition. For instance, little is known about vitamin E (α-tocopherol), a phenol anti-oxidant, presence in culture media. In the last few decades, little interest has been observed in studying certain vitamins, such as biotin and pantothenic acid. Plant species and cultivars require different amount of vitamins, while other do need any at all.. The

physiological and morphological output varies between plants when using the same vitamins. According to our desired outcome culture media remain open to modifications, especial the common (Murashige and Skoog,1962). Although sig-nificant vitamins such as thiamine impose their applica-tion in culture media; others are poorly applied such as ascorbic acid.Scientific knowledge on plant propagation was not the only significant outcome; however, some experiments offered economic solutions. In order to reduce costs, (Drew et al, 1991) suggested adding riboflavin, which degrades auxin, to the tissue culture media rather than transferring the tissue to a hormone (i.e. auxin) free media. In the future, studying the effect on a wider range of vitamins and plant simultaneously is needed for an enhanced fea-sibility outcome.

4.4 Amino acids

Media components such as amino acids and vitamins have been found to exert a profound effect on tissue culture systems of certain species. Optimization of such compounds can stimulate regeneration in recalcitrant cultivars (Benson, 2000).The required amino acids for optimal growth are usually synthesized by most plants, however, the addition of certain amino acids or amino acid mixtures is particularly important for establishing cultures of cells and protoplasts. Amino acids provide plant cells with a source of nitrogen that is easily assimilated by tissues and cells faster than inorganic nitrogen sources. Amino acid mixtures such as casein hydrolysate, L-glutamine, Lasparagine and adenine are frequently used as sources of organic nitrogen in culture media. Casein hydrolysate is generally used at concentrations between 0.25-1 g.l-1. Amino acids used for enhancement of cell growth in culture media included; glycine at 2 mg.l-1, glutamine up to 8 mM, asparagine at 100mg.l-1, L-arginine and cysteine at 10 mg.l-1 and Ltyrosine at 100mg.l-1 (Torres, 1989) Our study (Gerdakaneh at all, 2012) demonstrated that the type and concentration of amino acid have important effects on the somatic embryogenesis process and embryos development of strawberry cultivars. The best amino acid source for embryo culture of strawberry was proline. Different responses were also observed in the induction of somatic embryos in different genotype of strawberry by (Gerdakaneh et al. 2009). The available information from different studies suggests that optimal concentrations of different amino acids may be species or genotype-dependent, which needs to be determined before recommending its use (Chukwuemeka et al. 2005; Homhuana et al. 2008; Han et al. 2009).

4.5. Energy source

The sugars of the most important elements of the midpoint of food functioned in plant tissue culture and signify a key element for development in vitro, and to the fact that the removed tissue and the surrounding conditions is not suitable to do photosynthesis, regarding the lighting (when agriculture in the dark) and the absorption of CO2 in containers Agriculture (Pierik, 1999). Chirogelb sources and to use sucrose as a basis of carbon in the midpoint used food as several investigators attentions ranged from 2.3 % to get good consequences like (Reuveni, 1979, Zaid and Tisserat, 1983 and Mater, 1986, and Omar at all, 1992). With some of the investoigators using several carbon sources like glucose and fructose in food loops used in the cultivation of date palm tissue (Abdel-Samei et al, 1998), but they did not demonstrate effective in promoting development.

Nowadays several researchers tried to enhance the attentiveness of sucrose functioned in the middle of food for increasing the power stream to the part of plant and thus enhancing development and doubled Transplanter (Sake at all, 1998, Jasim and Saad 2001 and Khierallah and Bader, 2006) for developing the rooting over enhanced content Alcarbohedrati the midpoint of the food at the expense of the level of nitrogen and therefore enahncing the amount of the C / N Ratio, that play a pivotal role in affecting the success of the progression of rooting (Al-Maarri and Al-Ghamdi, 1997 and Taha et all.2001).

4.6. Physical state of media

The lead physical state of food amid a significant role in the development and growth of the transplanter is simulated, and therefore the accomplishment of the breeding program of cultivating tissues is achieved. The choice of the suitable physical state that causes the best development of Zruat usually relies on different features, such as a kind of plant and its appropriateness for cultivation in liquid medium, as some families favour to plant where the agriculture is like Bromeliaceae (Nbatadthaouhadh monocots). The ventilation element that put parts of a plant in semi-submersible vessels agriculture in rural liquid will decrease the dispensation of oxygen needed for development, so to resort to either decrease the quantity of liquid medium in a vessel or agriculture by changing the plant floats on the surface of the liquid, so the decreasing of the dimension has submerged. In the event that the immersion is essential for Zruat, it is advised to use shakers. Shakers of several types for achieving this goal, but in this regard attention must be paid to the injury that happened by the procedure of shaking as a result of the collision of the transplanter or plant cells to each other or the walls of the ampule. It offers a liquid medium typically raised well, Zruat, as the providing nutrients better from the midpoint of the semi-solid, and the discharge of damaging that can be excreted from the Transplanter melt and Taatkhvv that dissimilar to the centre steel, that are usedfor collecting topical secretions damaging about portions cultivated,

and so they are likely to be poisoned tissues and death (Pierik, 1999).

Lots of the related studies supports the need to use the semi- solid medium in most steps of the cultivation portions of the flowering of the date palm as it is comprised in the middle of the food material Alakar (Agar) and absorptions ranging from 0.6 - 1.0%, based on the source and amount of purity and also the severity of multiple sclerosis needed in the food centre (Loutfi and Chlyah, 1998 and Baker at all, 2006 and Daradkah, 2006). Although other investigators mentioned the use of the liquid in the middle phases of the induction of the emergence of embryos from callus in cellular pendants whether this callus is composed of shares of the vase (Bhaskaran and Smith, 1992) or the peaks of developing (Sharma et al, 1984 and Jasim, 2000) and in the vegetative phase of replication (El-Hammady et all.1999 and Khierallah and Bader, 2006). In stage of tempering plants resultant from tissue culture and preceding to transmission to the soil (Omar et al, 1992).

Limited information is obtainable on in-vitro bioreactor strawberry culture (Takayama and Akita 1998). Hanhineva et al. 2005 stated the shoot renewal from the leaf explants of the five strawberry cultivars in commercially obtainable TIB bioreactors (RITA®, VITROPIC, Saint-Mathieu-de- Tréviers, France) covering liquid MS medium with 9 µM TDZ and 2.5 µM IBA (Table 1). The TIB system showed to be well suitable for the shoot spread and for subsequent subculture of the evolving plantlets. Renewal frequencies were 70 ± 8 to 94 ± 2% and 83 ± 5 to 92 ± 3% in the TIB system and on semi-solid medium, correspondingly. The time of labour taken by the TIB scheme was less than half of the time essential for performing the plant material for the cultivation on semi-solid medium (Debnath and Da Silva, 2007).

Conclusions.

The concept of culture refers to the way of using of several parts of the exact plant. This process might be seeds or parts of the root or parts of the leg or part of the securities or alternative or pollen, on the situation nutritious that frequently cover basics of the Greater and Lesser and some vitamins and a source of sugars which often uses as sucrose as an environment nutritious. You can get members resemble the original mother plant in genetic arrangement in large amounts in a short time and this process is done under sterile circumstances.

Biotechnological methods reflected as well-organized policies for cultivating strawberry as it is very luxurious to import mother plants. Some techniques considered as important tool for cultivating the plants by presenting new types of the nominated plants for cultivating appropriate crops in a minimum quantity of time. It typically used with traditional breeding events, by using well-organized vitro shoot propagation and regeneration arrangement, food-cultivating packages are feasible. This possible power for reintroducing plants is very important for the optimistic use of in vitro approaches. Furthermore, producing numerous strawberry trees is very vital, as introducing mother plants are typically very expensive. Creating seeds is not typically widespread because different exact structures may be missing because of genetic inconsistency. Therefore, a technique like micro propagation recognized as a better substitute.

The development and exposure of the plant tissue in the laboratory can evaluate by the kind of media and the assembly of the middle by knowing that the basic needs of the tissues of the plant is like to the basic needs of plants full. It consists of the general media of a group of metallic elements such as major elements and trace elements, and a source of carbon. One of the sugars and some organic material core like amino acids and vitamins, and also developing regulators and water and material stiffness in the media such as agar or a material gelling agent. All of the mentioned elements has a special effect on the growth of the plant, thus it should conduct more studies on these items individually or together in order to reach media of the best is used in the micropropagation of plants. We recommend further studies on factors affecting the micropropagation of strawberry for obtaining useful results.

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