Studies on tissue culture and plant regeneration of *Emilia sonchifolia*(L.) DC.

LIU Yuan¹, WU Qing-hua², QIN Wen-liu¹, LING Zheng-zhu^{2*}.

2. Guangxi Botanical Garden of Medicinal Plant, Institute of Guangxi Medicinal Plant,

The Guangxi Branch, Institute of medicinal Plant, Chinese Academy of Medical Sciences (Nanning 530023)

[Abstract] Objective To explore if the quick propagation of *Emilia sonchifolia* (L.)DC. in vitro culture could be used to provide tube-cultured seedlings in short time. Methods Axial buds were used as explants and cultivated on Murashige and Skoog basal medium by adding different portions of hormones. Results After 30-day cultured., axial buds which were cultivated in MS + BA1.5mg \cdot L + NAA0.1 mg \cdot L⁻¹ could induce fascicular buds, and each node derived 4 to 5 fascicular buds. The induced fascicular buds were transferred to the medium of 1/2 MS + NAA1 mg \cdot L⁻¹ to induce roots. After the test-tube plantlet transplanted, there was no yellowing phenomenon (caused by yellow virus). Conclusion This research on tissue culture of *Emilia sonchifolia* (L.)DC. could supply tube-cultured seedlings for large-scale planting.

[Key Words] Emilia sonchifolia (L.)DC. ; Axial bud; Tissue culture; Regenerated plant

一点红组织培养获得再生植株的研究[▲]
刘 因¹ 吴庆华² 覃文流¹ 凌征柱²*
1. 广西大学(南宁 530005) 2. 广西药用植物园、广西药用植物研究所(南宁 530023)

[摘要] 目的 对一点红进行组织培养研究,探讨在短时间内快速繁殖一点红种苗的方法。方法 以一点红带有腋芽的茎段为外植体,用 MS+BA1.5 mg/L+NAA0.1mg/L培养基。结果 经30 d诱导培养,可得丛生芽4~5个;小芽苗转入1/2MS+NAA1mg/L培养基上诱导生根,20 d后可长成具有3~4条根系的再生植株。结论 此途径为人工栽培一点红提供优质种苗。

[关键词] 一点红;腋芽;组织培养;再生植株

[中图分类号] R282.2

Emilia sonchi folia (L.) DC., named lilac tasselflower in English, belongs to the feverfew family^[1]. Each part of lilac tasselflower can be used as medicine. Lilac tasselflower has such medicinal effects as clearing heat and expelling Miasma, reducing inflammation, discharging of urine, relieving pain and reducing fever. The plant can be used for the treatments of dysentery and many kinds of inflammations, such as the inflammation of respiratory disease, pneumonia, tonsillitis and mastitis^[2,3]. For example, Huahongpian, making from lilac tasselflower, is a good medicine for the treatment of gynecological disease. Nowadays, the lilac tasselflower are in great demand in medical industry. The natural resource of lilac tasselflower lessens because the environments that are suitable for the growth of lilac tasselflower are being destroyed for the reclamation and cultivation. In fact, the quality of lilac tasselflower is hard to guarantee on account of the erroneous collection of wild lilac tasselflower. Therefore, the cultivation of lilac tasselflower is imperative. In order to provide the

young plants of lilac tasselflower for large-scale planting and the materials of lilac tasselflower for the medicine industry, the research on tissue culture of lilac tasselflower was done to supply tube-cultured seedlings for large-scale planting.

1 Materials

Explants of *Emilia sonchifolia* (L.)DC. were taken from one-year-old healthy and strong plants grown in Guangxi Botanical Garden of Medicinal Plants.

2 Culture medium and conditions

The culture medium was Murashige and Skoog (1962) basal medium supplied with different concentrations of phytohormone. The induction medium: (1)MS + BA 1.0mg \cdot L⁻¹ + NAA 0.1mg \cdot L⁻¹; (2)MS + BA 1.5mg \cdot L⁻¹ + NAA 0.1mg \cdot L⁻¹; (3)MS + BA 2.0mg \cdot L⁻¹ + NAA 0.1mg \cdot L⁻¹; (4)MS + BA 2.5 mg \cdot L⁻¹ + NAA 0.1 mg \cdot L⁻¹. The subculture medium: (5)MS + BA

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作者简介:刘园(1982-),女,广西柳江人,在读硕士研究生。*通讯作者、硕士生导师

^{1.} Guangxi University (Nanning 530005), China;

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1.0mg·L⁻¹ + NAA 0.1mg·L⁻¹; (6) MS + BA 1.5mg·L⁻¹ + NAA 0.1mg·L⁻¹. Rooting medium: 1/2 MS + NAA 1.0mg· L⁻¹. The medium was supplemented with 2.0% sucrose and solidified with 0.5% (W/V) agar, and the PH was adjusted to 5.8 to 6.0 before autoclaving at 121°C and 108 kPa for 20min. All culture were incubated at (25 ± 2) °C under 10-hour daily illumination with white fluorescent light (1 500 to 2 000 Lx.).

3 Methods and Results

3.1 The Treatment of Material The stem segments with axially bud of lilac tasselflower were soaked and brushed in scour, and then washed thoroughly for 30 min under running tap water. They were surface sterilized in 0.1% Mercuric Chloride solution containing a few drops of Tween-20 for 8 to 10min, followed by 4 to 5 rinses in sterile distilled water. This part of stem with axially buds were cut into 0.3 cm long single node pieces, and then placed respectively in No.1 to No.4 medium.

3.2 Cluster buds' induction Explants were cultured for 7 days in induction culture medium, the bottom of stem expanded and new buds expanded, then sprouted bourgeon after 6 to 8 days culture. After 25-day cultured, explants in No.1 medium could be induced 2 to 3 shoots per node; and in No.2 culture medium, 4 to 5 buds could be obtained. The buds induced in No. 3 and No. 4 culture medium were more than that in No.1 and No.2 culture medium, but the shoots vitrification occurred, especially in No.4 culture medium. Thus, lilac tasselflower was sensitized with the using concentration of cytokinin. Higher concentration of cytokinin could be helpful to induce cluster buds, but could bring about shoots verification in later stage. Moderate concentration of cytokinin is necessary to get cluster buds and to avoid verification. 3.3 Multiplication of shoot cultures When the average height of cluster buds were 2 to 3 cm after 35-day induction culture, the cluster buds were cut into single bud and cultivated in No. 5 and No. 6 culture media for further multiplication. After 14-day multiplication cultured, the single bud cultivated in No. 5 culture medium grew new cluster buds. The growth coefficient was 6 to 7 times in a multiplication period of 30 days. The rate of multiplication of single bud cultivated in No. 6 culture medium was higher than that in No. 5 culture medium. As cluster buds grew, they got vitrified because of high concentration of BA. In the early stage of induction culture, the buds were cultivated in the medium with BA, so the buds could accumulate BA. As a result, the concentration of BA in subculture should be lower than that in induction culture.

3.4 **Rooting Culture and Transplanting** When cluster buds grew in 5 to 6 cm high, cluster buds were separated and cultured individually in No.7 medium. In the effect of NAA, the bases of single bud appeared initial roots after 7 to 10 days, and then became small roots after 20 days cultured. These roots were 2 to 3 cm in long. Each single bud had 3 to 4 roots. The rooting rate reached 90%. At this point, Plantlets were trained by opened the bottle caps at normal atmosphere temperature indoor, in the natural illumination conditions for 2 or 3 days. Plantlets with well-developed roots were removed from culture medium and then washed the roots under running tap water to remove agar. Plantlets were transferred to sand seedbed to ensure higher survival rate. In this way, the survival rate could be 95%. The tissue cultured seedlings were transplanted in April 20. The plant



The cluster buds of Emilia sonchifolia (L.)DC.

4 Brief Summaries

The research on the quick-propagation in vitro culture of Emilia sonchifolia (L.)DC. showed that the rate of multiplication could be 6 times. The quick-propagation in vitro culture could be used to provide lilac tasselflower in short time for the cultivation in large scale. The main stem of test-tube plantlet budded in 50 days after transplantation and the seeds ripened in 70 days. In the growth period of test-tube plantlet, there was no yellowing (caused by yellow virus) which happened commonly in the cultivation by seed. Without infected of yellow virus, the quick-propagation in vitro culture of lilac tasselflower could provide purified provenance, high-quality seeds for standardized and cultivation in large area.

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