

仙履蘭 'Maudiae' type 生產栽培系統與花期調節技術研究

Studies on production system and forcing culture techniques on *Paphiopedilum* 'Maudiae' type plants

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【摘要】

本研究為利用不同介質及不同 N-P-K 處理比例液肥試驗於仙履蘭 'Maudiae' type 生產栽培上。不同介質試驗結果顯示將幼苗栽培於蛇木屑中有助於植株生長，但成活率低（60%）；在混合椰纖與珍珠石（1：2）中對各生長及抽梗明顯較差；若栽培於泥炭與珍珠石（1：1，1：2）有助於植株生長，但成活率表現較低。對植株成長而言，各項植物生長特性對介質與肥料間反應，不同介質間及不同 N-P-K 比例處理間皆呈顯著主效應之差異，但兩者間大多無明顯交感作用存在。以中椰纖栽培成活率則較高（90%），且根部生長也較為良好。另外，樹皮對生長及開花率皆表現較差。以施用液肥來看，15-20-25 及 20-20-20 N-P-K 比例液肥對生長有明顯增長效果。從整體開花表現來看，介質以使用中、粗椰纖可提高開花率（50-52%）；液肥則以施用 15-20-25 N-P-K 比例有 43% 的開花率。綜合以上結果，植株栽植於粗或中椰纖及施用液肥 15-20-25 比例，無論對植株生長或開花皆有較佳效果。

以不同日/夜溫組合（30/25℃、30/20℃、30/15℃、25/25℃、25/20℃及 25/15℃）等六種不同溫度處理植株生長及開花反應，結果顯示於不同日/夜溫處理下花芽至開花所需時間及花開壽命皆以 30/20℃及 25/15℃下最長；高溫 30/20℃（溫差-10℃）對抽梗率有較佳的處理效果（70%）。整體而言，日/夜溫相差 10℃對開花品質有較佳效果。

利用 GA₄₊₇ 100 ppm、GA₄₊₇ 200 ppm、GA₃ 50 ppm、GA₃ 100 ppm、BA 200 ppm、BA 300 ppm、BA 400 ppm 不同生長調節劑加上對照組等八種處理，結果顯示施用低濃度 GA₃ 會抑制仙履蘭植株之生長；另外 GA₄₊₇ 100 ppm 及 GA₃ 100 ppm 其抽梗率皆達 80%；開花率則以 GA₃ 100 ppm 及 BA 200 ppm 分別為 70%及 60%較高。以花朵品質來看，施用 GA₄₊₇ 200 ppm 及 GA₄₊₇ 100 ppm，會使花朵產生畸形，使開放的花朵袋瓣部位消失；施用 GA₃ 及 BA 各處理濃度可使花朵正常並自然展開，花形左右對稱。綜合結果推論，GA₄₊₇ 100 ppm 及 GA₃ 100 ppm 有助於誘導花芽分化產生，GA₃ 100 ppm 及 BA 200 ppm 則可提升開花率。GA₄₊₇ 雖然能提高抽梗率，但開花率低，因此即使抽梗開花，仍產生畸形花。

以生產栽培 'Maudiae' type 仙履蘭而言，組培幼苗之介質與肥料管理建議可使用中椰纖配合液肥 20-20-20 以利植株生長；大苗及開花生產管理建議植株栽培於粗或中椰纖並搭配液肥 15-20-25 液肥。在花芽分化前，建議配合日/夜溫 30/20°C 或 25/15°C 下施用 GA₃ 100 ppm 或 BA 200 ppm，以促進開花。

關鍵字：花期調節、芭菲爾鞋蘭、開花、植物生長調節劑

【Abstract】

The study investigated the production and forcing culture techniques for *Paphiopedilum* 'Maudiae' type plants. The results of substrate test showed that *Paphiopedilum* seedling cultured in tree fern could enhance the growth response. But, the survival rate was lower (60%). Coir and perlite (1:2) mix showed lower growth and spiking rate ; Mixed peat and perlite (1:1 ; 1:2) substrate treatment could enhance the growth, but the survival rate was lower. The plant responses to substrate and fertilizer tests both showed significant main effects but no interaction effects. Survival rate of medium cocofiber was higher (90%), and could promote the roots development. Plants under bark culture the growth and flowering rate were both lower. Under two N-P-K liquid fertilizer treatments (15-20-25 and 20-20-20) could significantly enhance the growth. Medium and long cocofiber substrate treatments could promote the flowering rate (50-52%) ; 15-20-25 N-P-K liquid fertilizer have the highest flowering rate of 43%. *Paphiopedilum* culture in long or medium cocofiber applied with 15-20-25 N-P-K liquid fertilizer could both enhance growth and flowering.

Six different day/night temperature (30/25°C, 30/20°C, 30/15°C, 25/25°C, 25/20°C and 25/15°C) treatments were tested for forcing culture. The results showed effect of different day/night temperature treatments of 30/20°C and 25/15°C had longer flower bud to flowering time and flower life as compare to other treatments. High temperature 30/20°C (-10°C) treatment showed better spiking rate (70%). Results also showed that different day/night temperature at 10°C range the flowering quality of 'Maudiae' type was better.

The test on seven different PGRs (GA₄₊₇ 100 ppm、GA₄₊₇ 200 ppm、GA₃ 50 ppm、GA₃ 100 ppm、BA 200 ppm、BA 300 ppm、BA 400 ppm) and control showed that sprayed with low concentration GA₃ restrained growth of 'Maudiae' type plants. GA₃ 100 ppm and BA 200 ppm treatments showed better flowering ratio (70% and 60%, respectively). In flower quality, sprayed with GA₄₊₇ 100 ppm and GA₄₊₇ 200 ppm lead to abnormal flower, such as disappeared pouch. Sprayed with GA₃ and BA on *Paphiopedilum* 'Maudiae' type plants was beneficial to induce the normal appearance of flower bud. GA₄₊₇ and GA₃ 100 ppm could promote spiking rate, but lower flowering rate. However if it spiked to flowering, it could not reduce flower abnormality.

On production of *Paphiopedilum* 'Maudiae' type plants, it is suggested that using medium cocofiber with 20-20-20 N-P-K liquid fertilizer combination can enhance the plant growth of seedling ; *Paphiopedilum* 'Maudiae' type plants cultured in long or medium cocofiber with 15-20-25 N-P-K liquid fertilizer were beneficial to mature plants and flowering. Under day/night temperature 30/25°C or 25/15°C and spraying GA₃ 100ppm or BA 200ppm before the appearance of flower bud could promote flowering.

Keywords: forcing culture 、 *Paphiopedilum* 、 flowering 、 plant growth regulators (PGRs)