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# *Phalaenopsis* Sogo Yukidian 'V3' 蝴蝶蘭帶不同長度花梗株模擬海運日本對開花品質之影響

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## 摘要

黃肇家、黃慧穗、蔡金玉。2014。*Phalaenopsis* Sogo Yukidian 'V3' 蝴蝶蘭帶不同長度花梗株模擬海運日本對開花品質之影響。台灣農業研究 63(3):253–257。

本研究使用 *Phalaenopsis* Sogo Yukidian 'V3' 大白花蝴蝶蘭帶梗株為材料，植株先依梗長分為 5 組，各組梗長依次約為 1.3、2.2、3.4、4.2、5.5 cm。裝箱後，在 18℃ 黑暗下貯藏 11 d 以模擬海運日本。之後在一般溫室栽培，調查花梗變化與開花品質。結果發現，原始梗長較長的 (≥ 3.4 cm)，大都只有單梗，原始梗長較短的 (≤ 2.2 cm)，約 25–44% 具有雙梗，其第 2 梗大都很小，貯藏後幾乎都成為啞梗不能使用，原來的第 1 梗則都能順利正常開花。因此，在花梗數上應該可被接受。於催花時間，帶梗株貯後栽培約 60 d 即有 1 朵花開，和一般成熟株相較，可以減少催花時間約 1 mo 以上，因此可降低在日本栽培催花之成本。在開花品質上，從花梗長度 (約 50 cm)、花序長度 (約 42 cm)、花朵數 (約 12.5 朵)、花徑 (約 13 cm)、盆花壽命 (約 129 d) 來看，都是屬於極佳之品質。綜合這些結果，顯示 'V3' 蝴蝶蘭帶梗株海運日本應該是可行的。

**關鍵詞**：蝴蝶蘭、模擬海運、花梗、盆花壽命。

## 前言

台灣蝴蝶蘭海運外銷已經很普遍，為促進外銷進一步發展，希望開發帶梗株之出口，出口帶梗株可以縮短在國外催花之時間 1–2 mo，對拓展外銷有很大之幫助。台灣目前在平地以冷氣催花越來越普遍，也可以在冷藏庫內以人工光照得到發梗均一之帶梗株，提高帶梗株外銷發展之潛力。

蝴蝶蘭帶梗株海運歐美需要 25–30 d 運輸時間，經模擬貯運後，部分花梗在後續栽培時不再生長成為啞梗，此問題使帶梗株海運歐美無法實用。台灣帶梗株空運出口日本已實用多年，空運成本較高，僅有少數海運，海運對帶梗株品質之影響一直未有詳細研究，本研究以模擬貯運來探討帶梗株海運日本對品質之影響及可能性。

蝴蝶蘭成熟株海運之研究甚多，包括適當之貯運溫度 (Wang 1997; Huang *et al*. 2006; Wang *et al*. 2006)，以及處理及包裝方法 (Huang *et al*. 2006)。有關蝴蝶蘭帶梗株貯運之研究很少，在國立嘉義大學之研究，顯示帶梗株比未帶梗株可以提早開花約 30–40 d，在開花品質包括花梗長度、花序長度、花朵數，帶梗株與未帶梗沒有顯著之差異 (Huang *et al*. 2010)。在行政院農業委員會農業試驗所以 10 個品種測試，發現大多數品種都有啞梗問題，啞梗率約 30–80% 依品種而異 (Huang 2011)，對開花品質影響很大，因此未能商業化使用。宜蘭大學之研究，以 LED 在貯運間照明，可以進一步縮短帶梗株貯運後之催花日數 (Chang *et al*. 2010)，也使花梗長度在貯運間大幅提高 (Chang *et al*. 2009)。LED 在貯運

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間照明也被試用於改善啞梗，大約能使啞梗發生率減少一半 (Huang 2011)，效果不夠，因此沒有實用。

## 材料與方法

本研究使用之植株來自台南台霖生物技術股份有限公司，為 3.5 吋大白花 (*Phal.* Sogo Yukidian 'V3')，已在該公司經過低溫催花處理，為適合外銷日本之帶梗株。

這些帶梗株送到農業試驗所之後，先置於低溫溫室 (日溫/夜溫，24–25/18–19℃) 放置 1 d。依各植株最長的花梗之梗長分組，由 0.6–1.5 cm 至 5.6–6.5 cm 等共分 5 組 (表 1)，各組梗長平均為 1.3、2.2、3.4、4.2、5.5 cm (表 2)。每組取 16 盆，分組後直立裝於未打洞之密封紙箱，紙箱長寬高各為 55 cm × 52 cm × 35 cm，每箱裝 36 株。移到 18℃，在黑暗下貯藏 11 d 以模擬海運日本。貯藏後移到一般風扇水牆溫室 (日溫/夜溫，28–30℃/23–25℃，光度 9,000–15,000 lux，約 160–270 μmol $m^{-2}$ $s^{-1}$) 栽培，調查花梗之變化，到開花時，調查催花日數與開花品質。經過貯運及栽培 14 d 後 (合計 25 d)，調查梗長，若梗長沒有增加的視為啞梗，不列為梗數之內。由於在日本大白花蝴蝶蘭大都用於組盆，不需要分叉支，因此栽培過程將分叉支剪除。

催花日數為貯運後開始，到有 1 朵花開的日數。開花品質於頂端最後 1 朵花花朵盛開時調查，花梗長度為從花梗基部到最下位第 1 朵花之長度，花序長度為第 1 朵花至頂端最後 1 朵花之長度。花徑為花朵 (最下位第 2 朵) 2 個花瓣左右邊緣最大之長度。盆花壽命為植株放置在溫室，從 1 朵花開到有 1 朵花謝的日數。

**表 1.** *Phalaenopsis* Sogo Yukidian 'V3' 蝴蝶蘭帶梗株經裝箱後於 18℃貯藏 11 d 模擬貯運及栽培後植株梗數的變化。

**Table 1.** Effect of storage at 18℃ for 11 days on the spike number and abortion of the second spike of *Phalaenopsis* Sogo Yukidian 'V3' plants with spikes.

| Group (Pre-storage spike length, cm) | Pre-storage spike number | The existence of spike (%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pre-storage | | 14 d after storage | | On blooming | |
| | | 1st spike | 2nd spike | 1st spike | 2nd spike | 1st spike | 2nd spike |
| 1 (0.6–1.5) | 1.4 | 100.0 | 43.8 | 100.0 | 6.3 | 100.0 | 0.0 |
| 2 (1.6–2.5) | 1.3 | 100.0 | 25.0 | 100.0 | 0.0 | 100.0 | 0.0 |
| 3 (2.6–3.5) | 1.1 | 100.0 | 6.3 | 100.0 | 0.0 | 100.0 | 0.0 |
| 4 (3.6–4.5) | 1.0 | 100.0 | 0.0 | 100.0 | 0.0 | 100.0 | 0.0 |
| 5 (5.6–6.5) | 1.1 | 100.0 | 6.3 | 100.0 | 0.0 | 100.0 | 0.0 |

**表 2.** *Phalaenopsis* Sogo Yukidian 'V3' 蝴蝶蘭帶梗株經裝箱後於 18℃貯藏 11 d 模擬貯運及栽培後第 1 梗梗長之變化。

**Table 2.** Effect of storage at 18℃ for 11 days on the length of the first spike of *Phalaenopsis* Sogo Yukidian 'V3' plants with spikes.

| Group (Pre-storage spike length, cm) | Length of the first spike (cm) | | | |
|---|---|---|---|---|
| | Pre-storage | After storage | 14 d after storage | 30 d after storage |
| 1 (0.6–1.5) | 1.3 ± 0.1[z] | 2.7 ± 0.3 | 14.8 ± 1.1 | 36.3 ± 1.6 |
| 2 (1.6–2.5) | 2.2 ± 0.1 | 4.9 ± 0.2 | 19.4 ± 0.5 | 41.2 ± 0.6 |
| 3 (2.6–3.5) | 3.4 ± 0.1 | 6.9 ± 0.2 | 22.1 ± 0.5 | 43.3 ± 0.8 |
| 4 (3.6–4.5) | 4.2 ± 0.1 | 7.9 ± 0.2 | 22.9 ± 0.6 | 46.1 ± 0.7 |
| 5 (5.6–6.5) | 5.5 ± 0.1 | 9.5 ± 0.3 | 25.7 ± 0.8 | 46.6 ± 0.9 |

[z] Each data represents the Mean ± SE.

# 結果

## 貯運後花梗的變化

原始梗長比較短的植株，如 0.6–1.5 cm 與 1.6–2.5 cm (原始梗長 < 2.5 cm)，有 25.0–43.8% 具有雙梗 ( 表 1) ，原始梗長較長的 (> 2.5 cm) 植株，如 2.6–3.5 cm 至 5.6–6.5 cm，幾乎都沒有雙梗，具有第 2 梗的只有 0–6.3%。

啞梗調查結果，除 0.6–1.5 cm 外，所有其他組之第 2 梗幾乎全部都沒有增長，成為啞梗 (表 3)，0.6–1.5 cm 也只有 6.3% 具有雙梗 (表 1)。後續栽培時，第 2 梗生長緩慢，和第 1 梗差距越來越大，到栽培 30 d，增長最多的為 0.6–1.5 cm，其第 2 梗也只有 5 cm (表 3)，將之去除，因此開花時，所有植株都只有單梗 (表 1)。

各植株原有之第 1 梗，在後續栽培都持續正長生長，栽培 30 d 後，長度增加約 35–40 cm (表 2)，原始梗長較長的，增加多一些。到花朵盛開時，總梗長約 90 cm (花梗長加花序長)，各組間並無顯著差異 (表 4)。

## 催花日數與開花品質

帶梗株經貯運後，催花日數原始花梗較長的為 57.7 d，原始花梗較短的為 63.3 d (表 4)，差距約 1 wk。整體而言，帶梗株經貯運後，催花日數大約只需 60 d。

花朵盛開時，花梗長度各組皆約 50 cm，花序長度約 42 cm，花朵數約 12.5 朵，花徑約 13 cm，各組的結果都很相近 (表 4)，盆花壽命差異也很小，原始花梗較長的為 128.5 d，

**表 3.** *Phalaenopsis* Sogo Yukidian 'V3' 蝴蝶蘭帶梗株經裝箱後於 18℃貯藏 11 d 模擬貯運及栽培後第 2 梗梗長之變化。

**Table 3.** Effect of storage at 18℃ for 11 days on the length of the second spike of *Phalaenopsis* Sogo Yukidian 'V3' plants with spikes.

| Group (Pre-storage spike length, cm) | Length of the second spike (cm) | | | |
|---|---|---|---|---|
| | Pre-storage | After storage | 14 d after storage | 30 d after storage |
| 1. (0.6–1.5) | 0.2 ± 0.1[z] | 0.4 ± 0.2 | 1.7 ± 1.5 | 4.9 ± 4.4 |
| 2. (1.6–2.5) | 0.2 ± 0.0 | 0.2 ± 0.0 | 0.2 ± 0.0 | 0.7 ± 0.4 |
| 3. (2.6–3.5) | 0.5 ± 0.0 | 0.5 ± 0.0 | 0.6 ± 0.0 | 0.6 ± 0.0 |
| 4. (3.6–4.5) | –[y] | – | – | – |
| 5. (5.6–6.5) | 0.2 ± 0.0 | 0.2 ± 0.0 | 0.3 ± 0.0 | 0.3 ± 0.0 |

[z] Each data represents the Mean ± SE.
[y] No second spike existed.

**表 4.** *Phalaenopsis* Sogo Yukidian 'V3' 蝴蝶蘭帶梗株經裝箱後於 18℃貯藏 11 d 模擬貯運後之催花日數與開花品質。

**Table 4.** Effect of storage at 18℃ for 11 days on days to bloom and flower quality of *Phalaenopsis* Sogo Yukidian 'V3' plants with spikes.

| Group (Pre-storage spike length, cm) | Days to bloom[y] (d) | Stem length[x] (cm) | Inflorescence length[w] (cm) | Number of floret | Diameter of floret (cm) | Longevity of the spike[v] (d) |
|---|---|---|---|---|---|---|
| 1 (0.6–1.5) | 63.3 ± 0.7[z] | 48.7 ± 1.5 | 42.1 ± 1.2 | 12.3 ± 0.4 | 13.3 ± 0.1 | 130.1 ± 4.2 |
| 2 (1.6–2.5) | 61.1 ± 0.4 | 49.1 ± 0.8 | 41.6 ± 1.0 | 12.4 ± 0.3 | 13.3 ± 0.1 | 132.3 ± 3.0 |
| 3 (2.6–3.5) | 60.0 ± 0.5 | 49.9 ± 0.7 | 42.4 ± 0.7 | 12.5 ± 0.2 | 13.3 ± 0.0 | 127.8 ± 4.3 |
| 4 (3.6–4.5) | 58.7 ± 0.5 | 48.8 ± 0.9 | 42.1 ± 0.7 | 12.6 ± 0.2 | 13.1 ± 0.1 | 128.9 ± 3.6 |
| 5 (5.6–6.5) | 57.7 ± 0.3 | 49.9 ± 0.8 | 42.1 ± 1.1 | 12.7 ± 0.3 | 13.1 ± 0.1 | 128.5 ± 3.6 |

[z] Each data represents the Mean ± SE.
[y] Days to bloom represents the days after storage to the opening of the first floret.
[x] Stem length represents the length of spike from the base to the first floret at full bloom.
[w] Inflorescence length represents the length of spike from the first floret to the end of spike at full bloom.
[v] Longevity of the spike represents the days from the opening of the first floret to the senescence of any one floret. The plants were kept in greenhouse.

原始花梗較短的為 130.1–132.3 d，因此開花品質各組都很相似。

## 結論

‘V3’ 蝴蝶蘭帶梗株經 18℃貯藏 11 d 模擬海運日本，在花梗數上，應該是可被接受的，每棵植株最後都會有能正常開花的 1 個花梗。將一批蝴蝶蘭成熟株送進冷房催梗，於固定時間出來，必然會有梗長不同及梗數不一之帶梗株，這些帶梗株原始梗長較長的，大都只有單梗，原始梗長較短的，雙梗較高 (表 1)，這些第 2 梗大都很小。經過貯運及栽培後，具雙梗的植株，其第 2 梗幾乎全部成為啞梗，最後不能使用，但原來的第 1 梗都能順利正常開花。在日本，蝴蝶蘭單梗花，如果品質好，適合組盆，因此可被接受。

在催花時間上，帶梗株貯運後栽培約 60 d 即有 1 朵花開。通常 ‘V3’ 蝴蝶蘭成熟株，催花日數大都需要 90 d 以上，因此帶梗株海運日本可以減少在日本的催花時間約 1 mo 以上，因此可以降低在日本栽培催花之成本。

在開花品質上，本研究雖然沒有作空運或是未貯運之對照組，但是從花序長度，花朵數，花徑，盆花壽命之資料，和大部分 ‘V3’ 蝴蝶蘭未經貯運植株之開花品質相比較，此開花品質屬於極佳，因此模擬海運日本，開花品質仍是良好的。綜合這些結果，顯示 ‘V3’ 蝴蝶蘭帶梗株海運日本應該是可行的。

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# Effect of Simulated Marine Shipment to Japan on the Quality of *Phalaenopsis* Sogo Yukidian 'V3' Plants with Spikes

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## Abstract

Huang, C. C., H. S. Huang, and C. Y. Tsai. 2014. Effect of simulated marine shipment to Japan on the quality of *Phalaenopsis* Sogo Yukidian 'V3' plants with spikes. J. Taiwan Agric. Res. 63(3):253–257.

The *Phalaenopsis* Sogo yukidian 'V3' plants with spikes were used in this study. The plants were divided into five groups according to the length of the spike. The average lengths of the spikes in each group were 1.3, 2.2, 3.4, 4.2, and 5.5 cm. All the plants were stored at 18℃ for 11 days as a simulation of marine shipment to Japan. Then they were grown in a greenhouse to observe the changes of spikes and the quality of flowers. The results indicated that the plants with longer spikes (≥ 3.4 cm) usually had only one spike in each plant. About 25% to 44% of plants with shorter spikes (≤ 2.2 cm) had two spikes. After storage all the second spike become aborted. The first spike grew normally. All the plants had one normal spike can bloom eventually. It took about 60 days for the plants with spike to have the first floret bloom after storage. It was about 30 days shorter than those plants without spike. The flower qualities of these plants were very good. At full bloom the stem length was about 50 cm, the inflorescence length was about 42 cm, the number of florets was 12.5 on each spike, and the floret diameter was about 13 cm. The longevity of the spike was about 129 days. All these data indicated that it is feasible to export *Phal*. Sogo Yukidian 'V3' plants with spike to Japan by marine shipment.

**Key words:** *Phalaenopsis*, Marine shipment simulation, Spike, Longevity of the spike.

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