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## Accelerated rhizome forming and abscisic acid concentration in sacred lotus (*Nelumbo nucifera*) by low night water temperature

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### Abstract

The environmental factors, such as the temperature and photoperiods, play an important role in the dormancy stage of this tropical aquatic flower species, Sacred lotus (*Nelumbo nucifera* Gaertn.). Changes of temperature partially induced the fluctuation of endogenous phytohormone which affect plant growth and development, resulted not only poor growth but also reduced flower yields in mild winter of Thailand. To access the temperature factors, the experiment was conducted in CRD for 3 months under 3 ranges of low night temperatures (LNT) of water, i.e., ambient temperature (25°C) for being a control treatment, 20°C (LNT 20°C) and 15°C (LNT 15°C) by chilling unit. The data was collected in 2 stages, i.e., 45 days after treatments (45 DAT) and 90 DAT. Phytohormone such as abscisic acid (ABA) were investigated following each experimental period. It was found that the 20°C LNT suppressed the plant vegetative growth with less leaves number, leaf area, and leaf dry weight, while the leaf was absent when plant received 15°C LNT. Both LNTs stimulated the growth of underground part of the plant. 20°C LNT gave the higher stolon elongation, greater stolon diameter and more rhizome girdling, while the 15° LNT gave longer internode. Both LNTs induced more dry weight distribution to the stolon and higher accumulation of abscisic acid (ABA) concentration than ambient temperature in all organs (leaf, stolon, node). 20°C LNT gave higher ABA concentration in stolon part while 15°C gave higher ABA concentration in leaf and node part. The greatest accumulation of ABA was occurred in stolon part of 20°C LNT. While 15°C LNT resulted in highest ABA distributed to the node part of the plant. This finding might be beneficial information for developing sacred lotus as a cut flower for off-season production.

**Keywords:** Abscisic acid, *Nelumbo nucifera* Gaertn., rhizome yields, water cooling