

# First report of bacterial leaf blight of syngonium caused by *Xanthomonas campestris* pv. *syngonii* in Taiwan

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## ABSTRACT

Lee, Y. A., and Liu, Y. H. 2011. First report of bacterial leaf blight of syngonium caused by *Xanthomonas campestris* pv. *syngonii* in Taiwan. Plant Pathol. Bull. 20: 65-67.

Leaf blight symptoms on syngonium (*Syngonium podophyllum*) were observed in some nurseries in the Yang Ming Shan area, Taipei, Taiwan. Bacterial isolates were isolated from V-shaped lesions in diseased leaves by using xanthomonad differential (Xan-D) medium. The bacterium was identified as *X. campestris* based on physiological, biochemical, 16S rDNA sequence, and Biolog™ analyses. The bacterium isolated caused symptoms on syngonium but not on anthurium, and should be allocated to *X. campestris* pv. *syngonii* but not to *X. axonopodis* pv. *dieffenbachiae*. To our knowledge, this is the first report of this bacterium on syngonium in Taiwan.

Keywords: *Syngonium podophyllum*, Xan-D medium

## INTRODUCTION

Leaf blight symptoms on syngonium (*Syngonium podophyllum*) were observed during the springs of 2010 and 2011 in some nurseries in the Yang Ming Shan area, Taipei, Taiwan. The characteristic symptom on the infected leaves is the appearance of brown and V-shaped lesions along the margins of leaves (Fig. 1). The symptoms also appeared on the inside areas of leaves as small spots. The centers of the spots quickly turned brown and were surrounded by water-soaked and yellowish halos. The brown spots and the halos enlarged as the disease progressed and became irregular dry, necrotic lesions.

Bacterial isolates were isolated from the water-soaked

margins of V-shaped lesions in diseased leaves by using xanthomonad differential (Xan-D) medium<sup>(3)</sup>. The xanthomonad-like bacterial colonies, which were yellow-green, wet-shining, convex and surrounded by milky and clear zones, grew on the Xan-D medium after incubation for 3-4 days at 28°C (Fig. 2). Five characteristic colonies isolated from separate diseased leaves were selected for further characterization.

All bacterial isolates were gram-negative, positive for catalase and  $\beta$ -galactosidase, and negative for oxidase, nitrate reductase, urease, and tryptophanase (indole production). All hydrolysed starch, esculin and produced acids from metabolizing sucrose, glucose and arabinose but not from dulcitol, mannitol, and sorbitol. The above physiological and biochemical tests were conducted

according to Schaad *et al.* <sup>(4)</sup>. Biolog™ analysis identified the bacterium as *X. campestris* when GN2 plate profiles were compared with the GN601 identification database. An almost complete 16S rDNA sequence of isolate XcsE2 (1,503 bp, GenBank accession number JN164700) was determined and compared with the available 16S rDNA sequences in GenBank. The sequence was highly similar (99%) to those of some xanthomonads including *X. campestris* pv. *campestris* ATCC 33913 (AE008922), *X. campestris* pv. *zantedeschiae* A5 (AY605124), *X. axonopodis* pv. *syngonii* X430 (AY576650), and *X. axonopodis* pv. *dieffenbachiae* X481 (AY576646).

Bacterial suspensions ( $10^8$  CFU ml<sup>-1</sup>) were injected into the leaves of four syngonium plants to fulfil Koch's postulates. Inoculated plants were kept in a growth chamber at 28°C. Typical bacterial blight symptoms were observed after 6-10 days in all inoculated plants and were identical to those observed in the nurseries. Control plants, inoculated with sterile distilled water, showed no symptoms. The bacterium was readily re-isolated from diseased leaves. *Aglaonema commulatum* cv. Silver Queen, *Anthurium andreanum*, and *Dieffenbachia bausei* (DumbCane) (all *Araceae*) were also inoculated; blight symptoms were appeared on *A. commulatum* and *D. bausei* but not on *A. andreanum* even after 14 days.

Bacterial leaf blight of syngonium was first reported in the America then later in Mauritius where the pathogen was

designated as *X. campestris* pv. *syngonii* <sup>(1,2)</sup>. In contrast to *X. axonopodis* pv. *dieffenbachiae*, *X. campestris* pv. *syngonii* strains are highly virulent on syngonium but are not pathogenic on anthurium or other *Araceae*. The bacterium isolated caused symptoms on syngonium but not on anthurium, and should be allocated to *X. campestris* pv. *syngonii* but not to *X. axonopodis* pv. *dieffenbachiae*. To our knowledge, this is the first report of this bacterium on syngonium in Taiwan.

## LITERATURE CITED

1. Dickey, R. S., and Zumoff, C. H. 1987. Bacterial leaf blight of *Syngonium* caused by a pathovar of *Xanthomonas campestris*. *Phytopathology* 77: 1257-1262.
2. Jouen, E., Robène-Soustrade, I., Gagnevin, L., Pruvost, O., and Benimadhu, S. 2008. First report in Mauritius of bacterial leaf blight of *Syngonium* caused by *Xanthomonas campestris* pv. *syngonii*. *Plant Dis.* 92: 980.
3. Lee, Y. A., Sung, A. N, Liu, T. F., and Lee, Y. S. 2009. Combination of a chromogenic differential medium and *estA*-specific PCR for the isolation and detection of phytopathogenic *Xanthomonas* spp. *Appl. Environ. Microbiol.* 75: 6831-6838.
4. Schaad, N. W., Jones, J. B., and Chun, W. 2001. *Laboratory Guide for Identification of Plant Pathogenic Bacteria*. 3rd ed. APS Press, St. Paul, MN, USA.



Fig. 1. Leaf blight symptoms of syngonium infected by *Xanthomonas campestris* pv. *syngonii*

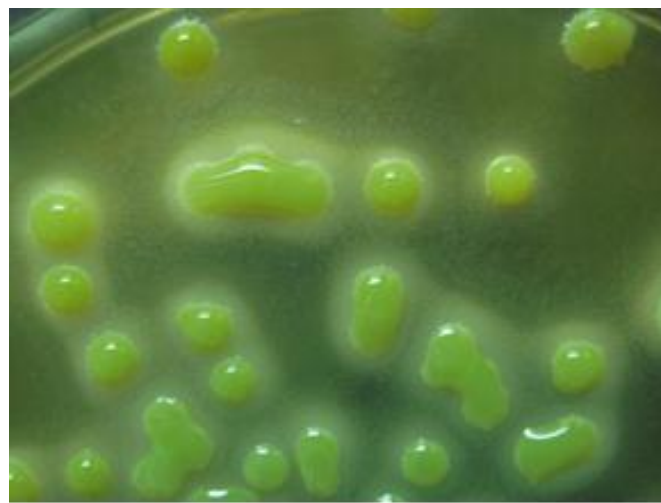


Fig. 2. Colonies of *Xanthomonas campestris* pv. *syngonii* grown on the Xan-D medium after incubation for 3-4 days at 28°C.

## 摘 要

李永安<sup>1,2</sup>、劉雅惠<sup>1</sup>. 2011. 合果芋由 *Xanthomonas campestris* pv. *syngonii* 引起之細菌性葉枯病在台灣之首度報導. 植病會刊 20: 65-67. (<sup>1</sup>輔仁大學生命科學系；<sup>2</sup>聯絡作者，電子郵件：035545@mail.fju.edu.tw；傳真：+886-2-29052193)

在台北陽明山的苗圃中發現合果芋有葉枯病的病徵，利用 xanthomonad 鑑別性培養基(Xan-D)，可從病葉上 V-型病斑上分離出細菌。以生理、生化、16S rDNA 序列及 Biolog 測試分析，所分離出的細菌經鑑定為 *Xanthomonas campestris*。經接種後，該細菌可在合果芋上產生病徵，但無法在火鶴花上引起病徵，因此應為 *X. campestris* pv. *syngonii*，而不是 *X. axonopodis* pv. *dieffenbachiae*。此為台灣對合果芋 *X. campestris* 細菌病害的首次報告。

關鍵詞：合果芋、xanthomonad 鑑別性培養基 (Xan-D)