植物病理學會刊　12:209-211, 2003

臺灣毛豆白粉病

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接受日期：2003 年5 月1 日

摘　要

陳昱初. 2003. 臺灣毛豆白粉病. 植病會刊12:209-211.

本文首次報導臺灣毛豆(大豆) 白粉病之發生及病原菌形態。2001 年於高雄區農業改良場之毛豆品種改良試驗田區內發現部分品系毛豆植株葉片上出現白色粉末黴狀物，初期在葉表面呈點狀分佈，病勢發展後期葉片、枝條及莖被白色黴狀物所披覆，植株之生長勢減弱，產量降低，發生嚴重時甚至葉片黃化、提早開花。迄今僅發現病原菌之無性世代，因此本文根據Boesewinkel, H. J. 1980 年之報告，依病原菌之無性世代形態特徵鑑定毛豆(大豆) 白粉病之病原菌爲*Microsphaera diffusa*。本病原菌對豌豆、紅豆、綠豆、萊豆及長豇豆等不具病原性，僅對毛豆部分品系具病原性。

關鍵詞：毛豆白粉病、無性世代、病原性測定

大豆(*Glycine max* (L.) Merr.) 又名黃豆，一年生豆科植物，原產於中國大陸，含豐富蛋白質、脂質、纖維素、礦物質、醣類、易消化纖維養分及油脂，爲世界上重要之植物性蛋白質和食用油來源[(1)]。大豆在台灣已有四百餘年栽培歷史，毛豆爲大豆莢果飽滿而尚未黃熟前採收之豆莢，目前栽培面積約7500 餘公頃，年產量6 萬餘公噸，是臺灣地區農產品出口外銷最大宗之經濟作物，主要輸往日本，年出口金額約爲5200 萬美元[(1)]。

2001 年於高雄區農業改良場之毛豆品種改良試驗田區內發現毛豆植株葉片上出現白色粉末黴狀物，初期在葉表面呈點狀分佈，隨病勢發展，漸呈灰白色粉狀，且病斑互相連接，使整個葉片被白色黴狀物所披覆，植株之生長勢減弱，部分品系提早開花，產量降低(圖一)。由於本病害在臺灣植物病害名彙中未見記載，是毛豆(大豆) 之新記錄病害[(2)]。本文報告本病之病徵、病原菌形態及病原性測定。

臺灣毛豆白粉病主要發生於秋冬裡作及春作，病徵與國外文獻上所記錄之大豆白粉病病徵描述相同[(5,6,7,8,9)]。病原菌之有性世代迄今尚未發現，無性世代產生之分生孢子是田間白粉病發生的主要感染源。病原菌之無性世代特徵爲：白色菌絲體外生於寄主葉表，形成圓形或不規則形病斑，發生嚴重時後期病斑互相癒合，甚至批覆全葉；分生孢子柄直立，單一著生，長度約爲65 - 110 μm，孢子柄上層部分伸長特化形成分生孢子，分生孢子柄腳胞(foot-cell) 呈筆直狀，附著胞(appresorium) 多裂(multilobed)，單生或對生。分生孢子球形(globose) 或近球形(subglobose)、單生，單胞、無色透明，大小爲30.2 - 32.5 ×20.8 - 26 μm (圖二)。未發現明顯的纖維狀顆粒體(fibrosin body)、吸器(haustorium) 形態。根據Boesewinkel, H. J. (1980) 對白粉菌科(Erysiphaceae) 無性世代之鑑定方法[(3)]，發生於台灣之毛豆白粉病病原菌鑑定屬於*Microsphaera diffusa* Cke. & Pk.，與國外報告大豆白粉病病原菌相似[(5,6,7,8,9)]，但由於高屏地區冬春溫度偏高，不利有性世代子囊果之產生，是否確屬同種，有待更進一步探討。利用罹病葉片接種法[(4)] 進行毛豆白粉病病原菌對不同寄主之病原性測定結果顯示，對包括豌豆、紅豆、綠豆、萊豆及長豇豆等均不具病原性，僅對部分品系之毛豆具病原性。

謝　辭

本文承蒙國立中興大學植病系謝教授文瑞協助鑑定病原，並蒙斧正初稿；高雄區農業改良場周國隆先生提供病害標本，行政院農業委員會藥物毒物試驗所李祈益先生協助掃描式電子顯微鏡照相，謹申謝忱。

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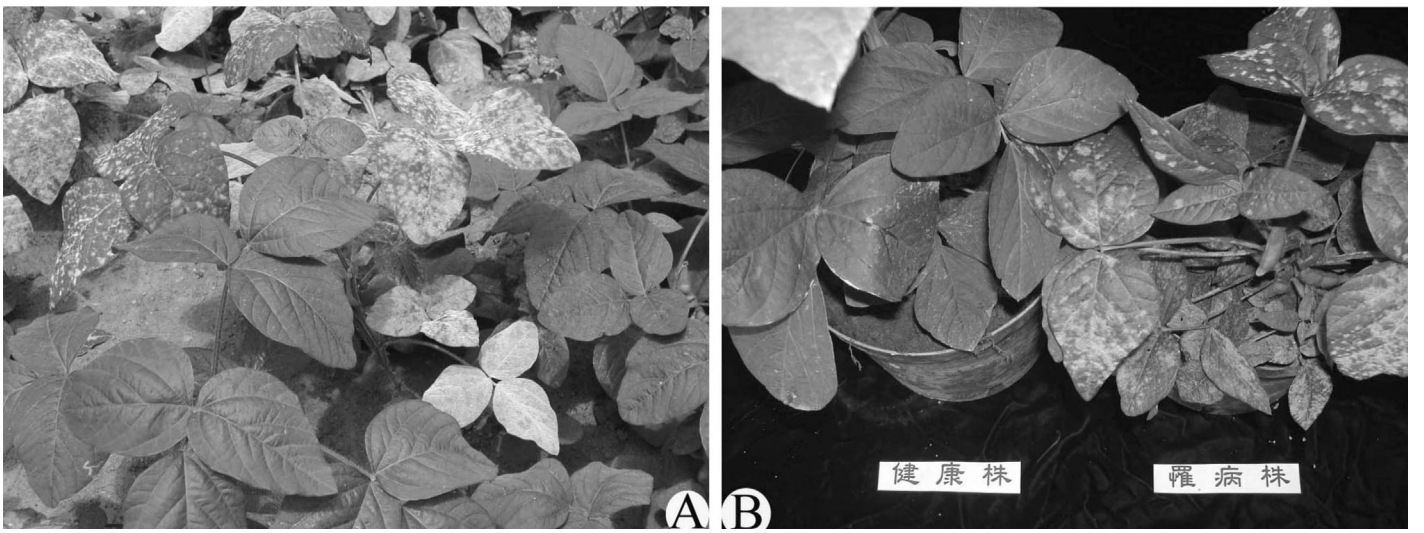
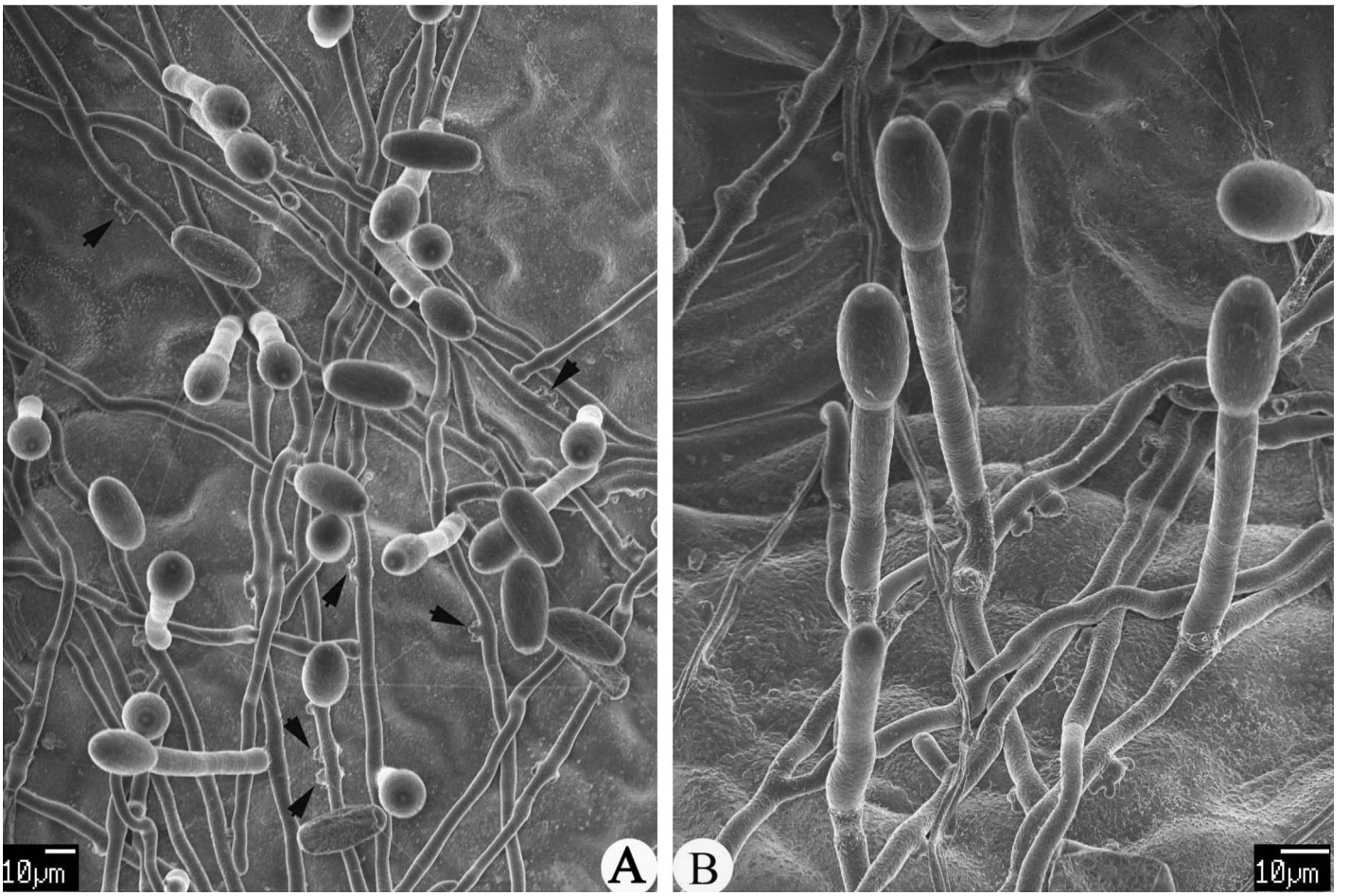


圖一、毛豆感染白粉病病徵。A. 田間病徵；B. 盆栽接種病徵。
Fig. 1. The powdery mildew of vegetable soybean leaves. Photographs of (A) symptom of vegetable soybean leaves in field ; (B) symptom of vegetable soybean leaves in ot by artificial inoculation.



圖二、毛豆白粉病原菌無性世代。A. 附著胞 (箭頭)；B. 分生孢子單生及直立之分生孢子柄。
Fig. 1. Anamorphic characteristics of *Microsphaera diffusa* on vegetable soybean leaves. Scanning electron micrographs of (A) appressoria (arrow) ; (B) conidium constricting out from the conidiophore.

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ABSTRACT

Chen, Y. C. 2003. Powdery mildew of vegetable soybean in Taiwan. Plant Pathol. Bull. 12:209-211. (Kaohsiung District Agricultural Improvement Station, Pingtung, Taiwan, R. O. C. ; Corresponding author, E-mail: yuchu@mail.kdais.gov.tw, Fax:+886-8-7224910)

A new powdery mildew on vegetable soybean was reported in Kaohsiung District Agricultural Improvement Station, Pintung, Taiwan, in 2001. The disease prevails in cool, humid autumn and spring seasons during the reproductive periods of vegetable soybean plants. The initial symptom appears first as small, circular, whitish powdery spots on the adaxial surface and late on the disease covered on both adaxial and abaxial surfaces of leaves, stems, petioles, and pods as well . Severely infected plants resulted in leaves abscission and yield reduction. The causal agent produces conidia only in the field and no teleomorph was found so far. The anamorph characteristics are whitish mycelium epiphytic on both adaxial and abaxial leaf surfaces; conidiophores upright, simple, 65-110 μm, upper portion increasing in length with formation of conidia, foot-cell straight , appressoria multilobed, single or opposite; conidia globose, 1-celled, hyaline, produced in single, 30-33$\times$19-26 μm. The fibrosing body in conidia, conidiophore cells and haustorium were not observed under microscope. Base on anamorphic characteristics, the pathogen was identified as *Microsaeria diffusa* (Boesewinkel, 1980). No disease symptom was observed when pathogenicity tests was conducted on garden pea (*Pisum sativum* L.), adzukibean (*Phaseolus angularis* Wight), mungbean (*Vigna radiata* (L.) Wilczek), lima bean (*Phaseolus lunatus* L.), and asparagus bean (*Vigna sesquipedalis* Fruwirth), while only few clones of vegetable soybean exhibited the susceptible reaction. This implies the potential for breeding resistant varieties to control the disease.

Key words: Vegetable soybean, anamorph, *Microsaeria diffusa*, pathogenicity tests