

# 以池上鄉稻田生長測試結構不敏感色素指數 Test SIPI for Life Cycle of Crop Rice in Chishang Township

周鑑本(Cheng K.-H.) 翁敏娟(Weng M.-C.) 張育承(Chang Y.-C.) 葉子葵(Yeh T.-Y.)  
章鶴群(Chang H.-C.)

中央氣象局衛星中心  
Meteorological Satellite Center, Central Weather Bureau

## 摘 要

本文以Landsat-8/9號繞極軌道衛星上載的OLI(Operational Land Image)儀器觀測資料，計算結構不敏感色素指數(The Structure Insensitive Pigment Index, SIPI)，SIPI代表葉子中類胡蘿蔔素與葉綠素的比值，這指數適用於樹冠區結構變化較大區域，偵測植物是否受疾病或其他壓力因素，當SIPI值小於0.8或大於1.8表示植物處於不健康或非綠色狀態。但由於要找到大範圍的受壓植物地區並不容易，故以池上鄉的稻田為測試標的，觀察稻田由生長到成熟期，稻穗中類胡蘿蔔素與葉綠素的比值改變。實驗結果顯示SIPI當接近成熟期時，稻株呈現非綠色的金黃色澤(雖非疾病)，SIPI指數逐漸升高，反映出稻葉逐漸轉至稻穗的現象，顯示SIPI具有偵知植物受疾病、其他壓力傷害或非綠色植物的可行性。

關鍵字：SIPI、類胡蘿蔔素、植物疾病

## Abstract

This paper focuses on the estimation of Structure Insensitive Pigment Index (SIPI) based on Landsat-8/9 OLI. SIPI indicates that the ratio of carotenoids to chlorophyll. The SIPI is suitable to estimate signs of stress vegetation or plant disease where vegetation is within the variable canopy structure. The value of SIPI for green or healthy vegetation is from 0.8 to 1.8. It is hard to seek a wide range of stress plants, therefore estimate crop rice in Chishang Township. Procedure for observing crop rice growth from seedlings to ripening, results show the increased SIPI value signals of ripening crop. As SIPI is close to the ear of rice, green changes color to golden (not disease). The higher SIPI relative to crop rice is tillering to ripening. SIPI could be used for stress vegetation or plant disease or non-green vegetation.

Key words: SIPI, carotenoids, plant disease