教育部補助大專校院延攬國際頂尖人才執行成果簡介

請依下列標題提供中英文版本，影音、照片及檔案若無，可免填。*為必填。

*標題	溫泉紅藻的光合作用調節機制 Regulatory mechanism of photosynthesis of extremophilic red algae
*計畫成果簡述	1. 發表溫泉紅藻新屬研究。 2. 著手進行溫泉紅藻光合作用保護機制的分析。 3. 於中山大學舉辦微生物生態研究年輕學者工作坊。 4. 新開設光合作用研究相關生物科學專業課程。 1. Establishment of a new genus of extremophilic red algae (Cyanidiophyceae). 2. Analysis of protective mechanisms in photosynthesis of extremophilic red algae. 3. Co-organization of a young scientist workshop on microbial ecology at NSYSU. 4. Delivering intermediate to advanced courses on photosynthesis studies
*成果說明	本計畫運用玉山青年學者計畫經費與學校提供之經費，為完成初步建置之光合作用實驗室購置專業儀器設備，實驗室研究主題為針對臺灣分離出的溫泉紅藻獨特的光合作用系統結構，研究嗜熱嗜酸紅藻的光合作用調節機制，為未來生技應用和發展打好所需基礎。第二年成效包括：與國內外學者合作，利用比較基因體學、形態與生理特徵比較，將陽明山國家公園採獲之藻株命名為新種，並歸為一個新屬中的新種，其學名為 *Cyanidiococcus yangmingshanensis*，其結果發表在藻類學領域著名期刊；分析此光自營生長藻株於不同光照環境下的抗壞血酸與抗氧化相關酵素變化，發現高光下這些成份的含量都會增加，顯示抗壞血酸相關的光保護機制可能普遍存在於不同種的溫泉紅藻；另外針對能保護光系統的非光化學淬滅進行分子機制的分析，目前已有初步成果。學術交流方面，與其他年輕學者合辦跨校微生物生態研究工作坊，促進各校相關領域師生交流，開創跨系及跨校學術合作的契機。系上教學方面，已申請新開設光合作用研究與植物學特色專業課程，持續努力培育光合作用基礎研究人才。 Benefiting from the funding and support of the Yushan Young Scholar Project and of NSYSU, the photosynthesis

	laboratory has been further strengthened with the installation of specialized instruments. The laboratory aims at understanding the regulatory mechanism of photosynthesis of extremophilic red algae under different light conditions, focusing on cyanidiophytes isolated in Taiwan and containing unique photosynthetic apparatus. During the second year of the project, a comprehensive comparative analysis of genomic, morphological, and physiological traits was successfully conducted to address the controversial phylogenetic position of one strain isolated from Yangmingshan National Park through cooperation among domestic and foreign scientists. The establishment of a new genus and a new species, *Cyanidiococcus yangmingshanensis*, is published in a high-impact journal in the field of phycology. Another finding revealed that the cell contents of ascorbic acid and antioxidant enzymes were increased under high light conditions in the abovementioned photoautotrophic strain. The results suggest that the photoprotection mechanism associated with ascorbic acid is prevalent among different species of cyanidiophytes. Analysis of the process of photoprotective nonphotochemical quenching in extremophilic red algae has been recently conducted and reveals some promising results. A workshop on microbial ecology was co-hosted with other young scholars and held at NSYSU to facilitate cross-institutional exchange and explore opportunities for collaboration. New undergraduate and postgraduate level specialized courses in photosynthesis research and plant science were planned and delivered under approval to train and better equip future photosynthesis researchers.	
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