

## 苗栗三義火炎山地區的沖蝕特性之研究

林俊全<sup>[1]</sup> 鄭遠昌<sup>[2]</sup> 任家弘<sup>[3]</sup>

**摘 要** 火炎山自然保留區為現有的 19 個自然保留區之一，其特徵為蝕溝發達、地表沖刷作用強烈，邊坡垂直聳立礫石惡地地形。本研究將集水區的源頭、河道、沖積扇三個區域變動的趨勢與變化量，加以說明其特色。

研究結果顯示，火炎山邊坡後退的形式有兩種，一種為平行後退，多出現在搬運能力強的地方；另一種為減坡後退，多發生在順向坡的邊坡。民國 80 年~91 年的資料顯示，10 年間平均的後退速率分別為平行後退邊坡每年 2.5-3 公尺（以 3 號集水區的邊坡計算）、減坡後退邊坡每年 1.5 公尺（以 4 號集水區的邊坡計算）。

在集水區源頭，侵蝕地貌的範圍不斷擴大，裸露地的後退速率以 3 號集水區最快，達每年 3 公尺，此結果比兩種邊坡後退的速率稍快。民國 75 年~91 年間，以民國 91 年的變遷幅度最大，主要的原因是受到民國 90 年的桃芝颱風及納莉颱風影響。

**關鍵詞**：火炎山礫岩、平行後退、邊坡後退、地形變遷、蝕溝、颱風、豪雨、沖蝕作用。

## Characteristics of the Erosion in Hoyenshan Area, Miaoli

Jiun-Chuan Lin<sup>[1]</sup> Yuan-Chang Cheng<sup>[2]</sup> Chia-Horn Jen<sup>[3]</sup>

**ABSTRACT** The Hoyenshan area, famous for its rugged gullies, was designated a nature reserve in 1986. This study quantifies the morphological changes of the conglomerate rock area over the last 20 years, by applying photogrammetric methods to a series of aerial photography acquired over a 20 year period. This enabled change detection to be conducted for the spatial extent and position of key geomorphological features. The results demonstrate two slope retreat processes: (1) parallel retreat, where the slope angle remains constant; this normally occurs in areas of high erosion; (2) slope retreat, where the slope angle reduces and this is often associated with an extension of the toe; this normally occurs on dip slopes.

Between 1991 and 2002, 2.5m of average parallel retreat at No.3 catchment and 1.5m of average slope retreat at No.4 catchment were observed.

At the headwater areas, parallel retreat of the slope could be as high as 3m and for catchment No.3 this is associated with significant deposition of slope forming material into the gullies. The topographic elevation of the gully floors do not appear to change and this suggests dynamic equilibrium.

The effects of typhoon Toraji and Nari in year 2001 produced significant

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[1] 國立台灣大學地理環境資源學系教授（通訊作者）

Professor, Department of Geography, National Taiwan University, Taipei, Taiwan, 106 (Corresponding Author)

E-mail: jclin@ntu.edu.tw

[2] 國立台灣大學地理環境資源學系研究助理

Research Assistant, Department of Geography, National Taiwan University, Taipei, Taiwan, 106

[3] 國立台灣大學地理環境資源學系助教

Teaching Assistant, Department of Geography, National Taiwan University, Taipei, Taiwan, 106

morphological changes, and these are clearly reflected in catchments No. 3 and 4.

**Key Words:** hoyenshan conglomerate rock, parallel retreat, slope retreat, morphological change, gullies, typhoon, heavy rainfall, erosional processes.