

行政院國家科學委員會專題研究計畫成果報告

「海洋鑽探計畫」(子計畫十)沖繩海槽之岩漿活動與演化(III)

Magmatism and evolution of the Okinawa Trough (III)

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主持人：鍾孫霖 (台大地質系教授)

Fax: (02) 2363 6095; E-mail: sunlin@ccms.ntu.edu.tw

一、摘要

本研究計畫為一三年期計畫，但研究經費採逐年申請補助。主要的研究對象除了沖繩海槽的岩漿岩之外，還包含與沖繩海槽演化有密切關聯的台灣北部及外海的火山活動。主要的研究內容包含精確的定年學和岩石、地球化學乃至地體動力模擬等。本報告涵蓋三年來之總體研究成果。

關鍵詞：沖繩海槽；岩漿活動；定年學；岩石地球化學

Abstract

This project is a three-year project to geochronologically and petrochemically study the magmatism in the Okinawa Trough thus better understanding its tectonic implications. Furthermore, the "post-collisional" volcanism around northern Taiwan and offshore islets, which may have been related to the arc-continent collision in Taiwan, subduction along the SW Ryukyu trench as well as opening of the Okinawa Trough, will be also studied. In this report, a summary of research results in the past three years will be outlined.

Keywords: Okinawa Trough; magmatism; geochronology; petrochemistry

二、計畫緣起與目的

本研究計畫之緣起和背景詳見計畫書之 C019 表，主要的研究目的包括：

1. 探討沖繩海槽的岩漿活動史及其與海槽擴張演化、琉球海溝隱沒作用的關係。
2. 對比研究沖繩海槽和環西太平洋弧後盆地的岩漿、構造異同及意義。
3. 探討台灣北部和外海火山活動的成因及其與沖繩海槽擴張演化、琉球海溝隱沒作用的關係。
4. 探討台灣北部後弧-陸碰撞相關作用和沖繩海槽演化的互動關係。
5. 探討台灣北部造山前後地幔性質的改變機制及所能引伸的地質意義。
6. 最終向國際 ODP 提出我國科學家主導的國際合作鑽探計畫。

三、研究結果與討論

本專題研究計畫自執行以來，已就撈自沖繩海槽中部的火山岩樣進行了氫-氫定年、岩石學、主量與微量元素及鋇-釷同位素地球化學等工作。此外，並對若干台灣北部及外海火山岩

樣完成了精確的微量元素和同位素組成分析。有些研究成果已正式發表於國內外知名地學刊物中。

另一方面，本研究和琉球大學的 Shinjo 及 Kimura 教授合作，利用日本研究船於 123.5 - 124.5°E 的西南沖繩海槽內打撈和潛航採到許多不同岩性的海底火山岩樣。此外，也利用我國海研一號研究船，至 122.5-123°E 附近多處打撈到海底火山岩樣。已分別對這些岩樣，有系統地完成氫-氫定年、岩石學、及元素與錫-釷同位素地球化學等分析工作，相關的研究論文已付梓或正在撰稿之中。

四、計畫成果自評

本專題研究計畫三年來的成果大致上達成預訂的研究目標，並已/將有多篇論文在國內外研討會上或知名地學期刊中發表（詳見參考文獻）。

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