

台灣板塊活動與物源變化關聯性研究

Plate Interactions and Source to Sink Variations in Taiwan

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有學者根據碎屑鋯石物源研究結果，認為台灣西部新近系沉積物很可能主要是來自東海陸架盆地，而東海陸架盆地之沉積物源則是來自長江。但在古長江襲奪金沙江和切穿長江三峽之前，古長江很可能承載的沉積物量不足以將泥沙一路輸送到東海陸架盆地。為了更好地理解台灣附近板塊活動引起的水系重組及盆地演化史，我們希望：

1. 利用台灣北部陸上及海域碎屑鋯石資料，驗證長江與東海陸架盆地及台灣沉積物源的關聯性；
2. 匯集台灣西部及台灣近海碎屑鋯石資料，以驗證其他可能的沉積物物源地區。

本計畫研究成果，除對基礎地球科學研究可以有所影響外，當有助於此一區域之天然資源探勘活動，尤其是在油氣能源方面。

Keywords: Detrital zircon, provenance study, Red River, South China Sea, East China Sea, and plate reconstruction

Cenozoic deformation of South and East Asia is largely shaped by the India-Eurasia collision at the beginning of Tertiary. This collision set up a series of chain reactions and largely modified the geomorphic and drainage conditions in this region. On the Tibetan side, it has long been proposed that the upstream of paleo-Yangtze River (i.e. the Jinsha River) was once flowing into the paleo-Red River which was the major sedimentary source to the Tokin Gulf-Yinggehai Basin. On the continental margin side in South China, some authors based on the provenance study results to suggest that the Neogene sediments in western Taiwan were possibly mainly coming from East China Sea Shelf Basin which received its sediments from the Yangtze River. However, before the capturing of the Jinsha River and incision of the Three Gorge, the paleo-Yangtze River probably was not carrying enough sediment loads to deliver sediments all the way to the East China Sea Shelf Basin. In order to better comprehend the drainage reorganization, continental margin and basin evolutionary histories (esp. the South China Sea and East China Sea) induced by the India-Eurasia collision, we are proposing to spend three years to do a thorough study. The main goals are to:

1. Use detrital zircon data and field structural observations from Vietnam to delineate the possible Jinsha River and paleo-Red River connection and the probable causes of major drainage reorganization from Miocene to Pliocene in northern Indochina;
2. Use detrital zircon data from northern onshore and offshore of Taiwan to verify the Yangtze River to East China Sea Shelf Basin and Taiwan sediment source connection;
3. Compile detrital zircon data from western Taiwan and offshore Taiwan to establish the possible sediment source regions;
4. Compile detrital zircon data from northern South China Sea margin to Taiwan and East China Sea Shelf Basin to study the effects of opening of South China Sea and continental margin extension (i.e. rift-drift transition);
5. Appraise the source to sink variations from Indochina to East China Sea and the relationships to major plate interactions in this region;
6. Combine all the results from the above-mentioned studies on to the paleogeographic reconstruction maps to evaluate the relationship between tectonic blocks reshuffling and evolution of the drainage systems.

This study will work closely with all the projects from the CREATE

(Comprehensive REsearch on Asia Tectonic Evolution) Group Project to tackle the subjects for accretionary and collisional tectonics in Asia. We will also carry out international collaboration with scientists from Vietnam and neighboring countries. The research outputs from this project can certainly be applied in the search for natural resources, esp. in the oil and gas industry.