

Zircon U-Pb geochronology of the western part of West Java: Magmatic history and tectonic implications

YU-MING LAI¹, LIN LO¹, WAI-KI LEUNG¹, SUN-LIN CHUNG², IWAN SETIAWAN³, HAO-YANG LEE², YI-JU HSIN², LEDIYANTJE LINTJEWAS^{1,3}, ANDRIE AL KAUTSAR^{1,3}, YOSHIYUKI IIZUKA² AND LONG XIANG QUEK¹

¹National Taiwan Normal University

²Academia Sinica

³LIPI

Presenting Author: ymlai@ntnu.edu.tw

Java Island belongs to the Sunda Arc which was built at a subduction zone between the Indian-Australian oceanic plates and the southeastern margin of the Sundaland. Arc volcanism on this island was erupted parallel to the trench since the Palaeogene to Recent. According to the tectonic setting, Java Island can be separated into three segments which named the West, Central, and East Java. Although most of the igneous age results given by the previous studies in the western part of West Java were younger than Miocene, however, some work suggested that an old Cretaceous arc might be located in the northern region and others proposed the Palaeogene 'Old Andesite' might extend westward from the East Java to this area, but no direct volcanic age evidence in this area can prove it yet.

Fifteen volcanic rocks (from basaltic andesite to dacite), five sandstones, and one beach sands sample were collected from the Danau volcanic complex, the Bayah Dome, and the Ciemas volcano. Zircons (including magmatic, inherited, and detrital zircons) were separated from these samples and finished U-Pb isotope dating analyses. According to the age data, this study identified four main results and implications: (1) The zircon U-Pb ages of the volcanic rocks: Danau (< 0.6 Ma, N = 2), North Bayah Dome (11.4 to 0.7 Ma, N = 7), South Bayah Dome (16.7 to 12.3 Ma, N = 4), and Ciemas (0.9 Ma, N = 1); (2) Inherited zircons in Danau and the North Bayah Dome yield Cretaceous ages (146 to 140 Ma) can be related to the magmatism from south Sumatra while the inherited ages older than Cretaceous only display in the South Bayah Dome and Ciemas; (3) Both the magmatic and detrital zircon ages apparent a northward-younging age trend in this area during the Miocene epoch, which implicates that the magmatism migrated further from the trench by some mechanism; (4) The Eocene age (ca. 37 Ma) from the detrital zircons were identified in the South Bayah Dome perhaps as an evidence for the remains of the Old Andesite bodies in the West Java.