

SARI

Studi Geologi Karakteristik Endapan Paleotsunami Daerah Paseban dan Sekitarnya,
Kecamatan Kencong, Kabupaten Jember, Jawa Timur

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Salah satu wilayah Indonesia yang rawan akan terjadinya tsunami adalah bagian selatan Indonesia, keterdapatan zona subduksi antara Lempeng Indo-Australia dengan Lempeng Eurasia menjadi pemicu terjadinya bencana alam tersebut. *Ring of Fire* yang melewati bagian selatan pulau Jawa dapat memicu terjadinya gempa bumi yang dapat menyebabkan terjadinya tsunami apabila deretan gunung api tersebut erupsi. Penelitian ini dilakukan untuk mengetahui sejarah seismik dan kejadian tsunami yang pernah terjadi, selain itu penelitian juga bertujuan untuk mengetahui ada atau tidaknya keterdapatan endapan paleotsunami serta untuk mengetahui karakteristik endapan tersebut. Penelitian dilakukan di selatan pulau Jawa tepatnya di daerah Paseban dan sekitarnya, Kecamatan Kencong, Kabupaten Jember dengan cara mengambil sampel secara vertikal dengan kedalaman 200 cm di lapangan dan dilanjutkan dengan analisis laboratorium berupa analisis granulometri, analisis XRF (*X-Ray Fluorescence*), analisis mikropaleontologi, dan analisis mineralogi. Penelitian – penelitian sebelumnya dilakukan di pesisir selatan Pulau Jawa bagian barat seperti daerah Banten, Pangandaran, Cilacap, Pacitan dan kemudian bergerak ke arah timur seperti Lumajang dan Banyuwangi. Hal ini dilakukan untuk membuktikan adanya tsunami yang menerjang di pesisir selatan pulau Jawa yang diakibatkan adanya gempa besar.

Ditemukan dua lapisan kandidat paleotsunami pada endapan yang berada di morfologi cekungan antar pematang (*swale*). Lapisan tersebut berada pada interval 100 - 127 cm dan interval 71 - 87 cm dengan ditemukannya *rip-up clast* dan kontak erosional dengan lapisan *paleosoil* di bagian bawahnya. Analisis granulometri menunjukkan bahwa lapisan paleotsunami A memiliki tebal 17 cm dengan ukuran butir lanau kasar – pasir sangat halus, sortasi sangat buruk, *fine skewed - coarse skewed*, kurtosis pada tipe *platykurtic*, dan pola kurva distribusi frekuensi *bimodal*. Sementara lapisan paleotsunami B memiliki tebal 16 cm dengan ukuran butir lanau kasar - pasir halus, sortasi sangat buruk, *very fine skewed – symmetrical*, kurtosis pada tipe *platykurtic - leptokurtic*, dan pola kurva distribusi frekuensi bimodal. Analisis XRF menunjukkan bahwa pada lapisan paleotsunami A dan B mengalami peningkatan unsur Ca dan Sr yang merupakan unsur penciri lingkungan laut secara signifikan. Ditemukan foraminifera bentonik (*Bulimina* sp.) dan pecahan – pecahan cangkang pada lapisan paleotsunami A. Sementara pada lapisan paleotsunami B ditemukan foraminifera planktonik (*Globigerinoides ruber*, *Globigerinoides trilobus*, *Neogloboquadrina dutertei*), foraminifera bentonik (*Bolivina* sp., *Spiroloculina* sp., *Triloculina* sp.), radiolaria, dan pecahan – pecahan cangkang.

Kata kunci: granulometri, XRF, mikropaleontologi, mineralogi, paleotsunami, Jember

ABSTRACT

Geological Study of Paleotsunami Deposit Characteristic in Paseban Area and Its Vicinity, District of Kencong, Jember Regency, East Java

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One of the regions in Indonesia prone to tsunami occurrence is the southern part of Indonesia which one of them is the southern part of the island of Java, the existence of a subduction zone between the Indo-Australian Plate with the Eurasian Plate being the trigger for the occurrence of the natural disaster. The Ring of Fire that passes through the southern part of Java is likely to trigger an earthquake that could cause a tsunami when the row of volcanoes erupts. This research was conducted to find out the seismic history and tsunami events that ever occurred, in addition research also aimed to know the existence or absence of paleotsunami deposits and to know the characteristics of such deposits. Research was conducted south of Java island precisely in the Paseban area and surrounding areas, Kencong Subdistrict, Jember County by taking vertically samples with a depth of 200 cm in the field and continued by laboratory analysis in the form of granulometric analysis, XRF analysis (X-Ray Fluoresence), micropaleontology analysis, and mineralogy analysis. Previous research was conducted on the southern coast of western Java Island such as Banten, Pangandaran, Cilacap, Pacitan areas and then moving eastwards such as Lumajang and Banyuwangi. This was done to prove the existence of a tsunami crashing on the southern coast of Java island resulting from a major earthquake.

*Two layers of paleotsunami candidates found on deposits that were in the morphology swale. The first layer is at intervals of 100 - 127 cm and the younger is at intervals of 71 - 87 cm with the discovery of rip-up clast and erosional contact with the paleosoil layer underneath. Granulometric analysis suggests that the first paleotsunami layer has 17 cm thick with a grain size of coarse silt– very fine sand, very poor sorting, fine skewed – coarse skewed, curtosis on platykurtic type, and bimodal frequency distribution curve patterns. While the younger layer has 16 cm thick with a coarse grain size – fine sand, very poor sortation, very fine skewed–symmetrical, curtosis in platykurtic – leptokurtic type, and bimodal frequency distribution curve patterns. XRF analysis showed that in both paleotsunami layers experienced significantly increased elements of Ca and Sr which are the tracing elements of the marine environment. Foraminifera bentonic (*Bulimina* sp.) and fragments–shell fragments found in first paleotsunami layer. While on the second paleotsunami layer found planktonic foraminifera (*Globigerinoides ruber*, *Globigerinoides trilobus*, *Neogloboquadrina dutertei*), bentonic foraminifera (*Bolivina* sp., *Spiroloculina* sp., *Triloculina* sp.), radiolaria, and shell fragments.*

Keywords: granulometry, XRF, micropaleontology, mineralogy, paleotsunami, Jember