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## Characteristics of volcanic rocks and associated intrusions based on petrography analysis in Jari-Krondonan Area, Bojonegoro Regency, East Java

Marin J. [✉](#); [Muhammad Y.M.](#); [Winarno T.](#)[Save all to author list](#)

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5

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Pandan volcano is one of the dormant Quaternary volcanoes in East Java characterized by several volcanic centers which extend to the northern part. This study is aimed to identify the volcanic rocks and intrusions of Jari - Krondonan area, Bojonegoro as well as determine their petrology and mineralogical characteristics. Geological observation was conducted to obtain primary data and to collect samples. Thin section of samples was prepared to analyze the petrographic aspects. Field observation shows several volcanic hills at Mount Jati, Mount Puru, Mount Watu, and Mount Lawang sites. Based on field mapping, lithologies of the research area are andesitic lava and intrusion with columnar joint or sheeting joint structure, surrounded by andesitic breccia. Andesite characterized by porphyritic texture with visible phenocrysts and volcanic glass groundmass. Samples from Mount Lawang and Mount Watu are composed of plagioclase and hornblende as main minerals. Samples from Mount Jati and Mount Puru are composed of plagioclase and pyroxene. Quartz, sanidine, and olivine

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 (2021) *Journal of Volcanology and Geothermal Research*

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# Table of contents

Volume 1047

2022

◀ Previous issue    Next issue ▶

**1st International Seminar on Earth Sciences and Technology 08/12/2021 - 09/12/2021 Online**

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Brian Bramanto, Dina A. Sarsito, Irwan Gumilar and Wedyanto Kuntjoro

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Utilization of Altimetry Satellites Microwave Radiometer for Atmospheric Observation over Indonesia

Fathin Nurzaman, Dudy D. Wijaya, Zamzam A. J. Tanuwijaya and Wedyanto Kuntjoro

+ Open abstract  View article  PDF

OPEN ACCESS 012003

3D Modelling of Meteorite from Astomulyo Village, Lampung, Indonesia by Close Range Photogrammetry (CRP)

Methods

D G Harbowo, J H Sitorus, L K Agustina, R Muztaba, T Julian and H L Malasan

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Development of Landsat-8 ARD Products for User Service in Indonesia


F Muchsin, K Ulfa, KA Pradono, Hendayani, Dianovita and KW Veronica


+ Open abstract  View article  PDF

OPEN ACCESS 012005

Tectonic Setting of Mount Agung, Bali: Insight From Petrology and Geochemistry Analysis

A Syafitri, I G B E Sucipta, A N Arifa, A Saepuloh and S Widiyantoro

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- 
- OPEN ACCESS** 012006  
Spatiotemporal Change of Chl-a Concentration in Jakarta Bay using Sentinel-2 Multispectral Imageries  
S Indriyaningtyas, F Setiawan, R F Lubis, H Bakti and W Widyatmanti  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012007  
Utilization of Terrestrial Laser Scanner Technology for Analyzing Shape of Dutch Cave (Bandung, West Java)  
G A Jessy Kartini, A Rizky and F A Rafiq  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012008  
Multivariate statistical analysis for sedimentary characteristics in an estuarine environment of the east flood canal river, Semarang  
Y Marantika, S H Nugroho, A Kurniasih, P S Putra, Lestari, S P A Wibowo, M T Kaisupy, Amar and Jakah  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012009  
Interaction of Air and Sea above Seamount in the Halmahera Sea  
D P Sobaruddin, F. Marpaung, R.A.B. Putra, A. Fahim, C.S. Dharma, D.T. Pramono and A. Kristiawan  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012010  
Clastic Sediment Characteristics of Gumai Formation: Preliminary Study of Tertiary Rocks in South Sumatra Basin  
M Hendrizan  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012011  
Understanding the Oceanography Condition in Java Sea using Hydrodynamic Simulation for Patimban Port Development  
Kholillah Y. Isnaeni, Hanif Diastomo, Candidad A. D. S. Nusantara and Wiwin Windupranata  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012012  
Registration Strategy of Handheld Scanner (HS) and Terrestrial Laser Scanner Integration for Building Utility Mapping  
Ratri Widyastuti, Asep Yusup Saptari and Arif Rahman  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012013  
Geochemistry of Gede Volcanic Complex West Java, Indonesia, Compared to Salak Volcano as its Proximity and how The Ciletuh Mélange Complex Lineament Affected It  
Erza Winanto, Achmad Nazar Abrory, Eric Edwin and Mirzam Abdurrachman  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012014  
Morphometry Analysis of Sedayu Mountainous Catchment Areas from Detailed Aerial Photos  
Tutur, Edo Kharisma Army and Arif Rohman  
[+ Open abstract](#) [View article](#) [PDF](#)
- 
- OPEN ACCESS** 012015  
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The Application of Electrical Resistivity Tomography using Wenner-Schlumberger Arrays Configuration to Identify the Geological Structure in Kancuh Warm Spring, West Java Indonesia

Patriks Vero Tongkeles, Suryantini and Angga Bakti Pratama

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The Significances of Cretaceous Petrified Wood Fossils from Padangcermin, Lampung in Paleoenvironmental Perspectives

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Mapping the distribution of natural ecosystems on peatlands through vegetation using the object-based image analysis (obia) method in bangko district, rokan hilir regency, riau.

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012018

Optimizing Image Scale and Resolution to Obtain Lineament Related Structures using ALOS PALSAR Dual Orbit Data

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---

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012019

Seismic Noise Analysis in InaTEWS Earthquake Station Network (*Case Study: Flores Earthquake 7.4, 14 December 2021*)

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012020

Analysis of Exploration Wells on Aquifer in Kaliwungu Formation and Regional Planning Recommendations

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---

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012021

Monitoring CO and O<sub>3</sub> concentration that caused climate change periodically using Google Earth Engine (study case: Java Island)

N M Ikram, L Afifah, B S Arthatia, S J Wicaksono, M Maharani, Ediyanto, T Ihsanudin and D Apriyanti

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012023

Love Wave Dispersion Analysis from Ambient Seismic Noise in Banyumas Basin, Central Java, Indonesia

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Characterization Of Sedimentary Process In An Estuarine Environment Based On Grain Size Trend Analysis And Geochemical Trace Element In The West Flood Canal River, Semarang

S N Devienna, S H Nugroho, A Kurniasih, P S Putra, Lestari, S P Awibowo, M T Kaisupy, Amar and Jakah

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## Geohazard and Environment

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012026

The Relationship of Lithology with Landslide Occurrences in Banyumanik and Tembalang Districts, Semarang City

D Trisnawati, Najib and A S Hidayatillah

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012027

Estimation of B-Value Variation as Earthquake Precursor in Java Region with Maximum Likelihood Method

D Arubi, Zulfakriza, S Rosalia, D P Sahara and N T Puspito

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Seismic Hazard Potential in Yogyakarta Based on HVSr Curve Estimation

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Numerical Modelling of Wave Attenuation in Pile Breakwater

F.A.R. Abdullah, T. Suprijo, H. Diastomo and G. Napitupulu

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012030

A review study of landslide analysis in Belimbing road, Pejagoan, Kebumen – Central Java, from hydrogeological aspects

N Mareta, S P Saputro, S Winduhutomo and R F Lubis

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Australian–Indonesian monsoon rainfall responses to the northern hemisphere climatic changes prior to the Last Glacial Maximum: an early indication

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012032

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# Characteristics of volcanic rocks and associated intrusions based on petrography analysis in Jari-Krondonan Area, Bojonegoro Regency, East Java

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**Abstract:** Pandan volcano is one of the dormant Quaternary volcanoes in East Java characterized by several volcanic centers which extend to the northern part. This study is aimed to identify the volcanic rocks and intrusions of Jari - Krondonan area, Bojonegoro as well as determine their petrology and mineralogical characteristics. Geological observation was conducted to obtain primary data and to collect samples. Thin section of samples was prepared to analyze the petrographic aspects. Field observation shows several volcanic hills at Mount Jati, Mount Puru, Mount Watu, and Mount Lawang sites. Based on field mapping, lithologies of the research area are andesitic lava and intrusion with columnar joint or sheeting joint structure, surrounded by andesitic breccia. Andesite characterized by porphyritic texture with visible phenocrysts and volcanic glass groundmass. Samples from Mount Lawang and Mount Watu are composed of plagioclase and hornblende as main minerals. Samples from Mount Jati and Mount Puru are composed of plagioclase and pyroxene. Quartz, sanidine, and olivine present as accessory minerals. Plagioclase and pyroxene occasionally formed glomerocryst and poikilitic texture, which play an important role in the fractionation and crystal settling processes. Sieve and regular zoning in plagioclase suggest magma mixing. Gabbro and metamorphic xenoliths found in Mount Lawang and Mount Watu indicates an interaction with country rock during magma rising.

## 1. Introduction

Pandan Volcano is a Pleistocene volcano [1], part of the Quaternary Sunda-Java volcanic arc magmatism [2]. The volcano is located in the Wilis – Lasem arc segment, East Java Province (Figure 1). Currently, the volcano is not active but still shows magmatic activity as indicated by the presence of geothermal manifestations such as hot springs and travertine on the northern slope of the volcano [1, 3]. Stratigraphy of Pandan Volcano is composed of the Pandan Breccia Formation consisting of andesite breccia and andesite lava as well as several intrusions were found in the northern part around Jari and Krondonan, Gondang District, Bojonegoro Regency, East Java. Pandan Volcano, which is Lower Pleistocene, situated in the Kendeng Zone. Kendeng Zone is Neogene sedimentary rock formations consist of volcanoclastic and pelagic marine successions [4] (Figure 2).

Petrology and volcanostratigraphy studies are discussed in several sites of igneous rocks from Pandan Volcano, particularly associated with geothermal manifestations. Several volcanic centers of Pandan Volcano on the northern slope are produced andesite lava, pyroclastic fall deposit, and pyroclastic flow breccia. There is also porphyritic andesite intrusion of Selo Gajah Hill which cause contact metamorphism effect on its surrounded sedimentary rocks [5]. Previous study on the petrological and geochemical characteristics of Pandan Volcano stated that magmatic activity is the source of heat in the

