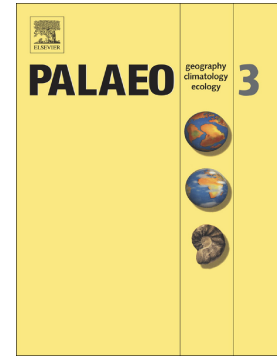


## Accepted Manuscript

Late Middle Miocene volcanism in Northwest Borneo, Southeast Asia: Implications for tectonics, paleoclimate and stratigraphic marker

Mu. Ramkumar, M. Santosh, R. Nagarajan, S.S. Li, M. Mathew, D. Menier, N. Siddiqui, J. Rai, A. Sharma, S. Farroqui, M.C. Poppelreiter, J. Lai, V. Prasad



PII: S0031-0182(17)30506-0  
DOI: doi:[10.1016/j.palaeo.2017.10.022](https://doi.org/10.1016/j.palaeo.2017.10.022)  
Reference: PALAEO 8489

To appear in: *Palaeogeography, Palaeoclimatology, Palaeoecology*

Received date: 11 May 2017  
Revised date: 21 October 2017  
Accepted date: 23 October 2017

Please cite this article as: Mu. Ramkumar, M. Santosh, R. Nagarajan, S.S. Li, M. Mathew, D. Menier, N. Siddiqui, J. Rai, A. Sharma, S. Farroqui, M.C. Poppelreiter, J. Lai, V. Prasad, Late Middle Miocene volcanism in Northwest Borneo, Southeast Asia: Implications for tectonics, paleoclimate and stratigraphic marker. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Palaeo*(2017), doi:[10.1016/j.palaeo.2017.10.022](https://doi.org/10.1016/j.palaeo.2017.10.022)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Late Middle Miocene volcanism in Northwest Borneo, Southeast Asia:  
Implications for tectonics, paleoclimate and stratigraphic marker**

**Mu.Ramkumar<sup>\*1,2</sup>, M.Santosh<sup>3,4</sup>, R. Nagarajan<sup>5</sup>, S.S. Li<sup>3</sup>, M. Mathew<sup>6</sup>, D. Menier<sup>6</sup>,  
N.Siddiqui<sup>7</sup>, J. Rai<sup>8</sup>, A. Sharma<sup>8</sup>, S.Farroqui<sup>8</sup>, M.C.Poppelreiter<sup>2</sup>, J.Lai<sup>2</sup>, V.Prasad<sup>8</sup>**

<sup>1</sup>Department of Geology, Periyar University, Salem – 636011. India. muramkumar@yahoo.co.in

<sup>2</sup>South East Asia Carbonate Research Laboratory (SEACaRL), Universiti Teknologi Petronas, Tronoh, Malaysia. M.Poppelreiter@SHELL.com; jonathanlai.c.m@gmail.com

<sup>3</sup>China University of Geosciences, Beijing, PR China. santosh@cugb.edu.cn; lishanshan199811@163.com

<sup>4</sup>Department of Earth Sciences, University of Adelaide, Adelaide SA 5005, Australia

<sup>5</sup>Department of Applied Geology, Curtin University, Sarawak, Malaysia. nagarajan@curtin.edu.my

<sup>6</sup>Laboratoire Géosciences Océan, UMR CNRS 6538, Université de Bretagne Sud, 56017 Vannes Cedex, France. dmenier5@gmail.com; manoj\_mathew7@yahoo.com

<sup>7</sup>Department of Geoscience, Universiti Teknologi Petronas, Tronoh, Malaysia.numairpng@gmail.com

<sup>8</sup>Birbal Sahni Institute of Palaeosciences, 53 University Road, Lucknow. India.

Jyotsana\_rai@yahoo.com; anupam110367@gmail.com; shazi3112@gmail.com;

prasad.van@gmail.com

\* Corresponding Author.

**Abstract**

Explosive volcanic events often produce pyroclastic materials that can be recognized from the geological record. These discrete pyroclastics form regional marker beds. Here we report the occurrence of a tephra layer interbedded within very thick coal beds near Mukah, Sarawak, Borneo. Traceable for tens of kilometers in the Mukah area of Sarawak, this tephra layer can be considered as regional stratigraphic marker with precise chronostratigraphic control. Systematic sedimentological, mineralogical, geochemical and zircon U-Pb geochronological studies have revealed a major effusive volcanic event during the latest Middle Miocene, presumably contemporaneous and/or related to a magmatic event of an earlier phase of the Mt. Kinabalu pluton or magmatism in West Sarawak or East Sabah. The volcanic event had promoted catastrophic flooding of coastal swamps and fall-out from the ash clouds that formed a regionally monotonous tephra layer across the Serravallian- Tortonian boundary. In conjunction with the regional occurrences of trap rocks, structural trends and known tectonic events, we constrained the regional depositional environments, and climate. The tephra layer was deposited in a coastal plain-swamp,-seasonal, shallow, high-moderate energy fluvial channel-lacustrine environmental setting, wherein atmospheric fallout and eroded material from regoliths formed over older basement and volcanic rocks of the hinterland which were mixed to produce the tephra layer. This tephra layer is sandwiched between the very thick coal beds. A pre-existent volcanic chamber that was active for a long time, also experienced periodic explosive activity from probably the same magma chamber and conduit and including a major explosive activity that recycled early-formed crystals and felsic magma (rhyolite-dacite) during the major effusive event are also recognized. Our findings provide robust evidence for the prevalence of intensive chemical weathering under a wet-humid climate, and relative tectonic quiescence before the major effusive event, and the existence of vast, monotonously gently-sloping coastal plains and luxuriant vegetation akin to the present.

**Key Words:** Volcanic tephra dispersal, Zircon geochronology, Middle Miocene tectonics, coastal swamp, paleoclimate, NW Borneo.

**1. Introduction**

Download English Version:

<https://daneshyari.com/en/article/8868437>

Download Persian Version:

<https://daneshyari.com/article/8868437>

[Daneshyari.com](https://daneshyari.com)