

## **PETROGENESIS BATUAN METAMORF DI DAERAH PERBUKITAN JIWO, KECAMATAN BAYAT, KABUPATEN KLATEN, PROVINSI JAWA TENGAH**

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Batuan metamorf regional dan asosiasinya di Pulau Jawa dapat dijumpai di Ciletuh (Jawa Barat), Komplek Luk Ulo dan Bayat (Jawa Tengah). Secara umum, Perbukitan Jiwo terbagi menjadi dua area yaitu Perbukitan Jiwo Barat dan Perbukitan Jiwo Timur yang dipisahkan oleh Sungai Dengkeng. Tujuan penelitian ini untuk mengetahui persebaran batuan metamorf di Perbukitan Jiwo, batuan asal dari batuan metamorf, fasies batuan metamorf, kondisi dan estimasi tekanan dan temperatur metamorfisme, serta penentuan *setting* tektonik dan sejarah geologi.

Metode penelitian terdiri dari tahap persiapan, tahap pengambilan data lapangan, tahap analisis data lapangan, tahap analisis laboratorium (petrografi, *X-Ray Diffraction*, *X-Ray Fluorescence*, dan *Scanning Electron Microscope-Energy Disperse Spectroscopy*), dan tahap integrasi dan intepretasi.

Batuan metamorf di Perbukitan Jiwo Barat tersusun oleh filit mika, sekis mika, sekis karbonatan, kuarsit, skarn hedenbergit, marmer, metabatulanau (hornfels), serpentinit, sekis epidot-glaukofan, *soapstone*, dan protomilonit. Kemudian di Perbukitan Jiwo Timur tersusun oleh filit mika, sekis mika, sekis klorit, sekis karbonatan, metabatugamping, sekis grafit, marmer, kuarsit, dan sekis tremolit-albit-epidot. Fasies batuan metamorf di Perbukitan Jiwo tersusun oleh fasies hornfels/skarn, fasies sekis hijau (dominan), dan fasies sekis biru (Perbukitan Jiwo Barat). Protolit dominan berasal batuan pelitik, namun juga hadir protolit berasal batuan basaltik-andesitik. Proses metamorfisme pada Kapur Akhir cenderung berada pada zona subduksi yang dapat membentuk fasies sekis biru (tekanan tinggi-temperatur rendah) dan fasies sekis hijau (tekanan rendah-temperatur sedang). Keberadaan fasies sekis biru cenderung di zona *slab* subduksi, sedangkan fasies sekis hijau berada di dekat permukaan. Serpentinit mengambil bagian dari proses ekshumasi Perbukitan Jiwo yang membawa sekis epidot-glaukofan ke permukaan. Proses metamorfisme pada kurun Paleogen – Neogen dipengaruhi oleh proses magmatisme yang membentuk skarn dan metabatulanau (hornfels) serta dipengaruhi oleh struktur geologi berupa sesar naik sinistral yang membentuk protomilonit. Batuan metamorf di Perbukitan Jiwo Barat dan Perbukitan Jiwo Timur memiliki perbedaan fasies metamorfismenya. Pada Perbukitan Jiwo Barat dapat dijumpai serpentinit dan sekis biru, sedangkan di Perbukitan Jiwo Timur tidak dijumpai asosiasi batuan tersebut. Studi detil pembentukan Perbukitan Jiwo dibutuhkan dari sudut pandang keilmuan lain, tidak hanya dari studi batuan metamorf saja.

**Kata Kunci :** Petrogenesis, Perbukitan Jiwo, Bayat, Batuan metamorf, Subduksi

## **PETROGENESIS OF METAMORPHIC ROCKS IN JIWO HILLS AREA, BAYAT, DISTRICT OF KLATEN, CENTRAL JAVA PROVINCE**

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Regional metamorphic rocks and its associated in Java Island founded in Ciletuh (West Java), Luk Ulo Complex and Bayat (Central Java). Generally Jiwo Hills divided into two areas, Western Part of Jiwo Hills and Eastern Part of Jiwo Hills that separated by Dengkeng River. The purposes of this study is to determine the distribution of metamorphic rocks in the Jiwo Hills, the origin of metamorphic rocks, metamorphism facies, condition and estimation of pressure and temperature metamorphism, also determination of tectonic setting and geological history.

The research methods comprising the following steps of preparation, field data collections, field data analysis, laboratory analysis (petrography, X-Ray Diffraction, X-Ray Fluorescence, and Scanning Electron Microscope-Energy Disperse Spectroscopy), and stage of integration and interpretation.

Metamorphic rocks in Western Part of Jiwo Hills composed by mica phyllite, mica schist, calcareous schist, quartzite, hedenbergit skarn, marble, metasiltstone (hornfels), serpentinite, epidote-glaucophane schist, soapstone, and protomilonit. Eastern Part of Jiwo Hills composed by mica phyllite, mica schist, chlorite schist, calcareous schist, metalimestone, graphite schist, marble, quartzite, and tremolite-albite-epidote schist. Facies metamorphic rocks in the Jiwo Hills composed by hornfels facies / skarn, green schist facies (dominant), and blue schist facies (Western Part of Jiwo Hills). The dominan protolith not only derived from pelitic rocks, but also derived from basaltic-andesitic rocks. Metamorphism process was originally a subduction zone that showing presence of blue schist facies (high P-low T) and green schist facies (low P-moderate T). Blue schist located near subduction slab, however green schist located near surface. The presence of serpentinite assumed as part of exhumation process that brings epidote-glaucophane schist and gabbro into the surface in Upper Cretaceous. Metamorphism process in Paleogen – Neogen formed skarn and metasiltstone (hornfels) also controlled by geological structure as sinistral thrust fold that formed protomylonite. Serpentinite and epidote-glaucophane schist founded in Western Part of Jiwo Hills, but those associated rock not founded in Eastern Part of Jiwo Hills. Furthermore, detail study regarding the formation of Jiwo Hills not only from metamorphic rocks study, but also from other scientific perspective.

**Keywords:** Petrogenesis, Jiwo Hills, Bayat, Metamorphic rocks, Subduction