# Petrography of Igneous Rocks from Chalawan, Kumpee, and B Prospects, Phichit and Phetchabun Provinces

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Independent study in geology 205499
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## ABSTRACT

The Chalawan, Kumpee, and B Prospects are located within the Loei Fold Belt. The host rocks mainly consist of volcaniclastic and volcanogenic sedimentary rocks that host epithermal gold–silver mineralization. However, intrusive dykes cross-cut the host rocks. These dykes are barren of economic mineralization and are therefore classified as waste rock in mineral resource modeling.

This study aims to investigate the petrographic characteristics of the intrusive dykes in the study area in order to classify the rock types and provide fundamental data for interpreting the distribution of the dykes. A total of 19 drill core samples from 15 boreholes were prepared as standard thin sections and analyzed under a polarizing microscope together with quantitative point-counting analysis.

Petrographic analysis classifies the igneous rocks into three main groups: (1) basaltic to dacitic rocks (17 samples) occurring as both dykes and lava units, (2) a diorite dyke (1 sample), and (3) a tuff (1 sample). Most samples exhibit moderate to high degrees of alteration, with sericite and chlorite as the dominant secondary minerals. The petrographic data provide a fundamental basis for improving mineral resource modeling and supporting future exploration planning

## STUDY AREA

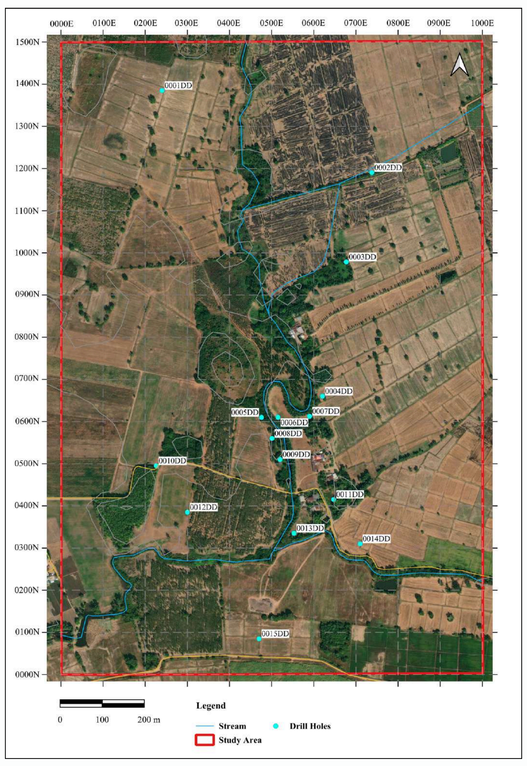



**Fig. 1.** Satellite imagery map of the study area showing the locations of 15 diamond drill holes, streams, and roads (modified from Esri World Imagery in QGIS).

The study area is located along the boundary between Phichit and Phetchabun Provinces, covering approximately 1.5 km². The terrain is mostly flat with some small hills. A stream, Khlong Sai Yang Rung, flows through the center of the area in a north–south direction.

## OBJECTIVE

- To study the petrographic characteristics of dykes in the study area, focusing on minerals, textures, and alteration for rock classification.
- To investigate the continuity and distribution of the dykes.

## METHODOLOGY

Review geological data of the study area using exploration drilling data, including collar locations, drill hole survey data, and geological logs.

Select representative rock samples from drill core based on their lithological characteristics.

Conduct petrographic analysis of rock samples using thin sections under a polarizing microscope.

Construct cross sections and a plan view of the study area.

## REFERENCE

Esri. (n.d.). *World Imagery Basemap*. Esri, Maxar, Earthstar Geographics, and the GIS User Community.

## RESULT

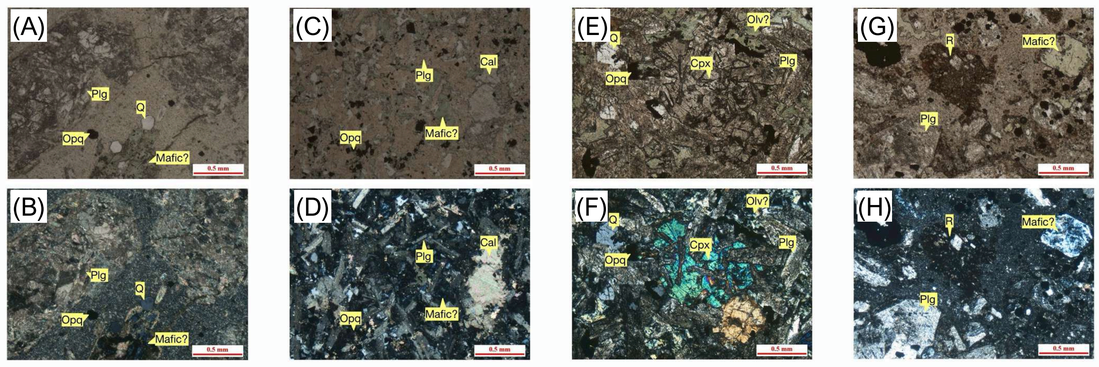



**Fig. 2.** Photomicrographs of representative rock samples. **(A–B)** Porphyritic andesite, **(C–D)** Aphyric andesite, **(E–F)** microgabbro, and **(G–H)** crystal tuff. Images (A, C, E, G) are in plane-polarized light (PPL), and (B, D, F, H) are in cross-polarized light (XPL).

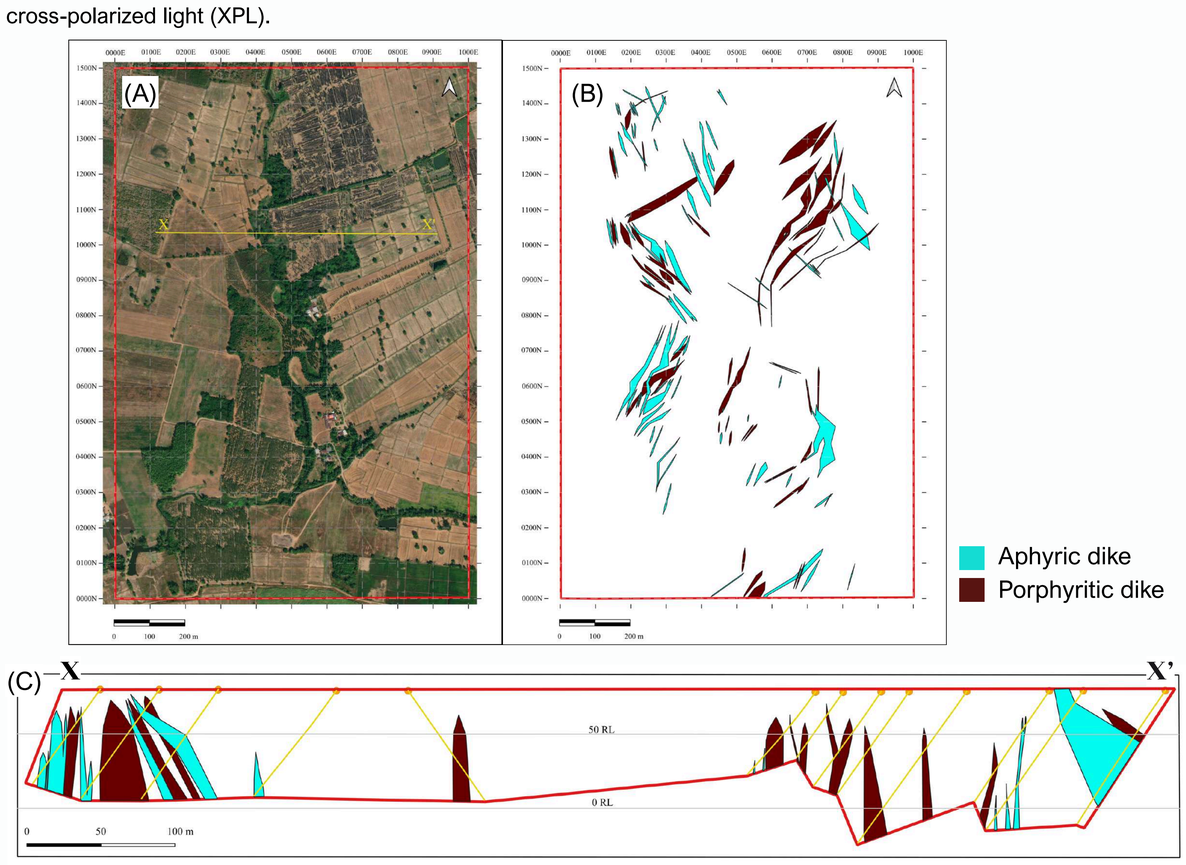



**Fig. 3. (A)** Plan view of the study area showing the location of the cross-section line X–X′. **(B)** Map showing the distribution of dykes in the study areaat an elevation of 50 m above sea level. **(C)** Cross section along line X–X′.

## CONCLUTION

A total of 19 rock samples from 15 drill holes were studied, including dyke, coherent units and host rocks. Petrographic analysis classifies the rocks into three main groups.

1. Basaltic to dacitic rocks (17 samples): These rocks show both porphyritic and aphyric textures. The dominant minerals are plagioclase and unidentified mafic minerals.
2. Microgabbro dyke (1 sample): This rock exhibits ophitic to subophitic textures and consists mainly of plagioclase and pyroxene.
3. Tuff (1 sample): This rock shows a pyroclastic texture composed of crystal fragments and volcanic rock fragments.

Alteration: Most samples show moderate to high degrees of alteration. The main secondary minerals are sericite, chlorite, and calcite.

Opaque minerals are also locally observed with skeletal textures, indicating rapid cooling.

Dyke orientation: The dykes mainly trend NE–NW and generally dip steeply.