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RESEARCH ARTICLE

Comparison of Granitoid Characteristics West Kalimantan and Karangsambung Based On Mineralogical And Geochemical Aspects

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Abstract

Indonesia was included in the ring of fire so that it has various types of tectonic products, one of which is granitoid. Granitoid is very complex rock and many are found in Indonesia. Some of them are found in West Kalimantan and Karangsambung. Basis of the reasearch is there is no research that compares granitoid in two regions. The purpose of this study was to compare rock characteristics and granite petrogenesis of West Kalimantan and Karangsambung. The research method used was collecting data on field, also laboratory analysis of rock samples using a polarization microscope, refraction microscope, and X-Ray Fluorescence analysis. The mineralogical characteristics of each study area tend to be almost the same. The predominant composition of the main minerals is quartz, plagioclase and orthoclase. But specifically the rock samples from West Kalimantan have been altered from phylic-silicification-propylitic. The entire study area contained accessory minerals, namely apatite, zircon, titanite, and for monazite only in the West Kalimantan sample. There was mineralization up to the supergene stage in the presence of the characteristic minerals for the supergene covelite and chalcocytes in the West Kalimantan sample. Geochemical analysis of both regions shows the same magma affinity, namely Calc Alkaline - High K Calc Alkaline. For West Kalimantan, the value of A / CNK <1.1 has a type metaluminious and > 1.1 a type peraluminious. Meanwhile, Karangsambung A / CNK value <1.1 has a type metaluminious. So that West Kalimantan granite has two I-type and S-type. While Karangsambung is I-type. West Kalimantan granite is formed in continental arc granite (CAG) and continental collision granite (CCG). Meanwhile, Karangsambung in Volcanic Arc Granite (VAG). It can be concluded that the granites of the two regions have quite different characteristics even though they belong to a relatively similar tectonic environment.

Keywords: Granite, Mineralogy, Geochemical, Petrogenesis, West Kalimantan, Karangsambung.

1. Introduction

Indonesia is an archipelagic country surrounded by two oceans, namely the Pacific Ocean and the Indian Ocean, two continents, called the Asian continent and the Australian continent, and is included in the ring of fire. Therefore, the tectonic process greatly affects the product, one of the products of tectonism is granitod. Granite rocks are granular igneous rocks that generally contain quartz and two types of feldspar (Barbarin, 1999). Granitoids are classified into several types based on mineral content, field appearance and petrography as well as chemical characteristics (Streckeisen, 1976; Pearce, Harris and Tindle, 1984; Maniar and Piccoli, 1989; Barbarin, 1999).

The location of the research was carried out in two different area called West Kalimantan and Karangsambung. According to (Ilmawan, 2019) in the West Kalimantan, especially Bengkayang, is included in low to medium sulphide epithermal mineralization, but does not discuss in detail about the rock of origin. Meanwhile, according to (Setiawan and Novian, 2015) Karangsambung granitoid of the Cordilleran type is derived from a normal volcanic arc product and the possibility of a Caledonian type granitoid which is the product of a post-tectonic collision of partial melting in the continental crust. Based on (Isyqi, Hastria and Ansori, 2016) classified the tectonic setting of Karangsambung granite into volcanic arc granite (VAG) with metaluminious magma of dominant origin.

The absence of research that compares the characteristics of the granitic rocks of Karangsambung and West Kalimantan is what underlies the authors to conduct research. This study aims to compare the mineralogical and geochemical characteristics of granitic rocks.

2. Regional Geology

2.1 Regional Geologi of West Kalimantan

According to (Suwarna *et al.*, 1993) who compiled the Geological map of the Singkawang. the research area includes the Sintang intrusion, Mensibau granodiorite and Pueh granite can be seen fig 1. Mensibau Granodiorite (Klm), has a lithology of granodiorite with the mineral composition of hornblende-biotite, tonalite, adamelite, eroded granite and thermylonite as well as brecciated diorite, quartz diorite, and xenolite of volcanic and sedimentary rocks formed in the Early Cretaceous. Pueh Granite (Kup), has a granite lithology, adamelite of Late Cretaceous age. Sintang intrusion (Toms), has a lithology of gabbro, granodiorite, quartz diorite, tonalite, diorite, gabbro quartz, changed by secondary minerals chlorite, epidote, sericite, and carbonate; the presence of sericite is associated with quartz-chalcopyrite-molybdenite veins with the presence of diffuse pyrite and there is gold mineralization having an Early Oligocene - Early Miocene age.

According to (Daines, 1985; Soeria-Atmadja, Noeradi and Priadi, 1999) occurred rifting in Eocene-Early Oligocene to form the South China Sea. The result of the expansion process causes subduction which results in a southward movement of the Continental Block. Tectonic processes that produce magmatic arcs occur in the Eocene-Early Oligocene, which can be seen from Sintang to Kelian along Central Kalimantan.

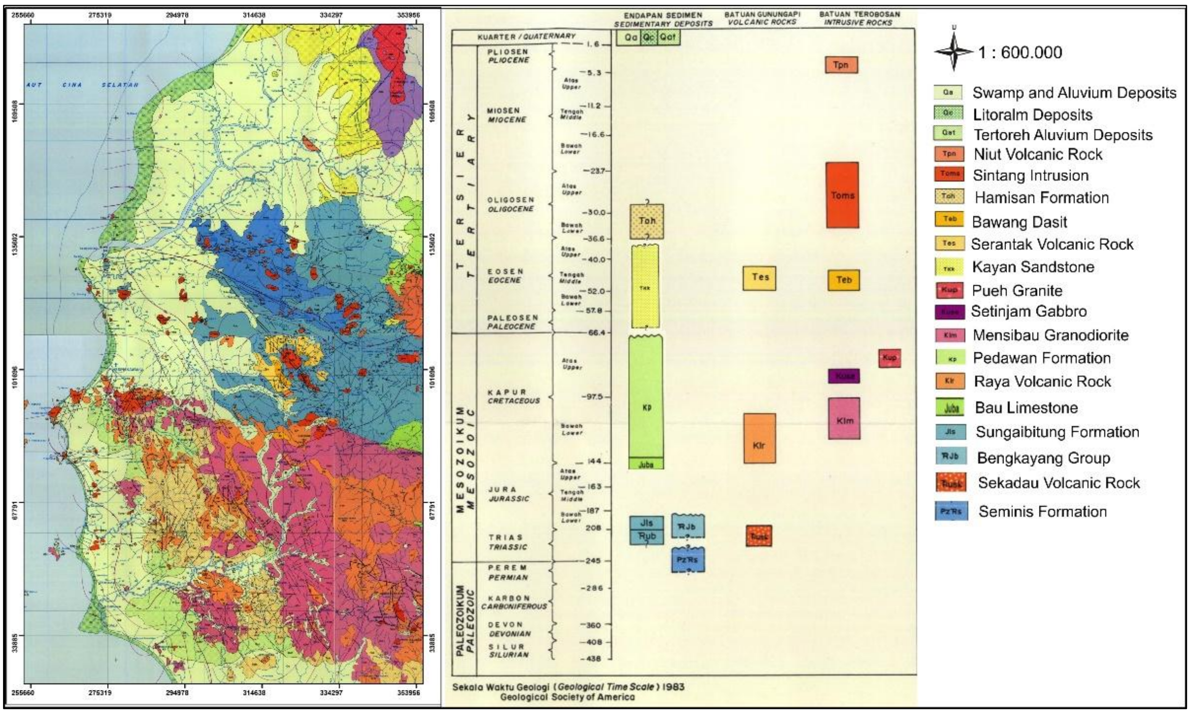

Fig 1. Correlation of Geological Map and Stratigraphy Singkawang, West Kalimantan (Suwarna *et al.*, 1993)

2.2 Regional Geologi of Karangsambung

Based on the division of physiographic zone according to (Van Bemmelen, 1949), the study area is a part in the South Serayu Mountains Zone and is located in the southern part of Central Jawa can be seen in fig 2.

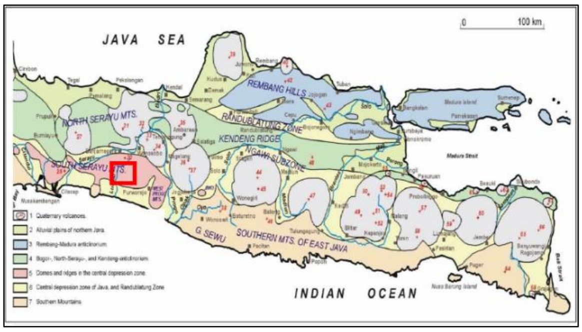

Fig 2. Physiography of Eastern part of Java (Van Bemmelen, 1949)

Based on stratigraphy conditions from (Prasetyadi, 2007) in fig 3, the research are include in Melange Luk Ulo Complex consist of Metamorphic rock, igneous rocks and also pelagic sediment (Asikin *et al.*, 1992)

The subduction process between the Indo-Australian Plate and the micro-Sundanese resulted in the formation of three tectonic patterns on the island of Java. The dominant structures found on the island of Java include the Java pattern with an east-west direction (EW), the Sunda pattern with a north-south direction (NS), and the Meratus pattern with a northeast-southwest direction (NE-SW) with the Javanese pattern as the youngest pattern (Pulunggono and Martodjojo, 1994)

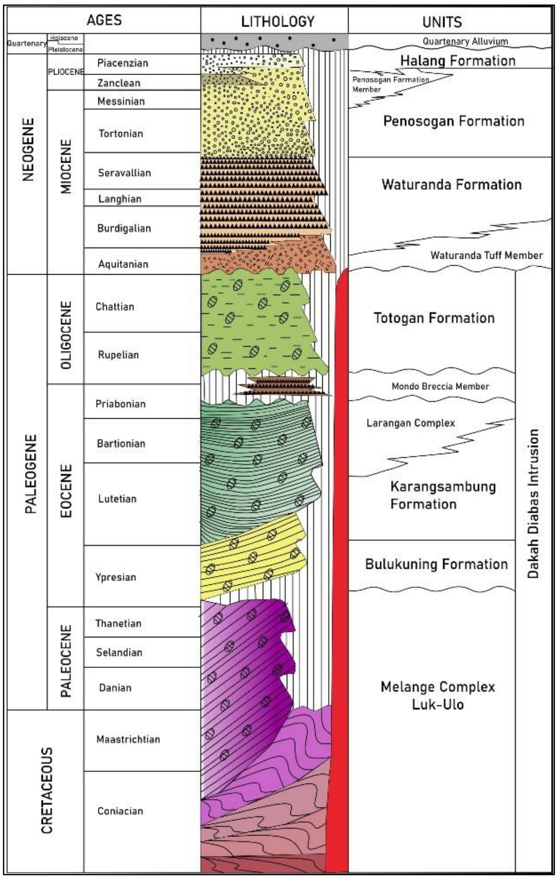

Fig 3. Regional Stratigraphy of Karangsambung (Prasetyadi, 2007)

3. Research Methods

Sampling was carried out in two different areas. Samples in the West Kalimantan area were taken as representatives of the granitoid samples. For the Karangsambung area samples were taken on a representative river flow from the granitoid sample. The methods used in this analysis are petrographic analysis and geochemical analysis.

This petrographic analysis was carried out at the Optical Laboratory of the Geotechnology Research Center, LIPI-Bandung. The sample analysis consisted of 39 samples with details of West Kalimantan rock samples including 2 fresh rock samples and 24 altered rock samples can be seen in fig 4.

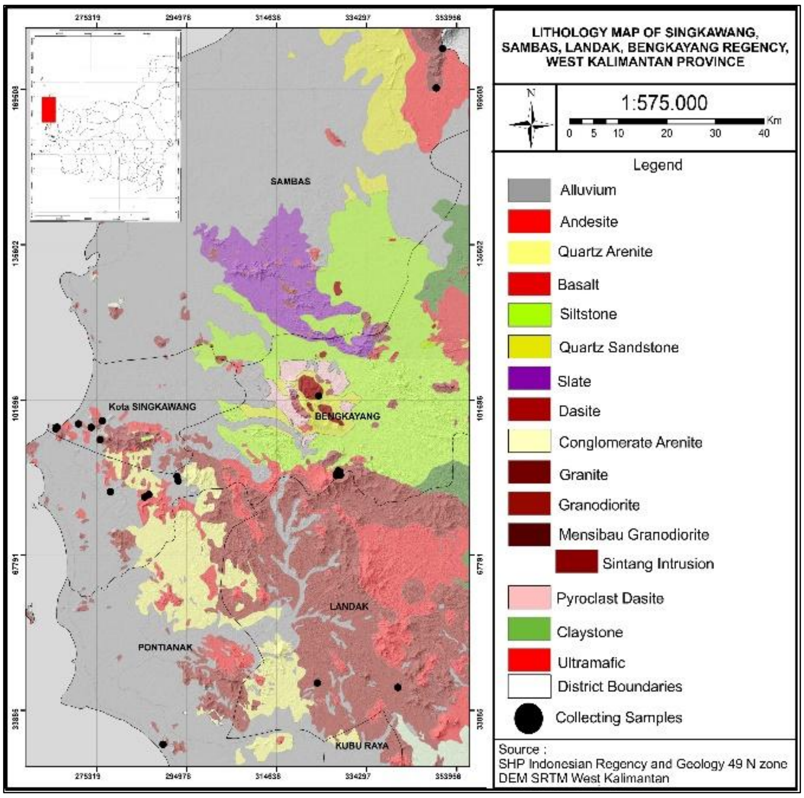

Fig 4. Litology map Research Area of Singkawang, Sambas, Landak, Bengkayang Regency.

Karangsambung rock samples included 13 fresh rock samples can be seen in fig 5. Specifically for West Kalimantan, mineragraphic analysis in the form of polishing sections consists of 4 sample. Geochemical analysis using XRF (X-Ray Fluorescence). XRF analysis of West Kalimantan samples was carried out by Activation Laboratories LTD., Canada. The results of the XRF analysis of West Kalimantan consisted of 14 samples. Due to limited data for the Karangsambung area, we only use secondary data from (Setiawan and Novian, 2015) and (Isyqi, Hastria and Ansori, 2016). The results of this XRF analysis are in the form of rock geochemical data in the form of data on major elements, trace elements, and rare earth elements.

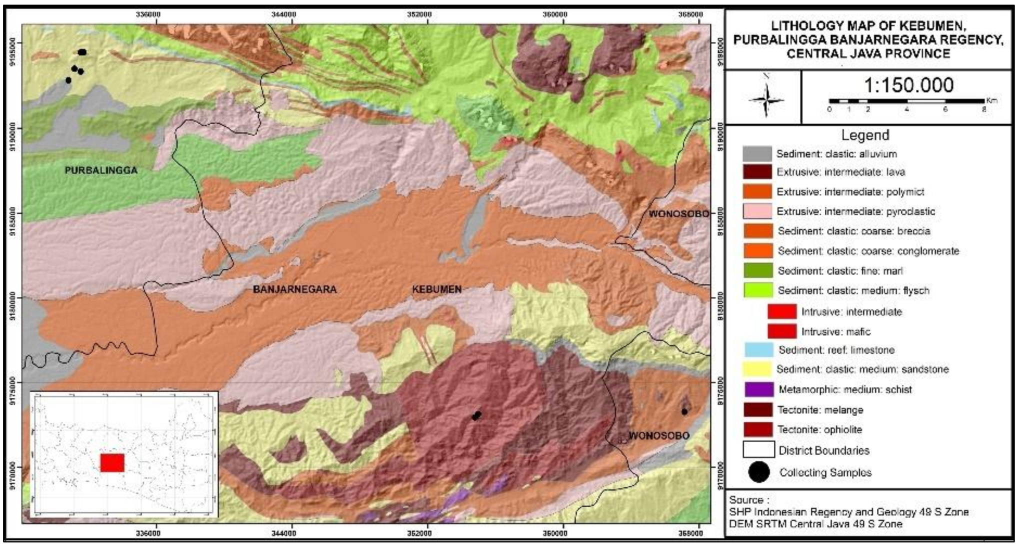

Fig 5. Litology map Research Area of Kebumen, Purbalingga, Banjarnegara Regency

4. Results and Discussion

4.1 West Kalimantan

4.4.1 Petrography

The results of petrographic observations of the research area produced several characteristics. Mineralogical characteristics have holocrystalline crystallinity, phaneritic granularity, but there are 3 samples that have porphyroafanitic granularity, subhedral crystal form. Most of the samples have undergone quite high rock alteration and deformation. There is a special texture in the form of consertal which has a characteristic indicating that there is intergrowth between quartz and feldspar. As well as the typical micrographic and granophyric where the quartz mineral grows randomly on the feldspar. The main minerals such as quartz, plagioclase, K-feldspar are replaced by secondary minerals in the form of alteration minerals. There are accessory minerals in the form of apatite, zircon, monazite, titanite. The phyllic – propylitic alteration zone.

Based on plotting on the IUGS (Streckeisen, 1976) the analyzed incisions tend to have the name monzogranite except for two incisions, namely sample codes I/080312/M-01 and III/110312/M-05 which have the name syenogranite, and alterted stone can be seen in fig 6.

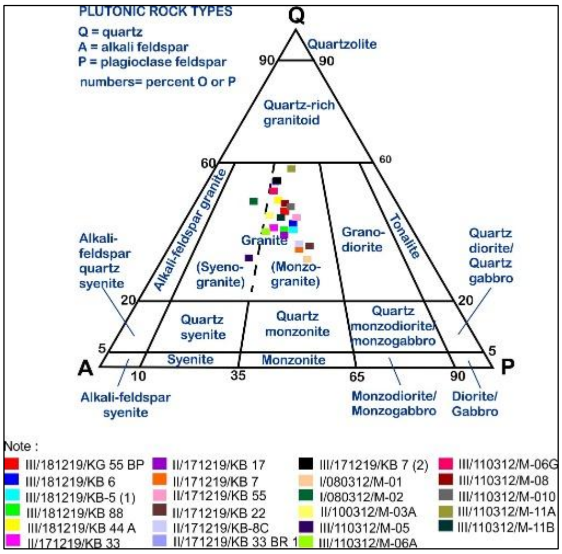

Fig 6. Plotting naming of rock west Kalimantan using IUGS (Streckeisen, 1976)

1. Syenogranite

This type of naming is only found in two rock samples. With an average mineral composition of 13% plagioclase, 17% quartz, 22% orthoclase, 3% opaque mineral. With a consertal texture. There is a secondary mineral sericite 40%, secondary quartz 5%. So this rock has undergone quite intense alteration. With selective pervasive alteration style, and moderate alteration intensity of 45% (Browne, 1991) it belongs to the philic alteration type can be seen fig 7.

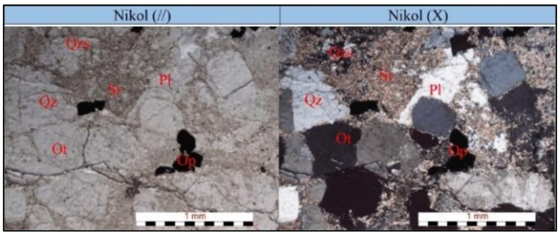

Fig 7. Photomicrograph of synogranite at sample III/110312/M-05 with Plagioclase (Pl), Quartz (Qz), Orthoclase (Ot), Clay (Lm).

2. Monzogranite

This naming type is dominantly found in West Kalimantan rock samples. With a composition of 23% plagioclase, 30% quartz, 17% orthoclase, 18% biotite, 2% opaque mineral. With a special texture in the form of concertal, poikilitic, secondary minerals in the form of 20% epidote. The presence of secondary minerals indicates that this rock has undergone alteration with a style alteration non-pervasive, with a low alteration rate of 20% (Browne, 1991). Has a propylitic alteration type can be seen in fig 8.

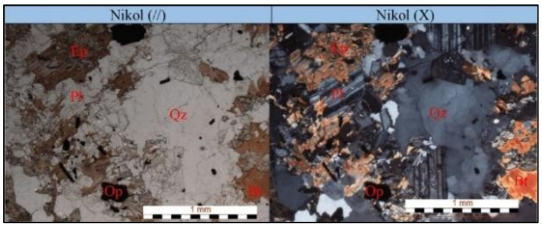

Fig 8. Photomicrograph of Monzogranite at sample II/181219/KG 88 with Plagioclas (Pl), Quartz (Qz), Orthoclas (Ot), Biotiet (Bt), Opaque mineral (Op), Epidote (Ep)

3. Altered Stone

This type of naming is based on the appearance on a polarization microscope, the dominance of the main mineral has been replaced but is still granitic. With a composition of 50% secondary quartz, 35% base mass, 13% clay minerals, and 2% opaque minerals. style alteration Pervasive, with a high intensity level of 100% alteration (Browne 1991). Based on its appearance, it is included in the silicification alteration type in fig 9.

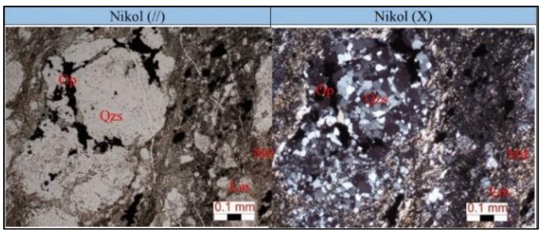

Fig 9. Photomicrograph of altered stone in sample code IV/191219/KB-8with secondary quartz (Qzs), clay minerals (Lm), base mass (Md), opaque minerals (Op)

The presence of accessory minerals as a marker and can be used as an indicator of petrogenesis. Accessory minerals found in West Kalimantan granitoid samples include zircon, monazite, apatite, titanite can be seen in fig 10.

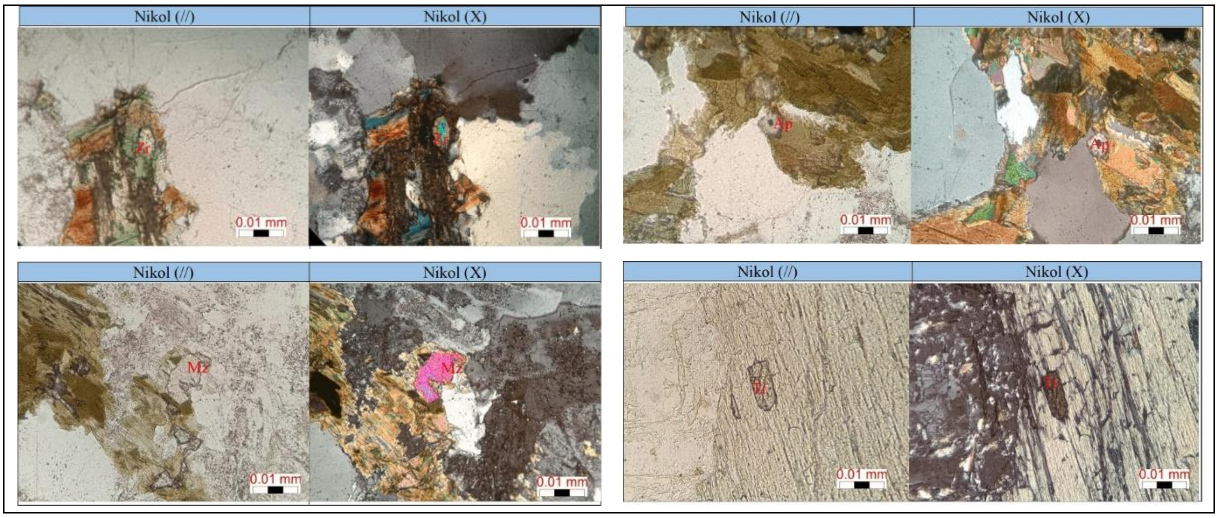

Fig 10. Accessory minerals in sample west Kalimantan. Zircon (Zr), Apatite (Ap), Monazite (Mz), Titantite (Ti)

4.4.2 Mineragraphy

Special for sample west Kalimantan doing a mineragraphy analysis. Based on the observation of the optical properties of the rock samples in the study area, they are divided into several groups including native element and sulfide minerals. Native element are founded, namely gold (Au). The appearance of gold (Au) was found with small grains as free grains that did not stick to the others seen in Fig 11.

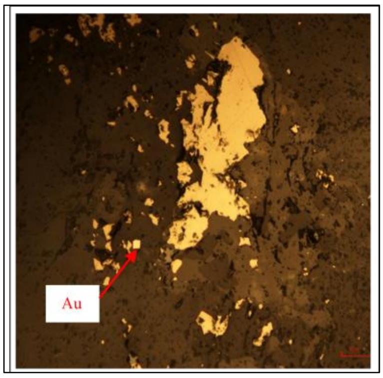

Fig 11. Photomicrograph appearance of native elements with the presence of free grain Au in rock samples code III/181219/KB-6 Bedrock

Based on observations of identified sulfide minerals, namely covelite (CuS), chalcocite (Cu_2S), pyrite (FeS_2), galena (PbS), chalcopyrite ($CuFeS_2$), bornite (Cu_5FeS_4), and sphalerite (ZnS) in fig 12.

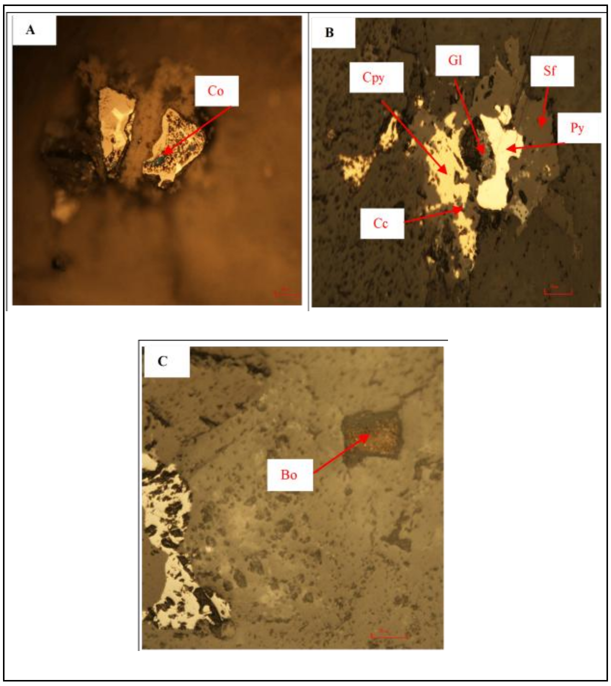

Fig 12. Photomicrographs of the presence of covelite in place of chalcopyrite (cpy) (A), the presence of sphalerite (Sf), pyrite (Py), chalcopyrite (Cpy), galena (Gl), and chalcocite (Cc) (B), the presence of bornite (Bo) (C), Incision polishing rock code III/181219/KB-7

Ore mineral paragenesis discusses the sequence of ore mineral formation stages. Based on the presence of covelite and chalcocite minerals, the mineralization of the study area has undergone a supergene stage.

Table 1. Mineralization Stage

Mineral	Mineralization Stage			
	Early	Middle	Late	Supergen
Pyrite				
Chalcopyrite				
Gold				
Sphalerite				
Galena				
Bornite				
Covelite				
Calcosite				

4.4.3 Geochemical

Harker diagram plotting was carried out by comparing the ratio of the main elements on the Y axis with SiO2 on the X axis. Since the study area had undergone quite intense alteration, plotting was carried out at a value of 66%. LoI value (Lost on Ignition) < 2.5 or quite fresh. The tendency of all elements decreases with the increase in SiO_2. Elements MgO, Fe_2O_3, TiO_2 decrease. These three elements are found in mafic minerals. This means that the crystal national fraction runs normally because the main composition of mafic minerals tends to decrease followed by an increase in SiO_2. The CaO element also decreased with the addition of SiO_2, and was followed by a relative increase in Na_2O content. It is interpreted that these two elements are the composition of plagioclase minerals. Due to the decrease in CaO levels and an increase in the relative levels of Na but not too significant, it indicates that there is a replacement or substitution between Ca and Na components when SiO_2 is added can be seen in fig 13.

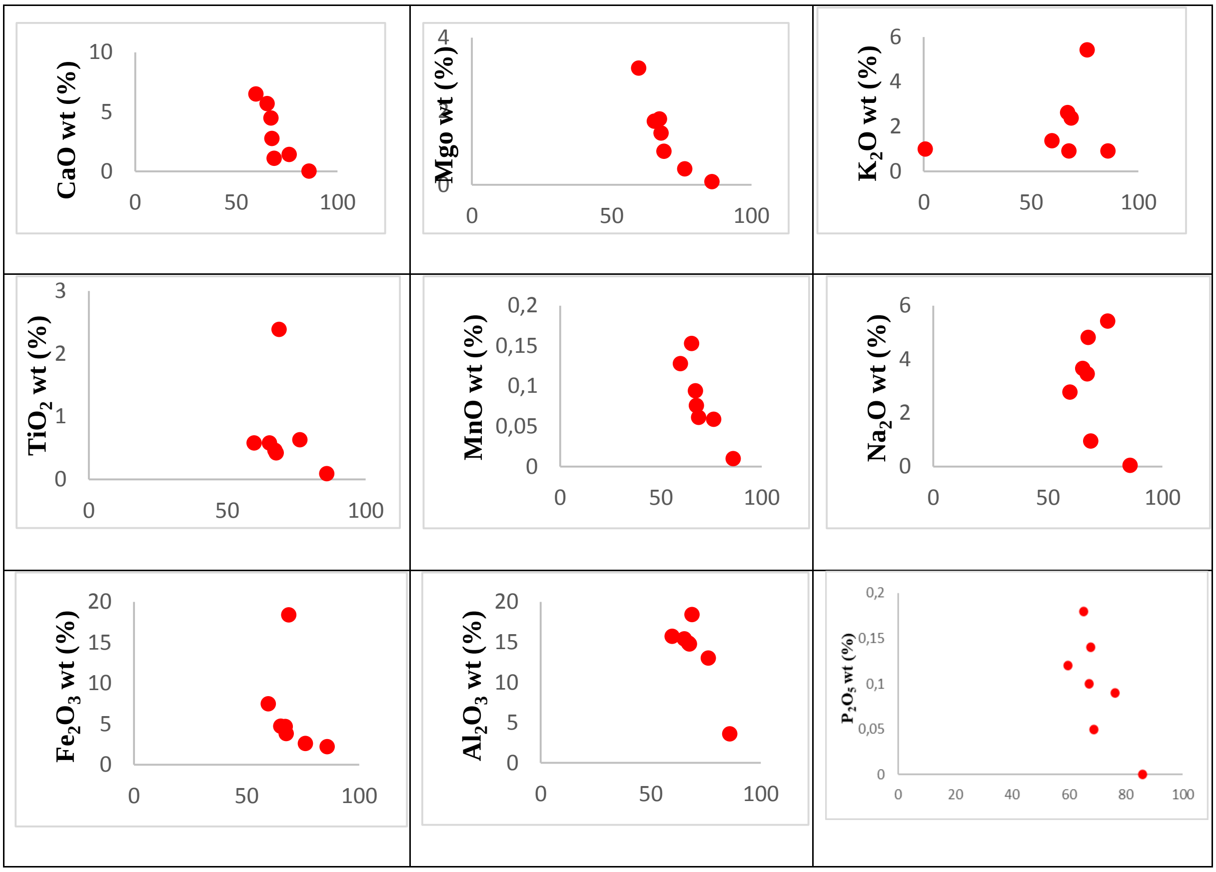

Fig 13. Harker Diagram

Plotting the magma affinity diagram shows that the magma in the granite sample of the study area is formed from magma that is High K Calc Akaline and Calc Alkaline. (Fig 14).

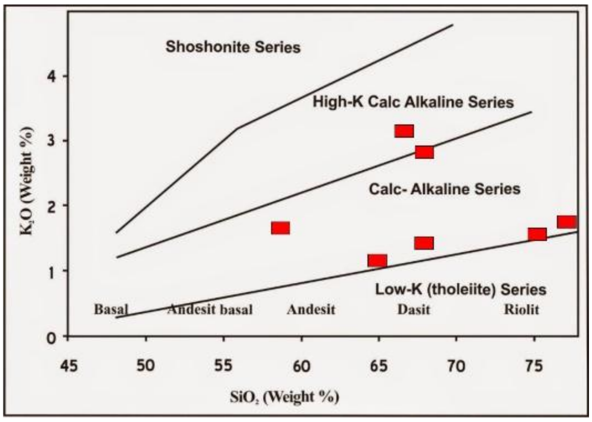

Fig 14. Plotting the classification of rock alkalinity levels (Peccerillo and Taylor, 1976)

The magma type diagram was made by (Chappel and White, 1974) to determine the type of granite which was then used as an indicator of granite petrogenesis parameters. Data is used in the form of moles of each selected main element, namely Al_2O_3, Na_2O, CaO, K_2O can be seen in table 2.

Based on the results of plotting on the magma type diagram according to (Chappel and White, 1974) the tested granite rock samples have almost the same characteristics or transition from metaluminious to peraluminious. <1.1 and >1.1 then the type of granite in the study area is a mixed type, namely type I granite and type S graniteType I granite implies a source rock of magma composition which is mafic to intermediate or infracrustal derivational (Chappel and White, 1974; Chappell and Stephens, 1988) can bee seen in fig 15. While this type of S granite indicates that the source rockis sedimentary rock or protolith crust (supracrast protolith (Chappell and Stephens, 1988).

Table 2. Calculate of mol compound A/NK, nad A/CNK mol value

Na_2O	K_2O	CaO	Al_2O_3	CNK	NK	A/NK	A/CNK
0,055645	0,027979	0,080179	0,146275	0,163802	0,083624	1,749195	0,892993
0,000645	0,009787	0,000714	0,035588	0,011147	0,010432	3,41132	3,19272
0,077581	0,009787	0,049643	0,145294	0,137011	0,087368	1,663015	1,060458
0,087419	0,006702	0,025536	0,127843	0,119657	0,094121	1,358278	1,068412
0,015323	0,025426	0,019643	0,180882	0,060391	0,040748	4,439036	2,995189
0,044839	0,014681	0,115714	0,154608	0,175234	0,05952	2,597597	0,882294
0,059032	0,007766	0,101607	0,151471	0,168405	0,066798	2,267584	0,89944

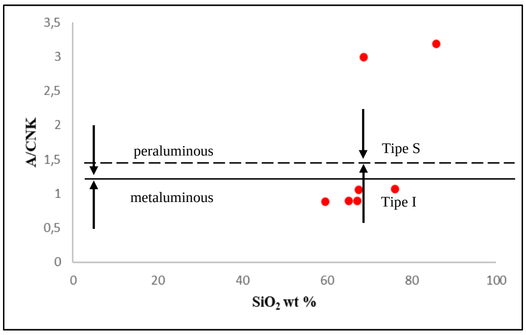

Fig 15. Diagram Type of Granite (Chappel and White, 1974)

This geochemical analysis also produces trace elements and rare rearth elements. For plotting, a normalized chondrite spider diagram and a normalized extend spider diagram of the primitive mantle were used to eliminate the Oddo-Harkins effect.

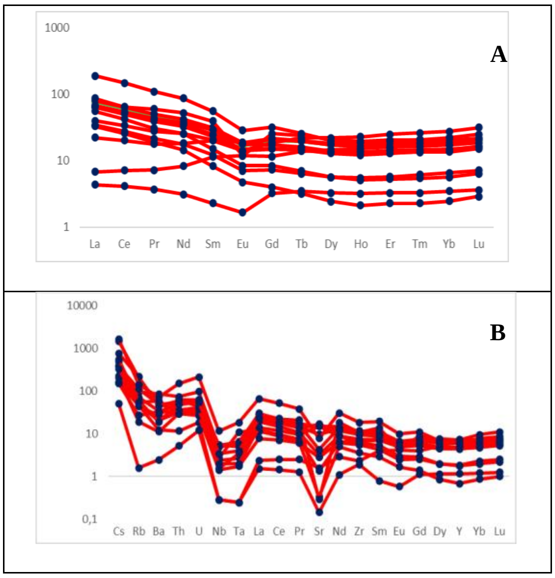

Fig 16. Normalized spider diagram chondrite (A) and Extend Spider diagram primitive mantle (B) (McDonough dan Sun, 1989)

Based on plotting in fig 16 This negative anomaly on the Eu element is related to subduction on the island arc or active continental margin. This negative anomalous pattern in Eu indicates that the granitoid was formed from magma remaining from the frozen solution after the plagioclase separation process (Gromet and Silver, 1987; Widana and Priadi, 2015) The elements Nb, Ta and Sr tend to be depleted or reduced to LREE. The Nb element has a negative anomaly. This is interpreted as the tectonic setting is still related to the volcanic arc. Sr element experiencing negative anomaly indicates a change of plagioclase Ca into plagioclase Na and K-Feldspar in late fractionation.

Based on the plotting in Aluminum saturation indeks diagram (Shand, 1943) in fig 17 found that samples of rocks scattered on the metaluminous towards peraluminous. When viewed overall, the dominant trend is towards peraliuminous, although there is a metaluminious magma type, so that the rock samples are classified as peraluminious and metaluminious. Tectonic environment ranging from CCG (continental collision granitoids), CAG (continental arc granitoids).

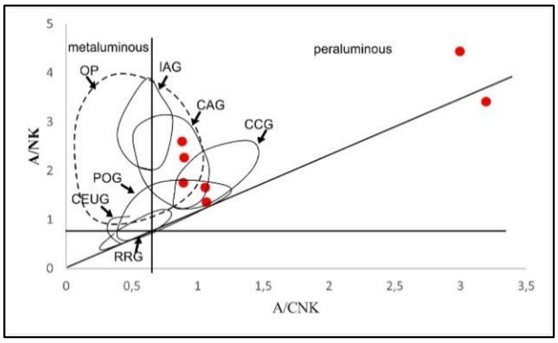

Fig 17. Setting Tectonics using Aluminium Saturation Indeks (Shand, 1943)

4.2 Karangsambung

4.2.1 Petrography

Mineralogical characteristics based on petrography have holocrystalline crystallinity, phaneritic, granularity, subhedral crystal form. There is a special texture in the form of consertal which has a characteristic indicating that there is intergrowth between quartz and feldspar. Then there is a special texture of pertite caused by the dissolution process to make pertite a phenocryst in K feldspar. As well as a typical antipertite where the quartz mineral grows randomly on the feldspar. The main minerals such as quartz, plagioclase, K-feldspar. There are accessory minerals in the form of apatite, zircon, titanite. Based on plotting on the IUGS Streckeisen classification (1967) the overall analyzed incisions tended to have the name monzogranite can be seen in fig 18.

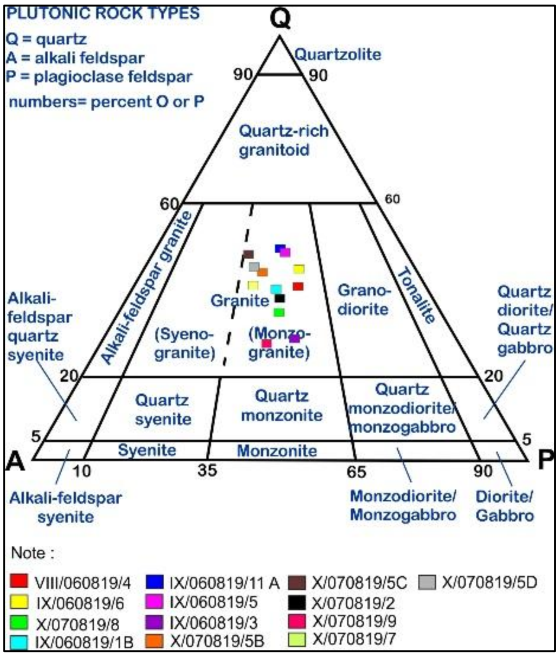

Fig 18. Plotting naming of rock Karangsambung using (Streckeisen, 1976)

1. Monzogranite

This type of naming is the naming of the entire granitoid sample being analyzed. Based on petrographic analysis, it has phaneric granularity, holocrystalline crystallinity degree, relationship between hypidiomorphic crystals, special texture in the form of consertal intergrowth, pertite, antipertyte, primary mineral composition in the form of plagioclase (An42) 20% , quartz 35%, orthoclase 20%, muscovite 25%. Can bee seen in fig 19.

The presence of accessory minerals as a marker and can be used as an indicator of petrogenesis. Accessory minerals found in West Kalimantan granitoid samples include zircon, monazite, apatite, titanite can be seen in fig 20.

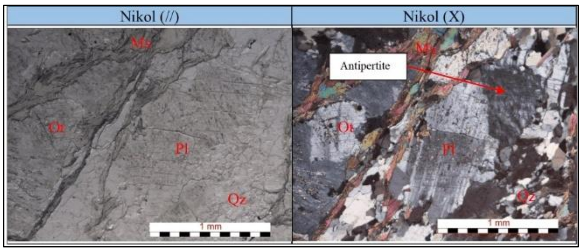

Fig 19. Photomicrograph of the antipertytic texture present on a thin slice of the sample code X/070819/5C with the composition of muscovite (Ms),orthoclase (Ot), plagioclase (Pl), quartz (Qz)

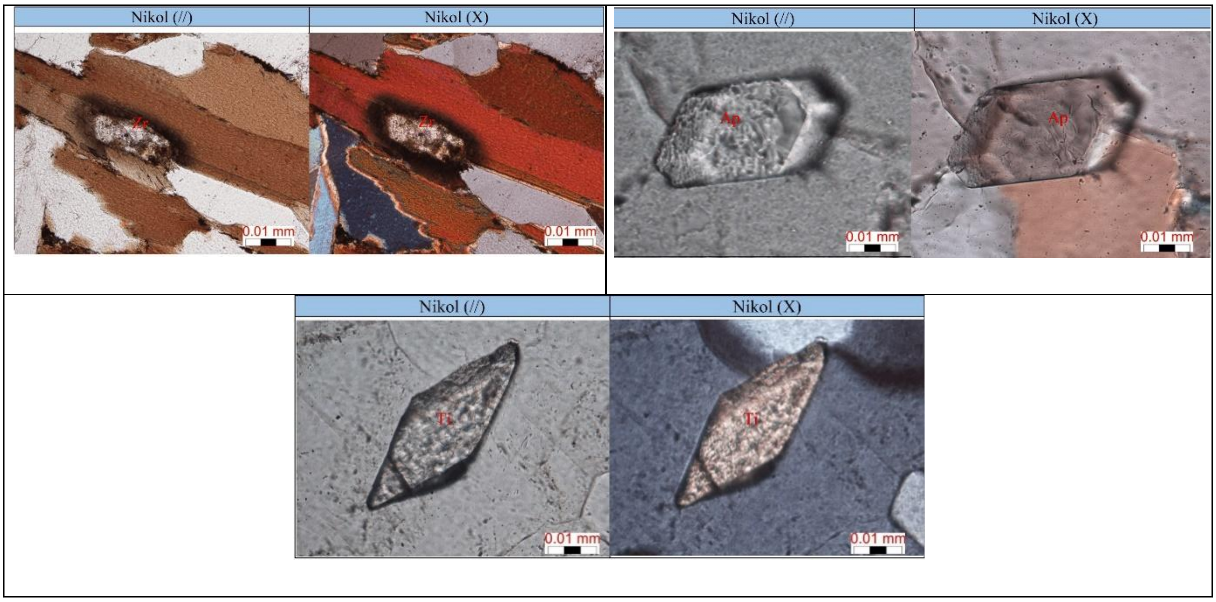

Fig 20. Accessory minerals in sample Karangsambung contains Zircon (Zr), Apatite (Ap), Titantite (Ti)

4.2.2 Geochemical

This geochemical analysis compares the data of previous research by (Setiawan and Novian, 2015) with (Isyqi, Hastria and Ansori, 2016). (Isyqi, Hastria and Ansori, 2016) used 5 samples for geochemical analysis, while (Setiawan, et al 2015) used 11 samples for geochemical analysis.

Major element used by harker diagram. This analysis uses a Harker diagram by comparing the SiO_2 element with other main elements. The plotting of (Setiawan and Novian, 2015) with (Isyqi, Hastria and Ansori, 2016) has pattern trend a relatively similar. It can be seen that the value of MgO, Fe_2O_3, TiO_2 decreased along with the increase in SiO_2. If you look at the three elements, it is interpreted that the content is found in mafic minerals. This means that the crystal fractionation is running normally. The CaO element also decreased with the addition of SiO_2, and was followed by a relative increase in Na_2O content. It is interpreted that these two elements are the composition of plagioclase minerals. For the trend overall, all elements have decreased but some have increased significantly. This can be interpreted to mean that they are still in the same genetic (Mustafa and Usman, 2016) can bee seen in fig 21.

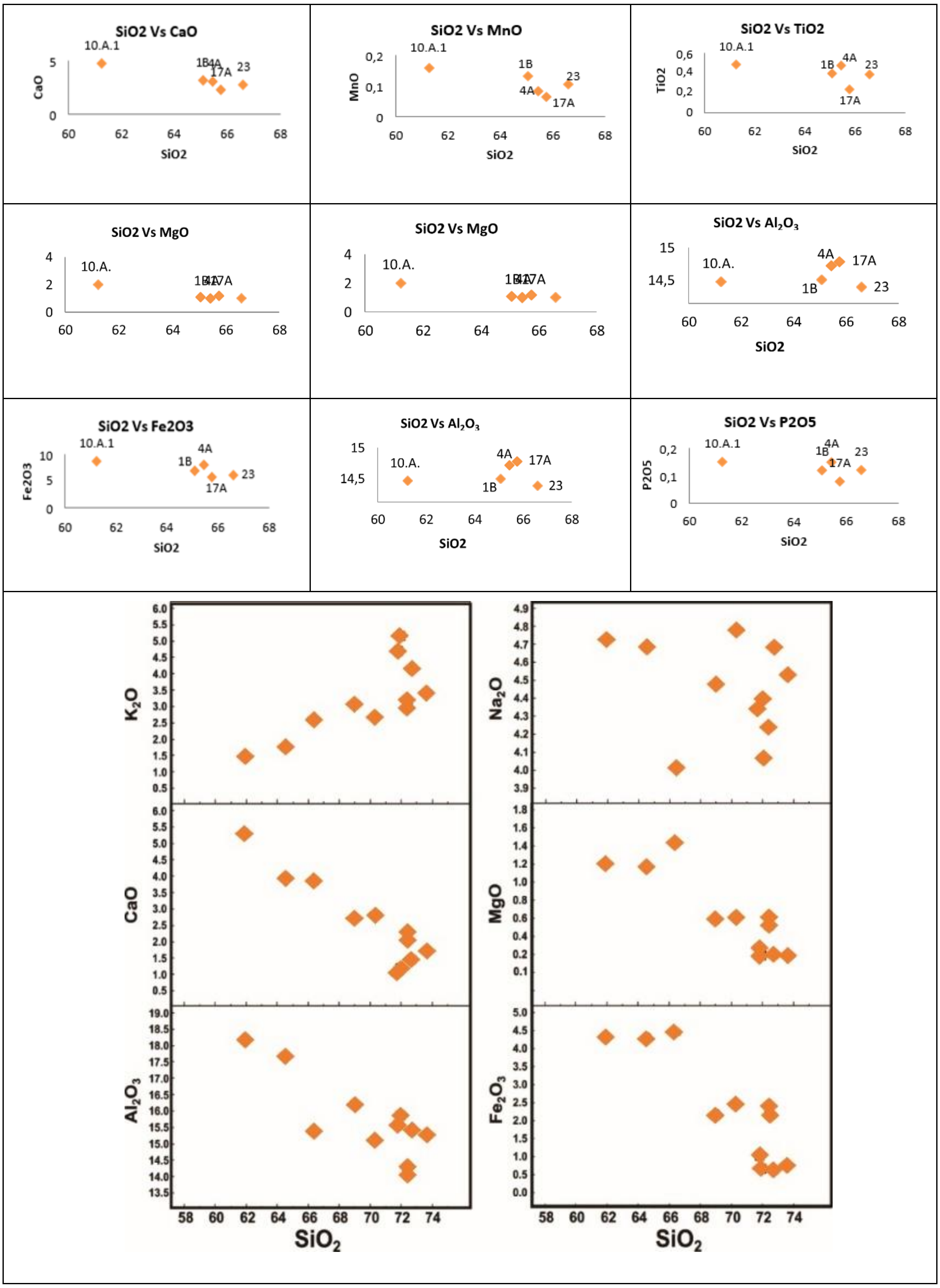

Fig 21. Comparison of the principal elements with SiO2 on the Harker diagram by (A) (Setiawan and Novian, 2015) (B) (Isyqi, Hastria and Ansori, 2016)

Plotting the magma affinity diagram shows that the magma in the granite sample in the study area is formed from magma that is High K Calc Akaline and Calc Alkaline can be seen in fig 22.

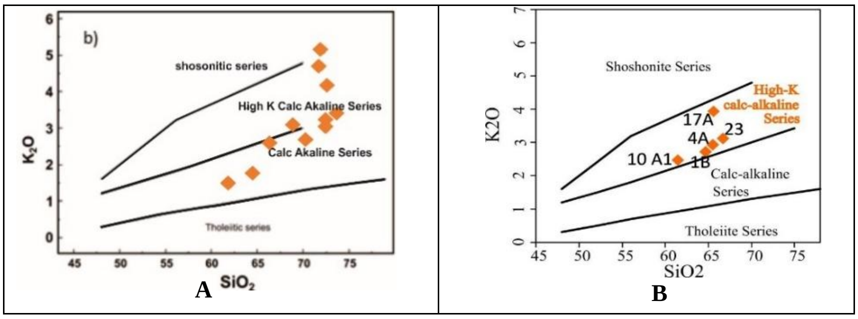

Fig 22. Plotting the classification of rock alkalinity levels by (a) (Setiawan and Novian, 2015) (b) (Isyqi, Hastria and Ansori, 2016) (Peccerillo and Taylor, 1976)

Based on the results of plotting on the magma type diagram according to (Chappel and White, 1974) granite rock samples have almost the same characteristics as metaluminious. this plotting spread but dominant in the metaluminious. For the type of granite, the research area is granite type I. This type of granite indicates that it implies a source rock from magma composition that is mafic to intermediate or infracrustal (Chappell and Stephens, 1988) can be seen in fig 23.

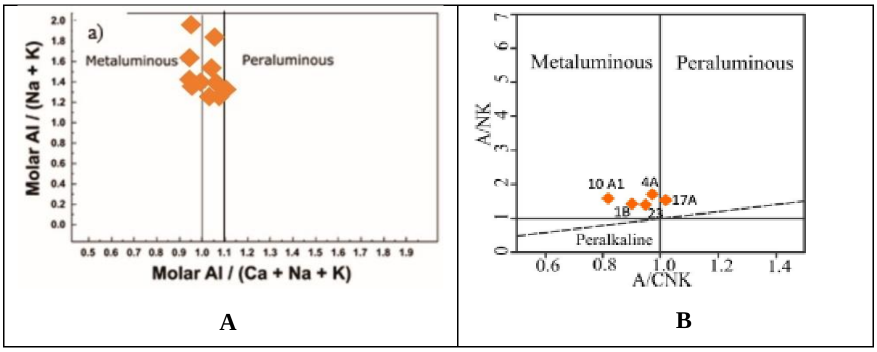

Fig 23. Granite type classification diagram (a) (Setiawan and Novian, 2015) (b) (Isyqi, Hastria and Ansori, 2016) (Chappel and White, 1974)

This geochemical analysis also produces trace elements and rare rearth elements. For plotting, a normalized chondrite spider diagram and a normalized extend spider diagram of the primitive mantle were used to eliminate the Oddo-Harkins effect.

The plot by (Setiawan and Novian, 2015) REE into two, namely enrichment of LREE elements with depleted HREE elements and enriched in LREE accompanied by depleted then enriched again in HREE. There is a position of negative anomalies in Nb and Tb element, as well as positive by Sr anomaly found in all the samples analyzed were randomly can see in fig 24.

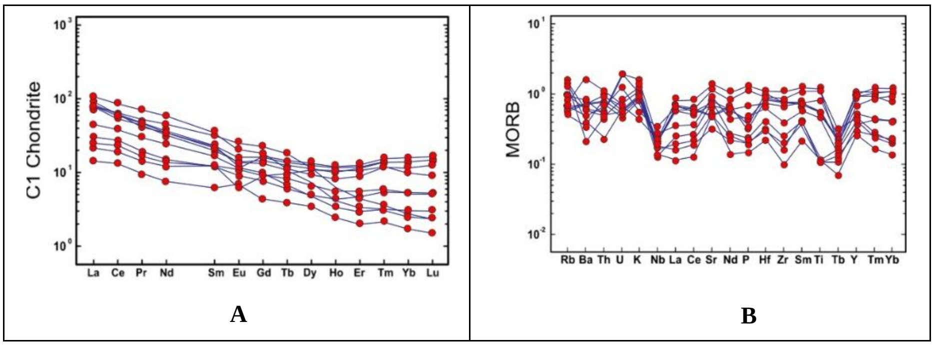

Fig 24. Spider diagram normalized chondrite (A) and Extend Spider diagram primitive mantle (B) by (Setiawan, et al 2015) (McDonough and Sun, 1989)

Based on pengeplotan by (Isyqi, Hastria and Ansori, 2016) on the normalization MORB there is enrichment of elements K, Rb , Ba, Th, Ce, and Sm, but depleted elements Ta, Nb, P, Hf, Zr, Ti, Y and Yb. Positive anomalies in low ionic potential incompatible elements such as K, Tb, Ba and Th were caused by the metasomatism process in the mantle of the solution agent which was released in theprocess subduction slab. Then negative anomalies in high ionic potential incompatible elements such as (Ta, Nb, P, Hf, Zr, Ti, Y and Yb caused by theprocess partial melting with a high degree of intensity used in the formation of stable mantle residues (Wilson, 1989). For the normalization of chondrite by (Sun and McDonough, 1989) shows apattern depleted on the element Eu. This negative anomaly in Eu is related to subduction at the island arc or active continental margin. This negative anomalous pattern on Eu indicates that the granitoid is formed from magma remaining from the frozen solution after the plagioclase separation process (Gromet and Silver, 1987; Widana and Priadi, 2015) in fig 25.

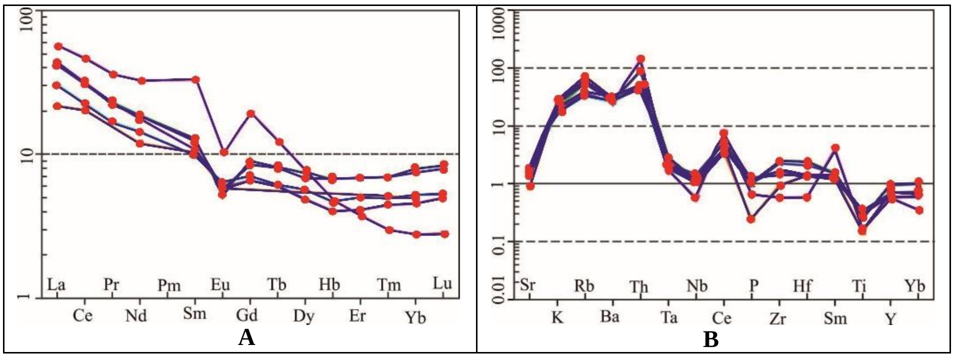

Fig 25. Spider diagram normalized chondrite (A) and Extend Spider diagram primitive mantle (B) by (Isyqi, Hastria and Ansori, 2016) (Sun and McDonough, 1989)

Based on the results of plotting the tectonic discriminant diagram from (Pearce, Harris and Tindle, 1984) from the diagram (Yb +Nb) vs Rb, Y vs Nb, Yb vs Ta, it was found that according to (Setiawan and Novian, 2015) and (Isyqi, Hastria and Ansori, 2016) this Karangsambung granitoid has atectonic environment. volcanic arc granite (VAG) can be seen in fig 26.

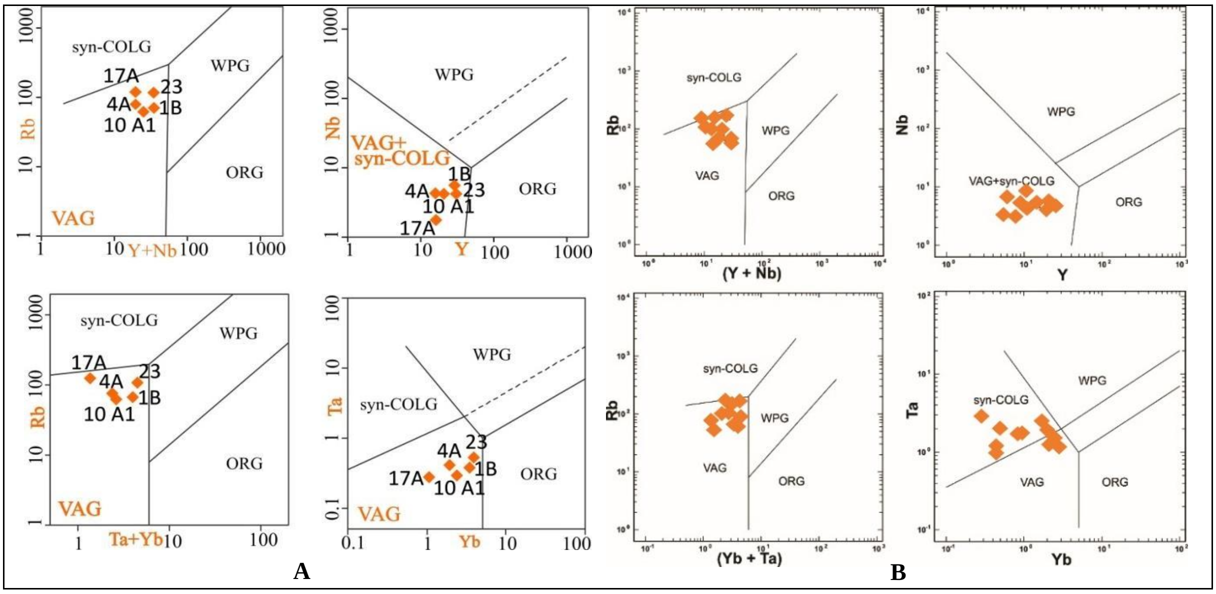

Fig 26. Plotting Discriminant Diagram (a) (Isqy, et al 2016), (b) (Setiawan et al, 2015) (Chappell and White, 1974)

4.3 Comparison of Granitoid Characteristics

Analysis has been carried out in the form of petrographic analysis, mineragraphy, as well as geochemical analysis of the granite rock samples in the study area. Then obtained several comparisons on the samples that have been analyzed from the two research areas can be seen in table 3.

Table 3. Comparison of Granitoid Characteristics

Parameter	West Kalimantan	Karangsambung
Special Textures	Consertal, poikilitic, micrographic, granophyric	Consertal, pertite, antipertite
Major Minerals	Quartz, plagioclas, ortoclas, biotite, hornblenda	Quartz, plagioclas, ortoclas, biotite
Accessory Minerals	Zircon, apatite, monazite, titanite	Zircon, apatite, titanite
Name of Rocks	Syenogranite, monzogranite, dan *altered stone*	Monzogranite
Alteration	phylic-Silisification-Propylitic	-
Magma Afanity	*Calc alkaline- high K calc alkaline series*	*Calc alkaline- high K calc alkaline series*
Type of Magma	Metaluminious and Peraluminious	Metaluminious
Type of Granite	I Type dan S Type	I Type
Setting Tectonics	*Continental Arc Granite (CAG) dan Continental Collision Granite (CCG)*	*Volcanic arc granitoid (VAG)*

5. Conclusion

Based on the mineralogical aspects of the petrographic analysis of granite in West Kalimantan and Karangsambung, there is quite a difference. West Kalimantan granite has a specialtexture micrographic, granophyric with altered rock conditions so that it has a phyllic-silicified-propyltic alteration zone. Has three types of naming synogranite, monzogranite, altered stone. With the presence of opaque minerals that can be analyzed for mineralization. The accessory minerals are zircon, moderate apatite, monazite, titanite. Karangsambung granite has a special texture that is typical of perite and antipertyte without the presence of secondary minerals. For the presence of the most accessory minerals, namely zircon. It has thename monzogranite.

Based on geochemical analysis, West Kalimantan granite has an affinity for Calc-High K Calc alkaline, magmawith metaluminious and peraluminious magma types resulting in granite types I and S, interpreted to be formed from different parental magmas. Formed inenvironments continental arc granite (CAG) and continental collision granite (CCG). Geochemistry of Karangsambung granite has an affinity Calc-High K Calc alkaline, magmawith a metaluminious magma type. So it has type I granite. Formed on volcanic arc granite (VAG).

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