LITHOLOGY UNITS PADAHERANG AREA AND SURROUNDING, CIAMIS DISTRICT, WEST JAVA PROVINCE.

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ABSTRACT

Administratively, Padaherang region and surrounding is included to kecamatan Padaherang, Ciamis Regency, West Java. The reason why this area is a research area is partly because the author feels that the area in Ciamis Regency is a southern mountainous area that is influenced by volcanism and sedimentation processes and other geological processes. In addition, there are still many geological problems that have not been fully revealed, so the author feels the need to conduct further and more detailed research. Objects to be studied in the field include rocks (description, sampling, direction of moves and slopes), indications of geological structures, and landscape appearances accompanied by sketch photos and additional data deemed to support the research results, The research steps carried out included several stages of work, namely the preparation stage, field work, laboratory research, and the stage of preparing reports. The trajectory that is traced in the field research that has been determined at the preparatory stage. If the trajectory is deemed inadequate, a search for additional trajectories is carried out. There are three methods used in geological mapping, namely the field orientation method, the compass trajectory method, the measuring tape method and the compass. In this mapping, the methods used are the field orientation method and the measuring tape and compass method. Threre are five lithology units which is arrange at research area, these units of lithologi from the older to the younger is breccias unit, sandstone units, claystone. Geology activity at research area predicted begun at Oligocen till Holocen era. first in Oligocen the volcanic activity is strong enough where the eruption produced the breccia and sandstone unit, this process stop at lower Miosen. And at the middle Miosen there is the tectonic activity hapenned. Limestone unit was diendapkan at middle Miocen, and claystone unit at upper Miocen, and quartery deposit is the younger unit at research area.

Keyword: *Lithologic units, stratigraphic order, Padaherang region, Ciamis Regency.*

INTRODUCTION

Understanding of geology is growing day by day, a lot opinion of experts about the progress of geology. In fact, geology can applied in various fields of scientific studies such as development, exploration, renewable environmentally friendly energy and education. This research is intended to reveal geological processes based on field data integrated with the analysis results in the studio and laboratory.

The research area is located Padaherang area, Ciamis District, West Java Province. The research area is located in the Southern Mountains Zone which is a series of highlands that stretches from Pelabuhan Ratu Bay to Nusa Kambangan area, Overall, the Southern Mountain Zone is part of the limb the southern part Geanticline of West Java. Based on the location of the research area which is located in the eastern part of the Southern Mountain Zone, this area is located in the Karangnunggal Plateau (figure 1).

Budhistrisna (1986) has mapped the Pangandaran area and its surroundings and compiled a report entitled "Geological Map of Pangandaran Sheet", in which the research area is composed of 4 rock formations, namely; Jampang Formation, Kalipucang Formation and Quaternary deposit (figure 2).

RESEARCH METHOD

The methods used in this study are fieldwork, laboratory analysis, data interpretation, and stratigraphic analysis. Activities in the field include data collection in the form of characteristics lithology and rock slope (strike and dip), and outcrop photos.

E-ISSN : 2579 – 3136

Method which used in data collection is: Field orientation method, plotting data with GPS, Compass trajectory method and measuring tape in several places. Petrographic analysis helps in observing rocks microscopically in order to know the composition of the constituents of a rock. Micropaleontological analysis helps in determining age relative of a rock unit and the depositional environment of a rock sediment.
The main purpose of doing a stratigraphic analysis is to obtain it age and grouping of rock units and proportionality to the formation that is in the literature.

RESULT AND DISCUSSION

Outcrops found in the field are generally not continuous. Besides being found along the river, outcrops are also found on the roadside. Each rock unit shows different lithological characteristics in the field and in the laboratory.

The method used in compiling the stratigraphic units is the informal lithostratigraphic units. These units are grouped based on the type of lithology, lithology uniformity, lithological dominance, and other characteristics found in the rock body, as well as the stratigraphic position between these units. Based on the above division, the rocks found in the study area can be divided from old to young as follows: breccia units – sandstone units – limestone units – quaternary deposits (sand and clay).

Breccia Unit, This unit is the oldest unit, consisting of breccia and sandstone and andesitic igneous rocks. Breccia is composed of andesitic igneous rock components with a diameter of 10-150 cm, with a fresh color of brownish gray, weathered yellowish brown color, poor sorting, open packaging, slightly angular to moderately rounded shape, tuffaceous sandstone matrix with medium to coarse sand grains, color fresh gray-brown, grain shape slightly angular to rounded, open-packed, poorly sorted, light minerals are present, interspersed with tuffaceous sandstone, fresh color is brownish gray, weathered color is yellowish brown, poorly sorted, open packed, large grain of sand fine to coarse, the grain shape is angular to rounded, there is a sedimentary structure graded bedding and parallel lamination. Andesitic igneous rock with fresh gray-black color, weathered gray-white color, andesitic igneous rock, porphyritic texture, contains mafic minerals, has high intensity and is filled with quartz veins and there are also vesicular (figure 3)

The microscopic description of the breccia component is composed of 30% plagioclase minerals, 15% pyroxene, 5% ore minerals, chlorite and embedded in a 50% fine-textured, porphyritic base mass (Andesite Porphyry, Travis, 1955). The discovery of chlorite minerals indicates that the rock has been changed. In the matrix found 35% plagioclase minerals, 10% pyroxene, 15% glass minerals, 5% ore minerals, and embedded in 30% fine-textured, porphyritic base mass. (Lithic tuff, Schimdt 1981). The breccia units found in the study area are members of the Oligocene – Miocene Jampang Formation and were deposited in shallow marine.

The relationship between this unit and the rock unit above it (sandstone) is comforable, this seen from the stratigraphic position and age obtained by a comparative study with previous researchers, Sukamto 1975 and Budhitrisna 1987.

Sandstone unit, This unit consists of sandstone and breccia. Tuffy sandstone with fresh gray-brown color, weathered yellowish-brown color, poorly sorted, packed open, large fine to coarse sand grains, angular to rounded grain shape, there is a sedimentary structure graded bedding and parallel lamination. There are bright minerals. Breccia is composed of andesitic igneous rock components with a diameter of 10-30 cm with a fresh color of brownish gray, weathered yellowish brown color, poor sorting, open packaging, slightly angular to moderately rounded shape, tuffaceous sandstone matrix with medium to coarse sand grains, fresh color brownish gray, the shape of the grains is angular to round, open, poor sorting, there are bright minerals. Microscopic description of the sandstone contains 40% plagioclase minerals, 20% pyroxene, 15 ore minerals, 20% glass minerals, 5% fine to coarse clastic textured matrix. The type of rock according to the classification proposed by Schmidt (1981) is Lithic tuff (figure 4).

E-ISSN : 2579 – 3136

The author did not find any fossils in this unit, so that their age was estimated based on their stratigraphic position, so the authors conducted a comparative study with the Jampang Formation (Budhistira, 1986 and Sukamto, 1975). information obtained that the sandstone units found in the study area are members of the Jampang Formation with an Oligocene - Miocene age and were deposited in shallow marine.

Limestone Unit, Limestone with fresh milky white color, weathered grayish white color. Clastic texture, large fine grain, hard, some are reef limestone. This unit develops in the northeastern central part of the study area. In the limestone found plagioclase minerals, pyroxene, clay minerals, there is also a large fossil shell foraminifera Heterostegina. Naming rocks with matrix component ratios generally is 60: 40% which is based on Dunham's (1962) classification called Packstone. In accordance with the naming of this unit. The dominant lithology is limestone. In general, reef limestones and clastic limestones have a fresh milky white color, white weathered color, for the clastic ones, the grain size is fine to very fine.

From the analysis of rock samples, fossils of small planktonic foraminifera and benthic foraminifera were obtained. **Small planktonic foraminifera fossils**: Orbulina Universa D'ORBIGNY, Globigerinoides immaturus LEROY, Globoquadrina dehiscens CHAPMAN, PAR, COIN, Globoquadrina altispira CUSMAN. **Benthonic foraminifera fossils**: Nodosaria sp, Bolovina sp and Uvigerina Peregina

The age of the fossils found in limestones shows a range of N10 – N15 or middle Miocene (see table 1). As for the depositional environment, based on benthic fossils, the depth ranges from 50 - 100 m and based on the bathymetric zone the depth is called the middle Neritic zone (see table 2).

This unit overlaps comformable with the sandstone unit, this conclusion is strengthened by the age range which does not indicate a time gaps in the sandstone and limestone units. And a literature study with previous researchers who stated that this unit overlapped comformable with the units below it (Budhitrisna, 1986).

CONCLUSION

The breccia unit as the oldest layer is covered in harmony by the sandstone unit. The age of this breccia unit is determined based on the comparison with the Jampang formation, namely Oligocene to Lower Miocene with marine depositional environment. Sandstone units are units that were deposited after the middle Miocene breccia to the upper and lower Miocene and were deposited in a marine environment. After that, limestone units are deposited sequentially.

ACKNOWLEDGEMENT

I would like to thanks to geological faculty of Padjadjaran University for giving the field permits and local government and local people for cooperation and accommodation during this mapping activity.

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Figure 1. Research Location (no scale)

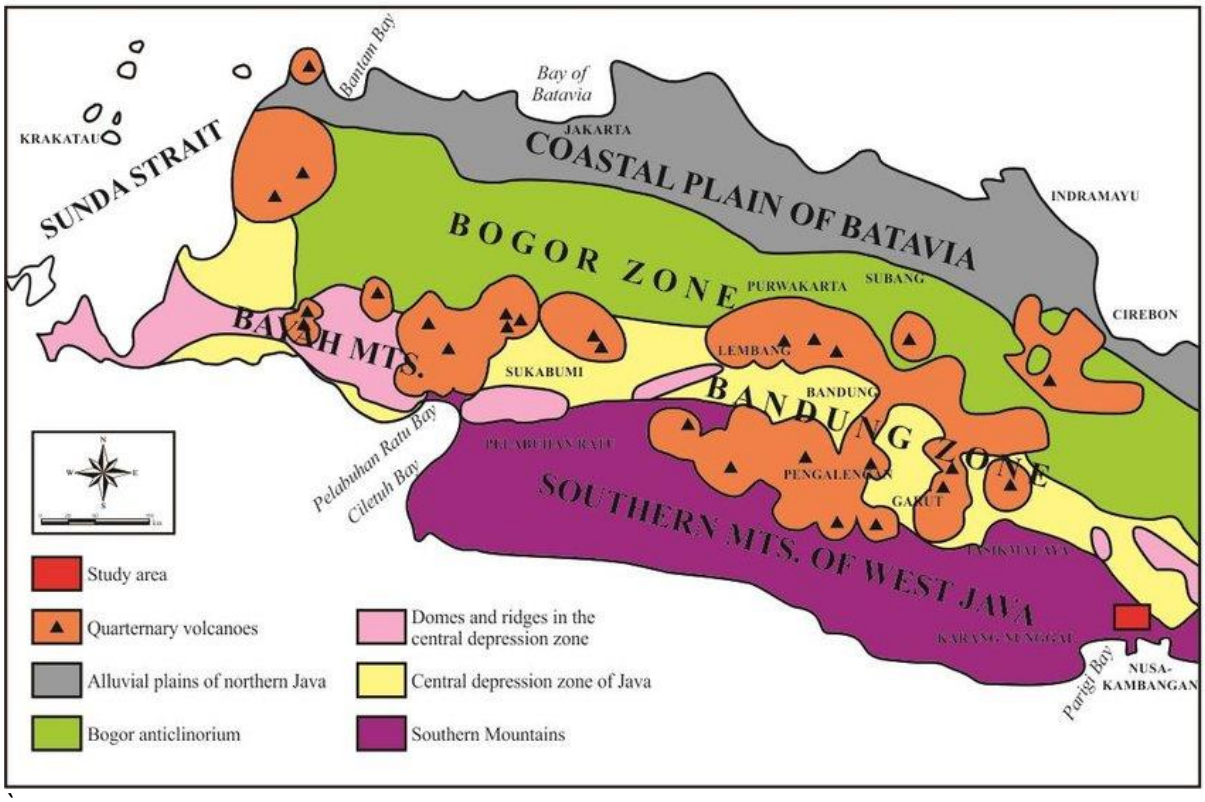

Figure 2. Regional Physiography (van Bemmelen, 1949)

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Figure 3. Breccia Outcrops

Figure 4. Sandstone Outcrops

Figure 5. Limestone Outcrops

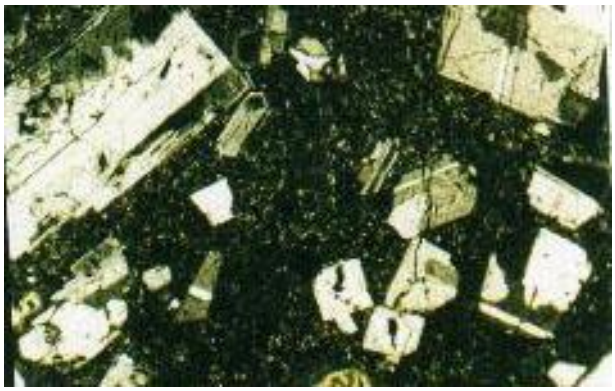

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Figure 6. Petrographic section breccia component.

Figure 7. Petrographic section sandstone matrix at breccia outcrops.

Figure 8. Petrographic section sandstone outcrops.

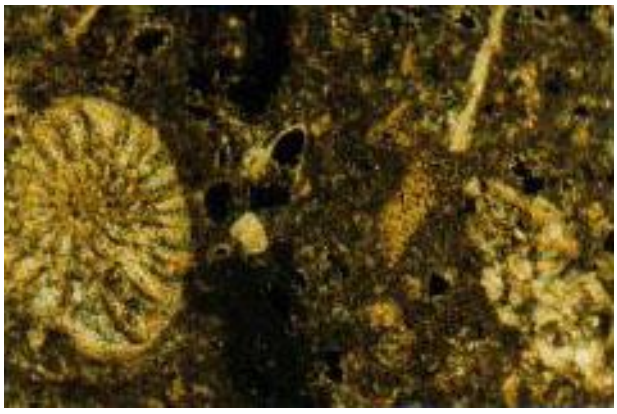

Figure 10. Petrographic section limestone outcrops.

Table 1. Fossils Analysis limestone unit (Relative dating).

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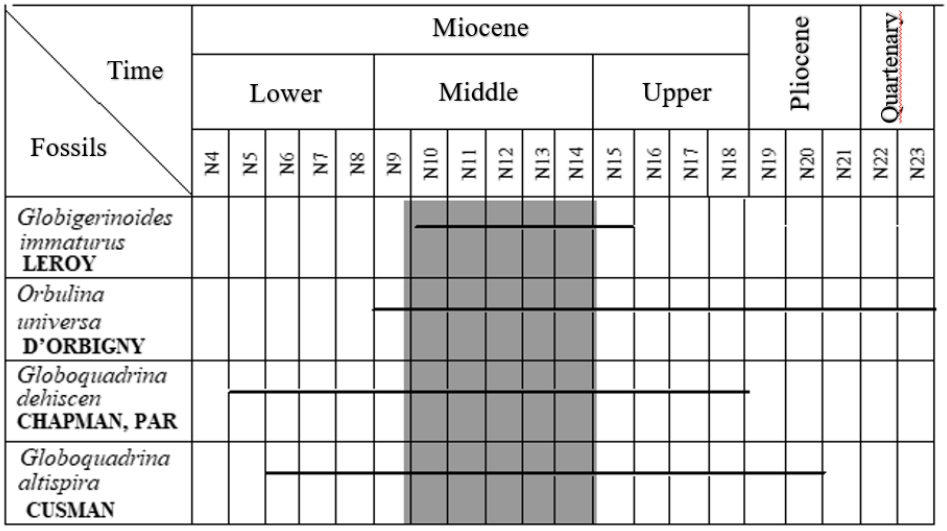
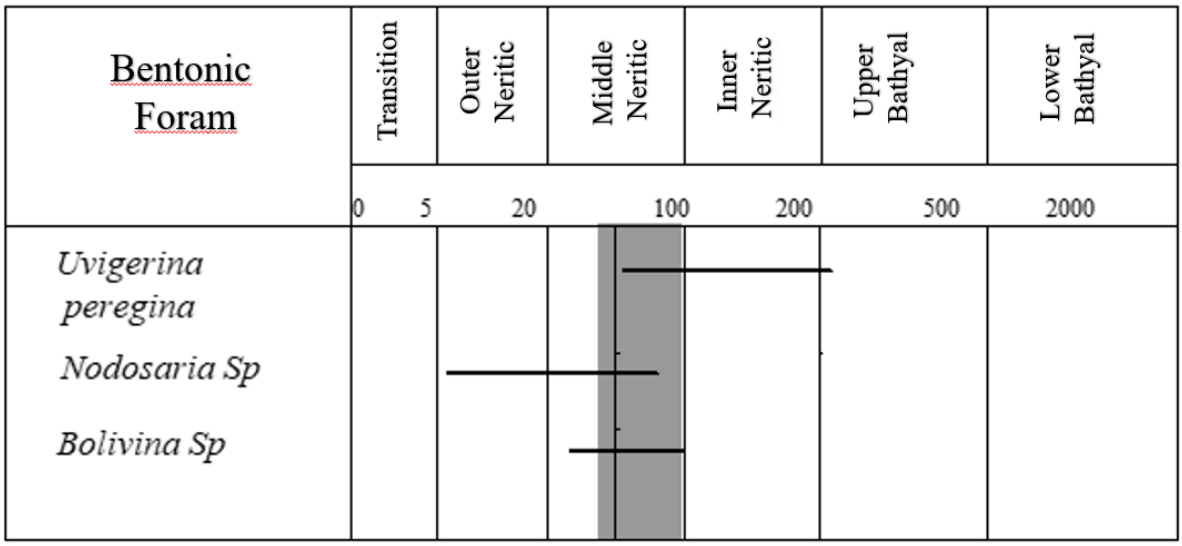


Table 2. Fossils Analysis limestone Unit (bathymetri zones).



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