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Abstract

Kepangeranan Banyumas is one of the old and noble family members from Banyumas Regency, Central Java, Indonesia, who owned and kept the ancient Banyumas manuscripts in the physical form of dluwang paper. This is a preliminary study to provide an initial overview of the physical conditions of Kepangeranan Banyumas dluwang manuscripts. The results showed that the four manuscripts were in category three, or critical condition, and needed immediate conservation treatment.

Keywords: *Dluwang Manuscript, Manuscript Preservation, Kepangeranan Banyumas, Banyumas*

1. INTRODUCTION

Banyumas Regency, which is in the province of Central Java, is one of the regions in Indonesia that has a distinctive style and cultural heritage. This uniqueness is reflected in various aspects, such as customs, regional arts, traditional culinary delights, tourism, and cultural artefacts. Among the wide variety of cultural artefacts typical of Banyumas that still exist today is an ancient manuscript. These ancient manuscripts can be found in both *daluang* or *dluwang* paper and European paper. In this paper, the term of '*dluwang*' will be used.

Banyumas Regency is included in the province of Central Java, Indonesia. According to Pigeaud's review of the history of the ancient Banyumas manuscripts (1967, p. 147), the pre-Islamic Javanese texts do not mention the manuscripts originating from the Banyumas district. However, the local history of Banyumas is well preserved by members of old families in Banyumas district and is considered unique in the Javanese historical literature (Pigeaud, 1967, p. 147).

One of the old and noble family members from Banyumas is the extended family of Kanjeng Pangeran Adipati Arya Gandasubrata, also known as *Kepangeranan Banyumas*. Kanjeng Pangeran Adipati Arya Gandasubrata was the Regent of Banyumas who ruled from 1913 to 1933 (Jatmiko, 2020). This family owned and kept the ancient Banyumas manuscripts in the physical forms of *dluwang* paper and European paper. In 2018, the extended family of Kanjeng Pangeran Adipati Arya Gandasubrata donated their collection of ancient manuscripts to the Universitas Indonesia (UI) library. Of the total manuscripts, four were manuscripts made from *dluwang*. In this research, the object of study will be focused on the physical condition of the *dluwang* manuscript of Gandasubrata's family that is kept in the main library of Universitas Indonesia. This research aims to provide an initial overview of the physical conditions of Gandasubrata's Banyumas *dluwang* manuscripts. The manuscript has never been previously physically identified and has historical value.

2. LITERATURE REVIEW

Several studies discussing manuscript preservation in Indonesia, especially in Java, were conducted by Rachman and Salim (2018). Their study underlined the physical deterioration identified in *daluang* manuscripts which belong to the Cirebon society. Permadi (2012) also identified manuscripts in the scrolls of the Cangkuang Temple Cultural Heritage (CBCC) collection through direct observation and sample testing in the laboratory. The results of the research present the characteristics of the manuscript material in the form of material thickness, material colour, fibre type, fibre length, acid content, and types of text defects. Padarik et al. (2015) identified the fungi found from old *dluwang* manuscripts from Mertasinga Village, Cirebon. Oetari et al. (2015) also identified the occurrence of fungi samples in deteriorated *dluwang* manuscripts. Their samples were taken from *dluwang* manuscripts in the libraries of royal palaces in Indonesia and the Faculty of Humanities Library of Universitas Indonesia.

What about the Banyumas manuscript? Research that examines the Banyumas manuscript has also been carried out in several aspects. Khoeriyah, Wartyo, and Sariyatun (2018) in their paper explore how the norms and values of the Banyumas community's social life are reflected in the text of Babad Banyumas. Priyadi (2006) documents and discusses different versions of Babad Banyumas manuscripts. Using philological methods, Priyadi elaborated and compared 62 of Babad Banyumas manuscripts, which were then categorized into 15 different versions (2006). Priyadi (2018) also studied the text of Babad Banyumas in the Wirjaatmadjan version as well as its transformed texts. In terms of the preservation of the Banyumas cultural heritage, Ratnaningrum and Prasetyawan (2018, p. 73) examined the role of the Banyumas Regional Archives and Libraries Service in preserving Banyumas culture through local content collections. The results of their research indicate the need to increase efforts to handle the local collection of Banyumas content.

What about study on *dluwang* manuscript preservation, especially on Banyumas? Based on literature search results, study on Banyumas *dluwang* manuscripts preservation is still lacking.

Therefore, this research also expected to draw attention to preserving the *dluwang* manuscripts of Banyumas as a cultural manifestation of Javanese people, especially *Kepangeranan Banyumas*. This paper also expects to enrich the study of the *dluwang* manuscript, especially the Banyumas.

3. METHODS

This study was conducted through direct observation of the physical conditions of the manuscript and storage room. A total of four *dluwang* manuscripts were observed visually using observation sheets. The survey sheet was adapted from Drijfhout (1999). The observation aspects studied included chemical, biological, and visual aspects. Chemical aspects include identification of paper acidity and moisture content. Biological aspects include identifying traces of damage to the surface of the manuscript caused by micro-organisms, insects, and rodents. The visual aspect includes identifying traces of damage to the surface of the manuscript caused by air pollution (dust and solid particle) and the condition of the paper itself.

The identification results are then assessed and put into three categories: good, average, and critical. To measure the acidity level of the paper, the researchers used a pH indicator paper. In addition, the temperature and relative humidity levels in the storage room were also measured using a thermo-hygrometer. Temperature measurements were only taken once during the observation.

The researchers carefully determined the category for each manuscript under study. A manuscript is categorized in good condition if it has a pH between 5-7, little dust is found, there are no signs of microorganisms, holes, tunnels, bite marks, grooves, smears, smudges, and paper bits, as well as no fading, no loose bits of paper and no brittleness. A manuscript is categorized as 'average' if it has a pH between 3-5, prominent deposits of dust and pollen, old damage and dead insects, and torn pages. A text is included in the 'critical' category if it contains the following: a pH of less than 3; permanent dirt, dust, sand, soil, soot, and mould; evidence of recent insect activities; parts of text affected; visible crumbling; and missing parts of pages.

4. FINDINGS AND DISCUSSION

Four manuscripts were observed in this study and this four *dluwang* manuscripts are given the codes B1, B2, B3, and B4, respectively. All manuscripts are stored vertically in a storage cabinet. Each manuscript was covered by Concorde paper. At the time of measurement (10 July 2020 at 12:00), the temperature of the storage room was 28.4°C, and the humidity was 58%. The room temperature in the storage cabinet is 28.4°C, and the humidity is 56%. Ritzenthaler (2010, p. 115) recommended that ideal conditions for storage of paper-based materials are a maximum storage temperature of 18°C and relative humidity between 35-45%. Therefore, the storage room temperature of 28.4°C and a humidity of 58% is not considered ideal. Ritzenthaler (2010, p. 115) further explained that relative humidity between 30-50% is low enough to avoid mould growth and high enough to avoid materials drying out and becoming brittle, while the temperature at 18°C will not cause harmful chemical reactions.

Cloves are also scattered in the storage cupboard to keep insects away. Cloves are considered effective as an insect repellent due to their fragrance. Manuscript crumbs due to deterioration are easily found around the manuscript's storage. For this reason, researchers must be careful when taking manuscripts from the cupboard because of the fragile condition of the manuscripts. In the following explanation, the identification results of each *dluwang* manuscripts will be described.

Manuscript B1 is a manuscript whose title has not been identified yet. This manuscript uses the Javanese script and language. The ink used is black. This manuscript is 21.5 cm high and 15.8 cm wide. The thickness of the front sheet is 0.15 mm, and the back sheet is 0.15 mm. The manuscript sheets are sewn and have three drains. The identified acidity level was 4.5 pH. The level of water content on the manuscript sheets is 13.2%.

The results of visual observations show that the manuscript looks fragile and dry, and the colour of the script looks brown. Termite and tick bite marks, mould stains, fire stains, flea leavings, and

insect eggs and faeces were all visible on the manuscript sheets. The manuscript sheets were also seen to be folded, wavy, and torn on several sides. This manuscript also has adhesive tape marks on the cover page. The manuscript sheet looks crumbled so that when it is lifted, the grain of the manuscript material will be palpable and visible. The manuscript cannot be opened further due to the condition of the manuscript sheets, which stick together. The results of the observations show that the manuscript B1 falls into category three, critical condition.

Manuscript B2 is a manuscript whose title has not been identified. This manuscript uses Javanese and Arabic characters and Javanese language. The ink used is black and red. This manuscript is 23 cm high and 17.5 cm wide. The thickness of the front sheet is 0.08 mm, the middle is 0.08 mm, and the back is 0.3 mm. The manuscript sheets are sewn and have four drains. The identified acidity level was 5.5 pH. The manuscript sheets are seen to be drooping so that when lifted, the grains of the manuscript material are palpable and visible. The moisture content on the manuscript sheets is 13.2%. Visual observations show that the manuscript looks dusty, and the paper is brown, brittle, and dry. The manuscript sheets also appear to be punctured by termite and tick bites.

There were also mould stains, fire stains, flea fossils, insect eggs, and dirt on the manuscript sheets. The manuscript sheets were also folded, wavy and torn on several sides. The manuscript sheet looks crumbled so that when it is lifted, the grain of the manuscript material will be palpable and visible. The manuscript cannot be opened further due to the condition of the manuscript sheets, which are sticky and adhering to one another. The results of the observations show that the B2 manuscript also falls into category three, critical condition.

Manuscript B3 is the script of the macapat song 'Dandanggula'. This manuscript uses the Javanese script and language. The ink used is black. This manuscript is not bound and has a height of 20 cm and a width of 13.8 cm. The thickness of the front sheet of the manuscript is 0.23 mm, and the back is 0.23 mm. The manuscript sheet is sewn and has seven drains. The identified acidity level was 5.5 pH. The manuscript sheet looks crumbled so that when it is lifted, the grain of the

manuscript material will be palpable and visible. The moisture content on the manuscript sheet is 12.3%.

Visual observations show that the manuscript looks dusty, and the paper is brown, brittle, and dry. The manuscript sheets were also marked with holes caused by termite and tick bites, and mould stains, fire stains, flea fossils, and insect eggs and feces were found on the manuscript sheets. The manuscript sheets were also folded and torn on the front and back sides. The manuscript cannot be opened further due to the condition of the manuscript sheets, which stick together. The results of these observations show that the B3 manuscript falls into category three, critical condition.

Manuscript B4 is a manuscript whose title has not been identified. This manuscript uses the Arabic script and language. The ink used is black. The manuscript is not bound and is 15.1 cm high and 9.5 cm wide. The manuscript sheets are sewn and have four drains. The three front drains are European paper, and one back drain is *dluwang* which consists of four sheets. The thickness of the *Dluwang* manuscript sheet page 1 is 0.22 mm, page 2 is 0.17 mm, page 3 is 0.17 mm, and page 4 is 0.16 mm. The identified acidity level of the *dluwang* is 4 pH. The level of water content on the manuscript sheet is 12%. Visual observations show that the manuscript looks dusty, and the paper is brown, brittle, and dry. The manuscript shows holes due to termite and tick bites, and there were mould stains, fire stains, flea fossils, and insect eggs and faeces on the manuscript sheets. The manuscript sheets also appear folded and torn on nearly every page. The manuscripts are difficult to open further due to the condition of the manuscript sheets that torn off due to termite bites. The results of the observations show that the B4 manuscript falls into category three, critical condition.

Based on the results of the observations, the conditions of all four *dluwang* manuscripts fall into category three, critical condition.

Table 1. Manuscript Condition Assessment

Code	Category	Assessment
B1 / A	3	Critical
B2 / AA	3	Critical
B3 / A7	3	Critical
B4 / A9	3	Critical

Based on the survey, the formats of Banyumas *dluwang* manuscripts in this research vary between 0.15 mm - 0.3 mm thickness, 15.1 cm – 23 cm high, and 13.8 – 17.5 cm width. Rachman and Salim (2018, p. 74) explained that *dluwang* sheets have different formats, based on the purpose. Regarding to the level of acidity, the scale of the pH test result was between 4 – 5.5 pH. Ritzenthaler (2010, p. 54) explained that acidity is one of the primary causes of paper deterioration. Perhaps the chemical properties and making process of *dluwang* affect the quality and durability of the material itself, especially the *acidity* level. Research on the chemical composition of *dluwang* might be conducted to explain further.

The majority of deterioration found in these manuscripts comes from biological factors, i.e. termite and flea bite marks, mould stains, and soot stains, flea leavings and insect eggs and faeces. It is assumed that poor handling and an improper storage environment in the past might be the primary factors that caused the deterioration found on these collections. Ritzenthaler (2010, p.103) highlighted that biological organisms, such as insects, rodents, and fungi, can damage archival materials. Fungi (mould and mildew) will grow while in favorable environmental conditions. On the other hand, insects (such as termites and silverfish) and rodents tend to prefer eating the organic substance that *dluwang* is made of. Improper care and handling in the past are also assumed to have caused damage to the collection.

5. CONCLUSION

The results showed that the four manuscripts were in category three, which considered as critical condition, and needed immediate improvement. Most of the damage could be due to previous inappropriate storage and handling, i.e., environmental, and also biological factors. This research suggests the following:

- a. Provide appropriate environmental and storage conditions, i.e., by keeping the temperature at the storage room as low as possible and controlling the relative humidity.
- b. Separate storage of each manuscript, e.g., storing it in a special box and not storing vertically.
- c. Advanced conservation techniques could be implemented to separate sheets that become stuck together.

Due to the limitations of this initial study, the authors also suggest future study to get the holistic picture of *Kepangeranan Banyumas dluwang* manuscripts collection preservation.

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