ARCHIPELAGIC CALENDAR IN THE JAVANESE AND BUGIS MANUSCRIPTS

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Abstrak

Manuscripts of the Javanese and Bugis calendars are products of the archipelago's culture. It is a fundamental issue with respect to astronomy as a science. This study analyzes the Bugis and Javanese calendars indicated in the manuscripts. Comparative descriptive analysis and literature research methods are both used in this study. According to the article, the Javanese and Bugis have manuscripts relating to the calendar as a way of life-based on natural phenomena. The *Lontara Bilang* and *Lontara Kutika Ugi Sakke Rupa* scripts belong to the Bugis people, whereas the *Serat Mustaka Rancang* and *Serat Widya Pradhana* manuscripts belong to the Javanese.
Keywords: calendar manuscript; Javanese manuscript; Buginese manuscript; astronomy

Abstrak

Manuskrip penanggalan Jawa dan Bugis merupakan produk budaya Nusantara. Keduanya merupakan menerapkan ilmu astronomi dalam basis fundamental penyususnananya. Artikel ini bertujuan untuk menganalisis penanggalan masyarakat Jawa dan Bugis yang tercantum pada manuskrip. Artikel ini menggunakan metode penelitian pustaka dengan analisis deskriptif-komparatif. Artikel ini menemukan bahwa masyarakat Jawa dan Bugis memiliki naskah yang berkaitan dengan sistem penanggalan sebagai pola hidup masyarakat yang berkaitan dengan fenomen-fenomena alam. Masyarakat Jawa memiliki naskah Serat *Mustaka Rancang* dan naskah *Serat Widya Pradhana*. Sedangkan masyarakat Bugis memiliki naskah *Lontara Bilang* dan *Lontara Kutika Ugi Sakke Rupa*.
Kata Kunci: Manuskrip Penanggalan, Manuskrip Jawa, manuskrip Bugis, Astronomi

A. Introduction

Manuscripts are rare collections belonging to all nations in the world. Every nation can see the life journey of its people through written texts, including the Indonesian nation as a nation with a variety of cultures from Sabang to Merauke, which has an overview of people's lives, socio-culture, customs, government, and others as stated in the manuscripts. Manuscripts are important to preserve because they contain matters relating to conditions or circumstances that differ from current conditions from the past; additionally, manuscripts contain various extraordinary information in various fields, such as literature, religion, law, history, customs, and so on.[1]

Clues to an event were found in the manuscripts, but several manuscripts need to be reviewed again to describe the time of the event. History demonstrates that at first, the community did not recognize the need or importance of time because it focused on natural patterns such as the sun, which always rises in the morning and sets in the evening.Therefore, people are not in a hurry to use time, and there are no provisions or rules for doing something in a certain time unit. However, in the process of living life, there are several important events that differ from one event to another..[2]

So the calendar exists as one of the needs of human life in society to remember an event and record important events, both concerning human life and natural events in the surrounding environment that are based on the circulation of celestial bodies such as the sun and moon, as well as other natural phenomena.The process of observing natural conditions and then forming notations through numbers in units of time has relevance to the science of astronomy, while studying manuscripts is related to philological studies. In this case, manuscripts are referred to as all handwritten products that store various expressions of creativity, taste, and intention.[3]

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[1]Hirma Susilawati, "Preservasi Naskah Budaya Di Museum Sonobudoyo", *Al-Maktabah: Jurnal Kajian Ilmu Dan Perpustakaan* 1 (2016): 62, diakses 31 Oktober 2022, doi: https://www.google.com/url?esrc=s&q=&rct=j&sa=U&url=https://ejournal.iainbengkulu.ac.id/index.php/almaktabah/article/download/2323/1931&ved=2ahUKEwjw49-O94n7AhUfUGwGHd0KCUkQFnoECAoQAg&usg=AOvVaw2V3a8DQU3fmVcMJ72hAeT1.

[2]Diah Ayu Agustina, "Menguak Sejarah Bangsa Lewat Titimangsa Naskah", *Manuskripta* 7.2 (2017): 120, diakses 31 Oktober 2022, doi: https://doi.org/http://journal.perpusnas.go.id/index.php/manuskripta/article/download/97/82.

[3]Agustina, 119.

This is what was inherited by the predecessors of the Javanese and Bugis communities in several manuscripts, namely *Serat Mustaka Rancang*, *Serat Widya Pradhana*, *Lontara Bilang*, and *Lontara Kutika Ugi Sakke Rupa*, which need to be known and preserved through study from the point of view of developing and interrelated science.

B. Method

Most of the literature related to the Archipelago calendar manuscripts can be found, but the existing sources are only focused on one particular community's calendar manuscripts. As a result, the author is interested in discussing the Archipelago calendar in Javanese and Bugis manuscripts using qualitative literature research methods based on several primary sources[4] and other related sources, and then comparing the calendar in each manuscript's content with the calendar of the Javanese and Bugis people to determine the conditions, uses, and superiority of each existing manuscript date.

C. Result and Discussion

C.1 *Serat Mustaka Rancang* Manuscript

The *Warsadiningrat* collection of manuscripts is a collection of manuscripts containing the ideas of the courtiers of the Yogyakarta and Surakarta Kratons from the early period of the kraton's establishment until the early 19th century. There are 86 manuscripts in the Warsadiningrat collection,[5] and one of the manuscripts in the Warsadiningrat collection (MWD1894b) by Mas Demang Warsapradongga (at the Susara Lestari Sastra Foundation) in 1894 had two texts in one manuscript with the title Serat Mustaka Rancang (SMR), namely regarding the calendar system and standard mastermind.[6]

At first, Javanese people had 7 days, namely; Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, while there are 5 *pasaran* days, namely, *Pon, Paing, Wage, Legi,*

[4]Jurnal "Sistem Penanggalan Dalam *Serat Mustaka Rancang*" oleh Achmad Saeroni, skripsi "*Serat Widya Pradhana*" oleh Resti Ayu Kusumasari, dan tesis "Naskah *Kutika* Suku Bugis di Kalimantan Timur: Kajian Filologi dan Gagasan Ekofenomenologi" oleh Rahmatia Ayu Widyaningrum.

[5]25 naskah berada di Yayasan sastra Lestari Surakarta, 1 naskah PNRI (Perpustakaan Nasional Republik Indonesia), 29 naskah di Kraton Kasunanan Surakarta, dan 31 naskah berada di Kraton Yogyakarta.

[6]Achmad Saeroni, "Sistem Penanggalan Dalam Serat Mustaka Rancang (Suntingan Teks dan Analisis Isi Naskah Koleksi Warsadiningrat)", (Skripsi, Universitas Diponegoro, 2018), h. 3. https://doi.org/http://eprints.undip.ac.id/70326/.

and *Kliwon*, and every *pasaran* day there are multiple markets called *neptu*.[7] The 5 *Pasaran* days are also known as *Pancawara* by the Javanese people as a unit of time that is the standard for spiritual matters. Everyday has each meaning as follows:[8]

Table 1. *pasaran* day and its meaning

***Pasaran* Day**		**meaning**
Legi	:	Advice
Paing	:	Fortune
Pon	:	Safety
Wage	:	Obstacle
Kliwon	:	Lose

Source: Achmad Saeroni, "Sistem Penanggalan Dalam Serat Mustaka Rancang"

a. *Windu* on *Serat Mustaka Rancang* Manuscript

Windu is an 8-year cycle in the calendar system that has the meaning of two words: *Wi* which means to talk about excessive things, and *Du*, which means to describe everything. So, the word "*windu*" is defined as "discussing or describing everything," describing what *windu* is, the types of *windu*, and their meanings. According to the SMR manuscript, there are four types of windu, they are *Windu Adi*,[9] *Windu Kunthara*,[10] *Windu Sangara*,[11] and *Windu Sancaya*.[12]

b. Year on *Serat Mustaka Rancang* Manuscript

The 4 *Windu* cycle that has been described previously is then broken down into 8 years, in the manuscript it is stated: "*...Pêcahe windu papat dadi wolu, dumunung ana taun wolu*" (SMR

[7]Saeroni, h. 13.

[8]This is stated by manuscript that: "*punika wotên pêkênan Lêgi enjing pitutur*, *Paing enjing rêjêki*, *Pon enjing slamêt*, *Wage enjing pacakwêsi*, *Kaliwon enjing kalangan*" (SMR h. 5) which more or less translates into Legi which means advice, Pahing which means fortune, Pon which means safety, Wage which means obstacle, Kliwon which means loss. Ali Khumaini, 'Makna Hari Dalam Tradisi Jawa', *Alif.id*, 2021.

Saeroni, h. 17.

[10] Saeroni, h. 18.

[11] Saeroni, h. 18.

[12] Saeroni, h. 18.

p. 3), they are: *Alip* year,[13] *Ehe* year,[14] *Jimawal* year,[15] *Je* year,[16] *Dal* year,[17] *Be* year, [18] *Wawu* year,[19] and *Jimakir* year.[20]

c. *Pranata Mangsa* month on *Serat Mustaka Rancang* manuscript.

The *Pranata Mangsa* month is a guide for farmers to determine the start of the planting period, while for fishermen, this time is a guideline for going out to sea and predicting the type of catch that is inherited orally by making the month the unit of time based on its circulation around the earth, ranging from 27 to 32 days per month. Knowledge related to *Pranata Mangsa* is limited by place and time. In general, Pranata Mangsa is a seasonal calendar for Javanese people. In the SMR manuscript, there is a difference of 6 days from June 17 to June 21 before finally returning to the initial calculation.[21]

d. *Kurup* on *Serat Mustaka Rancang* manuscript

The *kurup* is a unit of time that lasts for 120 years, the naming of each period of one *kurup* is taken from the first day, which is divided into seven, namely: The kurup cycle runs from *Akadiyah* to kurup *Senenngiyah*, so to return to the beginning of *kurup*, it takes 840 years (120 years x 7 *kurups*).[22]

e. *Wuku* on Serat *Mustaka Rancang* manuscript

Wuku, also called *Pawukon*, is a Javanese calculation of the duration of the circulation of time in units of weeks. This concept is the beginning of the day, which is calculated from the sun rises through day and night. *Pawukon/Wuku* is knowledge of the journey of human life based on the size of the nature of their respective destinies, which resembles horoscoop

[13]Windu begins with the year of Alip, which contains many natural events; many phenomena occur this year. "Siji dumunung's lust for the moon, nature's siji," the manuscript says (SMR p. 3). The meaning of this sentence is that there is a strong pull by the moon and nature (Earth) that occurs at one time in the year of Alip, causing many natural phenomena. People born on this day will have an aura that can attract other people.. See more on Septianingsih, "Ramalan Watak Dan Nasib Seseorang Dalam Naskah Palintangan (Suntingan Teks Dan Kajian Pragmatik)", *Fakultas Ilmu Budaya: Universitas Diponegoro*, (2017): 67, diakses 1 November 2022, doi: http://eprints.undip.ac.id/58178/1/JURNAL.pdf.

[14] Septianingsih, h. 19.

[15] Septianingsih, h. 19-20.

[16] Septianingsih, h. 68.

[17] Septianingsih, h. 20-21.

[18] Septianingsih, h. 21.

[19]Septianingsih, h. 21.

Saeroni, h. 21-22.

[21] Saeroni, h. 22-25.

[22]1) Saeroni, h. 22-25.

knowledge in archaeological astrology in its pattern. *Wuku* is mentioned in the SMR manuscript only as a time marker, namely: *Wuku Wayang*,[23] *Wuku Maktal*,[24] *Wuku Julungpujut*,[25] *Wuku Julungwangi*,[26] *Wuku Kelawu*,[27] and *Wuku Wukir*.[28]

In determining the date or day in the manuscript, *Serat Mustaka Rancang* refers to the calendar calculation system for Sultan Agung of Mataram, which began in 1547 Saka (1625 AD).[29]

C.2 *Sêrat Widya Pradhana* manuscript

The *Sêrat Widya Pradhana* manuscript is a manuscript of the *primbon* category, which contains the Solar and Lunar calendars. Besides that, this manuscript also contains a brief history of the use of the calendar in the period before and after Islam, as well as a combination of Islamic and Javanese calendars. *Widya Pradhana* consists of the words *Widya* and *Pradhana*. According to the Baoesastra Djawa Poerwadar Minta dictionary (1939), *widya* means *kawruh* (knowledge), *pradhana* is *pangarep* (leader) and *panggedhe* (authority).[30]

In the opening of the SW manuscript, it is explained how the year is calculated with the circulation of the sun and the circulation of the moon. First is the rotation of the sun, whose round trips meet in one year.[31] The second is the course of the moon's rotation, in which the rotations meet in one month. It was found that the number of days in the solar year for one

[23] Saeroni, h. 25-28.
[24] Saeroni, h. 25-28.
[25] Saeroni, h. 25-28.
[26]Saeroni, h. 25-28.
[27] Saeroni, h. 25-28.
[28]In the SMR manuscript it is used as a marker to enter the year 1868 which falls on the 28th day of the big month of the Alip year. Saeroni, h. 25-28.
[29]collection of Sasanan Pustaka Karaton Surakarta Hadiningrat Library with catalog number 352 Ha (101 years) by Ranggawarsita, Library of Sasana Pustaka Karaton Surakarta Hadiningrat with catalog number 16 Ca (± 82 years) copied by Soeriwidakdo R.M.P, collection of Radya Pustaka Museum with catalog number SMP-RP 238, and the Pura Pakualaman Library collection with catalog number Pr-3 (Sri Ratna Sakti Mulya, 2005). See more on Saeroni, h. 28.
[30]This manuscript contains one of the scopes of Islamic Astronomy in the form of calendars in the pre-Islamic, post-Islamic, and a combination of Islamic and Javanese calendars. There are 4 Sêrat Widya Pradhana manuscripts listed in the catalog. Resti Ayu Kusumasari, "Serat Widya Pradhana (Suatu Tinjauan Filologis)", (Skripsi, Universitas Sebelas Maret, 2014), h. 3-4.
[31]If one month is equal to 30 days, 10 hours, and 30 minutes, a half-year is equal to 182 days, 15 hours, and a year is equal to 365 days, 6 hours. However, if you break down the calculation into one month, which is 30 days, you get half a year (182 days), which is 14 hours, 54 minutes, and a year, which is 365 days, which is 5 hours, 48 minutes, and 45 seconds. Septianingsih, h. 101-102.

year is more than in the lunar year, with a difference of 10 days and 21 hours and 12 minutes.[32] This is because the moon rises about 30 to 70 minutes later each day than the previous day.[33]

a. Solar Calendar

The solar calendar system uses the sun's movement as the basis for calculations. The sun travels from a spring point to the next spring point in 365 days, 5 hours, 48 minutes, and 45 seconds. As in the excerpt of the text of the SW manuscript;

> Yang pertama jalannya perputaran Matahari. Perputarannya di dalam satu tahun. Secara rinci hitungannya di dalam satu tahun 365 hari 6 jam. Apabila diperjelas hitungannya di dalam satu tahun 365 hari 5 jam 48 menit 45 detik. (*SW* p. 1).[34]

In the SW manuscript, the historicization of the use of the solar year was used by the Arabs since there were regulations for calculating using the solar rotation system at the time of the Prophet Ismail, but the names of the days and months still used the names at the time of the Prophet Idris, which consisted of twelve months called *Buruj* and seven days called *Nujum*.

b. Lunar Calendar

Since the reign of the Prophet Muhammad, the Arabs no longer used the calendar by calculating the rotation of the sun but instead used the calculation of the rotation of the moon, as in the quotation from the SW manuscript;

> Bersamaan dengan zaman Nabi Muhammad saw. menjadi Rasul kemudian memerintah Mekah. Pada saat itu tanah Arab tidak ada yang memerintah, oleh karena itu Nabi Muhammad saw. memerintahkan orang Arab untuk menggunakan hitungan tahun Bulan (*SW* p. 11).

The text quote above shows the start of the Arab nation using calendar calculations that refer to the circulation of the moon. Since then, the names of the days and new months have appeared. The names of the days are: *Ahad* (Sunday), *Isnen* (Monday), *Tsalasa* (Tuesday), *Arbak*

[32]If the calculation exceeds half a month (14 days, 18 hours, 22 minutes), then one month (29 days, 12 hours, 44 minutes), then half a year (177 days, 4 hours, 24 minutes), and one year (354 days, 8 hours, 48 minutes), whereas if the calculation is in half a month, 14 days, 18 hours, 22 minutes, and 12 seconds, followed by a month of 29 days, 12 hours, 44 minutes, and 3 seconds, and a half-year of 177 days. 4 hours, 24 minutes, 18 seconds equals 354 days and 8 hours, 48 minutes, 36 seconds. When comparing the duration of the rotation of the solar year with the lunar year, Lihat Septianingsih, h. 101-102.

[33]Md. Towhiduzzaman, & A. Z. M. Asaduzzaman, "Calculation of the Dates of New Moon and Full Moon of All Months of the Upcoming Five Years (2017-2021)", *Scholar Journal of Physics, Mathematics, and Statistic*, 4.1 (2017): 10, diakses 21 Januari 2023, doi: https://doi.org/10.21276/sjpms.2017.4.1.2.

[34]The rotation of the sun in one year is 365 days, 5 hours, 48 minutes, and 45 seconds, according to the current calculation. However, in the SW manuscript, it is also written that the rounding is 365 days and 6 hours.

(Wednesday), *Thursday* (Thursday), *Jumungah* (Friday), and *Setu* (Saturday). Then the names of the months are: *Muharram, Shafar, Rabiul Awal, Rabiul Akhir, Jumadil Awal, Jumadil Akhir, Rajab, Sya'ban, Ramadhan, Syawal, Dzulqaidah*, dan *Dzulhijjah*.

The calculation of the rotation of the moon with the sun in one year is different. There is a difference in the calculation of solar and lunar years, as stated in the SW manuscript;

> Dan jika dijumlah hitungan tahun Surya dan tahun Candra adalah berselisih 1 tahun selisih 11 hari, 3 tahun selisih satu bulan, 15 tahun selisih satu tahun, 30 tahun selisih 2 tahun, 100 tahun selisih 3 tahun, 200 tahun selisih 6 tahun, 300 tahun selisih 9 tahun, 400 tahun selisih 12 tahun, 500 tahun selisih 15 tahun. 600 tahun selisih 18 tahun, 700 tahun selisih 21 tahun, 800 tahun selisih 24 tahun. 900 tahun selisih 27 tahun, 1000 tahun seisih 30 tahun (*SW* p. 2-3).[35]

c. The Usage of Islamic Calendar in Java

The Hijriyah year began to be used by the Javanese at the same time as the arrival of Islam on the island of Java, but the Javanese did not use the Hijri year counting rules only but combined them with *Pasaran*, namely *Pon, Wage, Kliwon, Legi,* and *Pahing*. The Arabic year began to be used in Java at the same time as the Javanese year 1443 of the Candra Sangkala during the Demak Kingdom. Sunan Giri II set the course of the calendar from *Kurup* to *Nêptu*.

> Selanjutnya menceritakan mulainya tahun Arab dipakai di tanah Jawa. Ketika tahun Hijriyah 931 bersamaan dengan tahun Surya Sangkala 1400. Terhitung di tahun Candra Sangkala Jawa 1443 pada jaman Kerajaan Demak. Karangan Sunan Giri ke II jalannya penanggalan diatur dari Kurup *Alip, He, Jim, Je, Dal, Be, Wawu, Jim* (*SW* p. 16-17).[36]

The SW text also mentions that each month has its nêptu value, namely *neptu pasaran* and also *nêptu dino*. The value of nêptu and its calculation in each name of the month and day is usually used by Javanese people to estimate the influence of these days.[37]

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[35]The essay uses years and months to describe how the solar year and lunar year are calculated differently. Three years are separated by one month, followed by 15 years by one year, according to the text's explanation. This math is flawed since there should be a difference of 5 years rather than 3 years and a month over the course of 15 years as stated by Septianingsih, h. 121-122.

[36]*Ing mangke amratelakakên awitipun wulan taun Arab kangge wontên ing tanah Jawi. Nalika taun Ijrah 931, amarêngi ing taun Surya Sangkala 1400. Kaetang ing taun Candra Sangkala Jawi 1443 jaman nagari ing Demak. Panganggitipun Sunan Giri kaping II lampahing pananggalan kaugêran saking kurup Alip, He, Jim, Je, Dal, Be, Wawu, Jim.* According to the book Astronomy Studies, which is backed up by Ahmad Izzan and Iman Syaifullah, Sultan Agung modified the calendar system in 1555 Saka by using the lunar guideline and mimicking the Hijri calendar before calling the years in each windu with *Alip, He, Jimawal, Je, Dal, Be, Wawu, dan Jimakir.*

[37]Septianingsih, h. 125.

C3 The Bugis's *Bilang Taung* on *Lontara Bilang* manuscript

The calendar of the Bugis people is summarized in a note known as *Sureq Bilang* or *Lontara Bilang*. *Bilang* is a calculation in the *Bugis* language, a word that has a broader meaning and function for the life of the *Bugis* people, who believe in the calendar as local wisdom knowledge, religious identity, and spirituality in the form of *Lontara* manuscripts as a very valuable product of local wisdom. Local wisdom refers to the noble values that community groups embrace and uphold in order to protect and preserve local culture and environment.[38]

The Bugis calendar has been confirmed to exist and was in effect before the influence of the Hijri calendar and the advent of the Christian calendar. The use of the Bugis calendar has been harmonized with the Gregorian and Hijri calendars from 1775 to 1795 by the King of Bone XXIII, La Tenri Tappu To Appaliweng (Sultan Ahmad Al Saleh Syamsuddin), in his diary kept in the British Museum. The determination of days and dates for natural events and human life has a mythological aspect that is believed by the Bugis people as a sign of good or bad events that will occur within the scope of society.[39]

Events or incidents that occurred in the past are then arranged in the *Bilang* system (calculation), namely *Bilang Uleng* (calculations or month cycles) and *Bilang Esso* (calculations or day cycles)..[40]

a. *Bilang Uleng* (Lunar Cycle)

1) *Bilang Ugi* (*Bilang* Bugis)

The Bugis divide a year into 365 days, which begin on May 16 (AD). The calculation in the Bugis year is the indigenous calendar, which is not modified by

[38]In this case, the function of the *lontara* is to record traces of events in the past in the form of days, months and years. See Dian Ekawati dkk., "Reinforcement of Character Education Through the Local Wisdom Values of Pappaseng", *International Journal of Education and Social Science Research*, 3.2 (2020): 247, diakses 21 Januari 2023, https://ijessr.com/uploads2020/ijessr_30_303.pdf.

[39]This understanding has been passed down from generation to generation through stories, writings, and customs, including a series of incidents of people who have died and natural events that have occurred. See Sukmawati, Rasywan Syarif, and Shippah Chotban, "Analisis Terhadap Hari Baik Dan Hari Buruk Dalam Sistem Penanggalan Penanggalan Suku Bugis Perspektif Ilmu Falak", *Hisabuna* 3.1 (2022): 2, diakses 1 November 2022, doi: https://journal3.uin-alauddin.ac.id/index.php/hisabuna/article/view/25030.

[40]Nadira, "Studi Komparatif Penanggalan Bugis Makassar Dan Jawa Persfektif Ilmu Falak", (Skripsi, Universitas Islam Negeri Alauddin Makassar, 2022), 37.

Hinduism and is different from the Javanese calendar, which has the remaining days calculated. The number of days in the Bugis calendar is the same every month. [41]

2) *Bilang Paringki*

The reference is to the object of the Portuguese calendar, *Bilang Paringki*. The word *Paringki* is often equated with the word *Parengki*, which refers to the meaning of the Portuguese. It can be said that *Parengki* existed because of the arrival of the Portuguese on Sulawesi island around the 15th century. If the mention of the word *Pariangki* is the same as *Parengki*, then it can be said that *Bilang Pariangki* is the Portuguese calendar, also known as the European calendar, namely AD.[42]

b. *Bilang Esso* (Daily Cycle)

The *Bilang Esso* among the Bugis people is local knowledge regarding the calendar system that was created before the arrival of Islam, but also contributed to the introduction of the Hijri calendar and the arrival of Europeans who introduced the Gregorian calendar based on *Lontara* letters. There are five categories of daily cycles: a three-day cycle (*Bilang Tellu*), a five-day cycle (*Bilang Lima*), a seven-day cycle (*Bilang Pitu*), a nine-day cycle (*Bilang Aséra*), and a twenty-day cycle (*Bilang Duappulo*).[43]

C.4 *Kutika Ugi Sakke Rupa* Manuscript

Lontara Kutika, with the manuscript title *Kutika Ugi' Sakke Rupa* (Kutika Bugis Anthology), is a manuscript in the collection of the Mulawarman Museum, East Kalimantan. This Lontara is called *Kutika* because it contains guidelines for calculating good and bad days

[41]The interesting thing in Matthes's review is that it states that the Bugis use the solar calendar or calendar calculations based on the circulation of the earth around the sun, which is divided into 12 months in one year according to the contents of two Lontara manuscripts, namely the code VI 18 manuscript (Statsbibliothek zu Berlin collection) and the manuscript Add MS 12345 (the manuscript diary or diary notes of the King of Bone, La Tenritappu Sultan Ahmad Al Salih). Nor Sidin, *Bilang Taung Sistem Penanggalan Masyarakat Sulawesi Selatan Berdasarkan Naskah Lontara* (Jakarta: Turikalengna, 2020), h. 13-18.

[42]Matthes mentions the term pariyama by linking the periodization involved in the history of the La Galigo epic. Matthes did not explain how the period was calculated, he knew that one pariyama meant a period of eight (8) or twelve years (12). Sidin, h. 38-39.

[43]The discussion of the day's cycles refers to Bugis manuscripts, namely the Add MS 12345 manuscript-British Library collection, the Add MS 12360 manuscript-British Library collection, the Add MS 12373 manuscript-British Library collection, the VT 81.10 manuscript-National Library collection (Jakarta), and the manuscript VT 129 of the National Library collection (Jakarta). The Bugis people's views on the quality of the day are based more on Islamic teachings combined with astronomical knowledge; for them, determining good and bad days is more than just a prediction; the daily cycle is a guide in all socio-cultural activities of the Bugis people. . Sidin, h. 58.

that are illustrated by animal types, time symbols, mathematical symbols, and constellation symbols.[44] Based on the colophon of the *Kutika Sure Ugi' Sakke Rupa* manuscript, it was completed in the 19th century (1311 H/1893 AD) with Jawi and Bugis letters in the exordium of the manuscript, then digitally converted in 2019.[45] In other literature, the text in this manuscript uses four different languages, namely Bugis, Malay, Arabic, and Banjar.[46]

In tracing the identity of the author of the KUSR manuscript, so far there are two possibilities. The first possibility is that the title "captain" contained in the opening of the text refers to the name Abdul Wahab Daeng Masikki, who became Kapitan Melayu during the Dutch colonial period. The second possibility is that the term "captain" is a title for a shipping leader, which refers to the name of a scholar, namely Abd al-Wahhab al-Bugisi, who is also recognized by Matthes[47] and Hadrawi[48] *Lontara' Kutika's* leader.[49]

The word *Kutika* comes from Sanskrit, from the word "*krittika*," which is then absorbed by the Malay language to become "*kutika*, or "*rejang*," which is defined as knowledge or "*widya*" regarding divination and insight that is not based on race or zodiac. *Kutika* experienced rapid development in tandem with the arrival of Islam in South Sulawesi. At first, traditional calculations were based on the quality of the day. After switching to the Hijri calendar system, the count of days totaling 30 or 29 days in a month began to follow Islamic conventions while still adjusting the sound system of the Bugis language; this was also applied to Bugis language

[44]Rahmatia, & Abdullah Maulani, "Pemikiran Sains-Sufistik Orang Bugis Dalam Naskah Kutika Ugi' Sakke Rupa", *Jurnal Lekture Keagamaan*, 19.2 (2021): 485, diakses 1 November 2022, doi: 10.31291/jlka.v19.i2.935.

[45]This manuscript contains tables of calculations or calendars to determine the change of day or month, which consist of seven parts; month and time calculations, calculations and predictions for all problems, guidelines for building houses, guidelines for buying boats, ethics and prayers for farming, as well as various types of istihara for general needs, and also contain general knowledge information that can be practiced by anyone just. See Maulani, h. 494 - 486.

[46]Rahmatia and Tommy Christomy, "Eco-Phenomenology In The Local Concept Of Buginese Agriculture Based On Kutika Manuscript", *E3S Web of Conferences*, 211.The 1st JESSD Symposium: International Symposium of Earth, Energy, Environmental Science and Sustainable Development (2020): 3, diakses 2 November 2022, doi: https://doi.org/https://doi.org/10.1051/e3sconf/202021101008.

[47] *Makassarche En Boeginesche Kotika's* author.

[48] *Assikalabineng: Kitab Persetubuhan Bugis*'s author.

[49]The existence of the KUSR manuscript found in the Kalimantan area is evidence of the existence of traces of Bugis knowledge traditions in the Malay region, which are related to the historical journey of the Bugis pasompe' (overseas). See more on Maulani, h. 503.

numbering, which did not have symbols. numbers, but in its development it follows the rules of Arabic numeral symbols.[50]

The time in 24 hours is classified again into 16 sub-times; they are *Pajang*, *Elek Kelek*, *Pammulang*, *Enrekesso*, *Tanggasso*, *Tanreesso*, *Araweng*, *Sarakesso*, *Petteng*, *Labbukesso*, *Sumpang Wenni*, *Laleng Penni*, *Tengabenni*, *Sarawenni*, *Denniari*, and *Wajeng Pajeng*.[51] Meanwhile, Sheikh Abdul Wahab al-Bugisi, in his calculation method, divides the day into five parts with their respective qualities. (*Kutika Pakkita Esso*).

This traditional knowledge is believed to have a certain impact on all forms of activities or activities of the Bugis community, especially work aimed at earning a living, so that quality time is sought for *mallise* and *nahas* time (nahase' tabbékka pitué nasiuleng) every month.[52] There are descriptions in the KUSR text that are not found in other *kutika* texts, one of which is the explanation of the *putika jamu' jangé*, which is known as the seventh time, namely a system of calculating time based on changing the clock seven times. The time sequence starts from Syamsu-Zahrah-Attarid-Qamar Zuhal-Mustarih-Mareh, and the seven times alternate every 1 hour in a 24-hour cycle. The calendar in KUSR includes two types of calendars: *Bilang Tellupulo* (a 30-day calendar based on the rising of the moon at night) and *Bilang Asera* (a 9-day calendar that is counted repeatedly for 30 days).[53]

D. Conclusion

Among the many manuscripts that already exist, the Javanese and Bugis have two that describe one area of astronomy, namely the calendar system, which is studied in philology. Each calendar in the manuscript has its own advantages and uniqueness based on with meaning in terms of name and intended use. Each calendar in the manuscript of the Javanese and Bugis communities serves as a guideline for carrying out daily activities that are relevant

[50]The use of the term *Kutika* in South Sulawesi is known as a traditional book of calculations which is basically not comprehensive, originating from South Sulawesi. *Lontara Kutika* is always written based on experience and repeated observations over a period of 50-100 years. See Maulani, h. 489-490.

[51]Fahmi Gunawan, "Pedoman Simbol Hari Baik Dan Hari Buruk Masyarakat Bugis Di Kota Kendari", *Patanjala: Jurnal Penelitian Sejarah Dan Budaya*, 10 (2018), diakses 2 November 2022, doi: 10.30959/patanjala.v10i3.431.

[52]The Nahas day is associated with the rise of Muharram which is considered to have an element of heat (*esso mapella*). Hadrawi, h. 192.

[53]Nama-nama hari, yakni *Macang*, Naga, *Pangaso*, *Ellong Tau*, *Ellong Betara*, *Ja'tunung*, *Masara*, *Malasa*, dan *Mate'*. Lihat Ningrum, h. 246.

to natural conditions/states in order for the activity process to run well and smoothly. Essentially, it is required to retrace and thoroughly examine each text that is present in one group of people in order to connect them and discover a comprehensive and diversified traditional calendar.

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