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Treatments of Eye Diseases in Malay Medical Manuscript *Ramuan Obat* EAP153/9/4

Mohd Affendi Mohd Shafri*

Abstract

The Malay medical manuscript *Ramuan Obat* EAP153/9/4 is a Malay medical manuscript from Riau Archipelago in today's Indonesia. It appears to focus on eye diseases and treatments. This study aims to evaluate if the traditional medicines and interventions in the manuscript can be supported scientifically. Critical transliteration and data extraction were performed by applying philological method in identifying and categorising the diseases and interventions. The *materia medica* was analysed by comparing scientific reports presented in PubMed and Google Scholar, and matching each ingredient to the intended purpose as indicated in the manuscript. The manuscript contains both physical and spiritual interventions amounting to 28 formulations for 7 different types of eye disease. Half of the *materia medica* and their use in *Ramuan Obat* EAP153/9/4 could be supported by contemporary scientific evidence. The lack of contemporary scientific evidence for other *materia medica*, on the other hand, could be attributed to the lack of scientific research on them rather and not necessarily a deficiency in effectiveness. More scientific studies would need to be carried out to validate the safety and efficacy of formulations contained in Malay medical manuscripts as the content could potentially lead to new drug discovery. Apart from scientific gains, the study could also contribute to the preservation of Malay medical culture and heritage.

Keywords: Ramuan Obat, Malay medicine, manuscript, Riau, medicine, eye disease

Introduction

Malay Medical Manuscript

It is estimated that around 22,000 Malay manuscripts are still extant around the world; 4,000 manuscripts are kept at the *Pusat Manuskrip Melayu* (Malay Manuscript Centre) of the Perpustakaan Negara Malaysia (National Library of Malaysia), *Dewan Bahasa dan Pustaka*, University of Malaya, state museums (Johor, Kelantan, Terengganu and Kedah), as well as abroad such as Indonesia (National Museum in Jakarta, and the provincial museums in Acheh, Riau, Medan), Brunei Darussalam, Sri Lanka, and the United States of America, in addition to European countries like France, Belgium, Netherland, German, Russia, England, Spain and Portugal.[1] Out of these, more than 100 manuscripts are medical manuscripts.[2]

The existence of Malay medical manuscripts allows study of Malay medicine to be re-evaluated. Since the interest in Malay medicine begun in early 70s, source of references for Malay medicine have come from either oral tradition or from colonial sources. Malay medical manuscripts preserve the original perspectives of Malay practitioners over several centuries, hailing from various corners of the Malay World, thus is more representative and have a clear edge against oral tradition and colonial sources. Thousands of formulations, fruits of laborious works and keen observations, are contained in the manuscripts most of which are hitherto unknown to modern world.

The utility of studying old medical manuscript is exemplified recently by Youyou Tu, who won the Nobel Prize for Medicine in 2015 for her breakthrough discovery of antimalarial drug called artemisinin. Youyou Tu studied ancient Chinese herbal formulation and found an effective formulation in a manuscript entitled *Zhou Hou Bei Ji Fang*, 'A Handbook of Prescriptions for Emergencies,' which was written by Ge Hong circa 284-346 CE.[3] In similar vein, by applying the concept of ethno-medicine and ethno-pharmacology in studying the Malay medical manuscript, the huge prospect of modern drug

* Mohd Affendi Mohd Shafri (PhD), Associate Professor, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Gombak, Selangor, Malaysia. Email: affendishafri@iium.edu.my.

[1] Harun Mat Piah (2015), "Ilmu Perubatan Melayu Tradisional dari Naskhah-Naskhah Lama," *Jurnal Antarabangsa Alam Dan Tamadun Melayu*, Vol. 3, No. 3, pp. 3–17.

[2] Mohd Affendi Mohd Shafri (2019), *Sari Segala Ubat*, Kuala Lumpur: Akademi Jawi Malaysia Sdn Bhd, p. 3.

[3] Tu, Y. (2011), "The discovery of artemisinin (qinghaosu) and gifts from Chinese medicine," *Nature Medicine*, Vol. 17, No. 10, pp. 1217–1220.

innovation and drug discovery as well as preserving the Malay heritage and traditional Malay medicine knowledge can be explored.

With regards to Malay medical manuscript study, several of the Malay medical manuscripts have been transliterated and published as full volumes. These include MSS2515,[4] Kitab Tib Muzium Terengganu,[5] MSS1292,[6] MSS2999,[7] Tayyib al-Ihsan,[8] al-Rahmah fi al-Tibb,[9] Rumah Ubat di Pulau Penyengat,[10] and MSS B 15.[11] Several researchers have made analysis of these manuscripts from the perspective of language.[12] Increasingly, Malay medical manuscripts are now also studied under specific medical themes such as dermatology[13] and parasitology.[14] The manuscript *Ramuan Obat* EAP153/9/4, as an intact volume comprising only one type of disease, namely eye diseases, allows discussion on a topic which has not yet been discussed previously from the perspective of Malay medical manuscripts.

Background of Manuscript

Ramuan Obat EAP153/9/4 is sourced from Riau, one of the regions in the Malay Archipelago that has vast collections of manuscripts, including medical manuscripts.[15] The medical manuscripts there form part of the individual or institutional collections such as *Balai Maklumat Kebudayaan Melayu Riau* and Linggam Cahaya Museum in Daik, Pulau Lingga. Most of these manuscripts had been digitalised under the supervision of British Library in a project called the 'Endangered Archive Project (EAP).'[16]

The manuscript *Ramuan Obat* EAP153/9/4 from Riau is selected as more than 80% of its content is medical. It is originally from the personal collection of the late Raja Syu'ib bin Raja Muhamad Zein which is now kept by his son Raja Muhammad Abdullozan. It was digitized under the British Library's Endangered Archive Project (EAP) during Raja Syu'ib's permission. The information regarding the origin of the manuscript as well as the digital images of the manuscript can be read and accessed online at EAP's website: https://eap.bl.uk/archive-file/EAP153-9-4. Thus, images from the manuscript are not included in this article. The use of this manuscript for research and publication has also been granted approval by the current owner, Raja Muhammad Abdullozan, via personal communication.

Ramuan Obat EAP153/9/4 contains treatment for the eyes exclusively and has not been studied previously. The manuscript consists of 12 pages of a blue-ruled exercise book with loose binding and no covers. The manuscript is estimated to come from late 19th century or early 20th century. 7 pages are fully written whereas other pages are empty or have scribblings. The first written page contains explanation of Basmalah and is not presented in this article.

Methodology

The methods of transliteration, data extraction and comparative analysis with contemporary scientific reports follow the method outlined and applied by Mohd Affendi (2019).[17]

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[4] Harun Mat Piah and Zawiyah Baba (2014), *Kitab Tib MSS2515*, Bangi: Penerbit UKM.
[5] Harun Mat Piah (2017), *Kitab Tib Muzium Terengganu*, Kuala Lumpur: Institut Penyelidikan Perhutanan Malaysia.
[6] Harun Mat Piah and Nik Musa'adah Mustapha (2019), *Kitab Tib MSS1292*, Kuala Lumpur: Institut Penyelidikan Perhutanan Malaysia.
[7] Abdul Ghani Hussain (2015), *MSS2999 Kitab Tib: Pandangan dan Tafsiran Perubatan Moden Terhadap Manuskrip Perubatan Melayu*, Kuala Lumpur: Institut Penyelidikan Perhutanan Malaysia.
[8] Mohd Affendi Mohd Shafri (2015), *Tayyib al-Ihsan fi al-Tibb al-Insan*, Kuala Lumpur: Akademi Jawi Malaysia.
[9] Mohd Affendi Mohd Shafri (2017), *al-Rahmah fi al-Tib wa al-Hikmah*, Kuala Lumpur: Akademi Jawi Malaysia.
[10] Mohd Affendi Mohd Shafri (2018), *Rumah Ubat Di Pulau Penyengat*, Kuala Lumpur: Akademi Jawi Malaysia.
[11] Mohd Affendi, *Sari Segala Ubat*.
[12] Ab. Razak Abdul Karim (2006), *Analisis Bahasa Dalam Kitab Tib Pontianak*, Kuala Lumpur: Dewan Bahasa dan Pustaka; Indirawati Zahid, Ab Razak Ab Karim and Rohaidah Haron (2019), "Kata Kerja dan Komunikasi Berkesan Dalam Kitab Tib Muzium Terengganu dan Huraian Teks," *Bitara: International Journal of Civilisational Studies and Human Sciences*, Vol. 2, No. 4, 27-42.
[13] Abdul Ghani Hussain (2019), *Dermatologi Dalam Kitab Tib Muzium Terengganu*, Kuala Lumpur: Institut Penyelidikan Perhutanan Malaysia.
[14] Muhammad Widus Sempo, Nazariah Yahya, Malki Ahmad Nasir and Mohd Azmi Mohd Razif (2020), *Rawatan Sakit Cacingan dalam Manuskrip Perubatan Melayu*, Kuala Lumpur: Penerbit USIM.
[15] Harun Mat Piah and Zawiyah Baba (2014), *Kitab Tib MSS2515*.
[16] Mohd Affendi, *Rumah Ubat Di Pulau Penyengat*.
[17] Mohd Affendi, *Sari Segala Ubat*.

Transliteration of the Manuscript

To transliterate the manuscript, a critical transliteration was performed by transliterating the text word-by-word together while correcting spelling and grammatical errors as well as inserting transliterator's interpretation of the text. Formulation number is given to each formulation in the manuscript in the format of 153/9/4/FXXX, for which:

153/9/4 denotes the accession number of the manuscript,
F denotes 'formulation'
XXX denotes the sequence number of a formulation.

References were made to established database such as Pusat Rujukan Persuratan Melayu (https://prpm.dbp.gov.my/) and publications such as A Dictionary of Malayan Medicine.[18]

Data Extraction and Classification

The data extraction process was performed by extracting data according to the types of materials (e.g. plant-based, animal-based and miscellaneous) and alphabetical order following the vernacular name of the materials. The scientific name, formulation number, and parts of the materials used are also included.

Comparative Analysis of the Content of the Manuscript to Contemporary Scientific Reports

Comparative analysis is a method in which use of individual herbal or animal or mineral in a traditional formulation in a text is compared to published papers in modern scientific databases. The presence of papers of related use or in support of the use in the manuscripts is an indication of verified use. However, the absence of the papers does not necessarily mean that the traditional use is unverified as many of the traditional Malay formulations, or even the individual ingredients from the Malay world, have not been studied by modern scientists. The sources of the modern scientific literature include PubMed and Google Scholar because both search engines are considered as useful clinical and biomedical-evidence search tools. While PubMed only retrieves peer-reviewed journal articles, Google Scholar on the other hand retrieves both peer-reviewed and non-peer-reviewed articles from vast range of medical sub-disciplines. The scientific evidence search strategy used in this study, used together with Boolean Operator, include:

a. In vitro study OR In/ex vivo study OR Animal study OR Randomised controlled trial study OR human case study.
b. Any parts of the *materia medica* that is used in the clinical study.

The search strategy was established to ensure that the scientific evidence retrieved for any *materia medica* is reliable and relevant.

Results and Analysis

The transliteration and translation of Ramuan Obat EAP153/9/4 is provided here:

153/9/4/F001 (The earlier page(s) appears missing.) ***Afyun yang baik maka asah pada besi beri air limau kapas atau minyak lenga maka sapukan pada kelopak mata di luar jua.***

Meaning: Ground opium of good quality on steel surface with the juice of cotton citron or sesame oil and smear onto the external part of the eyelid.

153/9/4/F002 ***Sebagai lagi ambil garam sedikit maka bacakan Qūl huwa Allāhū Āḥad maka disapukan pada kelopak mata.***

Meaning: Take a bit of salt and recite قُلْ هُوَ اللَّهُ أَحَدٌ then rub on the eyelid.

153/9/4/F003 ***Sebagai lagi disurat pada mangkuk sabun maka taruh semalam maka bubuh air esok hari maka dititikkan pada mata inilah yang disuratkan:***

وَلَوْ نَشَآءُ لَطَمَسْنَا عَلَىٰٓ أَعْيُنِهِمْ فَٱسْتَبَقُواْ ٱلصِّرَٰطَ فَأَنَّىٰ يُبْصِرُونَ
وَعَنَتِ ٱلْوُجُوهُ لِلْحَيِّ ٱلْقَيُّومِ ۖ وَقَدْ خَابَ مَنْ حَمَلَ ظُلْمًا
الْعَظِيمِ الْعَرْشِ بِحَقِّ أَسْكُنُ
تَمَّتُ الْكَلَم

[18] John D. Gimlette and H.W. Thomson (1939), *A Dictionary of Malayan Medicine*, London: Oxford University Press.

Meaning: Write on a white bowl,

وَلَوْ نَشَآءُ لَطَمَسْنَا عَلَىٰٓ أَعْيُنِهِمْ فَٱسْتَبَقُواْ ٱلصِّرَٰطَ فَأَنَّىٰ يُبْصِرُونَ
وَعَنَتِ ٱلْوُجُوهُ لِلْحَيِّ ٱلْقَيُّومِ ۖ وَقَدْ خَابَ مَنْ حَمَلَ ظُلْمًا
الْعَظِيمِ الْعَرْشِ بِحَقِّ أَسْكُنُ
تَمَّتُ الْكَلَم

leave it to sit overnight before filling the bowl with water the following day and as eyedrop.

153/9/4/F004 ***Ini ubat mata kabur berselaput atau tumbuh dagingan-dagingan maka ambil buah kelor dan akar keremak dan ibu kunyit kemudian ambil parang puting maka bakar semuanya (se)telah itu diasah dengan buah pala dan air limau nipis maka sapukan kepada mata kangkangkan biar sampai masuk sedikit-sedikit ke dalam mata āʿfīyāt adanya.***

This is the remedy for dimness of vision with cataract or pterygium. Take fruits of moringa, roots of *keremak* and the rhizome of turmeric. Burn the items on a piece of dulled machete and mix with nutmeg and key lime juice. Rub on the eyelid, let it seep into the eye bit by bit.

153/9/4/F005 ***Sebagai la(gi) ubat mata kabur maka ambil daun sirih yang kuning tiga helai ramas biar halus-halus maka ambil airnya dan bubuh sepang dan kayu arang kemudian tapis, bubuh bunga melur campurkan maka bacakan surah al-Ikhlāṣ tiga kali senafas maka titikkan ke dalam mata āʿfīyāt adanya.***

Meaning: Another remedy for dimness of vision, take yellow betel-pepper leaves, knead to fine texture and collect its juice then insert with sappanwood and charcoal. Strain, add jasmine flower and recite surah al-Ikhlāṣ three times in one breath and use the mixture as eyedrop.

153/9/4/F006 ***Sebagai lagi ubat mata kabur ambil pucuk budi tujuh helai dan gula batu sedikit maka digiling diperahkan pada mata adanya.***

Meaning: Another remedy for dimness of vision. Take seven shoots of *pucuk budi* and rock sugar, grind the ingredients and use as eyedrop.

153/9/4/F007 ***Sebagai lagi ubat mata kabur maka apabila ada merah-merah matanya lagi kering lakunya di dalam kedua matanya dan kering mukanya alamat bertambah penyakit sawdāwī dan ṣafrāwī maka ambil isi asam jawa yang kuning-kuning kemudian ramas dengan air kemudian bubuh pada perca putih maka tampalkan pada mata dan muka lalu dibawa tidur kerjakan tiap-tiap hari maka inilah jampinya:***

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدِنِ الَّذِيْ خَلَقْتَهُ مِنْ نُوْرِ وَهُوَ النُّوْر
فَكَشَفْنَا عَنْكَ غِطَاءَكَ فَبَصَرُكَ الْيَومَ حَدِيدٌ

Meaning: Another remedy for dimness of vision and when there is redness and dryness in the eyes, and dryness on the face, indicating bilious and liver problems. Take the yellow marrow of tamarind and squeeze with water, put on a white cloth and use as eyepatch when sleeping. Do every day together with this prayer:

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدِنِ الَّذِيْ خَلَقْتَهُ مِنْ نُوْرِ وَهُوَ النُّوْر
بَصَرُكَ الْيَومَ حَدِيدٌفَكَشَفْنَا عَنْكَ غِطَاءَكَ فَ

153/9/4/F008 ***Sebagai lagi jampinya tatkala di dalam mengambil air sembahyang maka simbahkan kepada mata maka baca ṣelawaṯ ini:***

محمد سد يدي نا ع لي عالم صد لي الد لهم
اَللَّهُمَّ صَلِّ عَلىٰ مَنْ عَلىٰ كَفَّيْهِ عَينُ قَتَادَةُ

tiga kali senafas telah jadi amalan tiap-tiap di dalam mengambil air sembahyang وَاللهُ أَعْلَمُ بِالصَّوَابِ

Meaning: Another the prayer to be recited when performing the ablution by splashing on the eyes:

محمد سد يدي نا ع لي عالم صد لي الد لهم
عَلىٰ مَنْ عَلىٰ كَفَّيْهِ عَينُ قَتَادَةُ اَللَّهُمَّ صَلِّ

Read three times in one breath. Recited everytime when performing ablution.

وَاللهُ أَعْلَمُ بِالصَّوَابِ

153/9/4/F009 ***Sebagai lagi ubat mata kabur atau berselaput maka ambil hempedu kambing dan masukkan lada sulah tujuh butir ke dalam hempedu itu maka ikat baik-baik maka gantung pada tulang bumbungan rumah betul sama tengah rumah itu apabila sampai tujuh hari ambil lada sulah itu sebutir pirik lumat-lumat beri air sedikit maka titikkan pada mata itu pagi dan petang sebutir sehari dan mandinya dua kali sehari hingga tujuh hari mujarāb.***
Meaning: Another remedy for dimness of vison or cataract. Fill in goat's bile with seven black (also known as white) pepper seeds are to be, neatly tied and placed at the center of house ridge for seven days. One black pepper seed is to be crushed with water and used as eyedrop. This is to be performed one seed a day, both morning and evening and shower twice a day until day seven.

153/9/4/F010 ***Sebagai lagi ubat mata kabur ambil limau kerbau kupas kulitnya belah tiga bubuh garam tiga buku maka rebus setelah masak maka embunkan kemudian pagi-pagi basuhkan pada mata biar masuk pada mata itu sedikit jika berselaput sekalipun baik juga, insyā Allāh Taʿālā mujarāb.***
Meaning: Another remedy for dimness of vision. Buffalo eye citron is to be peeled and cut into three pieces and mixed with three pieces of coarse salt. The mixture is boiled and be left overnight outside. The mixture is to be used as eyewash in the morning.

153/9/4/F011 ***Sebagai lagi ubat kabur mata ambil daun penaga tiga puluh helai yang baik jangan cacat maka surat alif tiga puluh satu huruf satu helai maka rebus barang tiga kali mendidih bangkit sejukkan pada pinggan putih rendamkan mukanya ke dalam pinggan serta bukakan matanya sekali, āʿfīyāt adanya.***
Meaning: Another remedy for dimness of vision. 30 pieces of *penaga* leaves that are not torn or damaged are to be taken and inscribed with 31 *alif* alphabet per leaf. The ingredients are boiled then cooled three times in a white bowl. The face should be dipped in the mixture with eyes opened.

153/9/4/F012 ***Sebagai lagi ubat mata kabur ambil daun merpoyan tumbuk lumat-lumat maka bubuh kepada perca putih maka perahkan kepada mata āʿfīyāt adanya.***
Meaning: Another remedy for dimness of vision. *Merpoyan* leaves is to be pounded into smooth texture, put onto white cloth and squeezed and used as eyedrop.

153/9/4/F013 ***Sebagai lagi ubat sakit mata tumbuh maka ambil ara tanah maka patahkan batangnya ambil getahnya cucuhkan kepada mata, āʿfīyāt adanya.***
Meaning: Another remedy for chalazion. Stem of *ara tanah* is broken to get the sap and used as eyedrop.

153/9/4/F014 ***Sebagai lagi ubat mata tumbuh maka ambil sepang dan tawas sedikit kemudian asah dengan air maka titikkan kepada mata, āʿfīyāt adanya.***
Meaning: Another remedy for chalazion. *Sepang* and potassium alum are rubbed down with water on hard surface and used as eyedrop.

153/9/4/F015 ***Sebagai lagi ubat (mata) tumbuh maka ambil akar kelumpang dikerat-kerat ditadah ambil airnya maka pagi-pagi titikkan kepada mata yang sakit itu, āʿfīyāt adanya.***
Meaning: Another remedy for chalazion. *Kelumpang* roots are cut into pieces to obtain the sap and be used as eyedrop in the morning.

153/9/4/F016 ***Sebagai lagi ubat mata jua jika sudah tumbuh maka ambil bulu ayam hitam maka cucuhkan kepada mata yang tumbuh itu inilah tawarkan kepada bulu ayam itu atau kepada mata***
Meaning: Another remedy for chalazion. Feather of black chicken is touched to the affected eye.

153/9/4/F017 ***Dan daging lembu dan cabai, ertinya campli, dan ursi dan terung dan bermula yang menambah cahaya mata segala makanan yang manis-manis adanya.***
Meaning: Beef, long pepper, *ursi* and eggplant or sweet food are materials that enhance eyesight.

153/9/4/F018 ***Sebagai lagi ambil buah kelumpang maka tunu ambil abunya maka ditiris maka dijadi akan garam maka ambil pijar dan kasturi maka dipercelakkan ketiganya pada matanya sapar itu adanya.***
Meaning: *Kelumpang* fruits are roasted and crushed into powder. The powder is then mixed with *pijar* and musk and used as eyeliner for unclear vision.

153/9/4/F019 ***Sebagai lagi ambil daun bilang-bilang papan dan cuka masam maka diperahkan ke dalam mata.***
Meaning: Leaves of *bilang-bilang papan* and sour vinegar are squeezed and used as eyedrop.

153/9/4/F020 ***Sebagai lagi ambil buah anjan-anjan putih dan daunnya maka dipipis lumat-lumat dipercelak pada mata adanya.***
Meaning: White *anjan- anjan* fruit and leaf are pounded into smooth texture and used as eyeliner.

153/9/4/F021 ***Sebagai lagi ambil biji bayam diasahkan akan airnya air mawar dicampurkan dengan paji maka dipercelak mata nescaya terang insyā Allāh Taʿālā.***
Meaning: Spinach seed is rubbed onto hard surface with rose water and mixed with *paji*. The mixture is used as eyeliner.

153/9/4 F022 ***Sebagai lagi ubat mata daging-dagingan ambil akar anjan-anjan putih dan bunganya dan daunnya dan kulitnya maka pipis lumat-lumat maka bubuh paji sedikit akan airnya cuka masam maka bubuh pada perca nipis maka perahkan pada mata.***
Meaning: Another remedy for pterygium. White anjan-anjan roots, flowers, leaves and bark are pounded into smooth texture and mixed with *paji* and sour vinegar. The mixture is put onto white cloth and used as eyedrop.

153/9/4/F023 ***Sebagai lagi ambil akar perupuk diasah pada batu akan airnya air madu adapun bunganya yang putih itu dikeluskan perahkan pada mata.***
Meaning: *Perupuk* roots are rubbed onto hard surface with honey. The mixture is then rubbed mildly with the white flower of *perupuk* and used as eyedrop.

153/9/4/F024 ***Sebagai lagi ambil khulanjan maka diasah akan airnya air susu orang belum bergigi maka perahkan pada mata.***
Meaning: Galangal is rubbed onto hard surface with milk and used as eyedrop.

153/9/4/F025 ***Dan sebagai lagi ambil keremak betina dikeluskan perahkan kepada mata.***
Meaning: *Keremak betina* is rubbed mildly and used as eyedrop.

153/9/4/F026 ***Sebagai lagi minyak lenga dipakai dengan air limau kapas dibubuhkan pada kelopak mata.***
Meaning: Sesame oil with cotton citron juice is used together on eyelid.

153/9/4/F027 ***Sebagai lagi ubat mata daging-dagingan ambil kulit pinang kelat maka tunu ambil abunya maka diheningkan maka dibubuh pada kapas perahkan pada mata.***
Meaning: Another remedy for pterygium. Bitter betelnut peel is roasted and its ashes is left cooled and put on cotton before being used as eyeliner.

153/9/4/F028 ***Sebagai lagi ubat mata sapar atau daging-dagingan ambil bunga pekan seratus dua puluh tangkai, bunga lenga lima puluh tangkai, lada sulah enam belas biji, cabai lima puluh biji, beras Kedah lima puluh biji, bittikh lima puluh biji, bawang tujuh hulas, kacang hitam tujuh biji, mata kunyit tujuh mata, sirih bertemu urat tiga helai, surat du'a ini:***

ع سق حم كهيعص لا ل ا ا ر ط ما و ا ه ا و ل ه
أَلاَ إِلَى اللهِ تَصِيْرُ الْأُمُورُ
اِيَّاكَ نَعْبُدُ وَ اِيَّاكَ نَسْتَعِينُ اِهْدِنَا

Maka pipis dengan air jernih maka geliga jemur kering-kering.

Dan jika mata sakit air susu akan airnya di asah maka diperah ubat itu ke dalam mata; dan jika mata sapar malam akan airnya kemih jika pada malam; adapun jika pada siang sapar akan airnya air embun; dan jika mata daging-dagingan akan airnya air mawar; dan jika mata bilis airnya air pinang muda adanya; dan jika hidung berbau busuk airnya air limau kapas muda; dan jika barah airnya sirih akan airnya; dan jika puru ketut akan airnya sarang limau kapas di asah maka palitkan pada luka ia; dan jika panau jahat minyak sempelah akan airnya maka dipersusuk pada segala

tubuh; jika ف ول ***airnya air terung perat akan airnya diasah maka diperahkan pada ke dalam telinga; dan jika dikerit ular air susu akan airnya; dan jika kena racun airnya mentimun pahit akan airnya maka diminum; dan jika batuk air pisang habu akan airnya; dan jika pitam air mangkuk di masak akan airnya; dan jika*** هڠوران ***air lemak hayam akan airnya; dan jika ngilu ketik daun sudu masak akan airnya; jika keteriakan air habu biji kapas akan airnya; jika busuk air buah pisang akan airnya, wallahu a'lam.***

Meaning: Another remedy for unclear vision and pterygium. Take one hundred and twenty *pekan* flowers, fifty sesame flowers, sixteen pepper seeds, fifty chilly seeds, fifty kernels of rice of Kedah type, fifty seeds of watermelon, seven cloves of onions, seven seeds of black turtle beans, seven stem buds of turmeric, and seven betel-pepper leaves with side-veins arching back into the midrib. On the betel-pepper leaves write the prayer:

ع سق حم كهيعص لا ل ا ا ر ط ما و ا ه ا و ل ه
أَلاَ إِلَى اللهِ تَصِيْرُ الْأُمُوْرُ
إِيَّاكَ نَعْبُدُ وَ إِيَّاكَ نَسْتَعِينُ اِهْدِنَا

Then, grind with a rolling stone on a spice-block with clear water, make into beads and leave to dry.

To use this formulation for other diseases, the clear water can be replaced accordingly: (i) for sore eye, replace with milk; (ii) for night blindness (nyctalopia), replace with urine; (iii) for day blindness (hemeralopia), replace with morning dew; (iv) for pterygium, replace with rose water; (v) for blear-eyed problems, replace with extracts from unripe areca nut; (vii) for sinusitis, use juice of cotton citron; (viii) for cancer or chronic wound, use betel juice; (ix) for certain type of yaws which cause great itchiness, replace with juice from the peel of cotton citron and salve on the scurf or wound; (x) for ring-worm infection, replace with *minyak sempelah* and apply all over the body; (xi) for ف ول (a type of unidentified problem), use the juice of black nightshade and squeeze into the ears; (xii) for snake-bites, use milk; (xiii) if poisoned, use juice of cucumber and drink; (xiv) for cough, replace with juice of pisang abu; (xv) for fainting, use boiled water which has become cool in a bowl; (xvi) for هڠوران (an unknown problem), use the extract from chicken fat; (xvii) for neuralgic headache, pick some sudu leaves and boil for its extract; (xviii) for hysterical symptoms, use the water mixed with ashes of cotton seeds; and finally (xix) for *busuk*, or putrid smell coming from the body, use banana juice. And God knows best.

Data Extraction and Classification of Ramuan Obat EAP153/9/4 Content

Classification of Eye Diseases

The transliteration of the text, *Ramuan Obat* EAP153/9/4, showed a number of eye diseases that include *mata kabur* (dimness of vision), *mata berselaput* (cataract), *mata tumbuh* (chalazion), *daging-dagingan* (pterygium), *mata sapar* (unclear vision including the night blindness (nyctalopia) and day blindess (hemeralopia)), *mata merah* (red eye), *mata kering* (dry eye), *mata bilis/bilas* (bleary or watery eye) dan mata *gatal* (itchiness of the eye), *mata sakit* (sore eyes) and unspecified eye disease. A total of 28 formulations are identified based on the transliteration of the text of *Ramuan Obat* EAP153/9/4. One formulation, code named 153/9/4/F028, can be used for several types of eye and non-eye diseases.

The formulations are sorted according to its use (Table 1) and the category of the formulation (Table 2). The non-eye complaints related to 153/9/4/F028 is not included in the interest of keeping the integrity of the results to eye diseases.

Table 1. Eye Diseases and Formulation Number in *Ramuan Obat* EAP153/9/4

Malay Vernacular Name	Probable Modern Scientific Name	Formulation Number (153/9/4/F0xx)
Mata kabur	Dimness of vision	153/9/4F004
		153/9/4F005
		153/9/4F006
		153/9/4F007
		153/9/4F009
		153/9/4F010

		153/9/4F011
		153/9/4F012
Mata berselaput	Cataract	153/9/4F004
		153/9/4F009
Mata tumbuh	Chalazion	153/9/4F004
		153/9/4F014
		153/9/4F015
		153/9/4F016
Daging-dagingan	Pterygium	153/9/4F004
		153/9/4F022
		153/9/4F027
		153/9/4/F028
Mata sapar	Unclear vision	153/9/4F018
		153/9/4/F028
Mata merah, kering dan gatal	Inflamed eye (red eye, dry eye, itchy eye)	153/9/4F007
Mata sakit	Eye sore	153/9/4/F028
Mata bilis/bilas	Bleary or watery eye	153/9/4/F028
Unspecified eye disease	N/A	153/9/4F001
		153/9/4F002
		153/9/4F003
		153/9/4F008
		153/9/4F017
		153/9/4F019
		153/9/4F020
		153/9/4F021
		153/9/4F023
		153/9/4F024
		153/9/4F025
		153/9/4F026

Table 2. Category and Number of Formulations Identified in *Ramuan Obat* EAP153/9/4

Category of Formulation	Number of Formulation(s)
Herbs or Materials Only	20
Herbs or Materials Supported by Prayer	5
Prayer Only	2
Incomplete	1

Classification of Materials

Based on the transliteration of the text of *Ramuan Obat* EAP153/9/4 manuscript, a total of 51 individual materials have been identified. These materials could further be divided into 3 categories namely plant-based materials, animal-based materials and others. The materials are arranged alphabetically according to their respective vernacular names along with their scientific names (if applicable) in Table 3, Table 4 and Table 5.

A. Plant-Based Materials

Table 3. The List of Identified Plant-Based Materials

Vernacular Name	**Scientific Name**	**Formulation Number (153/9/4/F0xx)**	**Parts Used**
***Afyun* (Poppy)**	*Papaver somniferum*	153/9/4/F001	Not stated; normally the seed
Akar keremak	*Ipomea digitata*	153/9/4/F004	Root
Anjan-anjan (putih)	*Memecyclon umbellatum*	153/9/4/F020	Leaf Fruit

		153/9/4/F022	Root Flower Leaf Bark
Ara tanah	*Euphorbia hirta*	153/9/4/F013	Stem latex
Asam jawa **(Tamarind)**	*Tamarindus indica*	153/9/4/F007	Fruit/flesh
Bawang	*Allium spp.*	153/9/4/F028	Bulb
Bayam **(Spinach)**	*Amaranthus spp.*	153/9/4/F021	Seed
Beras (Kedah)	*Oryza sativa*	153/9/4/F028	Seed (grain)
Bilang-bilang	*Sesuvium portulacastrum*	153/9/4/F019	Leaf
Bittikh **(Watermelon)**	*Citrullus vulgaris*	153/9/4/F028	Fruit
Buah pala **(Nutmeg)**	*Myristica fragrans*	153/9/4/F004	Fruit
Cabai	*Piper longum*	153/9/4/F017 153/9/4/F017	Fruit Fruit
Kacang hitam	*Phaseolus vulgaris*	153/9/4/F028	Seed
Kelor	*Moringa oleifera*	153/9/4/F004	Fruit
Kelumpang	*Sterculia foetida*	153/9/4/F015 153/9/4/F018	Root Root
Keremak betina	*Eclipta alba hassk*	153/9/4/F025	
Khulanjan **(Galangal)**	*Alpinia galangal*	153/9/4/F024	Root
Kunyit **(Turmeric)**	*Curcuma longa*	153/9/4/F004 153/9/4/F028	Rhizome Stem bud
Lada sulah **(Black pepper)**	*Piper nigrum*	153/9/4/F009 153/9/4/F028	Seed (peppercorn) Seed (peppercorn)
Lenga	*Sesamum indicum*	153/9/4/F001 153/9/4/F026 153/9/4/F028	Oil Oil Flower
Limau kapas **(Cotton citron)**	*Citrus aurantifolia*	153/9/4/F001 153/9/4/F026	Juice, from fruit Juice, from fruit
Limau kerbau **(Buffalo eye citron)**	*Citrus medica*	153/9/4/F010	Fruit peel
Limau nipis **(Key lime)**	*Citrus × aurantiifolia*	153/9/4/F004	Juice, from fruit
Marapoyan	*Rhodennia cinerea*	153/9/4/F012	Leaf
Mawar **(Rose)**	*Rosa spp.*	153/9/4/F021	Flower extract or juice (*air bunga*)
Melur **(Jasmine)**	*Jasminium sambac*	153/9/4/F005	Flower
Paji **or** ***kapur***	*Drybalanops lanceolata* or *D. Aromatic*	153/9/4/F021 153/9/4/F022	Powder
Pekan	*Jasminium curtisii*	153/9/4/F028	Flower

Penaga	*Mesua ferrea L.*	153/9/4/F011	Leaf
Peropok	*Hemigyrosa longifolia*	153/9/4/F023	Root
***Pinang* (Betelnut)**	*Areca catechu*	153/9/4/F027	Fruit peel
		153/9/4/F028	Unripe fruit
Pucuk budi	*Ficus benjamina*	153/9/4/F006	Shoot
Mawar	*Rosa spp.*	153/9/4/F028	Flower (rosewater)
Sepang	*Caesalpinia sappan*	153/9/4/F005	Not stated (most likely the bark)
		153/9/4/F014	Not stated (most likely the bark)
***Sirih* (Betel)**	*Piper betle*	153/9/4/F005	Leaf
		153/9/4/F028	Leaf with side-veins arching to midrib
***Terung* (Eggplant)**	*Solanum spp*	153/9/4/F017	Fruit
Ursi	Unidentified	153/9/4/F017	Not stated (most likely the root)

Figure 1. The flower of *lenga, Sesamum indicum* is one of the *materia medica* used for the treatment of eye disease in *Ramuan Obat* EAP153/9/4[19]

Figure 2. *Peropok, Messua ferrea,* which is rarely found mentioned in Malay medical manuscripts, is featured in *Ramuan Obat* EAP153/9/4[20]

[19] Mullookkaaran, C.C. BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0>, via Wikimedia Commons.
[20] Johnsingh, J.T. WWF-India and NCF, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons.

B. Animal-Based Materials

Table 4. The List of Identified Animal-/Human-Based Materials

Ingredients	Scientific Name	Formulation Number (153/9/4/F0xx)	Part Used
***Ayam hitam* (*Cemani* or black chicken)**	*Gallus gallus domesticus Brisson*	153/9/4/F016	Feather
***Kambing* (Goat)**	*Capra aegagrus hircus*	153/9/4/F009	Gall bladder
***Lembu* (Cow)**	*Bos taurus*	153/9/4/F017	Flesh
Susu orang belum bergigi	-	153/9/4/F024	Milk
Susu	-	153/9/4/F028	Milk
Kemih	-	153/9/4/F028	Urine

C. Miscellaneous

Table 5. The List of Identified Miscellaneous Materials

Ingredient	Scientific Name	Formulation Number (153/9/4/F0xx)	Forms Parts Used
***Cuka masam* (Sour vinegar)**	-	153/9/4/F019	Liquid
Embun	-	153/9/4/F028	Dew
***Garam* (Salt)**	Sodium chloride	153/9/4/F002	Salt
***Gula batu* (Rock sugar)**	-	153/9/4/F006	Sugar
***Kasturi* (Musk)**	-	153/9/4/F018	Oil
***Kayu arang* (Charcoal)**	-	153/9/4F005	Not stated (most likely powder)
***Madu* (Honey)**	-	153/9/4/F023	Liquid
***Tawas* (Alum)**	Potassium alum	153/9/4/F014	Powder

Comparative Analysis of Materials Used

Comparative analysis was performed by comparing the medical content of the manuscript with modern scientific literature as a method of appraising the content of *Ramuan Obat* EAP153/9/4 manuscript. The comparative analysis is presented in Table 6.

Table 6. Comparative Analysis of Materials and Modern Scientific Literature

Formulation Number (153/9/4/F0xx)	Vernacular Name	Scientific Name	Scientific Literature Evidence
F001	*Afyun*/Poppy	*Papaver somniferum*	Preservation of Retina Ganglion Cell Function by Morphine in a Chronic Ocular-Hypertensive Rat Model (Husain, Abdul and Crosson, 2012)[21]

[21] Shahid Husain, Yasir Abdul and Craig E. Crosson. (2012), "Preservation of Retina Ganglion Cell Function by Morphine in a Chronic Ocular-Hypertensive Rat Model," *Investigative Opthalmology and Visual Science*, Vol. 53, No. 7, p. 4289

	Limau Kapas (Key Lime)	*Citrus aurantifolia*	Anticataractogenic effect of hesperidin in galactose-induced cataractogenesis in Wistar rats (Manikandan and Arumugam, 2016)[22]
	Minyak lenga (Sesame oil)	*Sesamum indicum*	The Protective Effect of Sesamol in the Selenite-induced Experimental Cataract Model (Turgut, Ergen and Ilhan, 2017)[23]
F002	*Garam* (Salt)	Sodium chloride	Effects of a new anti-allergic agent: the magnesium salt of N-acetyl-aspartyl-glutamic acid on experimental allergic inflammation of the rabbit eye (Lapalus *et al*., 1986)[24]
F004	*Kelor*	*Moringa oleifera*	Retinoprotective Effects of Moringa oleifera via Antioxidant, Anti-Inflammatory, and Anti-Angiogenic Mechanisms in Streptozotocin-Induced Diabetic Rats (Gupta *et al*., 2013)[25]
	Akar keremak	*Ipomea digitata*	Not Found
	Kunyit (Turmeric)	*Curcuma longa*	Inhibitory effect of curcumin on proliferation of human pterygium fibroblasts. (Zhang *et al*., 2007)[26]
	Buah Pala (Nutmeg)	*Myristica fragrans*	Not Found
	Limau Nipis (Key Lime)	*Citrus* × *aurantiifolia*	Anticataractogenic effect of hesperidin in galactose-induced cataractogenesis in Wistar rats (Manikandan and Arumugam, 2016)[10]
F005	*Sirih* (Betel)	*Piper betle*	Not found
	Sepang (Sappanwood)	*Caesalpinia sappan*	One-step isolation of sappanol and brazilin from *Caesalpinia sappan* and their effects on oxidative stress-induced retinal death (Uddin *et al*., 2015)[27]
	Kayu arang (Charcoal)	-	Anti-inflammatory, antioxidant and antimicrobial activity of *Ophthacare* brand, an herbal eye drop (Mitra *et al*., 2000)[28]
	Melur (Jasmine)	*Jasminium sambac*	Daya guna seduhan bunga melati (Jasminum Sambac)

[22] R. Manikandan et al. (2010), "Effect of Curcumin on Selenite-Induced Cataractogenesis in Wistar Rat Pups," *Current Eye Research*, Vol. 35, No. 2, pp. 122-129.
[23] Burak Turgut, B., Irfan Ergen and Nevin Iihan (2017), "The Protective Effect of Sesamol in the Selenite-induced Experimental Cataract Model," *Türk Oftalmoloji Dergisi*, pp. 309-314.
[24] P. Lapalus et al. (1986), "Effects of a new anti-allergic agent: The magnesium salt of N-acetyl-aspartyl-glutamic acid on experimental allergic inflammation of the rabbit eye," *Current Eye Research*, Vol. 5, No. 7, pp. 517-522.
[25] Suresh Kumar Gupta et al. (2013), "Retinoprotective Effects of Moringa oleifera via Antioxidant, Anti-Inflammatory, and Anti-Angiogenic Mechanisms in Streptozotocin-Induced Diabetic Rats," *Journal of Ocular Pharmacology and Therapeutics*, Vol. 29, No. 4, pp. 419-426.
[26] Mingchang Zhang et al. (2007), "Inhibitory effect of curcumin on proliferation of human pterygium fibroblasts," *Journal of Huazhong University of Science and Technology in Medical Science*, Vol. 27, No. 3, pp. 339-42.
[27] Golam Mezbah Uddin et al. (2015), "One-step isolation of sappanol and brazilin from Caesalpinia sappan and their effects on oxidative stress-induced retinal death," *BMB Reports*, Vol. 48, No. 5, pp. 289-294.
[28] S. K. Mitra et al. (2000), "Anti-inflammatory, antioxidant and antimicrobial activity of Ophthacare brand, an herbal eye drops," *Phytomedicine*, Vol. 7, No. 2, pp. 123-127.

			dibandingkan dengan natrium diklofenak 1 persen (Noncort) tetes mata untuk mengurangi hiperemia konjungtiva pada mata kelinci (Abdan and Suhardjo, 2014)[29]
F006	*Pucuk budi*	*Ficus benjamina*	Not Found
	Gula batu (Rock Sugar)	-	Not Found
F007	Asam Jawa (Tamarind)	*Tamarindus indica*	In Vitro Anticataract Activity of Tamarindus Indica Linn. Against Glucose-Induced Cataractogenisis (Merugu, 2018)[30]
F009	*Hempedu Kambing* (Goat's Bile)	*Capra aegagrus hircus*	Not Found
	Lada Sulah (Black Pepper)	*Piper nigrum*	Antioxidant Effects of Piperine In In-vivo Chick Embryo Cataract Model Induced by Steroids (Vurmaz *et al*., 2019)[31]
F010	*Limau Kerbau* (Buffalo eye citron)	*Citrus medica*	An Expeditious Recovery from Stye – A Case Study (Prakruthi *et al.*, 2018)[32]
	Garam (Salt)	Sodium chloride	Effects of a new anti-allergic agent: the magnesium salt of N-acetyl-aspartyl-glutamic acid on experimental allergic inflammation of the rabbit eye (Lapalus *et al*., 1986)[12]
F011	*Penaga*	*Mesua ferrea l*	Not Found
F012	*Marapoyan/ merpoyan*	*Rhodamnia cinerea*	Not Found
F013	*Ara tanah*	*Euphorbia hirta*	Effect of *Euphorbia hirta* in Napthalene Induced Cataract in Rats (Rathnakumar, Jaikumar and Sengottuvelu, 2013)[33]
F014	*Sepang*	*Caesalpinia sappan*	One-step isolation of sappanol and brazilin from *Caesalpinia sappan* and their effects on oxidative stress-induced retinal death (Uddin *et al*., 2015)[16]

[29] Abdan, A., and Suhardjo, H. (2007). "Daya guna seduhan bunga melati (Jasminum Sambac) dibandingkan dengan natrium diklofenak 1 persen (Noncort) tetes mata untuk mengurangi hiperemia konjungtiva pada mata kelinci," Doctoral dissertation, Gadjah Mada University.

[30] Merugu, S. (2009), "In Vitro Anticataract Activity of Tamarindus Indica Linn. Againest Glucose-Induced Cataractogenisis," Doctoral dissertation, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore.

[31] Ayhan Vurmaz et al. (2019), "Antioxidant effects of piperine in in-vivo chick embryo cataract model induced by steroids," *Cutaneous and Ocular Toxicology*, Vol. 38, No. 2, pp. 182-189.

[32] Prakruthi, G. et al. (2018), "An Expeditious Recovery from Stye – A Case Study," *Delhi Journal of Ophthalmology*, Vol. 29, No. 2, pp. 61–64.

[33] Rathnakumar, K., Jaikumar, S., and Sengottuvelu, S. (2013), "Effect of Euphorbia hirta in Napthalene Induced Cataract in Rats [Abstract]," *Research Journal of Pharmacy and Technology*, Vol. 6, No. 8, pp. 908-911.

	Tawas (Alum)	Potassium alum	Comparative double-blind randomized placebo-controlled clinical trial of a herbal eye drop formulation (*Qatoor Ramad*) of Unani medicine in conjunctivitis (Siddiqui, Zafar and Iqbal, 2002)[34]
F015	*Kelumpang*	*Sterculia spp*.	Sterculic acid antagonizes 7-ketocholesterol-mediated inflammation and inhibits choroidal neovascularization (Huang *et al*., 2012)[35]
F016	*Bulu ayam hitam* (Black chicken feather)	*Gallus gallus domesticus*	Not Found
F017	*Daging lembu* (Beef)	*Bos taurus*	Not Found
	Cabai	*Piper longum*	Mechanism of capsaicin inhibition of aldose reductase activity (Alim *et al*., 2016)[36]
	Ursi	Unidentified	N/A
	Terung (Eggplant)	*Solanum spp.*	Not Found
F018	*Kelumpang*	*Sterculia spp*.	Sterculic acid antagonizes 7-ketocholesterol-mediated inflammation and inhibits choroidal neovascularization (Huang et al., 2012)[24]
	Kasturi (Musk)	-	Not Found
F019	*Bilang-bilang*	*Sesuvium portulacastrum*	Not Found
	Cuka masam (Sour vinegar)	-	Not Found
F020	*Anjan-anjan putih*	*Memecylon umbellatum*	Not Found
F021	*Bayam* (Spinach)	*Amaranthus spp.*	Not Found
	Mawar (Rose)	*Rosa spp.*	Not Found
	Paji	*Drybalanops lanceolata*	Not Found
F022	*Anjan-anjan putih*	*Memecyclon umbellatum*	Not Found
	Paji	*Drybalanops lanceolata*	Not Found
	Cuka masam (Sour Vinegar)	-	Not Found
F023	*Peropok*	*Hemigyrosa longifolia*	Not Found
	Madu (Honey)	-	A Double-Blind Clinical Trial on

[34] T. A. Siddiqui, T. S. Zafar and N. Iqbal (2002), "Comparative double-blind randomized placebo-controlled clinical trial of a herbal eye drop formulation (Qatoor Ramad) of Unani medicine in conjunctivitis," *Journal of Ethnopharmacology*, Vol. 83, No. 1-2, pp. 13-17.

[35] Jiahn-Dar Huang et al. (2012), "Sterculic acid antagonizes 7-ketocholesterol-mediated inflammation and inhibits choroidal neovascularization," *Biochimica Et Biophysica Acta (BBA) - Molecular and Cell Biology of Lipids*, Vol. 1821, No. 4, pp. 637-646.

[36] Zuhal Alim et al. (2017), "Mechanism of capsaicin inhibition of aldose reductase activity," *Journal of Biochemical and Molecular Toxicology*, Vol. 31, No. 7.

			the Efficacy of Honey Drop in Vernal Keratoconjunctivitis (Salehi *et al*., 2014)[37]
F024	*Khulanjan/ Lengkuas* (Galangal)	*Alpinia galangal*	(2R,3S)-Pinobanksin-3-cinnamate ameliorates photoreceptor degeneration in Pde6rd10 mice (Li *et al*., 2016)[38]
	Susu orang belum bergigi	-	Not found
F025	*Keremak betina*	*Eclipta alba hassk*	Antidiabetic effect of *Eclipta alba* associated with the inhibition of alpha-glucosidase and aldose reductase (Jaiswal *et al*., 2012)[39]
F026	*Minyak lenga* (Sesame oil)	*Sesamum indicum*	The Protective Effect of Sesamol in the Selenite-induced Experimental Cataract Model (Turgut, Ergen and Ilhan, 2017)[11]
	Limau kapas (Cotton citron)	*Citrus aurantifolia*	Anticataractogenic effect of hesperidin in galactose-induced cataractogenesis in Wistar rats (Manikandan and Arumugam, 2016)[10]
F027	*Pinang*	*Areca catechu*	Not Found
F028	*Pekan*	*Jasminium curtisii*	Not found
	Lenga	*Sesamum indicum*	The Protective Effect of Sesamol in the Selenite-induced Experimental Cataract Model (Turgut, Ergen and Ilhan, 2017)[11]
		Piper nigrum	Not found
		Piper longum	Not found
	Lada sulah	*Oryza sativa*	Not found
	Cabai	*Citrullus vulgaris*	Not found
	Beras Bittikh	*Allium spp.*	Not found
	Onion		Allium cepa exerts neuroprotective effect on retinal ganglion cells of pterygopalatine artery (PPA) ligated mice (Kumar et al. 2020)[40]
		Phaseolus vulgaris	Not found
		Curcuma longa	
	Kacang hitam	*Piper betle*	Inhibitory effect of curcumin on proliferation of human pterygium fibroblasts. (Zhang *et al*., 2007)[25]
		-	
	Kunyit	-	
	Sirih	-	
	Milk	*Rosa spp.*	Not found
	Urine	*Areca catechu*	Not found
	Dew		Not found
	Rose		Not found

[37] Ali Salehi et al. (2014), "A Double Blind Clinical Trial on the Efficacy of Honey Drop in Vernal Keratoconjunctivitis," *Evidence-Based Complementary and Alternative Medicine*, pp. 1-4.

[38] Yin Li et al. (2016), "(2R, 3S)-Pinobanksin-3-cinnamate ameliorates photoreceptor degeneration in Pde6rd10 mice," *Cutaneous and Ocular Toxicology*, Vol. 36, No. 3, pp. 273-277.

[39] Natasha Jaiswal et al. (2012), "Antidiabetic effect of *Eclipta alba* associated with the inhibition of alpha-glucosidase and aldose reductase," *Natural Product Research*, Vol. 26, No. 24, pp. 2363-2367.

[40] Saurabh Kumar et al. (2020), "Allium cepa exerts neuroprotective effect on retinal ganglion cells of pterygopalatine artery (PPA) ligated mice," *Journal of Ayurveda and Integrative Medicine*, Vol. 11, No. 4, pp. 489-494.

Pinang	Not found
	Not found

Discussion

Based on the transliteration of the *Ramuan Obat* EAP153/9/4, a total of 28 formulations were identified. The formulations can be further divided into a few categories namely formulations that utilize herbs or materials alone, followed by the second category which is the formulations that utilized herbs or materials supported by prayers. The third category of the formulation identified is the utilization of prayers alone and the final category involves incomplete formulation. 20 formulations are found to be in the first category, followed by 5 formulations that belong in the second category and 2 formulations in the third category. There is only 1 incomplete formulation i.e. the first formulation. This is due to the fact that the previous page that carries the rest of the formulation was found missing. This finding also raises the possibility that the manuscript is part of a larger, more complete text on eye disease, or even bodily system. This is however difficult to ascertain unless the other missing portions are available.

It can be observed that the traditional Malay medical practices as portrayed in *Ramuan Obat* EAP153/9/4 comprised of both physical and spiritual elements. The physical element is shown by the use of materials such as herbs and animals. The spiritual element on the other hand, is shown through the sole use or incorporation of prayers in the process of treatment as can be seen in some formulations such as 153/9/4F003, 153/9/4/F008 and 153/9/4/F028. The prayers in question comprised of *ṣalawāt*, fragments of Quranic verses and prayer from the Prophet Muhammad (SAW). It is noticeable that the essence of the prayers incorporated mainly revolves around eyes which makes their use for the treatment of eye diseases relevant. For example, as in formulation 153/9/4/F003, the use of the verse 66 of Surah Yāsīn **وَلَوْ نَشَآءُ لَطَمَسْنَا عَلَىٰٓ أَعْيُنِهِمْ فَٱسْتَبَقُوا۟ ٱلصِّرَٰطَ فَأَنَّىٰ يُبْصِرُونَ** which translate to "And if We willed, We could have obliterated their eyes, and they would race to [find] the path, and how could they see?"[41] Another example is the prayer or *ṣalawāt* in formulation 153/9/4/F008: اَللَّهُمَّ صَلِّ عَلىٰ مَنْ عَلىٰ كَفَّيْهِ عَينُ قَتَادَةُ. The history behind the prayer involved one of the Prophet's companions, Qatadah bin al-Nu'man whose eye was pierced by an arrow during the battle of Uhud, resulting in one of his eyeballs to be dislodged its the socket. In the event, Prophet Muhammad SAW went to him and put the dislodged eye back into its place. It quickly recovered and became Qatadah's best eye.[42] The origin of the *ṣalawāt* is unknown. It appears to have been formulated post-Prophet time. The use of Quranic verse, *ṣalawāt* or prayers in healing practices reflects the Islamic influence on the old Malay civilisation in the Archipelago and work to enhance healing effects of formulation or have healing property on its own.

The plant-based materials nevertheless form the dominant part of the manuscripts with only a few materials are probably from abroad such as anjan-anjan (*Memecylon umbellatum)* and afyun (*Papaver somniferum)*. The other plants are native plants of the Malay Archipelago which are commonly found in other Malay medical manuscripts, though whether the plants and other *materia medica* as well as each formulation is also used as eye treatments in the other Malay medical manuscripts would require a separate study. The use of specifically Malay lexicals such as *ayam cemani* (black chicken) and specifically Malay taxonomy, such as keremak betina (*Eclipta alba hassk)* in *Ramuan Obat* EAP 153/9/4 indicate that the medical knowledge in this manuscript is essentially Malay in nature, enriched with influences that came via trade routes and Islam.

The analysis performed on the extracted data identified a total of 49 different materials which are further classified into plant-based materials, animal-based materials and miscellaneous. Half of the materials mentioned in the *Ramuan Obat* EAP 153/9/4 manuscript in the treatment of eye diseases have some supportive evidence from contemporary clinical or scientific evidence, whereas the other half of the materials are yet be supported by scientific evidence in their abilities to treat eye diseases (Table 6). It is important to note that the current unavailability of scientific support does not immediately discount the potential of these materials as these could be due to limitations in search strategy and complete absence of research on the materials as eye treatments. Therefore, this calls for more scientific clinical studies to be carried out with regard to Malay medical manuscripts.

[41] Quran.com (2016), Surah Ya-Sin [36:66] al-Qur'an al-Kareem. Accessed September 3, 2020, https://quran.com/36/66.
[42] Mohammed Reda (2013), *Mohamed the Messenger of Allah:* محمد رسول الله (ص) [إلى كل يزي], Beirut: Dar Al-Kotob al-Ilmiyah, p. 365.

Conclusion

The study of the Malay medical manuscript *Ramuan Obat* EAP153/9/4 showed that the medical practices of the Malay civilisation comprised of both physical and spiritual elements as portrayed by the use of materials (physical element) and the incorporation of prayer as the spiritual elements. In terms of scientific values, half of the materials identified in the text of *Ramuan Obat* EAP153/9/4 manuscript are supported by clinical scientific evidence with regard of treating eye diseases and as more scientific studies are carried out, the gap between the verified and unverified contents of the manuscript can be closed.

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