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COMPARISON OF DRYING TIME OF REAGENTS BETWEEN EOSIN 2% REAGENTS AND NATURAL REAGENTS FROM IXORA COCCINEA FLOWERS AND BOUGAINVILLE FLOWERS FOR SOIL TRANSMITTED HELMINTH WORM EGGS EXAMINATION

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ABSTRACT

Eosin 2% reagent is commonly used to make stool preparations, but this reagent dries quickly so that the stool preparation cannot be left for a long time. The red Ixora coccinea flowers and the red Bougainvillea flowers are red in color which is similar to eosin reagent. The red Ixora coccinea is renowned for its anthocyanin content, especially pelargonidin glycosides, which contribute to its bright color. Betalain compounds betasianin and betaxanthin are the color pigments in bougainvillea flowers. Betalains are water-soluble pigments that can be divided into betacyanins (red color) and betaxanthins (yellow color). This study aims to comparison of drying time of reagents between eosin 2% reagents and natural reagents from ixora coccinea flowers and bougainville flowers for soil transmitted helminth worm eggs examination. Complete Randomised Design (CRD) is the research methodology used in this quasi experimental study, to see the comparison of eosin, Ixora coccinea flower's juice and red bougainvillea flower's repeat three more times and Anova used for data analysis. The average drying result of eosin reagent was 14.7 minutes, the average drying result of ixora coccinea flower juice was 24 minutes and the average drying result of bougainvillea flower juice was 29.3 minutes. From the research results it can be concluded that annova test there was a significant difference in the drying time of the reagent on the soil transmitted helminth egg preparation with P value 0, 000 < alpha value of 0.05.

Keywords: *Eosin. Ixora coccinea, Bougainville, Soil Transmitted Helminth*

INTRODUCTION

Worms are a disease caused by intestinal parasitic worms with a fairly high prevalence and spread throughout Indonesia. Worms are reported to rarely cause death but can affect the health and productivity of sufferers through decreased nutritional status. The slow and asymptomatic impact causes this disease to be ignored among other diseases (Annida et al., 2019). The main species that infect many people are roundworms (Ascaris lumbricoides), whipworms (Trichuris trichiura) and hookworms (Necator americanus and Ancylostoma duodenale) (Effendi & Widiastuti, 2014).

Soil Transmitted Helminth (STH) is a group of intestinal nematode worms that infect humans who ingest their eggs through the oral fecal route. Soil Transmitted Helminth (STH) infections are the cause of the most worm diseases in the world, especially the species of roundworm (Ascaris lumbricoides), hookworm (Necator americanus and Ancylostoma duodenale), and whipworm (Trichuris trichiura). Soil Transmitted Helminth (STH) infections are mainly found in warm places and strong humidity and poor sanitation. Lack of personal and environmental hygiene, people who walk barefoot, low immune and nutritional status have a higher risk of getting infections from STH (Budi apsari et al., 2020).

The simplest intestinal nematode worm egg examination uses eosin reagent which is a native method. This reagent is acidic and orange red in color. The use of 2% eosin is intended so that worm eggs can be clearly distinguished from the surrounding dirt. Eosin, in addition to its high demand, is also an expensive reagent compared to natural materials. The high price of eosin reagents opens the way to use local raw materials as an alternative to replace eosin staining. One of the local raw materials that can be used is the Ixora coccinea and Bougainvillea.

The red Ixora coccinea is renowned for its anthocyanin content, especially pelargonidin glycosides, which contribute to its bright color. Anthocyanins, derived from cyanidin, undergo various modifications such as hydroxylation and methylation, affecting its stability and color properties. Anthocyanin Composition The major anthocyanin in Ixora flowers is pelargonidin, which is a derivative of cyanidin, modified through glycosylation. Studies have shown that pelargonidin glycosides are essential for red pigmentation, as seen in other species such as Gentiana lutea, where similar modifications lead to different flower colors. Stability and Extraction Anthocyanins from Ixora coccinea exhibit stability under acidic conditions, making them suitable for dyeing applications. The extraction process using

methanol and hydrochloric acid increased the dye fastness on cotton fibers, indicating the practical application of this pigment (Xia et al., 2022).

American native Bougainvillea is a very showy, flowering, and robust plant. This plant blooms vibrantly most of the year and is essentially disease- and pest-free. Flavonoids, glycosides, alkaloids,phlobotannins, saponins, steroids, tannins, and terpenoids have all been found in bougainvillea flowers . Betalain compounds betasianin and betaxanthin are the color pigments in bougainvillea flowers. Betalains are water-soluble pigments that can be divided into betacyanins (red color) and betaxanthins (yellow color). Bougainvillea flower dye is comparable to the eosin staining agent on worm eggs (Mahdalena Risnawati, 2016).

Eosin 2% reagent is commonly used to make stool preparations, but this reagent dries quickly so that the stool preparation cannot be left for a long time, so we want to know whether the juice of natural reagents such as Ixora coccinea and Bougainvillea can last longer than eosin reagent.

METHODS

Complete Randomised Design (CRD) is the research methodology used in this quasiexperimental study. In this investigation will be compare the efficacy of eosin, Ixora coccinea flower's juice and red bougainvillea flower's in the protracted drying process. In this investigation to see the comparison of eosin, Ixora coccinea flower's juice and red bougainvillea flower's repeat three more times and Anova used for data analysis.

RESULTS AND DISCUSSION

Average result comparison of reagent drying time between eosin reagent and natural reagent from Ixora coccinea flowers and red bougainville flowers for examination of soil-transmitted worm eggs can be seen in Table 1.

Table 1. Average result comparison of reagent drying time between eosin reagent and natural reagent from Ixora coccinea flowers juice and bougainville flowers juice for examination of soil transmitted helminth eggs

Reagensia	Repetition I (minute)	Repetition II (minute)	Repetition III (minute)	Average
Eosin	15	14 menit	15 menit	14,7
Ixora coccinea	25	23 menit	24 menit	24
Red bougainville	28	31 menit	29 menit	29,3

Based on Table 1, it can be seen that the reagent that dries the fastest in the process of making stool preparations for examining soil-transmitted helminth eggs is the eosin reagent, which dries in 14.7 minutes. Table 1 also shows that the reagent that dries the longest in the process of making stool preparations for examining soil-transmitted helminth eggs is the red Bougainvillea flower juice reagent.

The outcomes of different reagents' average drying times of the reagents between eosin reagent, Ixora coccinea arda flower juice and ougainvillea flower juice in making stool preparations for examining Soil Transmitted Helminth eggs

The results of the analysis of the differences in the average drying time of the reagents between the eosin reagents of Ixora coccinea flowers juice and Bougainville flowers juice for examination of soil transmitted helminth eggs based on the Anova test can be seen and presented in Table 2.

Table 2. The average value of two measurement parameters

Types of reagents	N	Mean	Standar Deviation	P Value
Eosin 2%	**3**	14,6667	,57735	0,000
Ixora coccinea flowers	**3**	24,0000	1,00000	
Bougainville flowers	**3**	29,3333	1,52753	

The results of the study as presented in Table 2 show that the results of the Anova test on the drying time of the reagent obtained a P value of 0.000 < alpha value of 0.05, indicating that there was a significant difference in the drying time of the reagent on the soil transmitted helminth egg preparation.

There is a difference in drying time between the eosin reagent, Ixora coccinea flower juice and red Bougainvillea flower juice, because the flower juice in the manufacturing process is a 100% concentration that does not add distilled water, while 2% eosin in the manufacturing process contains distilled water, where 100 ml of distilled water is added to 2 grams of eosin.

Eosin dye is a bromine derivative of fluorescein that has two very strong dyes, closely related dyes commonly known as Eosin yellowish (Eosin Y) and Eosin bluish (Eosin B). Eosin is acidic and orange-pink in color. The eosin commonly used for microscopic examination is Eosin Y. Eosin Y is chemically known as disodium 2- (2,4,5,7-tetrabromo-6oxido-3-oxo-3H-xanthen-9-yl) benzoate has a molecular formula of (C20H6Br4Na2O5) and a molar mass of 691.85 (Rahman, 2017). Ixora coccinea has a color similar to the eosin dye. Ixora coccinea is known for its bright anthocyanin content, especially pelargonidin glycosides, which contribute to its red color (Patil & Datar, 2015).

Bougainvillea flowers are also similar to eosin dyes containing color pigments which are betalain compounds (betasianin and betaxanthin) (Aji, Nur, 2020) . Betalains are water-soluble pigments that are classified into betacyanin (red) and betaxanthins. (yellow) (Miguel, 2018). This bougainvillea flower dye is similar to eosin reagent which can be used for staining worm eggs.

CONCLUSION

Ixora coccinea flower juice and red Bougainvillea flower juice can be used to examine stool preparations containing soil transmitted helminth eggs with a longer drying time than eosin reagent.

There was a significant difference in the drying time of the reagent on the soil transmitted helminth egg preparation with P value 0, 000 < alpha value of 0.05.

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