Journal of World Future Medicine, Health and Nursing, 2(1) - Feb 2024 157-167

Identification of Synthetic Dyes Red Syrup Beverage Products at Local City of Makasar with Thin Layer Chromatography Methode and Visible Spectrophotometry

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Article Information:
Received February 10, 2024
Revised February 19, 2024
Accepted February 25, 2024

ABSTRACT

Colorants are known to be food additives as ordinary colors and artificial colors, which when added or applied to food can give or further develop variety. As a shade of food or water, including carotene, rivoflavin, cobalamin, caramel, chlorophyll, myoglobin, hemoglobin, anthocyanins, flavonoids, quinones, and xanthones. To distinguish the red color produced in Makassar's homemade sweetened water by using the techniques of minimum base chromatography and visible light spectrophutometry and to determine the suitability of the color used with the Indonesian Population Guidelines Order 033 Period 2012 concerning food additives. Techniques: This kind of exploration uses a logical graphic strategy (perception of the research center) which means to get a picture of the utilization of a food additive, specifically the processed red color as a shade in water private-made sweeteners circulating in the Makassar section market. A sample of privately made sweeteners from the Makassar section tested positive for manufactured red color Carmoisine, which is an engineered shading agent allowed in food. The level of Carmoisine in the sweetener testing was 36.31 mg. kg, this indicates that the color level of Carmoisine meets the requirements specified in the Population and Safety Guidelines of the Republic of Indonesia, Order 033 Period 2012, which is 70 mg.kg.

Keywords: *Aligned, Sweetener, Synthetic*

Journal Homepage https://journal.ypidathu.or.id/index.php/jnhl

How to cite: Roddu, K, A., Baharuddin, S., Anggrainy, H. (2024). Identification of Synthetic Dyes Red Syrup Beverage Products at Local City of Makasar with Thin Layer Chromatography Methode and Visible Spectrophotometry. *Journal of World Future Medicine, Health and Nursing*, 2(1), 157-167. https://doi.org/10.70177/health.v2i1.726
Published by: Yayasan Pendidikan Islam Daarut Thufulah

INTRODUCTION

Since the onset of the-201 period, the role of food additives (BTP) (Pérez & Serra-López, 2019), especially food additives, has become important along with the encouragement of innovation in food additive manufacturing (Narenderan dkk., 2021). The abundance of food additives in pure form and financially available at relatively low prices will support the expansion of the use of food additives (Fukuda, 2021), and this means increased use of these ingredients for everyone.

Determining the nature of something to be a food generally depends on several variables, such as taste, surface and health benefits, and microbiological properties (Hendrix dkk., 2020). However, before the different elements are considered, outwardly the causes of variety appear first and in some cases are very obvious (Crini dkk., 2020). Besides being a quality-determining cause, variety can also be a marker of novelty or readiness (D. Liu dkk., 2022). Good blending strategies or handling techniques can be indicated by the presence of uniform and even tones

Increasing advances in science and innovation have led to major changes in food handling (Di Pizio dkk., 2019). Nowadays, many things are added to food and water for various purposes (Chandrasekar dkk., 2020). The ingredients added to food are called food additives (BTP).

Food additives are known to be mixtures (or combinations of various mixtures) that are intentionally added to food and water during handling, packaging, and stockpiling and are not a basic raw material (Abuhassna dkk., 2020). These food additives can be in the form of additives, colorings, sugars (Liang dkk., 2021), flavorings, cell reinforcements, stem enemies and emulsifiers.

Sweetener is one type of water that has different flavors and variations (El-Shafai dkk., 2020). This one sweetener is very well known in the community in general (Tkaczyk dkk., 2020), this self-made product from Bagianbaru South Kalimantan has been introduced since around the 1976 period (Dobslaw dkk., 2019). To attract consumers to sweetened water, the makers usually use color experts to produce more attractive variants (Clark dkk., 2022). The type of color that is often added to the sweetener is known to be artificial red color, namely ponceau, erythrosine, carmoisine, rhodamin B (Sajid dkk., 2019). Therefore, it is necessary to conduct a study to get an overview of the use of seuatu into food additives, especially memhasilsi red color as a color specialist in personal artificial sweeteners (Wang dkk., 2020). Makasar section (K. Liu dkk., 2019). Are the types of special colors added to sweeteners circulating in Makassar in accordance with the Guidelines of the Imam of the Republic of Indonesia No. 033 Period 2012 concerning special colors added to food?

The past exploration was led by Nasution (2014) with the title of research on engineered dyes in the type of food and water snacks at SDN IX Ciputat District Ciputat Tangerang District In the section (Li dkk., 2021), it was found that the artificial dyes found in the food and water bite test were rejected by the Guidelines of the Indonesian Pastor Keyamanan Order 722. Menkes.Per.IX.1988 (Baker-Smith dkk., 2019). However, the number of engineered colors is known to be 15 kinds of colors (Arvinen-Barrow dkk., 2020). Therefore, it is important to screen and regulate the circulation of the types of food and water snacks in schools, as well as provide guidance and direction to the merchants so that they understand the types of engineered colors and their threat to keyamanan.

RESEARCH METHODOLOGY

Instruments

The equipment used in this exploration is known as research center plate, autoclave, mix bar, visible light spectrophutometry, exicator, chromatografy plate, chromatografy vessel, drying stove, scientific equilibrium.

Materials

The materials used in this exploration are known to be aluminum foil, distilled water, Cold acid corrosive (C2H4O2), Aquades (H2O), Hydrochloric corrosive (HCl), Smelling salts (NH 4 Bulk), N - butanol, Ether oil, Sweetener test, Rhodamine B dye, Erythrosine dye, Ponceau 4R color, Carmoisine color.

Fat Free Downy Readiness

The wool is absorbed in ether for a few seconds, after which the fluff is removed and then spread out, the wool is ready for use.

Relative Standard Setting Readiness

Weighed 1.05 grams of Rhodamine B, 1.05 grams of Erythrosine, 1.05 grams of Pounceau 4R, 1.105 grams of Carmoisine (Witkowski dkk., 2023). Then put it into a 50 ml measuring jar and add clean water into the mold.

Readiness Test Setting

Measure 50 mL of sweetener mixture, then add 50 mL of pure water and 1 mL of HCL, then let stand and shake (Bezemer dkk., 2019). Fluff sans fat is put into the sample sequence and then warmed while stirring for ± 10 minutes, then removed and washed with clean water (Chung dkk., 2022). The fuzz was put into a 110 mL glass container and added 1 mL of 5 percent smelling salt sequence and 10 mL of distilled water, then warmed over a water shower until the color on the wool faded (Cruz dkk., 2022). Then, the wool was removed and the color sequence was separated and collected in a water shower, then put into a 10 mL estimator teapot and the volume was filled with pure water to the mold.

Eluent sequence n- butanol - corrosive acid ice - water (28:14:16.8)

Prepare a container that has been washed thoroughly, then dried. N-butanol - corrosive acid ice - water was added as the eluent with the difference of 28:14:16.8 (Castro-Muñoz dkk., 2022). The immersion flow was completed by inserting drain paper into the chamber (Liauchonak dkk., 2019). When the soaking interaction is complete, the eluent is ready for use.

Plate Sequence

The dishes were put into a drying stove for 30 minutes at 110°C to dry. After drying, the dishes were put into a desiccator designed to pre-cool them before use (Błaszczyk-Bębenek dkk., 2020). Then, a line is drawn on the plate to define the top and bottom edges. The plate is ready for use.

Subjective Investigation

The staining sequence and standard sequence are visible on the chromatographic plate. After the staining system is complete, the plate is inserted into the chamber containing the eluent (Nalugwa dkk., 2022). Then the chamber is closed so that the elution flow can continue (Agustanti & Astuti, 2022). After the elution interaction is complete, it is lifted and removed from the chamber to add the ID of the red color produced.

Quantitative Investigation

Carmoisine standard setting planning

volumetric teapot, then the volume was expanded to the line mark and an answer with a concentration of 110 ppm was obtained.

Making Similar Standard Bends

Carmoisine (110 ppm), pipetted 1.5 mL, 1 mL, 1.5 mL, 2 mL, and 2.5 mL into 10 mL volumetric jars, diluted to the line mark of 5, 11, 15, 21, 25 ppm and then the absorption of the standard setting was estimated using a maximum frequency spectrophotometer.

Frequency Assurance

A sequence of standards with a grouping of 15 ppm is taken and their uptake at frequencies up to the most extreme frequency is estimated.

Assimilation Estimation Test

The retention of split samples was estimated using a visible light spectrophotometer at a maximum frequency of 515 nm.

Estimation of Produced Color Content

The level of color produced was determined by incorporating the retention information of the sample into the relapse condition directly from the standard bend.

Investigation of information

The information collected is known that the Rf value obtained, which is the correlation of the distance traveled by the stain and the distance traveled by the eluent (Shang dkk., 2022). Visible light spectrophutometry estimation information as color retention information engineered from the thespian settings and then determined the centralization of the resultant color in the example using straight relapse:

You = a + bX

Where:

Y = Absorption

X = Concentration (bpj)

a = Intercept

b = Slope or Slope of the value of a and b can be calculated using the formula:

$$a = \frac{\Sigma y - b\ (\Sigma x)}{n}$$

$$b = \frac{(\sum s)(\sum y) - n(\sum sy)}{(\sum s)^2 - n(\sum s^2)}$$

RESULT AND DISCUSSION

Research results

Table 1. The results of the calculation of the Rf value of each point on the sample and the standard of artificial red dye difference using the eluent n-butanol - glacial acetic acid - water (28:14:16.8).

Code Sample	**Number of Stains**	**Observation result**			**Information**
		Stain Color	**RF Value**	**References**	
	1	Red	**1,83**	Red	**Contains Karmoisin**
Sweetener	1	Pink	1,91	Pink	-
Rhodamine B Difference	1	Red	1,97	Red	-
Erythrosine Difference	1	Red	1,7	Red	-
Ponceau 4R Difference	1	Red	1,83	Red	-

Quantitative analysis

Table 2: Measurement Results of Internal Sweetener Karmoisin by Visible Light Spectrophometry at a Wavelength of 515nm.

Sample	Replication	Absorption	Speed (mg.kg)
Sweetener	1	1,5693	36.31

Table 3. Results of Absorbance Measurement of Carmoisine Standard Solution Using Visible Light Spectrophutometry at 515nm Wavelength

Concentration	Absorption (A)
5 ppm	1,1796
10 ppm	1,3123
15 ppm	1,4662
20 ppm	1,6289
25 ppm	1,7894

In this test, the ID of Red Color Engineering in Sweetened Water from the Makassar Section Environment has been completed using Slight Base Chromatography and Visible Light Spectrophotometry.

The proof discrimination interaction begins with the creation of a sample sequence. Made by separating colors, this interaction was done to draw variations by utilizing fleece by dissolving 50 ml of red sweetener mixture with 50 ml of distilled water and 1 ml of HCL (Yue dkk., 2019). The reason for adding HCL is known to make the climate acidic and work in the most common way to maintain variation in the fleece, then let stand and shake (Yue dkk., 2019). Next, put the fleece sans fat that has just been absorbed by the oil ether, then heat it in a water shower while stirring for ± 10 minutes. This is done with the aim that the downy can assimilate the variation present in the sample.

The fur is then removed and washed with clean water, after which the fine fur is put into a measuring cup and 1 ml of scented salt solution and 10 ml of clean water are added and warmed over a water shower until the variation in the wool is blurred (Schottelius dkk., 2019). The reason behind the addition of the scented salt is known to be to make the air cooler, so that the color of the down is more easily blurred when warmed. Subsequently (Tkaczyk dkk., 2020), the fine wool is removed and the sequence is separated, then packed again in the water shower and a sample sequence is obtained, then put into a 10 ml measuring jar and the volume is filled with pure water to the mold.

The tender loving care plates were put into a drying oven to dry at 110°C for 30 minutes with the aim of removing the water fume content on the plates and forming silica gel on the plates (Da Rosa Schio dkk., 2019). Afterwards, it was cooled in a desiccator before use.

Planting is done using a smooth cylinder (Sosa-Martínez dkk., 2020). Sample droplets should be kept as little as possible by dribbling repeatedly, allowed to dry before the next smearing is done, then eluted using the eluent n butanol - cold acid corrosive water (28:14:16.8) in a chromatography vessel (chamber) first (Zhang dkk., 2020). has been immersed. This flow is done by immersing the base of the stained chromatographic plate in a soluble framework for elution interactions to occur.

The flow of proof of distinction using a fine-grained chromatograph is completed under UV light (spotting). Then, at that time, the visible spots were examined (Almoisheer dkk., 2019). The engineering red color ID of Rhodamine B, Erythrosine, Ponceau 4R and Carmoisine by calculating the Rf value of each spot from the sample and its correlation standard and then looking at it.

In view of the information presented in table 4, the results of calculating the Rf value of the testing standard for the engineered red color and the results of determining the Rf value of the spot on the sample using the eluent n-butanol - cold acidic water (28:14:16.8) showed that the tespemanis was positive for the color Carmoisine, this should be apparent from the Rf value and staining between the sample and the Carmoisine correlation standard.

Quantitative examination was estimated using visible light spectrophutometry at a frequency of 515 nm to obtain Carmoisine levels of 36.31 mg.kg (Jafarian dkk., 2023). Based on the exploration that has been done, Carmoisine found in the sweetened water environment of Bagian Baru, South Kalimantan, is a result of food shade engineering that is allowed based on the guidelines (Schottelius dkk., 2019). Guidelines of the Imam of Health of the Republic of Indonesia, Order 033 Period 2012, the highest level of use allowed is known that 70 mg.kg for various types of seuatu into food, so the sweetener that is tried is still within safe limits for consumption.

CONCLUSION

The sample of homemade sweetener from Makassar Section tested positive for the red color of produced Carmoisine, which is an engineered shading agent allowed in food. The level of Carmoisine in the sweetener sample was 36.31 mg. kg, this indicates that the color level of Carmoisine meets the requirements specified in the Guidelines of the Imam of the Republic of Indonesia Security Order 033 Period 2012 which is 70 mg.kg.

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