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OBSERVATION OF THE NATURAL PH OF SOME FLOWER AND PLANT SAMPLES ON THE CAMPUS OF UNIVERSITAS WIJAYA KUSUMA SURABAYA

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Abstract

This study aimed to observe the acid-base pH of several samples of flowers and plants around the campus. Recognizing acids and bases is usually done by using indicators. The purpose of acid-base indicator analysis is to measure acid-base reactions; this usually requires indicators or tools such as litmus paper, pH indicator paper, and electrodes for acids and bases. Indicators were extracted from Allamanda flower plants, Bougainvillea flowers, and Dracaena reflexa plants using solvents (water) and alcohol. The method used in this study is the practicum method and a literature review using Google Scholar articles and sources.

Keywords: *observation; acids; bases, Allamanda flower plants, Bougainvillea flowers, Dracaena reflexa plants*

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INTRODUCTION

Acid-base is an electrolyte solution with properties such as acids having a sour taste and bases having a bitter taste. There is a difference between acids and bases. That is, acidic solutions have a pH below seven, and acidic solutions can produce H+ ions, while essential solutions have a pH above seven and can produce OH- ions. The golden trumpet flower, or Allamanda catartica, is a creeping woody plant. This natural flower is trumpet-like, with a short tube at the base, widening at the base, and

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widening at the end. Paper flower or bougainvillea. These are called paper flowers because of their thin cover, which resembles paper. This flower is trendy as an ornamental plant because it has a variety of beautiful flower colors. Dracaena reflexa is an ornamental type of striped plant. Dracaena is an upright-growing plant with internodes and single leaves. Several studies have been conducted to test several plants as potential acid-base indicators. Each plant has color pigments or anthocyanins as a potential source of natural acid-base indicators, and plants are shown to have different color changes when sample extracts are added to acid and base solutions. Natural acid-base indicators can replace synthetic indicators because they are easy to find, extractable, environmentally friendly, safe, accurate, and cost-effective (Mahmud, Ihwan and Jannah, 2018).

Artificial and natural acid-base indicators are used in chemistry labs. Scientists created the litmus test for experimental purposes. The litmus paper commonly used in laboratories is paper. There are two types of litmus paper: red litmus paper and blue litmus paper. A substance is classified as acidic if the blue litmus paper turns red or the red litmus paper remains red; otherwise, if the red litmus paper turns red or the blue litmus paper remains blue, the substance is classified as essential. Various flowers around the campus of Universitas Wijaya Kusuma Surabaya can be used as natural indicators using extracts of Alamanda flowers, paper flowers, and Dracaena reflexa plants. Not all plants and flowers are good indicators. Good indicators can display different colors in acidic and basic solutions. PH paper can be made from various plants that contain certain dyes.

For this reason, sufficient knowledge is needed to make pH paper as a substitute for litmus paper or indicator paper. Acid-base indicators are subjective. The color change depends on the equivalence point reaching a specific pH value. Non-natural chemicals commonly used as indicators can be replaced by materials obtained from the environment (Mulyaningtyas *et al.*, 2020). Based on the description above, this research aims to observe or monitor the natural pH of flowers and plants using solvents (water) and alcohol.

MATERIAL AND METHODS

This research was conducted at the Biology Laboratory of Universitas Wijaya Kusuma Surabaya. This study uses an extraction method using a solvent (water) of about 4 to 5 drops and alcohol of about 5 to 6 drops.

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Chemicals used are alcohol, water, drop pipettes, Petri dishes, beakers, pestle mortar, tissue, pH paper, or litmus paper. The raw materials studied were alamanda, paper, and Dracaena reflexa plants.

The experimental design in this study involves two treatments, namely water and alcohol, and each treatment is carried out with two repetitions. The first step is to prepare the raw materials of Alamanda flowers, paper flowers, and Dracaena reflexa plants that have been picked. After that, cut the flowers and plants into small pieces, then put each flower and plant into a different mortar and add a few drops of water to each mortar. After that, grind the flowers and plants until smooth to produce extracts. After the flowers and plants are smooth and produce extracts, the next step is to take pH paper to measure the pH levels in the flower and plant extractions. Repeat the same thing for the second experiment. For experiments using alcohol, the same as in experiments using water, namely, preparing raw materials for alamanda flowers, paper flowers, and Dracaena reflexa plants that have been picked. After that, cut the flowers and plants into small pieces, then put each flower and plant into a different mortar and add a few drops of alcohol to each mortar. After that, grind the flowers and plants until smooth to produce extracts. After the flowers and plants are smooth and produce extracts, the next step is to take pH paper to measure the pH levels in the flower and plant extractions. Repeat the same for the second experiment.

RESULTS AND DISCUSSION

Golden Trumpet Flowers (Allamanda cathartica) are crushed and given water and then measured using a pH meter; the result for the pH value is 4, and the color of the indicator on this flower is yellow; this indicates that the flower contains an acidic pH, and likewise, when the flower is crushed and given alcohol when measured using a pH meter, the pH value is 5. The yellow indicator on this flower indicates an acidic pH (Table 1). Paper Flowers (Buoganvillea) When mashed and given water and then measured using a pH meter, the pH result is 9, and the indicator color for this flower is pink; this indicates that the paper flower contains a basic pH, and likewise when using alcohol when measured using a pH meter for a pH value of 12, and for the indicator color on this flower is pink, this indicates that the paper flower (Bougainville) contains a base (Table 2).

A natural acid-base indicator shows a color change in the pH 1 -2 route in an acidic atmosphere, while at pH 3-7, it can indicate an acidic atmosphere (Mitarlis, Azizah and Yonatha, 2018). *Dracaena reflexa*, when given water and then measured using a pH meter, the

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result for the pH value is 6, and the color of the indicator on this plant is orange (orange); this indicates that this plant contains acid; when using alcohol and measuring it using a pH meter, the pH value is 6.5. The indicator's color is light green, so the plant contains an acidic pH (Table 3). The anthocyanin substance contained in some flowers is affected by its stability by the presence of protein. Proteins can react with anthocyanins, which will form deposits or gelatin and cause the color of anthocyanins to disappear (Sulfiani and Sukmawati, 2020). Plant petals contain pigments that, when extracted, will produce a variety of colors. A good acid-base indicator is an indicator that can show different colors in acidic and basic solutions (Karo, 2016).

The results of the study are listed in the table below.

Table 1.

No	Species Name	pH Acid		pH Base		Image Description
1	Golden Trumpet Flower *(Allamanda Cathartica)*	Water	Alcohol	Water	Alcohol	
		4	5	-	-	
		4	5	-	-	

Tabel 2.

No	Species Name	pH Acid		pH Base		Image Description
2	Paper Flowers *(Bougainvillea)*	Water	Alcohol	Water	Alcohol	
		-	-	9	12	
		-	-	9	12	

Tabel 3.

No	Species Name	pH Acid		pH Base		Image Description
3	Dracaena Reflexa plant	Water	Alcohol	Water	Alcohol	
		6	6,5	-	-	

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		6	6,5	-	-	

CONCLUSIONS

The study shows that the flower shows that extract of the Golden Trumpet Flower (Allamanda Cathartica), Paper Flower (Bouganvillea), and Dracaena reflexa Plant can be used as a natural indicator to determine the acidic and basic properties of a substance or compound because it gives an apparent color change in acids and bases. In acidic solutions to yellow and pink, essential solutions are to light green.

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