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Color and Aroma Sensory Tests on the Hedonic Method of Rosella (Hibiscus Sabdaiiffa L.) Essential Oil

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A B S T R A C T

The rosella plant functions as a remedy for hypertension, diabetes and diuretics. The aim of this study was to test the hedonic color and aroma of rosella essential oil. Research method: hedonic test. The results: Flower Petals (%) (really like 60, like 40 , Aroma (%) : really like 55, like 45. Roselle Leaf Oil (%) : really like 25, like 75, Aroma (%) : really like 30, likes 70, ; Rosella seeds: color (%) : really likes 15, likes 85, aroma (%) : really likes 15, likes 85, ; Roselle stems : color (%) : really likes 30, likes 70, aroma (%) really liked 15, liked 85, ; Rosella root: Color (%) really liked 25, liked 75, Aroma (%) : really liked 15, liked 85, So rosella flower petals were the best.

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INTRODUCTION

Rosella is a plant that grows a lot in tropical areas such as in Indonesia. Rosella flowers are used in Kediri as functional drinks and food coloring and dried flowers are marketed for traditional drinks. It is hoped that this basic research plan will add new knowledge insights as material to be developed in further research. Rosella (Hibiscus sabdariffa L) is a plant that has flowers with a characteristic sour taste and produces a red color, so it can be used as a flavoring and coloring agent in making pudding. Rosella flower petals are part of the plant that can be processed into food products. The flower petals of this plant are dark red, thick and succulent. Roselle calyx extract contains high amounts of vitamin C along with succinic acid and oxalic acid which are the two dominant organic acids. Rosella is a shrub or shrub which is a seasonal plant.

The problem that has not been done much research is how to get essential oils from parts of the rosella plant and what are the results. Study of essential oil extraction using the Water Steam Distillation method. The research objective was to study the color and aroma of essential oil extraction in stems, roots, leaves, seeds, flower petals. The benefits are for the needs of perfume raw materials or the need for analysis of chemical compounds that are useful for adding to the body of knowledge. The results of this fundamental research are expected to become initial theoretical material which can be continued with further experiments into developmental research related to pharmacology or herbal medicine to cure various diseases and perfumes.

TEORETICAL REVIEW

Rosella (Hibiscus sabdariffa) is a plant that is known to have functional benefits. Its flower petals are rich in antioxidants which act as free radical scavengers and are often used as natural dyes [Handarini, 2014]. Rosella flower petals are part of the plant that can be processed into food products. The flower petals of this plant are dark red, thick and succulent. Roselle calyx extract contains high amounts of vitamin C along with succinic acid and oxalic acid which are the two dominant organic acids. Rosella petal extract also contains ascorbic acid which is higher than oranges and mangoes [Suwandi, 2012]. The chemical components of rosella flower extract in goyang bean products which function as food coloring also have medicinal properties are Xhantosine, 5,5',7,7'- Tetrabromoindigo, Oleic acid, chemical linoleic acid, gammatecopherol, Vitamin E or alphatecopherol, Squalene [Fauziati and Sampepana, 2016.].

According to the researcher [Gustiarani. and Yuyun Triastuti, 2021] , roselle flowers can be made into soy milk bavarois pudding which is useful and

liked by consumers. Natural substances extracted from plants can act as a potential source of anti-aging because they are photoprotective. This is related to the fact that plants must be protected from exposure to sunlight because direct exposure to the skin is one of the causes of premature aging. The obvious symptoms include the appearance of wrinkles, dry and rough skin and the appearance of dark spots on the skin. This anti-aging is believed to help slow down the effects of premature aging [Fauzi, et al., 2012]. This gives a little picture of the ability of plants to protect the skin through the compounds contained in plants in the form of bioactive compounds such as phenolic compounds and are supported by the presence of compounds that are antioxidants [Prasiddha, et al., 2016]. In Indonesia with a tropical climate, rosella can thrive.

METHODOLOGY

The research was conducted from June to August 2023 at the Agrotechnology Laboratory, Faculty of Agriculture, Kadiri Islamic University, Kediri and the Volatile Laboratory, Brawijaya University, Malang. The equipment used includes: 1 unit distiller, knife, scales, bottles, stationery, plastic containers, scissors, photo tools, labels. The materials needed are rosella plants, water. The method used for distillation is water steam distillation for extracting essential oils from rosella plants and the Hedonic method for sensory testing of essential oil yields produced with color and aroma test parameters consisting of the 5 samples mentioned above. Panelists who tested 20 people used a tool in the form of a question sheet that had to be answered as shown in Table 1.

Table 1. Samples of Essential Oil Color and Aroma Tests

Number and name of the panelist	1(more like)	2 (like)	3 (dislike)

RESEARCH RESULT

Sensory test data of rosella petal essential oil

The results of sensory analysis assessed by 20 panelists of various ages and different types of education showed a very good response, namely the color of essential oils from flower petals, panelists really liked about 12 people, liked 8 people and didn't like 0, while the aroma test really liked 11 people, 9 likes and dislikes 0 . This can be seen in Figure 1.

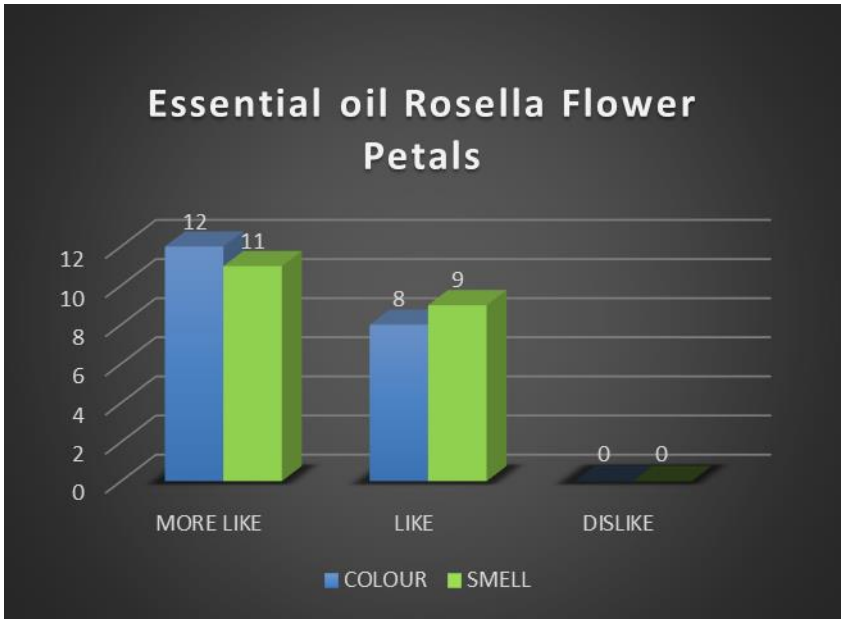

Figure 1. Diagram of rosella petal essential oil

Sensory test data of rosella seed essential oil

In observing the essential oil testing data found in the seeds, 3 people really liked it, 17 people liked it, 0 people didn't like the color. As for the aroma, the test value is the same as the color. The results can be seen in Figure 2.

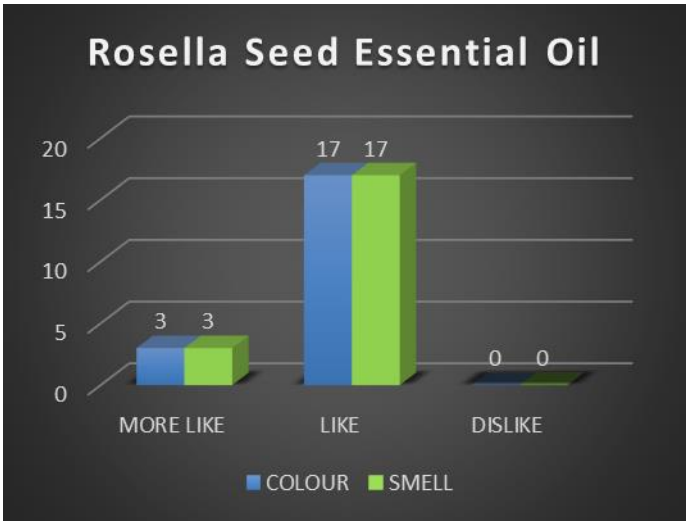

Figure 2. Roselle seed hedonic test diagram

Sensory test data of rosella leaf essential oil

Organoleptic analysis of rosella leaves can be seen in Figure 3. It was explained that the essential oil had a light yellow color which was liked by 5 people, 15 people liked it, while 6 people really liked the aroma and 14 people liked it.

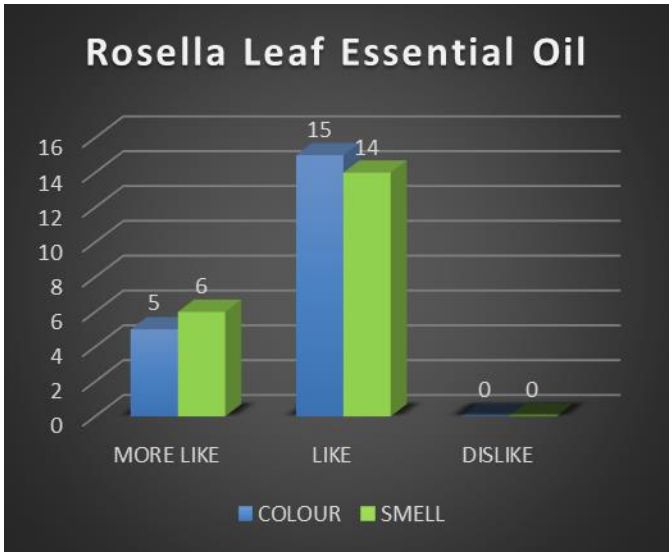

Figure 3. Roselle leaf hedonic test diagram

Sensory test data of rosella stem essential oil

Rosella stems contain relatively little essential oil, in oil extraction using the water steam distillation method a yield of 0.2 cc is obtained in the distillation of 1 kg of stems. The color of the oil is dark yellow and based on the color sensory test there are 6 respondents who really like it, 14 people who like it, while only 3 people really like the aroma and 17 people like it. This data can be seen in Figure 4.

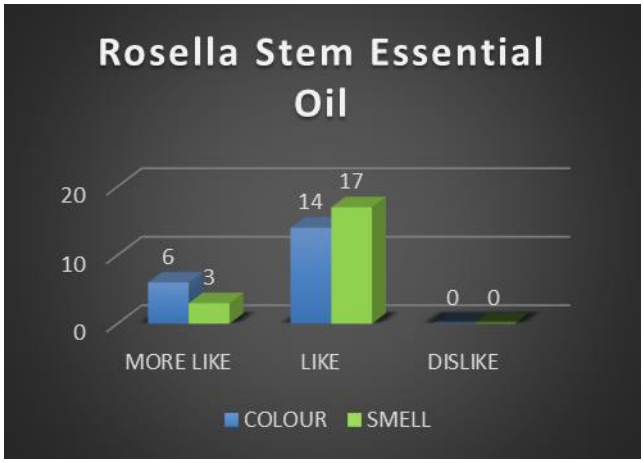

Figure 4. Diagram of a Hedonic Test on a Rod

Sensory test data of rosella root essential oil

The roots of this plant contain relatively little essential oil. The yield of the root distillation results is only 0.1 cc in 1 kg of fresh material. The sensory test results obtained a value of 5 people really liked, 15 people liked the yellow color and the scent that people really liked, while 17 people answered they liked it, see Figure 5.

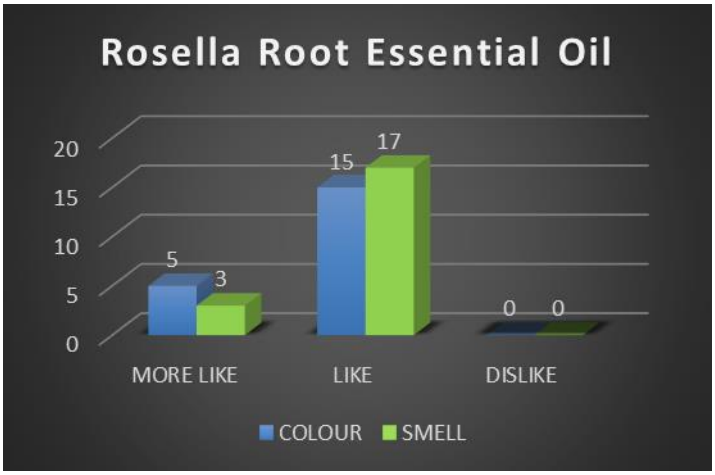

Figure 5. Rosella root hedonic test diagram.

DISCUSSION

Essential oils are now one of the many NTFPs (non-timber forest products) products that have great potential as a source of income or livelihood for communities living around the forest. This is because of the high level of demand for essential oils and Indonesia is the 9th largest essential oil exporting country in the world with an export value of USD 123 million in 2013 [Rosiana, et al,. 2017]. This great need must be supported by the availability of sufficient raw materials, and if you only rely on materials that are taken directly or grow wild in the forest, it will be very difficult to continue production going forward. Based on this, it is necessary to study potential plants as essential oil producers which in the end are expected to be developed and cultivated around forests or become part of agroforestry. Various plant species have been used as the main source of essential oil raw materials, including sandalwood, clove, aloes, gandapura, eucalyptus, mace, cinnamon, massoi wood, pine, citronella and kaffir lime [Wahyudi, 2013]. Herbal roselle leaves contain several phytochemical compounds that function as antioxidants and antibacterials. Antioxidant compounds contained in rosella leaves include neochlorogenic acid, chlorogenic acid, cryptochlorogenic acid, rutin, and isoquercitrin [Wang, et al., 2014]. Opinions [Alshami, & Alharbi, 2014] explained the extraction of roselle calyx using 80% methanol with the maceration method obtained an extract solution that has strong antifungal activity against the fungus Candida

albicans and there is a synergistic interaction with voriconazole (an antifungal drug). This basic research can be developed into applied research or development research using qualitative or quantitative methods that are useful in the fields of chemistry, biochemistry, agriculture, fisheries, pharmaceuticals, medicine and others.

CONCLUSION

In the hedonic test of rosella plants with 20 panelists, it was concluded that the essential oil whose aroma and color were most liked by panelists representing consumers was rosella flower petals which had the highest score, while the lowest score was oil from rosella seeds.

SUGGESTION

The research team suggests continuing research on the development of essential oils in flower petals to be used as ingredients for perfumes and herbal medicines.

ADVANCED RESEARCH

This research still has limitations so further research is still needed on this topic.

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