

CHAPTER I

INTRODUCTION

1.1. Background

In the era of globalization, the development of communication tools is increasing and one of the widely used electronic devices is a gadget that makes it easy for all people. Gadgets are electrical items that have many application features to provide information, provide various news media, social networks, and even entertainment. Gadgets or smartphones are also used as a means to increase knowledge for everyone from adults to students¹. The development of technology has an impact on adults, and even has an impact on the world of children so that it affects early childhood development and education².

Gadget dependence in children can have a negative impact resulting from radiation on gadgets. The type of radiation produced by gadgets is radiofrequency (RF) radiation, which is not classified as extremely lethal or dangerous. However, at high levels and with intensive intensity, it can damage body tissues. High smartphone addiction can cause brain cortex disorders that cause cognitive inhibition which results in children's focus only on gadgets and makes lazy activities, decreased memory and problems related to children's intelligence³.

Cognitive function is closely related to a person's intelligence, which is characterized by a diverse interest, particularly in ideas during the learning process. Cognitive processes are linked to intelligence levels, as indicated by a strong curiosity for new ideas and learning. If there is a delay in cognitive function, brain growth and development will not reach their full potential. There are various ways people try to enhance intelligence potential, and some individuals even consume nerve supplements as an additional means to boost their cognitive abilities⁴.

¹ Dian Kurniawati, "The Effect of Gadget Use on Student Achievement," *Edukatif: Journal of Educational Sciences* 2, No. 1 (May 2, 2020): 78–84.

² Rahma Hidayati, "The Role of Parents: Face-to-Face Communication in Monitoring the Impact of Gadgets During the Golden Age," *Source: Journal of Communication Science* 5, No. 2 (February 18, 2020),

³ Fungki Oktaviyati Et Al., "Analysis of the Impact of Gadget Radiation on Children's Motor and Cognitive Development" 7, No. 01 (2023).

⁴ Abdurrahman Akib, "Effectiveness of Pegagan Extract (*Centella Asiatica*) in Increasing Acetylcholine Levels in the Brain of Healthy Wistar Rats" (Thesis. Faculty of Medicine, Sriwijaya University, 2018).

Therefore, there is a lot of distribution of supplement products to help children's brain development. So far, many herbal nerve supplements have been used that can provide nutrients to the brain to help increase intelligence, such as ginseng and ginkgo biloba. However, these plants are difficult to obtain and the price is relatively expensive. So it is necessary to look for other alternatives, one of which has the content as a nutrient in the brain is the pegagan plant (*Centella asiatica* (L) Urb.) which grows a lot in Indonesia⁵.

Pegagan plant contains vitamin A, vitamin B, vitamin C, minerals and the content of triterpenoid saponins (asiaticosides) in pegagan is known to improve cerebral blood circulation. Asiaticosides are effective in increasing vitality and memory and overcoming senile dementia which is closely related to nucleic acids. Pegagan also has a high antioxidant content, can facilitate wound healing, improve memory, reduce inflammation and increase cognitive activity⁶.

Various types of supplement preparations can make it easier for consumers to consume the nutrients they need per day. The market potential in the nutraceutical field is quite large. Nutraceuticals are made from organic ingredients without the addition of harmful chemicals and are taken to meet daily nutritional needs. Gummy candy or jelly candy is a type of soft candy that has a chewy texture that varies from slightly soft to slightly hard. This dosage form has relatively many advantages over other dosage forms. Gummy candies are preferred by children because they have an attractive color, smell, taste, shape and texture. Generally, the manufacture of gummy candy is made with gelatin as a base material to form a chewy texture⁷.

Gelatin is usually produced with collagen-like materials from both bones and skin obtained from animals such as pigs and cows. However, the animal content in gelatin is almost 80% produced from pig skin, 15% from split (a thin layer on cow skin), the rest comes from cattle, fish and pig bones as much as 5%. In fact, pig gelatin is more widely marketed than bovine gelatin, because pig gelatin is easier to process. As for fish and cow gelatin, its availability is limited and the price is

⁵ Ibid.

⁶ Rika Lisiswanti and Sekar Ronna Fiskasari, "Benefits of Pegagan (*Centella Asiatica*) in the Treatment of Alzheimer's Disease," *Majority Journal* 6, No. 2 (2017): 132–136.

⁷ Lia Agustina, Welan Irnandini, And Briandini Dwi Astuti, "Nutraceutical Formulation of Gummy Candy Puree Preparation of Yellow Pumpkin (*Curcuma Moschata*) With Variation of Gelatin Content and Evaluation of Preparation," *Proceedings of National Pharmacy Seminar Article* (2019).

relatively more expensive. As a Muslim consumer, this is very problematic because of its halalness. In accordance with the Word of Allah in Surah Al-Baqarah verse 173.

أَمَّا حَرَّمَ عَلَيْكُمُ الْمَيْتَةَ وَالدَّمَ وَلَحْمَ الْخِنْزِيرِ وَمَا أُهْلَ بِهِ لِغَيْرِ اللَّهِ فَمَنْ اضْطُرَّ غَيْرَ بَاغٍ وَلَا عَادٍ فَلَا إِثْمَ عَلَيْهِ إِنَّ اللَّهَ غَفُورٌ رَحِيمٌ

*“Indeed, He has only forbidden you carrion, blood, pork, and (the meat of) animals slaughtered in (the name of) other than Allah. But whoever is compelled to eat them, not for want of appetite, and does not transgress the limits, there is no sin on him. Indeed, Allah is Forgiving, Merciful.”*⁸

Therefore, to replace animal gelatin is to use plant-based ingredients that have similar properties, namely carrageenan. Carrageenan derived from *Eucheuma cottonii* red seaweed has hard and sturdy gel properties that can replace gelatin. In the food industry, carrageenan is used to form food products such as sausages, ice cream, condensed milk, and jelly. This is because carrageenan can form a gelling agent that makes good binding. The formation of chewy texture in making gummy candy is influenced by the gelling agent as a gelling agent. Therefore, variations in carrageenan content were carried out to determine the best optimization of carrageenan addition so as to produce a good gummy candy preparation⁹.

1.2. Problem Formulation

1. What are the results of the phytochemical screening test of triterpenoid compounds in pegagan leaf extract?
2. What are the results of the quality evaluation of gummy candy preparations of pegagan leaf extract with variations of *Eucheuma cottonii* carrageenan?
3. Does the concentration of pegagan extract and variation of *Eucheuma cottonii* carrageenan concentration as gelling agent effect the quality evaluation?

1.3. Research Objectives

1. Knowing the results of phytochemical screening test of triterpenoid compounds in pegagan leaf extract.

⁸ Ministry of Religious Affairs of the Republic of Indonesia. (2019). Al-Qur'an and its Translation. Jakarta: Ministry of Religious Affairs of the Republic of Indonesia.

⁹ Agustina, Irnandini, And Astuti, “Nutraceutical Formulation of Gummy Candy Puree Preparation of Yellow Pumpkin (*Curcuma Moschata*) With Variation of Gelatin Content and Evaluation of Preparation.”

2. Knowing the quality evaluation results of gummy candy preparations of pegagan leaf extract with variations of Eucheuma cottonii carrageenan.
3. Knowing the effect of pegagan leaf extract concentration and variation of Eucheuma cottonii carrageenan concentration as a gelling agent on the evaluation of gummy candy preparation quality.

1.4. Research Benefits

1. Theoretical Benefits

The results of this study can add to science and be used as reference material in further research literature, especially research on gummy candy preparations made from the active ingredients of pegagan extract with activity in cognitive function in memory.

2. Practical Benefits

Hasil Hasil penelitian ini dapat diharapkan memberikan informasi kepada peneliti lain terutama dalam industri pangan nutrisi mengenai gummy candy dari ekstrak pegagan (*Centella asiatica (L) Urb.*). Sehingga dapat menghasilkan produk *gummy candy* yang mempunyai aktivitas dalam fungsi kognitif pada daya ingat.

1.5. Originality of Research

Table 1 Originality of Research

Research Title	Research Methods	Variable	Results	Research Differences
Synergistic Effect of Combination of Pegagan (Centella asiatica) Herb Extract and Moringa (Moringa oleifera) Leaf Extract in Improving Memory Function ¹⁰ .	Laboratory experimental	Dependents: Improved memory function, Pegagan extract (Centella asiatica (L) Urb) Independent: Moringa and Pegagan leaf extracts	The combination of pegagan herb extract and moringa leaves in a ratio of 1:1 is the best combination in improving memory and learning functions.	Dependents: Evaluation of gummy candy preparation Independent: Pegagan leaf extract concentration
Formulation and Nutrasetical Evaluation of Gummy Candy from Kelakai (Stenochlaena Palustris (Burm.F.) Bedd) Leaf Juice) ¹¹ .	Laboratory experimental	Dependent: Gummy candy preparation Independent: Kelakai Leaf Juice	Gummy candy preparation evaluation obtained optimal results with gelatin and carrageenan bases.	Dependents: Quality evaluation of gummy candy preparation Independent: Pegagan leaf extract
Chemical and Organoleptic Characteristics of Seaweed Jelly Candy ¹²	Laboratory experimental	Dependent: Jelly candy characteristics Independent: Seaweed	The results of jelly candy without carrageenan have a water content that complies with SNI with a maximum value of 20%.	Dependents: Quality evaluation of gummy candy preparation Independent: Pegagan leaf extract

¹⁰Yudhi Purwoko, Syamsudin, and Simanjuntak, "Synergistic Effect of Combination of Herba Pegagan (Centella Asiatica) Extract and Moringa (Moringa Oleifera) Leaf Extract in Improving Memory Function."

¹¹ Asdini Et Al., "Formulation and Nutrasetical Evaluation of Gummy Candy from Kelakai Leaf Juice (Stenochlaena Palustris (Burm.F.) Bedd)."

¹² Angcivioletta Moniharapon, "Chemical and Organoleptic Characteristics of Seaweed Jelly Candy," Journal of Industrial Technology Research 8, No. 2 (March 8, 2018): 91.