Techniques of additional *Kappaphycus alvarezi* on seaweed face mask production

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Abstract. The need for a wide variety of cosmetic products such as masks that require natural active ingredients provides an opportunity for the use of seaweed as a cosmetic ingredient. *Kappaphycus alvarezii*, one carrageenophytes, capable of forming a gel in the seaweed to produce good pasta. Ultraviolet radiation is one cause of skin damage all concerned in the cosmetic industry. These include skin damage is skin ageing, several changes in the skin, and skin cancer. Some studies found that some types of seaweed that have antioxidant potential can be applied in cosmetics. Applications antioxidants compounds in cosmetics have functioned as an anti-ageing, protection of body cells, bleach, and UV light protective. Mechanical processing products face mask with the addition of seaweed in BBP2HP through two phases, flouring processes raw materials and making processes seaweed facial mask. Face mask-making techniques with seaweed addition initiated by heating and mixing the oil phase, the aqueous phase, and filler. The addition of seaweed into the face mask can form a thermo-reversible gel that can stabilize the mask preparation and the result of mask-shaped is pasta.

1. Introduction
The utilization rate is estimated to have only reached 25%. Meanwhile, the types of seaweed owned by Indonesia are recorded as 555 types of seaweed [1]. This condition is an ample opportunity and challenge for the fisheries and marine sector to be able to exploit and develop the potential of existing marine resources such as seaweed. Processed products are diverse and have high selling value, and seaweed is also essential in the food, pharmaceutical, cosmetic, and food industries, paint, textiles, even the paper industry [2]. Some cosmetic products contain chemicals that are harmful to some consumers [3], causing some consumers to switch to products that use natural ingredients to avoid unwanted effects. The need for cosmetic products such as masks that require natural active ingredients provides an opportunity for the potential use of seaweed as a cosmetic base ingredient.

Red seaweed which is widely used is *Kappaphycus alvarezii* which is one of the carragaenophytes which is able to form a gel on seaweed to produce a good paste, producing fluorine starch [4]. Besides, the superiority of this type of seaweed is a fishery product that is currently being developed to become a superior
fishery product in the future. Based on this background, the report on fieldwork activities at the BBP2HP (Balai Besar Pengujian Penerapan Hasil Perikanan) Jakarta is to determine the technique of making seaweed masks of the K. alvarezi type, which is a type of processing non-consumption products that can increase the economic value of seaweed.

2. Material and methods
This research activity has been carried out at the BBP2HP Jakarta. This activity was carried out from January 2016 to February 2016. The method used in the Field Work Practice is observative and descriptive. Primary data were collected either through observation, interviews or active participation, among others, the making of K. alvarezi seaweed masks which includes how to select and process seaweed as a raw material for making masks, and the amount of seaweed flour yield. The collection of other primary data from the process of making seaweed masks is the amount and type of raw materials for seaweed masks.

3. Result and discussion
3.1. The technique of making face masks with the addition of K. alvarezi seaweed
The processing technique for seaweed mask products at BBP2HP goes through two stages; namely, the first is the process of collecting the raw materials for K. alvarezi seaweed and the second is the process of making the seaweed mask product K. alvarezi. The technique of making masks is done by heating and mixing, which begins with heating the ingredients. Oil phase and water phase in separate places, then mix both the oil phase and water phase ingredients and put the filler or filler material. The material formulation used by BBP2HP is divided into three phases, namely the oil phase, the water phase and the filler (Table 1).

| No | Ingredients            | Percentage (%) | Function                  |
|----|------------------------|----------------|---------------------------|
| 1  | Emulgade                | 6.0            | Emulsifier                |
| 2  | Acetil alcohol         | 2.5            | Emulsifier, Surfactant    |
| 3  | Paraffin liquid        | 2.0            | Emollient                 |
| 4  | Aquadest               | 70             | Solvent                   |
| 5  | Titan dioxide          | 10             | Sunblock                  |
| 6  | Metil Paraben          | 0.2            | Anti-bacteria             |
| 7  | Prophil Paraben        | 0.2            | Anti fungi                |
| 8  | Citrate acid           | 2.0            | Brightness and pH balance |
| 9  | TEA (Triethanolamine)  | 2.0            | Buffer, humectant, and polymer plasticizer |
| 10 | Extract Chamomile      | 2.0            | Skin smoothing and anti-ageing |
| 11 | Alkohol                | 2.0            | Parfume solvent           |
| 12 | Parfume                | 1.0            | Perfume                   |
| 13 | Milk                   | 2.0            | Brightness                |
| 14 | Seaweed Powder         | 4.0            | Antioxidant, gel-forming  |
| 15 | Premium BA (Bolus Alba)| 5.0            | filler                    |
| 16 | Premium ACA (Anti Cracking Agent) | 1.0 | Anti-coagulant |

3.2. Seaweed siege process
The K. alvarezi seaweed flour used is the result of drying the seaweed at the hall. The seaweed harvesting process begins with washing and soaking the dried seaweed, chopping, drying, and holding it. The process of washing and soaking dry seaweed aims to remove impurities that are still attached and soften the seaweed. Dried seaweed is soaked in water for three days of soaking, including 30% of quicklime at the last step of soaking. The seaweed drying process uses an oven with a temperature of 30-40°C with continuous monitoring to avoid burning the dried seaweed. The purpose of drying is to reduce the moisture content of the material to a limit where the development of microorganisms that can cause decay to stop, as well as changes due to enzyme activities, make the material not easily damaged so that it has more extended durability and facilitates further processing [5].

The weight was 85 grams, where the seaweed experienced a weight loss of 95.75% from the initial weight. The seaweed flouring process uses a stainless blender several times until a fine powder is obtained and then sieved. The seaweed flour sieve used is 200 μm in size [6]. The yield of seaweed flour from the sieving process is 3%, namely 60 grams of seaweed flour from a wet weight of 2 kg. This result is due to a decrease in weight during the shedding, drying, refining, sieving, and filtering processes. The colour of the seaweed flour produced is yellowish-white.

3.3. The manufacturing process of K. alvarezi seaweed face mask products

The technique of making masks is carried out by heating and mixing which begins with heating the oil phase and water phase, then mixing the oil phase and water phase, and final step was mixing with the components of the filler (Figure 1).

3.3.1. Oil phase

The oil phase is oil-soluble, usually acidic. The heating of the oil phase, which consists of emulgade, acetyl alcohol, and liquid paraffin is carried out by dissolving materials that have the same solubility point, namely at 90°C above the heater. The function of these three materials is as an emulsifier. The emulsifier is a surfactant that is able to reduce the interface tension of two phases, namely hydrophilic and hydrophobic molecules. Products that use a mixture of water and oil always use an emulsifier in the formulation [7].

3.3.2. Water phase

The liquid phase is a water-soluble material, usually alkaline. The liquid phase heating is carried out separately from the oil phase. The liquid phase consists of titan dioxide dissolved in aquadest, which is heated at 45°C above the heater. The addition of methylparaben and propylparaben after the mixture of ingredients is wholly mixed which functions as a preservative, while the addition of citric acid serves to maintain the pH of cosmetic preparations to remain the same during use and storage. The application of these ingredients is made to overcome the pH changes which are not expected to cause skin irritation in these cosmetic users [6].

3.3.3. Mixing oil and water phase

The mixing of the oil phase into the water phase is carried out by heating at a temperature that is not too different, namely 75°C to avoid phase separation. If the water phase is not the same temperature as the oil phase, then some wax or fat will become stable, so there is a separation between the water phase and the oil phase [8]. The addition of TEA to the beaker glass is carried out by continuously stirring the preparation because it affects the viscosity of the mask preparation. TEA is used as an anionic emulsifier and can produce oil-in-water emulsions that are homogeneous and stable [9]. The mixing process is continued by adding chamomile extract, alcohol, milk and perfume alternately as additional ingredients. The addition of milk to the mask also gives a white/bright and clean colour effect to the appearance of the mask and a softening effect on the mask's texture [6].
3.3.4. Filler

The last process is adding fillers, namely bolus alba, premium ACA and seaweed flour. Bolus alba functions as a brightening agent absorb perspiration and sebum, adds shine to the skin, due to its hygroscopic nature its use in cosmetics does not exceed 25% [10]. Premium ACA is silicon dioxide which acts as an anti-lump. As well as seaweed flour which is the main ingredient which in addition to containing antioxidant compounds also can form a gel thermo-reversible so that it can stabilize the mask preparation, the ability to form gels occurs when heated and allowed to cool because it contains 3,6-anhydro galactose groups [11]. The resulting mask is a mask in the form of a paste. Pasta is a semisolid preparation containing one or more medicinal ingredients intended for topical use. Pasta is a dense, stiff ointment that does not melt at body temperature and acts as a protective layer on the area being applied. The paste effect is stickier than powder. The paste form penetrates the skin layer [12].

3.4. Packaging of the product
The packaging used for the seaweed mask is a white mask pot. The choice is because the ingredients are safer to be stored in a tightly-closed container and protected from light. The use of natural cosmetic ingredients, mainly from marine products, is currently being developed [13]. The marine product that we have known for a long time as food is the type of seaweed _K. alvarezii_ [14]. This type of seaweed has become very popular because Indonesia's production is relatively high and has become a potential supplier of raw materials for the cosmetic industry abroad [15].

The development of domestic cosmetic products today also needs attention. Research on the use of active ingredients from marine products has begun to be widely carried out [16,17]. However, cosmetic products produced are still minimal. Various cosmetic products on the market, one of which is facial scrubs [18]. This product is quite famous for various reasons, it is not only affordable for the middle to the lower class but the benefits it has for its users as a skin cleanser and whitener have been felt.

In this research report, the scrub product with the addition of _K. alvarezii_ seaweed is a scientific report which is expected to encourage the domestic cosmetic industry to produce quality products. Essential findings from domestic scientists and industry support are expected to be able to provide an atmosphere for the development of cosmetics made from seaweed _K. alvarezii_ in the future. The yield of 2 kg of _K. alvarezii_ seaweed, only produces 60 grams (3%) which indicates that the water content in the seaweed is still very high [14]. Besides, the formulation of the scrubs produced was still mostly composed of some chemicals whose use had to be done carefully under the supervision of the BPOM. The most extensive composition (70%) is water, followed by titan dioxide (10%) as sunscreen. This facial mask is containing 4% of seaweed powder due to the primary function as a thickener, gel-forming, and antioxidants sources [16,17].

4. Conclusion
The processing technique for seaweed mask products at BBP2HP goes through two stages, the process of collecting the raw material for _K. alvarezii_ seaweed and the process of making the seaweed mask product _K. alvarezii_. The technique of making masks is done by heating and mixing, starting with heating the oil phase and water phase, then mixing the oil phase and water phase, and adding fillers or fillers. The yield of seaweed flour is 60 grams of seaweed flour (3%) from 2 kg of wet weight. Pasta is a form of the final product of the face mask.

5. References
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