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Extraction of Tannins Compound from Tingi Wood Bark Extract and It's Aplication on the Tanner Snapper Fish (Green Jobb-fish) Skin

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Abstract
The research objective is the extraction of tannins from tingi wood bark extract and it's application on the tanning of green job-fish (*Aprion virescens*) skin as raw material for commercial leather products. The factor that is used as a source of treatment is concentration of tingi bark extract with five treatments, respectively: 5.0% (a1) ; 7.5% (a2) ; 10.0% (a3) ; 12.5% (a4) ; 15.0% (a5) (interval 2.5%) with three replications. Statistical methods used to analyze data is Variant Analysis and Least Significant Difference Test. Leaher quality parameters was observed that the thickness (mm), tensile strength (N/cm^2), elongation (%), tear strength (N/cm), wrinkle temperature (ºC), enervation (mm), oil/fat content (%). The data were analyzed by analysis of variance and a real range test Duncan (Duncan Multiple Range Test / DMRT) at a significance level of 95%, and processed with SPSS version 18.
Based on the observations of a tanned leather sample, it is known that the Thickness value of the samples of treatment a1, a2, a3, a4, a5 respectively: 0.69 ; 0.61 ; 0.60 ; 0.69 ; 0.68 mm, Tensile strength: 639.75 ; 926.27 ; 923.13 ; 809.37 ; 753.51 N/cm^2, Elongation: 33.82 ; 35.70 ; 34.52 ; 38.10 ; 23.35%,Tear strength: 186.72 ; 341.37 ; 335.32 ; 431.39 ; 182.47 N/cm, Temperature wrinkle: 76.33 ; 76.00 ; 81.00 ; 83.33 ; 81,33ºC, Enervation: 1.79 ; 1.65 ; 1.72 ; 1.57 ; 1.75 mm, Oil/fat content: 6.70 ; 7.58 ; 7.95 ; 8.34 ; 7.87%. Based on the results of the overall analysis, all quality parameters to according the quality requirements SNI 06-4586-1988 about freshwater snake leather tanned chrome, with a 12.5% treatment of tingi bark extract liquid (a4) is the best treatment.
Keywords: concentration, quality, leather, skin, tannin, tingi bark extract, white snapper

1. Background

Indonesia has a diverse fishery potential that important economic value, one of the economically important fisheries commodities are snapper (red snapper, white and green Jobb-fish). Statistics of the Ministry of Maritime Affairs and Fisheries in 2012, showed that the production of white snapper from the year 2000 to 2010 experienced an average increase of 4.41% as many as 68 788 tonnes in 2000 and increased to 97 695 tonnes in 2010 (Anonymous, 2012). Along with increased production of the catch, the industrial activity in the production process filet of snapper to meet the needs of local consumers, national and international (particularly in the hotel, restaurant, bar and formal occasions) also increased. Increased of filet industrial activity that implications for the production of a byproduct of processing (such as skin, head, offal and fish bones) that often cause problems (especially pollution) environment. Along with advances in science and technology (science, technology, art and

culture) and innovation community, expected byproduct/waste industry can be utilized as a variety of derivative products (food and non-food) an important economic value (Sahubawa, et al. 2012).

Based on the results of field studies at the center of fishing and processing industry in East Java, Central Java, Bali and Yogyakarta, ± 20% of fish skins wastes only be used/processed into refined products with economic value as low as leather crackers /rambak (Rp 500 -1,000/seed); 40% mixed with household waste or food and agricultural products into animal feed (duck, pork, catfish) and flour at a price of Rp 1,000 to 2,000/kg using traditional and intermediate technology; 10% is processed with modern technology as the raw material of collagen and gelatin; 20% is processed into fish meal (Rp 3,000-4,500 / kg) with semimoderen or modern technology; and 10% is processed into tanned leather as raw material for commercial products and leather goods (Sahubawa and Bambang, 2011). Although the use of leather as a raw material is still limited, but it has enormous economic potential as it can be processed into products of commercial fish skin with a very high price. Utilization skin snapper as raw material for leather products (shoes, bags, wallets, key chains, belts and other accessories) is very suitable because it has the size (length, width and thickness) corresponding to the size of the product, as well as having economic potential is high because the product the resulting show motif (former scales) are very exotic and ascending (Sahubawa and Pertiwingrum, 2014). In addition to the above advantages, the use of snapper skin in the tanning industry and processing of products/goods commercial skin can increase the diversification of fishery products, source business field of new productive and labor absorption in large quantities, also in industrial handycraf, gloves and crafts other skin (Director of Dian Manda Yogyakarta, 2014).

Tanning is the process of maturation of rawhide that is labile (easily rotten/damaged due to the activity of bacteria) into the skin stable (as raw material for commercially leather products) using chemicals scraper protein and disposal of meat fat and skin tissue as well as materials tanner (mineral, chemical, vegetable/ natural) (Sahubawa and Pertiwiningrum, 2014). Tanned leather produced more resistant to mikorganisme activity and physicochemical damage. Mechanism tannery in principle is the inclusion of tanning material into the tissue and skin collagen fibers resulting in the chemical bonds between the collagen skin tanning substances. Due to this mechanism, as the skin collagen protein perishable tanner will react with the material so that the skin becomes stable (resistant to the effects of chemicals, microorganisms and physical) (Purnomo, 2001).

According Suparno et al. cit. Prastyanto (2001), in general the tanner material used in the production process tanned leather is a mineral (crom III sulfate), which is one type of tanner material that super reactive in meeting the industry's need for quality raw materials to process and capacity high production, but it does have a logical consequence of the pollution of the environment (human health, water, soil, water organism, water and microorganisms decomposers). Thus, the necessary alternative solutions to the use of non-mineral tanning materials (especially vegetable/natural) environmentally friendly, or a mixture of vegetable and synthetic/chemical as well as a mixture of vegetable and mineral) are very limited use in tanning leather industries.

During this time, the new vegetable tanning agent used is mimosa extract/powder which is extracted from acacia bark, whereas batik Indonesia has a lot to know other local plants (wood high, tegeran, jambal, jackfruit, tea, mangroves and so on etc.) that containing active compounds (tannins) which acts as a preservative and dye fabric, thread and leather. Cleaner plants classified as local resources are renewable, easily available, and it contains tannins of 18-40% (Anonymous, 2010). According Emiliana et al. (1999), the bark cleaner can be used as dyes and environmentally friendly alternative to tanning and leather dyes as a supplement ingredient in overcoming difficulties tanning materials imported during the monetary crisis. Tingi wood bark contains tannin which can produce a brown color, but used as a coloring agent, can be used as a tanner because of its ability to precipitate proteins without altering the physical and chemical properties of the skin.

This study uses primary raw materials (snapper skin) and natural tanning materials (tingi wood bark), with treatments that are tested varying concentrations of tingi bark extract liquid with five (5) the level of treatment,

respectively: 5.0%; 7.5%; 10.0%; 12.5% and 15.0%. Expected with treatment variations of concentration, the concentration can be seen best in the leather production of white snapper (green job-fish). Based on this background, the formulated research objectives as follows: (1) extraction and analysis of the levels of tannin from the tingi bark extract liquid, (2) study the physical and chemical characteristics of skin barramundi kind of tanner green jobb-fish and tingi bark extract liquid concentration that the best (optimal) in the tanning process of the white snaper skin and (3) application processing of tanner snapper leather as commercial products and leather goods.

2. Materials and Methods

2.1. Equipment and materials

Equipment used for the extraction of tannin from the tinggi wood bark, among others: the pot boiled capacity of 10 liters, compost and gas cylinders (heating), filter cloth, measuring cups capacity of 1 liter, plastic bucket capacity of 10 liters, separating funnel, and 1 unit of analysis levels tannins. Equipment tannery fish, among other things: gloves, spoon stirrer, masks, loyan and plastic buckets, measuring cups, thermometer, pH meter / litmus paper, analytical balance, the storage box shell fish, knife SKIVING, plastic tubs, pH paper, the unit leather tanning and finishing equipment (embossing machine, glazing machine, perenggang boards, stacking tool, tensile strength test macine, calipers, soxhlet, softness tester, eksikator, caliper, thickness gauge and shrinkage temperature tester).

The main materials/base used in the tanning process, among others: the bark extract high, fresh white snapper skin the kind of green job-fish, water, distilled water, sodium carbonate (Na_2CO_3), sodium bicarbonate / sodium bicarbonate ($NaHCO_3$), basintan RS-3, sodium sulfide (Na_2S), ammonium sulphate (ZA), Teepol, the indicator phenol ptyalin (pp), anti-fungal, lime ($CaOH_2$), formic acid (FA), sincal MS, katalix GS, binders, oropon (OR), sintan RP-2, oil sulfonation and salt (NaCl). Bark and bark extract height and skin fresh white snapper can be seen in Figure 1a, 1b and 2a, 2b.

2.2. Research Methods

2.2.1. Processing methods and analysis of fish skin quality

The method of processing fish skin as finished leather (raw material) products and leather goods are "tanning method", which consists of three (3) stages: stage pre-tanning, tanning and finishing. To determine the quality of finished leather (tanned) is used method of organoleptic for analysis of elongation and thickness, physical methods for the analysis of properties of enervation, tensile strength and tear strength, and chemical methods for the analysis of water content, oil/fat, chromium and others.

2.2.2. Methods of data analysis

The method used in the data analysis observations and measurement are statistical methods used in the study is the analysis of variants and Duncan Multiple Ranges Teste with a completely randomized design (CRD) single factor (Gaspersz, 1991), using 1 (a) factors as the source of the treatment is "concentration of tingi bark extract liquid" with 5 (five) treatments such as diebutkan in advance. Statistical analysis of the data processed by SPSS version 10.

(1). Concentration of the tingi bark extract liqued is 5.0% ……..... (a1)
(2). Concentration of the tingi bark extract liqued is 7.5% ……..... (a2)
(3). Concentration of the tingi bark extract liqued is 10.0% ……..... (a3)
(4). Concentration of the tingi bark extract liqued is 12.5% ……..... (a4)
(5). Concentration of the tingi bark extract liqued is 15.0% ……..... (a5)

2.3. Quality Parameters of Tanner Lether

Quality parameters of fish skin tanned analyzed are (1) physical quality (thickness, elongation, tensile strength, tear strength, enervation and temperature wrinkle), (2) the quality of the chemical (moisture, content oil/ fat) and (3) organolpetic quality (elongation).

2.4. Procedure for Implementation

2.4.1. Extraction of tingi wood bark

Tingi wood Bark destroyed with the machine shredded up into powder, filtered by sieve size of 60 mesh, extracted with water (comparison samples and water = 1: 4), boiled for 1 hour at 100°C, the cooking water filtered with gauze and paper strain.

2.4.2. Preservation of fresh snapper fish skin

White snapper leather raw materials ordered from CV. Bee Jay Seafoods, Probolinggo, East Java, in the form of fresh skin (wet) provisionally preserved with salt (NaCl), the way is the fish skin is washed with running water, drained for 25 minutes, arranged in a box of styrofoam is plated with a layer of salt + ice equally among leather, styrofoam box is kept in cold storage to maintain freshness for some time to use.

2.4.3. Tanning process (pre-tanning, tanning, finishing) fish skin

Stages of the process of "pre-tanning" consists of some fairly long process, include: the process of disposal of meat on the bottom surface of the fish skin, weighing the skin to determine the total weight, soaking in a solution of lime and teepol, protein removal treatment and erosion of fat. Stages tannery made up the tanning process, neutralization, re-tanning, anointment and fixation. Finishing stage consists of drying, stretching, sanding, glazing, plattening, ironing and tanned leather (leather finished).

3. Results and Discussion

3.1. Tannin content (%)

The treatments tested in this study have different levels of tannins, which increases with the addition of tingi bark extract liquid concentration (see Table 1). Based on test results, levels of tannin from tingi bark extract liquid is 36.38%. Levels of tannins in plants > 45% (quite good), 15-45% (enough), 10-15% (low) and <10% (approximately). Factors that determine the differences in the levels of tannin is the type of crop, soil and climate, plant age, origin and extraction method.

Tannins are phenolic compounds that can react with collagen protein to form insoluble complex compounds. Tannins are not soluble in organic solvents such as ether, chloroform, benzene, hexane but slightly soluble in ethyl acetate. Tannins are generally derived from plants, but some tannin also be obtained from the mineral. Tannins derived from the wood, bark, fruits, roots and leaves of plants/herbs. The skin of the plant has a production potential of tannin at most (Pratama, 2005).

3.2. Thickness of white snapper fish skin (kinds of green jobb-fish) (mm)

Based on the analysis of variance, it appears that the treatment of tingi bark extract liquid is tested in the tanning process does not significantly affect on the thickness value of white snapper skin sample (kinds of green jobb-fish) tanned at a significance level of 95% and 99%. This indicates that the tested treatment does not significantly influence changes in the thickness value of the tanner white snapper leather samples. The mean value of thickness from tanner leather sample ranging from 0.60 mm (a1) - 0.69 mm (a5), with the value of each treatment as shown in Figure 3. Value of thickness skin samples from all treatments meet the quality requirements recommended SNI 06 -4586-1988 of freshwater snake skin leather and SNI 06-4362-1996 chrome on chrome tanned lizard leather for shoe tops.

The mean value of the thickness of the skin samples snapper is greater than the sample thickness tanned leather carp mimosa 10% is equal to 0.30 mm (Hikmawati, 2012) and red tilapia tanned skin samples mimosa 10% amounting to 0.53% (Zidni, 2012) , According Untari et al. (2009), differences in thickness due to the ability of tannins that can enhance the content of the skin and fill the empty spaces of the fiber network so that more and thicker skin. Thickness will also affect the stability of the skin, where the skin sample stability is influenced by crosslinking formed between materials with protein kolegen tanning leather. Which have been tanned skin will

have a total crosslinking more than tanned skin is not so more able and resistant to gravity, tap and tear charged him, including boiling water (Purnomo 1992).

3.3. *Tensile strength (N/cm^2)*

Based on the analysis of variance, it appears that the treatment of tingi bark extract liquid concentration is tested in the tanning process does not significantly affect the tensile strength of tanner white snapper skin samples at a significance level of 95% and 99%. This indicates that the tested treatment does not significantly influence changes in the value of tensile strength of tanned leather samples. The mean value of the tensile strength of tanned leather samples ranged from 639.75 N / cm2 (a1) - 926.27 N / cm2 (a5), with the value of each treatment as shown in Figure 4. The tensile strength of skin samples from all treatment according to the quality requirements recommended by SNI 06-4586-1988 about freshwater snake skin leather chrome.

The mean value of the tensile strength of tanned white snapper skin samples produced higher when compared to the results of research Susanti (2006) which uses red snapper leather tanned mimosa 16% amounted to 904.97 N/cm^2, but lower when compared with the results Kuswanto (2009) which used red snapper leather tanned 20% recovery + 80% chrome that amounted to 1,057.77 N/cm^2, Astrida (2008) used tilapia leather with 10% mimosa that amounted 1,750.08 N/cm^2, Zidni et al., (2012) in the skin of red tilapia with mimosa treatment of 10% amounting to 1514.02 N/cm^2 and Wulansari (2010) by treatment with 2% chromium + 6% + 3% syntan mimosa on white snapper skin that amounted of 2,891.30 N/cm^2.

The tensile strength is the maximum amount of force required to pull the skin to break up expressed in N/cm^2 based on SNI 06-1795-1990. The quality of the collagen fibers that make up the skin determines the large-small tensile strength of leather tanned. Fahidin and Muslich (1999) states that the greater of the tanners dye molecules, the power absorption greader of the collagen fibers of the substance tanner. Vegetable tanning substances will react with collagen and improve the bonding between the fibers of the skin and skin structure change the fibers into a compact. According to Purnomo (1985), the skin is tanned with vegetable tanning materials will provide results that are less resistant to heat, his skin a little stiff, but tender and gives skin properties containing (solid), brown color and high tensile strength.

3.4. *Elongation (%)*

Based on the analysis of variance, it appears that the treatment fluid concentration Cleaner bark extract is tested in the tanning process does not significantly affect the value of elongation white snapper tanned leather samples at significance level of 95% and 99%. This indicates that the tested treatment does not significantly influence changes in the value of the tensile strength of skin samples of fish. The mean value of elongation of samples ranged from 25.35% (a1) - 38.10% (a5), with the value of each treatment as shown in Figure 5. The value enervation skin samples from all treatments meet the quality requirements recommended SNI 06-4362 -1996 on chrome tanned lizard leather for shoe tops.

Figure 5 shows the average value of elongation increased with addition of concentrations of tingi bark extract liquid. This indicates that the greater the concentration of tingi tanning materials is used, the higher the elongation value as more tannin that reacts with the collagen fibers. The mean value of elongation from tanner white snapper skin samples that produced higher when compared with Susanti (2006) with a value of elongation from red snapper skin samples tanned mimosa 16% amounting to 32.25% and Astrida (2008) on tilapia skin tanned mimosa 10% amounted to 24.67%, but lower when compared with Wulansari (2010) with 2% chromium + 6% syntan + 3% mimosa on white snapper amounted 78.00%, Hikmawati (2012) on the tilapia skin tanned mimosa 10% amounting to 74.67%, and Zidni et al., (2012) in the red tilapia skin tanned mimosa 10% amounting to 54.00%.

According Untari cit. Astrida (2008), elongation values are influenced by the large-small tanner material that penetrates and binds to collagen fibers. According to Purnomo (1985), the skin is tanned using vegetable tanning materials obtained skin containing, solid but rigid so low of elongation. The low elongation obtained on leather tanned with vegetable tanning is the result of increased bond the fibers of the skin by vegetable tanning materials and changing fiber into a compact structure of the skin. The compact structure of the skin which inhibits the

entry of oil as a relaxant, causing the skin to become stiff. Elongation associated with enervation skin/skin elasticity generated.

3.5. *Tear strength (N/cm)*

Based on the analysis of variance, it appears that the treatment of tingi bark extract fluid concentration is tested in the tanning process does not significantly affect the value of the power of the tanner white snapper leather samples at significance level of 95% and 99%. This shows that the using treatment no significant effect on change in value of tear strength from tanner leather samples. The mean value of tear strength from tanner white snapper skin samples ranged from 182.47 N/cm (a1) - 431.49 N/cm (a5), with the value of each treatment as shown in Figure 6. The tear strength of white snapper skin samples from all concentration according to the quality requirements recommended SNI 06-4586-1988 about freshwater snake skin leather tanned chrome.

Based on Figure 6 shows that the average value of tear strength of skin samples increased withing addition concentrations of tingi bark extract liquid. This gives an indication that the higher the concentration used, the more tannin which binds to collagen fibers. According Judoamidjojo (1981), collagen fibers act as a support mechanical causes in bone strength and tear resistance of the skin.

The mean value of tear strength from tanned leather samples produced higher than the skin samples of white snapper tanned 20% cromium recovery + 80% chromium that amounth 226.23 N/cm (Kuswanto 2009) and Astrida (2008) with 10% mimosa on tanner tilapia leather that amounted to 173.40 N/cm, but lower when compared with tilapia leather tanned mimosa 10% that amounting to 882.41 N/cm (Hikmawati, 2012), Zidni et al., (2012) in the red tilapia skin tanned mimosa 10% that amounting to 473 N/cm and white snapper leather tanned chrome 2% + 6% syntan + 3% mimosa amounted to 1,165.33 N/cm (Wulansari, 2010).

According Hikmawati (2012), tear strength differences may be caused by differences in the use of tanner raw materials, and physical processes in tanning. According to Purnomo (2001), leather that tanned vegetable has a tear strength which is smaller when compared to leather tanned chrome. The tear strength of skin is also influenced by the growth and development of fish (including the width of the skin and the cells that make up the skin) are made of collagen fibers make up the skin becomes more complex and powerful.

3.6. *Enervation (mm)*

Based on the analysis of variance, it appears that the treatment of tingi bark extract liquid is tested in the tanning process does not significantly affect the value of enervation of tanner white snapper leather samples at significance level of 95% and 99%. This indicates that the tested treatment does not significantly influence changes in the enervation value of fish skin samples. The mean value of enervation from white tanner snapper skin samples ranges: 1.57 mm (a1) - 1.79 mm (a5), with the value of each treatment as shown in Figure 7.

Figure 7 shows the average value of enervation that resulting from each treatment is relatively the same. The mean value of enervation of tanner leather samples that lower than the value of the enervation of white snapper skin samples tanned mimosa 10% that amounted 2.15 mm (Astrida 2008), white snapper skin tanned a concentration of 2% chromium + 6% syntan + 3% mimosa that amonted 4.24 mm (Wulansari 2010), red tilapia skin tanned mimosa 10% of 2.09 mm (Zidni, et al., 2012), and red snapper skin tanned mimosa 16% amounted 3.25 mm (Susanti, 2006).

One phase tanning that important influence on the level of the enervation of skin is the process of anointment. Anointment process aims to incorporate the oil into the structure of the skin so the skin has a good thrust to water. In addition, the anointment aims to get the skin more supple, flexible, soft and has high elongation in accordance with the product/leather goods are processed (Purnomo, 2001). Tanning process results in the skin tissue into the open so that facilitate the penetration of substances or materials into tanner skin collagen fibers making the skin more stable and limp.

3.7. *Wrinkle temperature (ºC)*

Based on the analysis of variance, it appears that the treatment of tingi bark extract liquid concentration is tested in the tanning process significantly affect on the wrinkle temperature of the tanner white snapper skin sample at the significance level of 95% and 99%. This shows that the treatment is tested significantly influence changes in

wrinkle temperature values of fish wrinkle skin. The mean of wrinkle temperature values of tanner leather samples ranged from 76.33^{0}C (a1) - 83.33^{0}C (a5), with the value of each treatment as shown in Figure 8. The wrinkle temperature value of skin samples from all treatments that according to the quality requirements Recommended SNI 06-4586-1988 about freshwater snake leather tanned chrome.

Figure 8 shows the mean wrinkle temperature value of each treatment increased with the addition concentrations of tingi bark extract liquid, meaning that the higher the concentration of the tinggi bark extract liquid, more tannin which binds to collagen fibers. This indicates that the wrinkle temperature of skin samples was strongly influenced by the concentration of tanning materials. Based on the results DMRT, was significantly different from the treatment a1 a3, a4 and a5, but not significantly different a1 a2 and a3 to a5 are not significantly different (Figure 8). The wrinkle temperature values of black tilapia skin samples tanned mimosa concentration of 10% is equal 66,00ºC (Prastyanto, 2011), white snapper skin tanned a concentration of 2% chromium + 6% syntan + 3% mimosa for 99,50ºC (Wulansari, 2010), tilapia skin tanned mimosa 10% amounted 86,33ºC (Astrida, 2008), red tilapia skin tanned mimosa 10% of 80,00^{o}C. Wrinkle temperature values of tanner white snapper skin samples higher than the skin samples of the red tilapia tanned mimosa (Prastyanto 2011 and Zidni, et al., 2012), but lower than the sample tanned leather produced Wulansari (2010) and Astrida (2008). According Kurniani cit. Astrida (2008), the wrinkle temperature is closely related to the maturity skin. The more mature skin, the higher the wrinkle temperature of the skin sample so that the quality of skin resistance to heat (hydrothermal) higher. According to Covington et al *cit*. Wulansari (2010), the amount of hydrothermal resistance of tanner leather is influenced by the type and amount of material that binds to a protein tanning leather. Temperature wrinkle is a skin condition occurs when collagen shrinkage due to the broken structure of collagen fibers by heating extreme conditions (Sarkar, 1995).

3.8. *Oil/fat content (%)*

Based on the analysis of variance, it appears that the treatment of tingi bark extract liquid is tested in the tanning process significantly affect the amount of oil/fat from tanner white snapper leather samples at significance level of 95% and 99%. This shows that the treatment is tested that significantly influence on the changes of oil/fat content of the fish skin samples. The mean levels of oil/fat from tanner leather samples ranged from 6.70% (a1) - 8.34% (a5), with the value of each treatment as shown in Figure 9. Levels of oil/fat skin samples from all treatments according to the quality requirements Recommended SNI 06-4586-1988 about freshwater snake tanned leather chrome tanning.

Figure 9 shows the average value of the amount of oil/fat has increased along with the addition of liquid concentration of tingi bark extract up to 12.5%. According Untari et al. cit. Prastyanto (2011), the fat content test aims to determine the amount of absorption of tanning materials for fat content (especially natural fats) affect the ability of tanning ingredients penetrate into the fish collagen fibers. The greater the level of oil/fat (especially those that exceeded the maximum limit), can inhibit the entry of tanner into the skin tissue. DMRT test results showed that the concentration of tingi extract liquid of 12.5% that produce high levels of oil/fat highs. Levels of oil/fat is high can cause discomfort to the user of the product as it will undergo oxidative reactions and lead to rancidity.

Levels of oil/fat from tanner white snapper skin samples produced higher than of red tilapia leather tanned chromium concentration of 20% recovery + 80% chromium fresh produce fat content of 7.81% (Kuswanto, 2009), but lower than the red tilapia skin tanned mimosa 10% amounted to 9.37% (Zidni et al. 2013), white snapper skin tanned 2% chromium + 6% syntan + 3% mimosa 10.60% (Wulansari 2010), carp leather tanned mimosa 10% amounted 28.61% (Hikmawati, 2012), as well as black tilapia skin tanned mimosa 10% amounting to 21.36% (Prastyanto, 2011). According Poedjiadi (1994), the levels of oil/ fatis influenced by the stage of anointment due to the penetration of oil into the leather webbing which serves to enhance the skin enervation.

4. Conclusions and Recommendation

4.1. *Conclusions*

a. Levels of tannins produced from tingi wood bark extract liquid amounted to 36.38%.

b. The best treatment is generated in this study is the concentration of the tingi wood bark extract liquid is 5.0% because the value of the physical parameter testing (thickness, elongation, tear strength, enervation and wrinkle temperature) for all treatments according to the SNI 06-4586-1988 about fresh water snake lether tanned chrome, except tensile strength properties.
c. Levels of oil/fat from all treatments according to the SNI 06-4586-1988 about fresh water snake leather tanned chrome.

4.2. Recomendation

a. Need further research using other vegetable tanning materials that contain enough tannin greatest.
b. Required the use of treatment with a tingi extract liquid concentration that greater intervals in order to obtain a significant difference.

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Tabel 1. Tannin compound content in the every treatments

No	Treatments (%)	Tingi Bark Extract Liquid (ml)	Tannin Content (gr)
1	5.0	16.0	0.3961
2	7.5	22.5	0.5571
3	10.0	34.0	0.8418
4	12.5	50.0	1.2380
5	15.0	112.5	2.7855

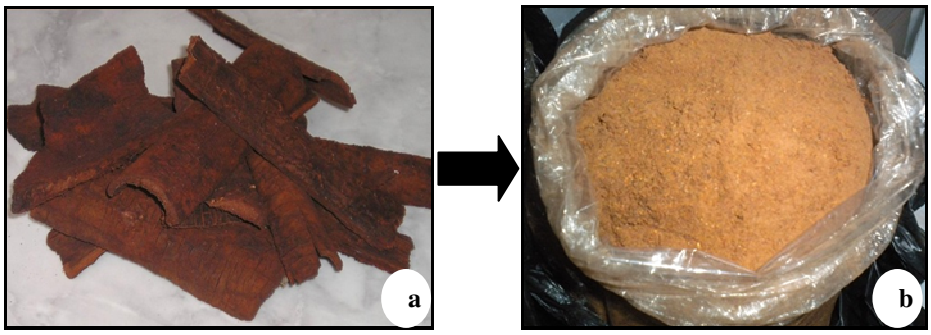

Figure 1: (a) Sample of tingi wood bark, (b) local tingi wood bark crushed (Indonesia)

Figure 2. (a) fresh white snapper fish skin, (b) leather tanned

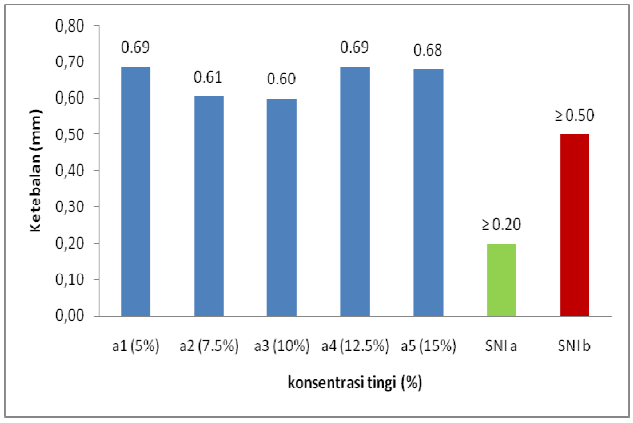

Figure 3. The average value of the thickness of white snapper skin sample tanned tingi bark extract liquid
description:
SNI a : SNI 06-4586-1988 about freshwater snack skin tanned crome
SNI b : SNI 06-4362-1996 about lizard-skin leather for shoe tops

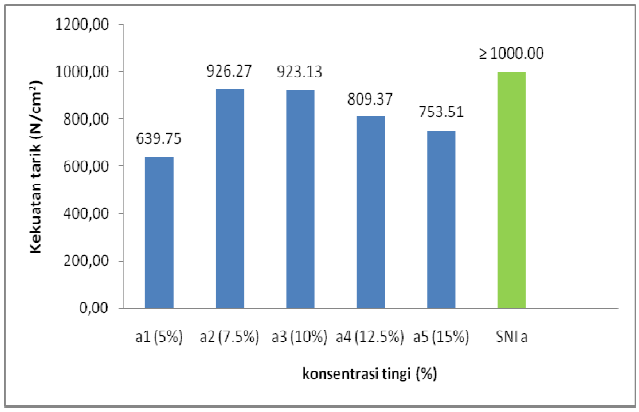

Figure 4. The average value of the tensile strength of snapper skin sample tanned tingi bark extract liquid
Description:
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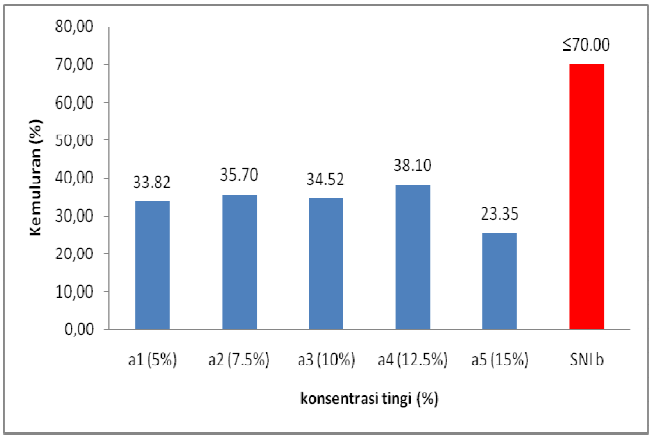

Figure 5. The average value of the elongation of white snapper skin sample tanned tingi bark extract liquid
Description: SNI b : SNI 06-4362-1996 about lizard-skin leather for shoe tops

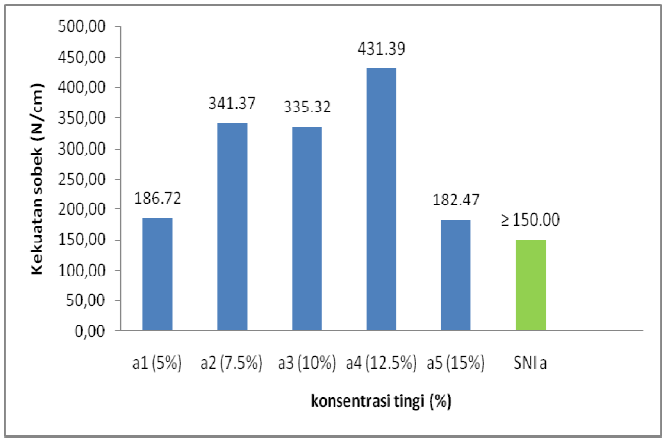

Figure 6. The average value of the tear strength of white snapper skin sample tanned tingi bark extract liquid
Description: SNI a : SNI 06-4586-1988 about freshwater snack skin tanned crome

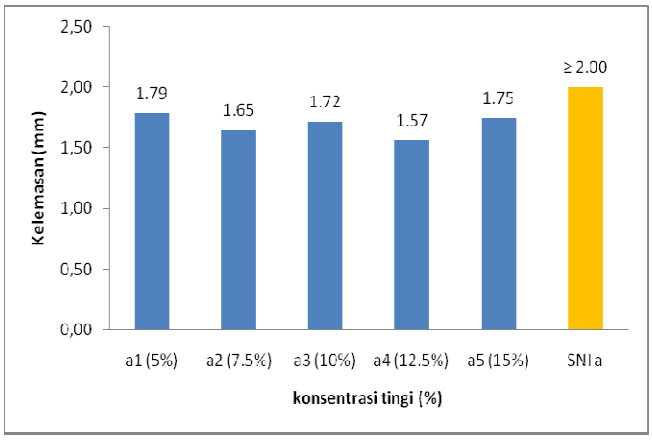

Figure 7. The average value of the enervation of white snapper skin sample tanned tingi bark extract liquid
Description: *Keterangan : Burk's Bay : enervation value for shoe tops and suede leather*

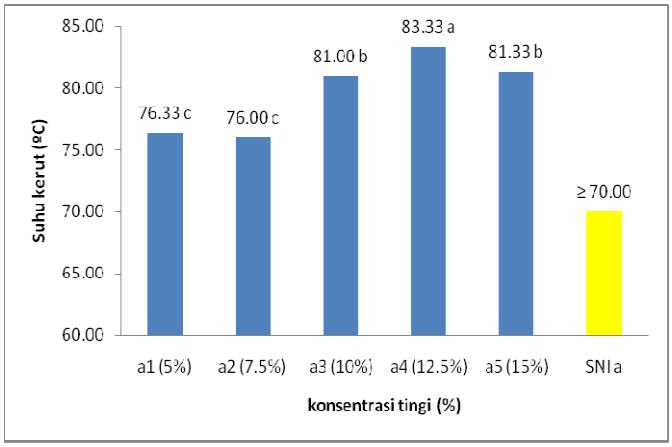

Figure 8. The average value of the wrinkle temperature of white snapper skin sample tanned tingi bark extract liquid
Description: SNI a : SNI 06-4586-1988 about freshwater snack skin tanned crome

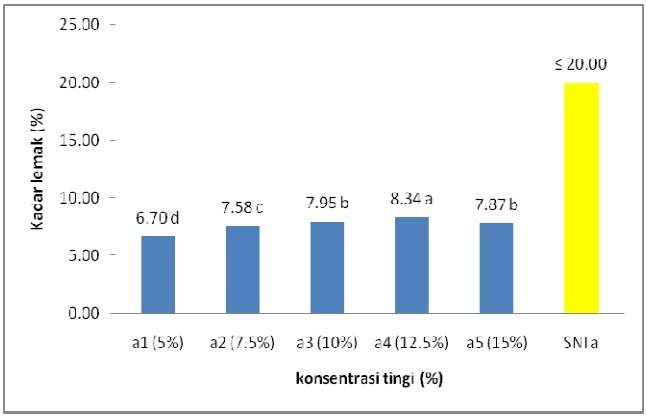

Figure 9. The average value of the oil/fat content of white snapper skin sample tanned tingi bark extract liquid

Description: SNI a : SNI 06-4586-1988 about freshwater snack skin tanned crome