Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.7, No.18, 2017

Tannin Compound Extraction of Tingi Wood Bark and Its Aplication on the White Snapper Skin Tanning (Green Jobb-fish) as a Raw Material of Leather Creative Product

Vanny Ryny Lasmauly[1] Latif Sahubawa[1*] Ambar Pertiwiningrum[2] Emeliana[3] Ustadi[1]
1.Fisheries Sciences Depertement, Agriculture Faculty, Gadjah Mada University, Yogyakarta
2.Animal Sciences Faculty, Gadjah Mada University, Yogyakarta
3.Institute of Leather, Rubber and Plastics, Yogyakarta
Jl. Flora No. 01, Kampus GMU Bulaksumur, Yogyakarta-Indonesia PO. Box. 55281

Abstract
The research objective is the extraction of tannins from tingi wood bark and its application on the tanning of white snapper skin (green jobb-fish) as a raw material for commercial leather products. The factor that used as a source of treatment is concentration of tingi wood bark extract with 5 treatments, respectively: 5.0% (a1), 7.5% (a2), 10.0% (a3), 12.5% (a4) and 15.0% (a5) (interval 2.5%) with 3 replications. Leaher quality parameters was observed consist of: Thickness (mm), Enervation (mm), Elongation (%), Tensile strength (N/cm^2), Tear strength (N/cm), Wrinkle temperature (ºC) and Oil/fat content (%). The data were analyzed by analysis of variance and a real range test Duncan (Duncan Multiple Range Test) 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 tanners snapper leather samples of treatment a1, a2, a3, a4 and a5 respectively: 0.60, 0.61, 0.60, 0.69 and 0.68 mm ; **Enervation**: 1.79, 1.65, 1.72, 1.57 and 1.75 mm ; **Elongation**: 33.82, 35.70, 34.52, 38.10 and 23.35 % ; **Tensile strength**: 639.75, 926.27, 923.13, 809.37 and 753.51 N/cm^2 ; **Tear strength**: 186.72, 341.37, 335.32, 431.39 and 182.47 N/cm ; **Wrinkle temperature**: 76.33, 76.00, 81.00, 83.33 and 81.33 ºC ; **Oil/fat content**: 6.70, 7.58, 7.95, 8.34 and 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 a4 treatment (12.5% of tingi wood bark extract) is the best treatment.
Keywords: concentration, extract, tannin, quality, leather, tingi wood bark, white snapper

1. Background

Indonesia has a diverse fishery potential that important economic value, one of the economically important fisheries commodities are snapper fish (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 leather, head, offal and fish bones) that often cause problems (environmental pollution). 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, approximately 20% of fish skins wastes that only be processed into refined products with economic value as low as leather crackers (Rp 500 to 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 to 4,500/kg) with semimoderen or modern technology and 10% is processed into tanned leather as raw material for commercial products (Sahubawa and Bambang, 2011). Utilization of snapper skin 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 leather in the tanning industry and processing of goods commercial leather products can increase the diversification of fishery products and source business field of new productive in large quantities, also in industrial handycraf, gloves and crafts other leather (Director of Dian Mandala Yogyakarta, 2014).

Tanning is the process of maturation of rawhide that is labile into the leather stable (as raw material for commercially leather products) using chemicals materials and disposal of meat fat and leather 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 collagen fibers of the skin thus forming a chemical bond between the collagen leather tanning substances. Due to this mechanism, as the leather collagen protein perishable tanner will react with the material so that the leather 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 processing of 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/other local plants (tingi wood, 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% to 40% (Anonymous, 2010). According Emiliana et al. (1999), 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 leather.

This study uses primary raw materials (snapper leather) and natural tanning materials (tingi wood bark), with treatments that are tested varying concentrations of tingi bark extract with 5 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 tingi wood bark extract, (2) study the physical and chemical characteristics of white snapper leather and tingi wood bark extract concentration that the best (optimal) in the tanning process of the white snaper leather and (3) application processing of tanner snapper leather as commercial products.

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, 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 leather, water, distilled water, sodium carbonate (Na_2CO_3), 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 protein, oropon (OR), sintan RP-2, sulfonation oils and salt (NaCl). Tingi wood bark and its extract likewise fresh white snapper skin and tanned leather can be seen in Figure 1 and 2.

2.2. Research Methods

2.2.1. Processing methods and analysis of fish leather quality

The method of processing fish leather 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 one factor as the source of the treatment is "concentration of tingi wood bark extract" with five treatments. Statistical analysis of the data processed by SPSS program version 10.

(1). Concentration of the tingi wood bark extract is 5.0% ……..... (a1)

(2). Concentration of the tingi wood bark extract is 7.5% ..... (a2)
(3). Concentration of the tingi wood bark extract is 10.0% ..... (a3)
(4). Concentration of the tingi wood bark extract is 12.5% ..... (a4)
(5). Concentration of the tingi wood bark extract is 15.0% ..... (a5)

2.3. Quality Parameters of Tanner Lether

Quality parameters of fish leather 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 skin

White snapper leather raw materials ordered from CV. Bee Jay Seafoods, Probolinggo, East Java, in the form of fresh leather (wet) provisionally preserved with salt (NaCl), the way is the fish leather 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) of snapper 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 leather, weighing the leather 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 concentration (see Table 1). Based on test results, levels of tannin from tingi wood bark extract 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 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 leather of the plant has a production potential of tannin at most (Pratama, 2005).

3.2. Thickness (mm)

Based on the analysis of variance, it appears that the treatment of tingi wood bark extract is tested in the tanning process does not significantly affect on the thickness value of tanner white snapper leather sample (*green jobb-fish*) 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) to 0.69 mm (a5), with the value of each treatment as shown in Table 2. The thickness value of leather samples from all treatments meet the quality requirements recommended SNI 06 -4586-1988 of freshwater snake leather tanned chrome and SNI 06-4362-1996 lizard leather for shoes tops.

The mean value of the thickness of the white snapper leather samples is greater than leather carp sample tanned mimosa 10% is equal to 0.30 mm (Hikmawati, 2012) and red tilapia leather samples tanned 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 leather and fill the empty spaces of the fiber network so that more and thicker leather. Thickness will also affect the stability of the leather, where the leather sample stability is influenced by crosslinking formed between tanner materials with leather collagen protein. Which have been tanner leather will have a total crosslinking more than tanner leather is not so more able and resistant to gravity, tap and tear charged him, including boiling water (Purnomo 1992).

3.3. Elongation (%)

Based on the analysis of variance, it appears that the concentration of tingi wood bark extract is tested in the tanning process does not significantly affect on the value of elongation of tanners white snapper 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 leather samples. The mean value of elongation of samples ranged from 25.35% (a1) to 38.10% (a5), with the value of each treatment as shown in Table 2. The value elongation of leather samples from all treatments meet the quality requirements recommended SNI 06-4362 -1996 on the lizard leather for shoe tops tanned chrome. Table 2 shows that the average value of elongation increased with addition of concentrations of tingi wood bark extract. This indicates that the greater the concentration of tanners 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 leather samples that produced higher when compared with Susanti (2006), where a value of elongation from red snapper leather samples tanned mimosa 16% amounting to 32.25% and Astrida (2008) on tilapia leather tanned mimosa 10% amounted to 24.67%, but lower when compared with Wulansari (2010), where mixture of chromium 2%, syntan 6% and mimosa 3% amounted 78.00% on white snapper sampeles, Hikmawati (2012) on the tilapia leather tanned mimosa 10% amounting to 74.67%, and Zidni et al, (2012) in the red tilapia leather tanned mimosa 10% amounting to 54.00%.

According Untari cit. Astrida (2008), elongation values are influenced by the concentration of tanner material that penetrates and binds to collagen fibers. According to Purnomo (1985), the leather that tanned with vegetable tanning materials obtained leather containing, solid but rigid so low of elongation. The low elongation obtained on leather tanned with vegetable tanning materials the result of increased bond the fibers of the leather by vegetable tanning materials and changing fiber into a compact structure of the leather. The compact structure of the leather which inhibits the entry of oil as a relaxant, causing the leather to become stiff. Elongation associated with enervation leather (leather elasticity generated).

3.4. Enervation (mm)

Based on the analysis of variance, it appears that the treatment of tingi wood bark extract 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 leather samples. The mean value of enervation from tanner white snapper leather samples ranges from 1.57 mm (a1) to 1.79 mm (a5), with the value of each treatment as shown in Table 2. Table 2 shows that the average value of enervation that resulting from each treatment is relatively the same. The mean value of enervation of leather samples that lower than the value of the enervation of white snapper leather samples tanned mimosa 10% that amounted 2.15 mm (Astrida 2008), white snapper leather sample that tanned mixture of chromium 2%, syntan 6% and mimosa 3% that amonted 4.24 mm (Wulansari 2010), red tilapia leather tanned mimosa 10% that amounted 2.09 mm (Zidni, et al., 2012) and red snapper leather sample tanned mimosa 16% that amounted 3.25 mm (Susanti, 2006).

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

3.5. Tensile strength (N/cm^2)

Based on the analysis of variance, it appears that the treatment of tingi wood bark extract concentration is tested in the tanning process does not significantly affect the tensile strength of tanner white snapper leather 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/cm^2 (a1) to 926.27 N/cm^2 (a5), with the value of each treatment as shown in Table 2. The tensile strength of leather samples from all treatment according to the quality requirements recommended by SNI 06-4586-1988 about freshwater snake leather tanned chrome.

The mean value of the tensile strength of tanner white snapper leather samples that produced higher when compared to the results of research Susanti (2006) which uses red snapper leather tanned mimosa 16% is amounted to 904.97 N/cm^2, but lower when compared with the Kuswanto (2009) which used red snapper leather tanned mixture of crome recovery 20% and chrome 80% that amounted to 1,057.77 N/cm^2, Astrida (2008) used tilapia leather with 10% of mimosa that amounted to 1,750.08 N/cm^2, Zidni et al., (2012) in the red tilapia leather tanned 10% of mimosa, amounting to 1,514.02 N/cm^2 and Wulansari (2010) by mixture of chromium 2%, syntan 6% and mimosa 3% on white snapper leather that amounted to 2,891.30 N/cm^2.

The tensile strength is the maximum amount of force required to pull the leather to break up expressed (N/cm^2) based on SNI 06-1795-1990. The quality of the collagen fibers that make up the leather determines the large-small tensile strength of tanner leather. Fahidin and Muslich (1999) states that the greater of the tanners dye molecules, the power absorption greader of the collagen fibers of the tanner materials. Vegetable tanning

materials will react with collagen and improve the bonding between the fibers of the leather and leather structure change the fibers into a compact. According to Purnomo (1985), the leather is tanned with vegetable tanning materials will provide results that are less resistant to heat, his leather a little stiff, but tender and gives leather with properties that dense-filled (solid), brown color and high tensile strength.

3.6. Tear strength (N/cm)

Based on the analysis of variance, it appears that the treatment of tingi wood bark extract 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 leather samples ranged from 182.47 N/cm (a1) to 431.49 N/cm (a5), with the value of each treatment as shown in Table 2. The tear strength of white snapper leather samples from all concentration according to the quality requirements recommended SNI 06-4586-1988 about freshwater snake leather tanned chrome. Based on Table 2, shows that the average value of tear strength of leather samples increased withing addition concentrations of tingi wood bark extract. This gives an indication that the higher of concentration that 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 leather.

The mean value of tear strength from tanner leather samples produced higher than the leather samples of white snapper tanned mixture of cromium recovery 20% and chromium 80% that amounth 226.23 N/cm (Kuswanto 2009) and Astrida (2008) with 10% mimosa on tilapia leather that amounted to 173.40 N/cm, but lower when compared with black tilapia leather tanned mimosa 10% that amounted to 882.41 N/cm (Hikmawati, 2012), Zidni et al., (2012) in the red tilapia leather tanned mimosa 10% that amounted to 473 N/cm and white snapper leather tanned mixture of chrome 2%, syntan 6% and mimosa 3% that 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 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 leather is also influenced by the growth and development of fish (including the width of the leather and the cells that make up the leather) are made of collagen fibers make up the leather becomes more complex and powerful.

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 leather 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 leather. The mean of wrinkle temperature values of tanner leather samples ranged from 76.33^{0}C (a1) to 83.33^{0}C (a5), with the value of each treatment as shown in Table 2. The wrinkle temperature value of leather samples from all treatments that according to the quality requirements Recommended SNI 06-4586-1988 about freshwater snake leather tanned chrome.

Table 2 shows that the mean of wrinkle temperature value of each treatment increased with the addition concentrations of tingi wood bark extract, meaning that the higher the concentration of the tinggi wood bark extract, more tannin which binds to collagen fibers. This indicates that the wrinkle temperature of leather samples was strongly influenced by the concentration of tanning materials. Based on the DMRT results, 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 (see Table 2). The wrinkle temperature values of black tilapia leather samples tanned mimosa 10% is equal 66.00ºC (Prastyanto, 2011), white snapper leather tanned mixture of chromium 2%, syntan 6% and mimosa 3% that ammounted to 99,50ºC (Wulansari, 2010), tilapia leather tanned mimosa 10% amounted 86.33ºC (Astrida, 2008), red tilapia leather tanned mimosa 10% of 80.00^{0}C. Wrinkle temperature values of tanner white snapper leather samples higher than the leather samples of the red tilapia tanned mimosa (Prastyanto 2011 and Zidni, et al., 2012), but lower than the sample tanner leather that produced Wulansari (2010) and Astrida (2008). According Kurniani *cit.* Astrida (2008), the wrinkle temperature is closely related to the maturity leather. The more mature leather, the higher the wrinkle temperature of the leather sample so that the quality of leather 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 by protein in the leather. Temperature wrinkle is a leather 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 wood bark extract 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 leather samples. The mean levels of oil/fat from tanner leather samples ranged from 6.70% (a1) to 8.34% (a5), with the value of each treatment as shown in Table 2. Levels of oil/fat leather samples from all treatments according to the quality requirements Recommended SNI 06-4586-1988 about freshwater snake leather tanned chrome.

Table 2 shows that the average value of the amount of oil/fat has increased along with the addition of concentration of tingi wood 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 leather tissue. DMRT test results showed that the 12.5% of tingi wood bark extract that produce high levels of oil/fat content. 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 leather samples produced higher than of red tilapia leather tanned mixture of chromium recovery 20% and chromium 80% fresh produce fat content of 7.81% (Kuswanto, 2009), but lower than the red tilapia leather tanned mimosa 10% amounted to 9.37% (Zidni et al. 2013), white snapper leather tanned mixture of chromium 2%, syntan 6% and mimosa 3% that amounted to 10.60% (Wulansari 2010), carp leather tanned mimosa 10% that amounted to 28.61% (Hikmawati, 2012), as well as black tilapia leather tanned mimosa 10% that amounted to 21.36% (Prastyanto, 2011). According Poedjiadi (1994), the levels of oil/fat influenced by the stage of anointment due to the penetration of oil into the leather webbing which serves to enhance the leather enervation.

4. Conclusions and Recomendation

4.1. Conclusions

Levels of tannins produced from tingi wood bark extract that amounted to 36.38%.The best treatment is generated in this study is the concentration of the tingi wood bark extract is 12.5% (a4) 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. Levels of oil/fat from all treatments according to the SNI 06-4586-1988 about fresh water snake leather tanned chrome.

4.2. Recomendation

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

Acknowledgements

This work was financially supported by the Institution Cooperation Research Grant, Dirlitabmas, Dikti Jakarta. Thank you presented to the Honorable Mr. Sahubawa et al, roomates Gives us the opportunity to help carry out research in the completion of my studies, and technician of FishTechnology Laboratory, Animal Feed and Nutrition Laboratory, Department of Fisheries Science, Faculty of Agriculture, Gadjah Mada University who has helped smooth the study.

Figure 1: (a) Tingi wood bark (a) and its extract sample (b)

Figure 2. (a) fresh white snapper skin (*green jobb-fish species*) & (b) tanned leather

Tabel 1. Content of tannin compounds in the every treatments

No	Treatments (%)	Tannin Content (%)
1	5.0 (a1)	0.3961
2	7.5 (a2)	0.5571
3	10.0 (a3)	0.8418
4	12.5 (a4)	1.2380
5	15.0 (a5)	2.7855

Table 2. Average of quality parameters value of white snapper leather (*green jobb-fish*) tanned tingi wood bark extract

Quality Parameters	**Unit**	**Treatments (Tingi wood bark extract, %)**					**Value Range**	**Best Treatment**	**SNI.a***	**SNI.b***
		a1 (5.0)	**a2** (7.5)	**a3** (10.0)	**a4** (12,5)	**a5** (15.0)				
1. Thickness	mm	0.60	0.61	0.60	0.69	0.68	0.60-0.69	a4	≥ 0.2	≥ 0.5
2. Enervatio	mm	1.79	1.65	1.72	1.57	1.75	1.75	a1	≥ 0.2	-
3. Elongation	%	33.82	35.70	34.52	38.10	23.35	23.35-38.10	a4	-	30-70
4. Tensile strength	N/cm^2	639.75	926.27	923.13	809.37	753.51	639.75-926.27	a2	≥ 1.000	-
5. Tear strength	N/cm	186.72	341.37	335.32	431.39	182.47	182.47-431.39	a4	≥ 150.0	-
6. Wrinkle temperature	^0C	76.33	76.00	81.00	83.33	81.33	76.00-83.33	a4	≥ 70,0	-
7. Oil/fat content	%	6.70	7.58	7.95	8.34	7.87	6.70-8.34	a1	≤ 20,0	-

Note *a : SNI 06-4586-1988 about freshwater snake skin tanned chrome
*b : SNI 06-4362-1996 about lizard-leather for shoe tops

REFERENCES

Anonym. (2011), Strategic Plan of the Ministry of Marine Affairs and Fisheries, Years 2010-2014. Ministry of Marine Affairs and Fisheries, Jakarta-Indonesia.

Anonym. (2010), Product Processing Research Institute and Biotechnology, Marine and Fisheries Research Agency (BBRPPB-BRKP), Jakarta. Waste Processing Fish Leather So Craft. <http://www. bbrp2b. dkp. go.id/en/tag/kulit.ikan/>. Accessed on March 17, 2012.

Anonym. (2012), National Fisheries Statistics. Directorate General of Capture Fisheries, Ministry of Marine Affairs and Fisheries, Jakarta-Indonesia.

Astrida, M. (2008), Effect of Mimosa Extract on the Quality of Tanned Red Tilapia Leather. Research Report, Depertement of Fisheries Sciences, Faculty of Agriculture, Gadjah Mada University, Yogyakarta-Indonesia.

[BSI, 1988], SNI 06-4586-1988 about Freshwater Snake Lether Tanned Chrome. Indonesian Standarization Commite, Jakarta.

Director of Dian Manda Yogyakarta. (2014), Strategy Development and Marketing of Commercial Stringray Leather Product. Short Discussion, Aspects of Business Development of Goods Commercial Leather

Products in the Framework of the Free Trade Area/MEA.
Emiliana, E. (1999), Inventory of Natural Dyes from Local Plant for Leather Industry. Internal Technical Reports of Balai Besar Kulit, Karet and Plastik Yogyakarta.
Fahidin and Muchlis. (1999), Science and Technology Leather. Faculty of Technology and Mechanization. Agriculture. IPB Bogor.
Gasperz, V. (1991), Designers Method Experiment. CV. Amrico, Bandung.
Hikmawati, F. (2012), The Effect of Mimosa Extract Concentration on the Tanning Goldfish Lether Quality and It's Aplication as Raw Material on Wallet Processing. Research Report, Depertement of Fisheries Sciences, Faculty of Agriculture, Gadjah Mada University, Yogyakarta-Indonesia.
Judoamidjojo, R.M. (1981), Basic Technology and Chemical Peels. Fishery Product Technology. Bogor Agricultural Institute. Bogor.
Kuswanto, H. (2009), Reuses the Chrome of Retanning Step on the Red Tilapia Leather Tenned. Research Report, Depertement of Fisheries Sciences, Faculty of Agriculture, Gadjah Mada University, Yogyakarta-Indonesia.
Nugraha, G. (1999), Utilization Tanin From Bark Acacia (Acacia mangium, Willd) as Vegetable Tanning Materials. Research Report, Faculty of Agricultural Technology. Bogor Agricultural Institute. Bogor-Indonesia.
Prastiyanto, I. (2011), Utilization of Black Tilapia Leather Tanned Mimosa Extract as Raw Material of Gloves Golf Prepared. Research Report, Depertement of Fisheries Science, Faculty of Agriculture. Gadjah Mada University, Yogyakarta-Indonesia.
Pratiwi, M.A. and Sutanti, S. (2005), Time The Effect of Extrction Time and Solvent Concentration on the Yield of Dye Compound of Tingi and Jambal Wood. Scientific Magazine of Region VI Kopertis. Volume XV Number 23: 56-60.
Purnomo. (1985), Basic Knowledge of Tannery Technology. Leather Technology Academy. Yogyakarta.
Purnomo. (1992), Chicken Leg Tannery. Kanisius Press, Yogyakarta-Indonesia.
Purnomo. (2001), Appropriate Technology of Stringrays Tannery. Kanisius Press. Yogyakarta-Indonesia.
Susanti, M. 2006. The Processing of Red Snapper Leather with Using Mimosa Extract. Research Report, Departement of Fisheries Science, Faculty of Agriculture, Gadjah Mada University-Yogyakarta.
Sahubawa, L. and Bambang, H. (2011), Potential and Utilization Survey on Industry Leather Fish Filet in Denpasar Bali. Leather Industry Development Project Grants Integrated Fish. Center for Leather, Rubber and Plastics Yogyakarta. Ministry of Industry Jakarta.
Sahubawa, L., Pertiwiningrum, A., Emeliana, K. and Bintoro, W. (2012), Processing Engineering of White Snapper Leather as Gloves and Accessories Commercial in Support of Creative Leather Industries Program, Yogyakarta. Grants Institutional Cooperation, Dirlitibmas General of Higher Education, Ministry of National Education, Jakarta.
Sahubawa, L. and Pertiwiningrum, A. (2014), Leather Processing Technology Innovation Pari Become Fish Leather Products Commercial (Jackets, Bags & Accessories), Sharing the CV. Rejowinangun Original Leather. Appropriate Technology grant. Directorate Community Service, LPPM UGM.
Untari, S., Emeliana, K., Sutyasmi, S. and Susila, S. (2009), Intensive Program Ministry of Research and Technology. Center for Leather, Rubber and Plastics (BBKKP). Yogyakarta.
Winarno, F.G. (1989), Chemistry of Food and Nutrition. Fourth printing. PT. Scholastic. Jakarta.
Wulansari, T.P. (2010), Effect of Mixed Tanning Materials (chromium, Mimosa, and Syntan) on the Quality of White tanned leather snapper for Raw Material Gloves Golf.
Zidni, I., Ustadi and Sahubawa, L. (2013), Utilization of Red Tilapia Skin as Raw Material for the Processing of Belt and Strap Watches. National Proceedings of the Indonesia Fishery Products Processing Society (MPHPI). MPHPI cooperation with the Department of Fisheries Product Technology, Faculty of Fisheries and Marine Sciences, University of Diponegoro, Semarang.