

PRELIMINARY STUDY ON THE MANUFACTURE OF LEATHER FROM WATER SNAKE

By

**ELEONOR C. SANTOS,¹ PURITA O. DELA PEÑA²
and REGINA S.J. NAPUGAN³**

Bureau of Fisheries

INTRODUCTION

Leather is one of the oldest commodities in the contemporary world market. The manufacture of these hides and skins antedates by centuries any of man's scientific knowledge of chemistry. Egyptian leather after 3,000 years, was found to be still of good quality. The color and the strength were unimpaired.

It is believed that until 1900, the development of the leather industry was chiefly the result of rule-of-thumb discoveries, since it is quite recent that many of the theories of leather tanning have been given chemical terms. Perhaps, the most modern advancement in the leather industry has been the discovery and application of chrome in the tanning process. At present, more than 70 per cent of upper-shoe leather is chrome-tanned.

Leather material which is the subject of this study was made from water snake locally known as *Kalabucab*, (*Natrix sipedon sipedon*) (*Disteira orinata*). The purpose of this study is to determine the quality of leather from the said raw material.

MATERIALS AND METHODS

The water snakes used were taken from the Tinajeros River directly in front of the Dagat-dagatan Saltwater Fishery Experimental Station. For the first trial, 50 pieces of *kalabucab* of varied sizes were used.

¹ Junior Fishery Technologist, Bureau of Fisheries.

² Senior Fishery Technologist, Bureau of Fisheries.

³ Supervising Fishery Technologist, Bureau of Fisheries.

The following procedures were used:

1. *Salting* — Raw skins decay rapidly so that some of the methods of preparation are used to arrest the bacterial action. One method is the application of salt on the flesh side of the skins. The skins are arranged for the proper drainage of the brine. Great care must be taken in the operation as many irregularities in the finished products may be traced back to defects in the curing and storing process.

2. *Preparation of skins for tanning* — The skins are inspected to correct defects before subsequent operations. Dirt and slate were removed to restore the skins to their natural soft hydrated states. There are different methods used for this purpose.

For this project, the drum method was used. Washing was done in a cylindrical wooden drum, internally fitted with wooden pegs. The drum was rotated for ten minutes which gave the skins a tumbling effect during washing.

This operation is important because the skin will not respond properly to the different tanning operations if the back is not wet properly.

3. *Liming* — The skins were limed to loosen and remove the scales. A solution of 400 per cent water, 2 per cent lime and 1 per cent sodium sulfide was made in a small drum (all percentage based on the weight of the skins). The skins were soaked and stirred for two hours, after which another 2% lime was added. Then the skins were washed to remove the scales which became loose.
4. *Deliming* — After washing, the skins were soaked in a solution composed of 2% ammonium sulfate and 200% water for 45 minutes with constant stirring; 0.3% oropon was added to the mixture (the stirring was continued for another 20 minutes). Then, the skins were washed.

Ammonium sulfate was used as deliming agent. Oropon, an enzyme, was also added to remove certain proteins and to improve the color of the grain. The ammonium salt dissolves the lime, thus regulating the pH of the solutions to activate the enzymes.

5. *Pickling* — The skins were stirred in 200% water and 7% salt for 20 minutes. Then 1% concentrated sulfuric acid was added slowly with constant stirring for an hour and 30 minutes and left overnight.

The skins were pickled before actual tannage to remove the last traces of lime, and to lower the pH to a degree which is suitable for tanning. The salt prevents plumping by the acid.

6. *Chrome tanning* — The skins were stirred in the solution of 80% water and 4% salt. Then 9% Chromosal B was added in four parts every 15 minutes. Stirring was continued for one and a half hours, after which 1% soda ash was added slowly for one hour. Stirring was continued for another five hours. The mixture was left overnight and then the skins were hanged.

At the start of the actual tannage, the acid absorbed by the skin reduced the basicity of the chromium solution, thus, giving a slow uniform initial tannage which is most important in the formation of a smooth firm grain.

7. *Re-wetting* — The chrome leather was re-wet, inasmuch as a hard leather was produced after drying. The leather was washed for 10 minutes. It was then stirred in 200% water and 0.5% ammonia for 90 minutes (based on dried weight of leather) and then washed again for 10 minutes. After re-wetting, the leather was stirred in a solution of 400% water and 1% Sulfanol SS for 30 minutes. Then 2% Chromosal B was added. The stirring was continued for another 45 minutes.
8. *Neutralization* — The leather was stirred in 1% calcium formate dissolved in 200% water for 15 minutes; then 0.5% sodium bicarbonate was added. Stirring was continued for another 45 minutes. This was followed by washing for 10 minutes.

After tanning, the chrome leather was neutralized to remove at least from the outer layers, the remaining uncombined acid which would impair the dyeing and fat-liquoring of the leather. In most cases, neutralization was carried with alkali, particularly sodium bicarbonate. To insure complete tanning,

the leather was stirred in 200% water with 3% Tannigan LH, added in four parts every 15 minutes. The mixture was stirred for 80 minutes. Then the leather was washed for 10 minutes.

9. *Fat Liquoring* — The leather was stirred in a mixture of 200% water (60° C), 1 per cent DRG, 1% DPU, 0.5% H₂F for 60 minutes.

Fat liquoring involves the incorporation of oils and grease to soften the leather.

10. *Drying and dyeing* — The leather was nailed to a flat surface until it dried. This was followed by brush finishes, application of lacquer, and ironing.

RESULTS AND CONCLUSIONS

The experiment reported herein is our first attempt to tan water snake skins. The science of leather chemistry is so intricate and complicated that it needs time and full appreciation in all its aspects.

However, our experiment involving different stages of growth of skins was found quite satisfactory. Full grown skins of water snakes are the most suitable material for leather making and at the same time profitable as a source of livelihood.

RECOMMENDATIONS

The results of our first experiment showed a need for further research. Attempt should be made to make a stronger and evenly dyed leather.

It is suggested that instead of brush finishes, vat dyeing should be tried to insure evenly dyed products.

ACKNOWLEDGMENT

Grateful acknowledgment is due to the owners of the Leoncio Carlos Tannery Inc. of Meycauayan, Bulacan, for providing the use of their facilities and whose assistance and encouragement have made this study possible.

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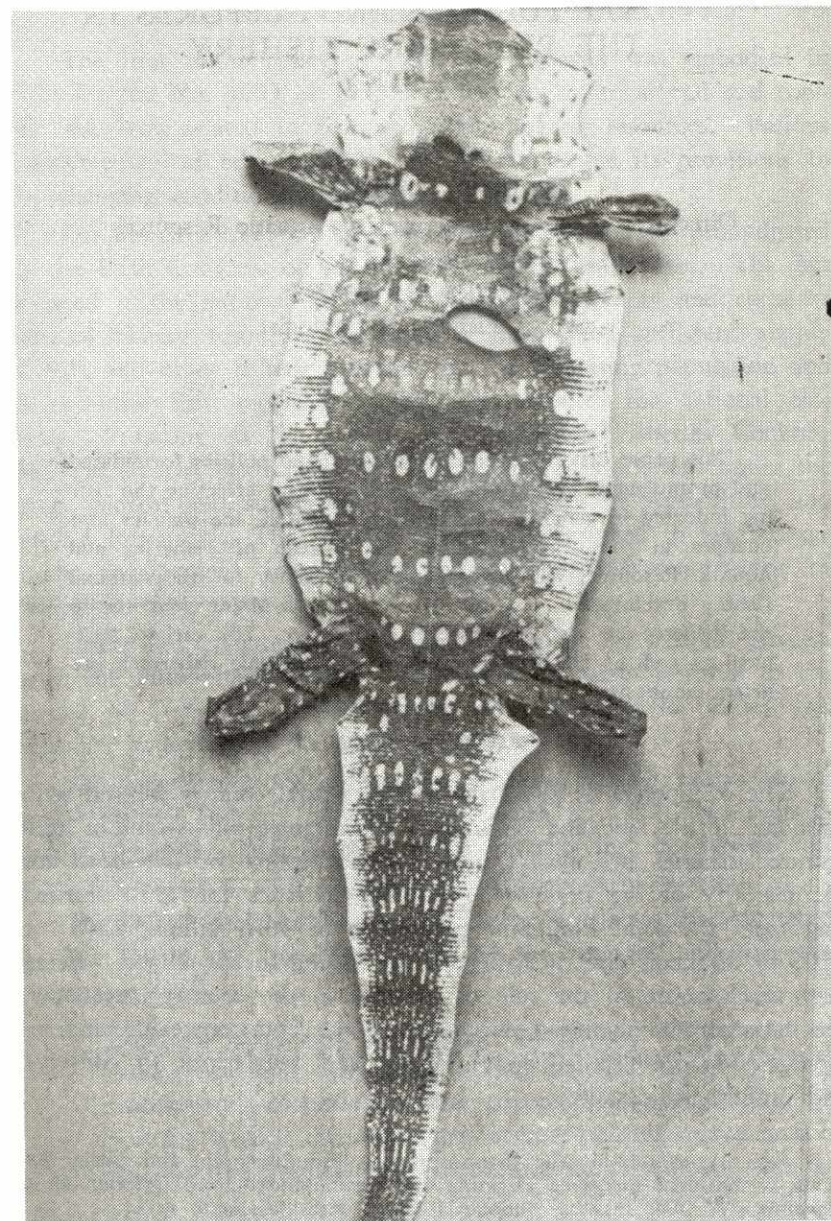
Snake and lizard leathers and the articles that could be made out of them.
Step-in and bag were made from snake leather.



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Step-in made from snake leather.



Processed lizard leather.