

PERBEDAAN SUHU STEAMING PADA KULIT DOMBA SAMAK GAMBIR ECOPRINT TERHADAP KUALITAS FISIK, COLOR FASTNESS, DAN STRUKTUR MORFOLOGI KULIT

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INTISARI

Penggunaan bahan penyamak alami dan teknik penyelesaian yang ramah lingkungan semakin penting dalam pengolahan kulit berkelanjutan. Penelitian ini bertujuan untuk mengevaluasi pengaruh suhu *steaming* dalam proses ecoprint pada kulit domba yang disamak dengan gambir, dengan fokus pada kualitas fisik, *color fastness*, serta struktur serat kolagen yang diamati melalui scanning electron microscopy. Tiga perlakuan diterapkan, yaitu *steaming* pada suhu 50°C (P1), *steaming* pada suhu 60°C (P2), dan *steaming* pada suhu 70°C (P3), dengan masing-masing perlakuan diulang sebanyak tiga kali. Sifat fisik yang diukur meliputi kekuatan tarik, elongasi, kekuatan sobek, kelembutan, dan suhu kerut. Hasil penelitian menunjukkan bahwa nilai kekuatan tarik masing-masing perlakuan adalah 3,115; 2,120; dan 1,202 N/cm² untuk P1, P2, dan P3, sedangkan elongasi mencapai 50,37%; 49,71%; dan 63,35%. Kekuatan sobek berkisar antara 17,73 hingga 22,06 N, kelemasan antara 3,63 hingga 5,03 mm, dan suhu kerut antara 78,20°C hingga 80,37°C pada seluruh perlakuan. *Color fastness* meningkat seiring kenaikan suhu, dengan hasil terbaik (nilai 2/3 dan 3) diperoleh pada suhu 60°C. Analisis mikroskopis mengonfirmasi bahwa serat kolagen paling rapat pada suhu 60°C, sementara pelonggaran serat terjadi pada 70°C. Analisis statistik menggunakan analisis varians satu arah yang dilanjutkan dengan Uji Jarak Berganda Duncan menunjukkan adanya perbedaan nyata antarperlakuan. Dapat disimpulkan bahwa suhu *steaming* berperan penting dalam menentukan kualitas fisik dan estetika kulit domba ecoprint yang disamak gambir, dengan suhu 60°C teridentifikasi sebagai kondisi optimal. Temuan ini menunjukkan bahwa *steaming* terkontrol dapat meningkatkan hasil ecoprint serta mendukung pengolahan kulit berkelanjutan.

Kata Kunci : Ecoprint, kulit domba, penyamakan gambir, suhu *steaming*, kualitas fisik, *color fastness*

DIFFERENCES IN STEAMING TEMPERATURES OF GAMBIER TANNED ECOPRINT SHEEPSKIN ON PHYSICAL QUALITY, COLOR FASTNESS, AND MORPHOLOGICAL STRUCTURE OF THE SKIN

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ABSTRACT

The use of natural tanning agents and environmentally friendly finishing techniques has become increasingly important in sustainable leather processing. This study aimed to evaluate the effect of steaming temperature in the eco-printing process of sheepskin tanned with gambier, with particular attention to physical quality, color fastness, and collagen fiber structure observed through scanning electron microscopy. Three treatments were applied, namely steaming at 50°C (P1), steaming at 60°C (P2), and steaming at 70°C (P3), with each treatment repeated three times. Physical properties measured included tensile strength, elongation, tear strength, softness, and shrinkage temperature. The results showed that tensile strength values were 3.115, 2.120, and 1.202 N/cm² for P1, P2, and P3, respectively, while elongation reached 50.37%, 49.71%, and 63.35%. Tear strength ranged from 17.73 to 22.93 N, softness from 3.63 to 5.03 mm, and shrinkage temperature from 78.20°C to 81.17°C across treatments. Color fastness improved with increasing steaming temperature, with the best ratings (2/3 and 3) obtained at 60°C. Microscopic analysis confirmed that collagen fibers were most compact at 60°C, while loosening of fibers occurred at 70°C. Statistical analysis using one-way analysis of variance followed by Duncan's Multiple Range Test indicated significant differences among treatments. It can be concluded that steaming temperature plays a crucial role in determining the physical and aesthetic quality of gambier-tanned eco-printed sheepskin, with 60°C identified as the optimal temperature. This finding suggests that controlled steaming can enhance eco-printing outcomes and support sustainable leather processing.

Key words: Ecoprint, sheepskin, gambier tanning, steaming temperature, physical quality, color fastness