

74. Title: Natural dye from pineapple fruit

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Key Words: Natural Dye, Antimicrobial Dye

Domain: Textiles (Dyes)

Summary: A pineapple fruit top is rich in tannin compounds which have various biological properties. In pineapple products processing, pineapple residue accounted for 30-42% of the pineapple processing wastes, usually discarded as a by-product which is a cause of waste of resources. Therefore, to take full advantage of the processing and pineapple residue of great significance to the promotion of high-value environmental protection and pineapple industries. The technology is developed to improve dyeing performance and impart multifunctional properties to wool with modified functional colorants explored from pineapple crown. Natural pineapple fruit top was explored as a major source of natural dye. A precipitation method in which flavonoid dyes present in pineapple fruit tops were allowed to undergo chemical reaction via chelation with Al (III) and Fe (II) metal salts. This method was successfully demonstrated the potential of modified dyestuff to produce colorful, antioxidant and antimicrobial wool fabric. The dye also imparted good antioxidant and excellent antimicrobial effect against both *S. aureus* and *E. coli*.

Name Dye	Antioxidant Activity		Antibacterial activity			
	Before washing	After washing (5 cycles)	Before washing		after washing (5 cycles)	
			<i>E.coli</i>	<i>S. aureus</i>	<i>E.coli</i>	<i>S. aureus</i>
Native colorant	91.49 %	66.03%	98.18%	99.23 %	77.67%	78.42%
Fe-modified dye	89.24 %	87.38%	97.30%	98.72%	90.94%	93.32 %
Al-modified dye	90.12%	85.68%	98.10%	98.79%	91.45%	92.75%

Table: Functional properties of dyed wool with native and modified colorants

Advantages:

- » This method is feasible alternative for synthetic agents in development of protective clothing.
- » Wool fabrics dyed with pineapple crown extract biomolecule imparted potent anti-bacterial and anti-oxidant effects.
- » It is substitute of acidic dyeing medium for wool fabrics.
- » This method provides inexpensive multifunctional textile dye.

Applications:

- » Medical garments, Sanitary garments, Military garments
- » Napkins, disposable wipes, Socks and Carpets.

Scale of Development: A functional prototype dye is developed and tested in Laboratory.

Technology Readiness Level: 4

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