Developing a DNA-Based Technology for Identifying the Presence of Egyptian Cotton Fibers in Various Textile Products

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Introduction

- Premium Egyptian cotton is the best in the world and in constant high demand. Because of its value, this national resource is subject to counterfeiting which results in lost revenues. This loss, while known to be significant, is immeasurable with current methods.

- The Internal DNA extracting method will provide a high technology marking and detection solution which will measure and prevent these counterfeits. This will allow recovery of lost revenues and the preservation of the quality and value of the Egyptian cotton.

- Provides a complete detection system and the tools for counterfeit prevention and brand protection. This will result in recovery of lost revenues, to ensure quality and global consumer confidence and to restore pride in this national resource.

Claim: lack of a metric system for measuring the Egyptian cotton "G.b" and Upland Cotton, "G. h" and Indian Cotton "G. A" in yarns, fabrics and readymade garment.

- Without a metric in place to verify the cotton species of the product at various points in the supply chain, the potential for mislabeling is significantly amplified. Product mislabeling affects the entire supply chain and every participant is accountable to ensure correct product labeling.

- Some consumers, brand owners and retailers are unaware, while others are aware, but do not have reliable methods by which they can check the authenticity or content of the products. Traditional cotton testing and authentication methodologies do not provide high enough resolution data that can be relied upon to verify original premium ELS Egyptian cotton fiber in finished goods.

The potential for product mislabeling is high due to the lack of:

- Diagnostic testing to prove authenticity of product
- Controlled manufacturing processes
- Stringent compliance standards
- Quality control audits at various stages along the supply chain
- Coordinated industry support and government enforcement

Solution: Certifying Fiber Content with Internal DNA Testing

- Utilizes innate genetic differences between the Gossypium barbadense, i.e. Egyptian Cotton, and Gossypium hirsutum i.e., Upland and Gossypium arboreum i.e., indian cotton as endogenous DNA to determine the species from which the fabrics are derived.

- Internal DNA test that can be used to determine if a cotton product contains G. barbadense (Extra Long Staple), or G. hirsutum (Upland) or G. arboreum (Indian) or a blended.

With a concerted effort, a unified goal, and the use of internal DNA as tools, everyone in the supply chain can trust the integrity of premium Egyptian cotton products and everyone becomes a winner:

- Egyptian growers sell more premium cotton.
- Manufacturers produce better quality & reliable products.
- Retailers deliver an array of desirable products.
- Brand owners ensure quality and reinforce loyalty.
- Consumers are rewarded with consistent products.

Research Approach and Methodology

- The current applied study is concerned with method for isolating biological macromolecules including nucleic acids from mature cotton fibers. The cotton fibers are used before and after being processed into yarns, woven fabric or knitted fabric or finished apparel, prior to the isolation of the biological macromolecules.

INTERNAL DNA TESTING

The aim of the testing is establish an efficient, easy, fast, and cost-effective DNA isolation procedure that yields large amounts of pure total genomic DNA from Egyptian cotton by the standard CTAB DNA isolation protocol of Doyle and Doyle (1987) and or rather expensive commercial DNA isolation kits, Williams and Ronald 1994; Peterson et al. 1997; Zhang and McStewart 2000).

PCR Analysis

PCR amplification of DNA was used to assess the utility of DNA isolates in molecular studies involving PCR amplification of nuclear. DNA is extracted from cotton fiber, cotton fabric and cotton clothes and subjected to PCR techniques which enable the identification of the species of cotton utilized in the textile or cotton material of interest, by using two primer, Forward and reverse primer

CERTIFICATE OF ANALYSIS
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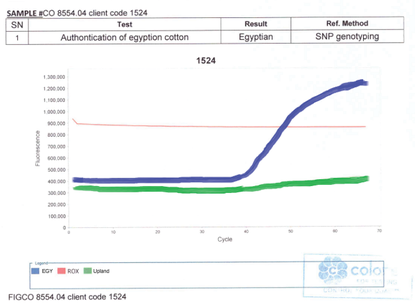
Testing Result: Eight samples of textile, Samples submitted and identified by client

Note: tests were performed by PCR technique using ViiA 7 by Life Technologies

SAMPLE #CO 8554.04 client code 1524

SN	Test	Result	Ref. Method
1	Authontication of egyption cotton	Egyptian	SNP genotyping



FIGCO 8554.04 client code 1524

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No. CO 8554/10/2015 Date: 01/11/2015
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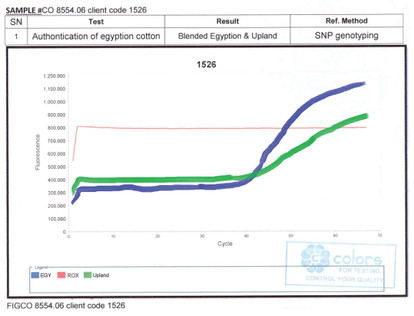
Testing Result: Eight samples of textile, Samples submitted and identified by client

Note: tests were performed by PCR technique using ViiA 7 by Life Technologies

SAMPLE #CO 8554.06 client code 1526

SN	Test	Result	Ref. Method
1	Authontication of egyption cotton	Blended Egyption & Upland	SNP genotyping



FIGCO 8554.06 client code 1526

Note: tests were performed by PCR technique

SAMPLE # CO 8177. 02 client code 1506

	Test	Result	Ref. Method
	Authontication of egyption cotton	Upland	PCR

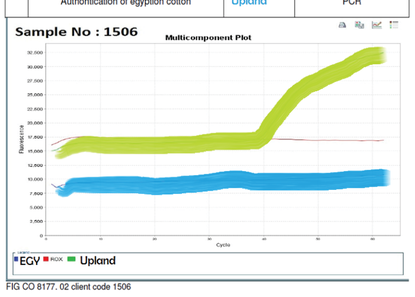


FIG CO 8177. 02 client code 1506

Patent Number: 2081-2015

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PATENT OFFICE

THANK YOU
FOR YOUR ATTENTION