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A.K.M. MAHABUBUZZAMAN, M.O.G. MIAZI, M. MANIRUZZAMAN, M.D. HOSSAIN AND AKM M. ALAM



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## A STUDY ON SMELL FREE AND ECONOMIC JUTE PROCESSING OIL (VERDURE) FOR JUTE SPINNING INDUSTRY

A.K.M. MAHABUBUZZAMAN<sup>1</sup>, M.O.G. MIAZI<sup>2</sup>, M. MANIRUZZAMAN<sup>3</sup>, M.D. HOSSAIN<sup>4</sup> AND AKM M. ALAM<sup>5</sup>

<sup>1</sup>Principal Scientific Officer, <sup>2</sup>Chief Scientific Officer, <sup>3</sup>Senior Scientific Officer, Mechanical Processing Division, Bangladesh Jute Research Institute (BJRI), Manik Mia Avenue, Dhaka-1207, <sup>4</sup>Managing Director, The Jute Fibres BD and <sup>5</sup>Iowa State University, USA.

\*Corresponding author & address: Dr. Engr. A.K.M. Mahabubuzzaman, E-mail: dr.mahabub@hotmail.com

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### ABSTRACT

Mahabubuzzaman AKM, Miazzi MOG, Maniruzzaman M, Hossain MD, Alam AKMM (2018) A study on smell free and economic jute processing oil (verdure) for jute spinning industry. *J. Innov. Dev. Strategy*. 12(1), 23-25.

Jute is woody, coarse, rigid and brittle in nature. Jute fibre is unyielding to external forces and lacks in fibre to fibre cohesion. These properties of jute fibre are undesirable and unfavorable for its processing through series of mechanical systems. So, slippery reagent is necessary to add on jute for processing. With the green house effect and air pollution concern all around jute plays a vital role as a natural product to maintain a clean habitat. Verdure push-up another advance steps to make an environmental friendly and make more pollution free world for the future generation. Verdure oil is whitish color jute processing oil. This product readily diluted with water at room temperature. Before emulsion preparation it is necessary to shake properly on container. Verdure produces emulsion as normal JBO emulsion process. It is smell and hydrocarbon free oil. Yarn quality is good and also cost effective because use of JBO will decrease. As a result production cost of yarn will be reduced and produced yarn will be smell free and smooth which are demands of buyer.

**Key words:** *verdure, jbo, emulsion*

### INTRODUCTION

Jute is called the golden fibre of Bangladesh. It is practically one of the major foreign exchange earners of Bangladesh. So, jute has a tremendous impact in the economy of Bangladesh. It also generates enormous employment opportunities home and abroad mainly as labour forces for crop production, processing, handling, manufacturing, trades and shipment. The cultivation of jute has manifold advantages. The crop improves the soil fertility. Its sticks are useful to the farmers as a source of fuel, fencing and thatching materials. The products of jute are environment friendly and biodegradable. For these advantages, the jute and jute products have world wide popularity (Atkinson 1964).

Jute is woody, coarse, rigid and brittle in nature. Jute fibre is unyielding to external forces and lacks in fibre to fibre cohesion these properties of jute fibre are undesirable and unfavorable for its processing through series of mechanical systems. So, slippery reagent necessary to add on jute for processing. With the green house effect and air pollution concern all around jute plays a vital role as a natural product to maintain a clean habitat.

Jute fibre is comprised of about 60% fibrous elements (cellulose) and about 40% non-fibrous substances. The strength properties of jute fibre are due to the fibrous of fibrous elements on process jute loss its strength and make short fibre as dust. Verdure oil as slippery reagent minimize fibre to fibre friction and make soft feeling jute product. Verdure oil also removes undesirable impurities from fibre & produce clean yarn. Jute fibres quality depends on property of fibres as fineness, length, crimps, rigidity, resilience, color, hygroscopic, softness, specific gravity, electric property, lusture, strength and elasticity, fibre to fibre cohesion, undesirable & unfavorable for processing. Verdure oil response a vital role to parallelization fibre from cohesion easily for its slippery property (Ali 1990).

For the survival of jute industry, it is necessary to improve the uniformity of product, obtain certain physical characteristics in the yarn or fabrics along with advantages of jute process for cost savings, smell free product produce and yarn makes soft feelings. For this reason quality eco-friendly jute yarn is required and with this end of view this project has been undertaken.

### MATERIALS AND METHODS

Jute fibres (100 Kg for each trial) of BWC grade were selected as raw material for this experiment. Jute fibres were piled with the application of 25% normal emulsion (Oil-19.5%, Water-80%, emulsifier-0.5%). On the other hand, other same jute fibres were piled with Verdure and JBO mixing emulsion used (JBO-3%, Verdure oil 1%, Emulsifier-0.5%, Water-95.5%) and kept for 48 hours for maturation(Booth 1968). The entire piled jute fibres were passed through on breaker card, finisher card, 1<sup>st</sup> drawing and 2<sup>nd</sup> drawing machine. All slivers were processed through 3<sup>rd</sup> drawing machine and spinning machine to produce 241 tex yarns. Finally the spun yarns were tested as per standard methods.

### RESULTS AND DISCUSSION

241 tex jute yarn were produced with different types of emulsion mixing system through slip draft spinning frame. In this experiment, 05 trials were conducted. From each trial 10 samples were tested and mean, SD, CV% of tensile strength were putted in the table. Textile properties of produced yarn were measured under standard testing method.

Table 1. Physical properties of 241 tex jute yarn from only JBO emulsion used

Count tex(lbs)	Droppings of breaker card /50kg (Kg)	Tensile Strength			Quality Ratio (%)
		Kg(lbs)	SD	CV%	
241 tex (7lbs/spy)	0.43	2.62 (5.884)	0.437	16.67	84.06
	0.49	2.78 (6.128)	0.433	15.57	87.55
	0.53	2.64 (5.82)	0.491	18.59	83.14
	0.46	2.57 (5.665)	0.488	20.00	76.84
	0.48	2.61 (5.754)	0.426	16.57	80.94
<b>Average</b>	<b>0.52</b>	<b>2.474 (5.452)</b>	<b>0.455</b>	<b>17.48</b>	<b>82.506</b>

Table 2. Physical properties of 241 tex jute yarn from verdure mixing emulsion used

Count tex(lbs)	Droppings of breaker card /50kg (Kg)	Tensile Strength			Quality Ratio (%)
		Kg(lbs)	SD	CV%	
241 tex (7lbs/spy)	0.53	2.49 (5.489)	0.421	16.90	78.42
	0.47	2.64 (5.820)	0.472	17.87	83.14
	0.46	2.68 (5.908)	0.419	15.63	84.40
	0.51	2.52 (5.555)	0.438	17.38	79.36
	0.47	2.41 (5.313)	0.482	20.00	77.32
<b>Average</b>	<b>0.49</b>	<b>2.548 (5.617)</b>	<b>0.446</b>	<b>17.556</b>	<b>80.528</b>

In this experiment, droppings of breaker card, tensile strength and Quality Ratio of produced yarn at slip draft spinning frame was determined. In table-1 & 2, it was found that yarn quality produced by using conventional emulsion and verdure mixing emulsion was almost same. It was highly remarkable that large quantity JBO was decreased by using verdure oil.

#### Cost Analysis per ton:

7 lbs/spindle yarn with JBO:

1. BWC	: 1000kg @50/-	= 50000 Taka
2. Jute batching oil (JBO)	: 5% = 50 Kg @70/-	= 3500 Taka
3. Emulsifier	: 0.2% = 2 Kg @245/-	= 490 Taka
4. Water	: Rest quantity	= -----
5. Processing cost (Yarn)	: 10 Taka/Kg	= 1000 Taka

Total cost per ton = 54990 Taka

7 lbs/spindle yarn with Verdure:

1. BWC	: 1000kg @50/-	= 50000 Taka
2. Jute batching oil (JBO)	: 0.75% = 7.5 Kg @70/-	= 525 Taka
3. Verdure	: 0.25% = 2.5 kg @ 110/-	= 275 Taka
4. Emulsifier	: 0.2% = 2 Kg @ 245/-	= 490 Taka
5. Water	: Rest quantity	= -----
6. Processing cost (Yarn)	: 10 Taka/Kg	= 1000 Taka

Total cost per ton = 52290 Taka

Cost savings per ton to using verdure mixing emulsion on jute process: (54990 - 52290) Taka = 2700 Taka

#### **CONCLUSION**

With the jute sector encountered serious crisis for sluggish demand for hydrocarbon free jute products, Verdure oil response to this crying need of the customer. Verdure oil mixing emulsion economy then only JBO emulsions for jute processing (Ranjan 1985). Verdure oil mixed emulsion as a substitute of JBO but for smooth process & reduce badly smell from jute product, recommend 50-60% JBO reduce and add only 0.20 to 0.40% Verdure oil on emulsion. Verdure oil mixed emulsion also can capable to remove/reduce bad smell from JBO. In this experiment, droppings of breaker card, tensile strength and Quality Ratio of produced yarn at slip draft spinning frame was determined and found that yarn quality produced by using conventional emulsion and verdure mixing emulsion was almost same. It was highly remarkable that large quantity JBO was decreased by using verdure oil.

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