



Design And Develop Infant Carry Bed Using Aloe Vera Fabric Dyed With Pomegranate Peel

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Abstract: The Research on design and development of infant carry bed has been carried out by using aloe vera fabric which is dyed using pomegranate peel. The carry bed for the little one is becoming in more demand as the parents are conscious about their baby's health and safety. Infant carry bed is invented by the Europeans that is been followed for decades which was later mass produced and sold all over world. In Canada, Ashley was the first maker to start producing nests in 2013. She was the one who modified the baby nest with chevron quilted resting space for the baby's safety. The fabric in current carry bed brings lot of skin allergies to baby's skin as fabric used is hard and also most of the fabric are not breathable material. Aloe vera fabric has an incorporated with aloe vera gel which is good for skin and also it repels outside moisture and cold as it has large number of pores. This fabric makes the baby feel warm when it is cold outside and cold when its hot outside. The fabric is dyed with Pomegranate peel as it contains lot of flavonoids, antioxidants and phenolic acid which boost the cell regulation. The carry bed was constructed by using wadding material and suitable accessories which is lightweighted, comfortable during travelling.

Keywords- Sustainable, Aloe Vera fabric, Natural dye, Pomegranate peel dye, Baby carry bed

I. INTRODUCTION

Infant bed is invented by the Europeans for the safety of the babies. Infant bed is invented by the Europeans that is been followed for decades which was later mass produced and sold all over world. In Canada, Ashley was the first maker to start producing nests in 2013. She was the one who modified the infant bed with chevron quilted resting space for the baby's safety. There are different types of structure like infant pods, cocoons etc. It is perfectly a lightweight product as it is also used when travelling. The only purpose for infant carry bed is for the baby's safety where in travel or anywhere around house the infant can be in your eye sight. It can be also used as play mat. A baby carrier is a practical way to carry babies and keep the parent's hand free.

While choosing a carrier for baby always look for healthy hip positioning for baby. Using T.I.C.K.S rule helps on positioning of babies and to avoid suffocation of babies. T.I.C.K.S is stated as Tight-In view at the time-Close enough to kiss-Keep chin off the chest-Supported back. The fundamental uses of carrier bed are Naps, lounging, tummy time, massages and diaper changes, Safe and comfy space for infant while bedsharing, Convenient place to park your infant during bonding time with friends and family. Familiar spot for babies while travelling.

The research is mainly focused on infant carry bed which doesn't not create skin allergies for babies and also absorbs fluids faster, also gives protection to babies with antibacterial, antioxidant properties and also environmental friendly.

2. METHODOLOGY

- **Research** on the Infant carry bed, types and other specification was done along with the research on Aloe Vera fabric and to find the suitable sustainable dye and finalized the dye as pomegranate peel
- **Study** was carried out about the construction of the infant carry bed
- **Dyeing and Testing on fabric-** The infant carry bed material was subjected dyeing process using natural dyes and then EPI, PPI, GSM, thickness, tensile strength, tearing strength, Wettability, Color fastness to rubbing and washing tests were conducted to determine the suitability of the material for product development
- **Product development:** the product was developed from the dyed fabric

2.1. DYEING OF ALOE VERA FABRIC USING POMEGRANATE PEEL

Pomegranate peel of 10-15 fruits has to be taken. First the Aloe Vera fabric is mordanted using alum. Fabric Mordant is done to remove the starch from the fabric. Alum is used as a mordant. Water is Boiled for 15-20 minutes. Stir the water to dissolve the alum. After mordant solution is prepared immerse the fabric to the solution and keep it aside for 30 minutes. After 30 minutes squeeze the fabric to remove the water from the fabric and dry it in shade. Now after drying the fabric is ready for dyeing.

On preparation of dye bath, Pomegranate peel is added to water and boiled it in 100 degree Celsius later stirred it well. After 20-30 mins of boiling, once the color of the pomegranate peel is extracted the solution is filtered for 2-3 times to remove all the peel waste and other excess particles so that the patches do not occur. After filtration the fabric is dipped inside the dyed solution for 1 hour. The fabric is on movement during the dyeing process as the fabric will be treated equally.



Fig.1 Immerse the Aloe Vera for the Mordant process



Fig.2 Adding pomegranate peel dye into water



Fig.3 Immersing the fabric into dye

Once the fabric is immersed to the dye bath and the dye is set to the fabric. Take the fabric out wash to extract all the waste particles out and to make sure if the color doesn't fade. After the first wash, wash the fabric again to check the color fastness of the fabric. Later squeeze it well.



Fig.4 Pomegranate peel dyed fabric

2.1.1 CALCULATIONS

Table 01: Recipe and calculation for dyeing of aloe vera fabric with pomogranate peel

Material	PERCENTANGE	TOTAL WEIGHT OF FABRIC	TOTAL
Pomegranate peel Dye	40 percentage	$120*2=240$	$240*40/100=96$ grams
Bath Ratio	1:20	$48*2=96$	$96*20000/1000=1.92$ litre

Weight of the fabric: 1m = 120 gms

1:20 bath ratio = 30 liters for 1 kg

- 96 grams of pomegranate peel is required
- 1.92 litres of water are required for dyeing

2.2 TESTING OF FABRIC

The following tests were conducted on Aloe Vera fabric to check the suitability of the process for product development and usability using the standard testing procedures:

- EPI and PPI using pick counting glass
- GSM using GSM cutter and digital balance
- Thickness test using thickness gauge
- Tensile strength using Digi-strength tester
- Tearing strength using Elmendorf tearing strength tester
- Wettability using wettability tester
- Color fastness to rubbing using crock meter and washing using launderometer.

These test for the fabric was conducted before and after dyeing.

2.3 CONSTRUCTION OF INFANT BED

The following measurement was followed to construct the infant carry bed-

- Total Length of the bed-26 inch
- Length of body cover- 16 inch
- Length of head cover-9 ½ inch
- Breadth of bed-18 inch

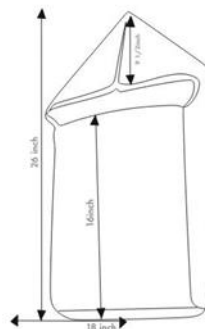


Fig 5: Digital construction of Infant bed

2.4 FINAL PRODUCT



Fig.6 Final Product

3 RESULT AND DISCUSSION

The test results of the fabric for various test conducted are as follows:

Table 02: Tests conducted for the fabrics

Name of the Test	Before dyeing	After dyeing
Thickness in mm	17.4	17.8
GSM	118	120
EPI	112	103
PPI	85	72
Tearing strength in g (Warp)	18	18.5
Tearing strength in g (Weft)	17.5	18.2
Tensile strength in kg (Warp) kg/cm ²	4.18	7.72
Tensile strength in kg (Weft) kg/cm ²	4.22	7.26
Wettability	1.03	10.8

Table 02 clearly explains that the fabric properties improved after dyeing, with increase in thickness, GSM, tearing strength, tensile strength and wettability. The EPI and PPI has reduced owing to absorption of dye and process.

Table 03: Color fastness test for dyed fabric

Colour fastness to Rubbing		
Staining on Cotton	Dry	Wet
Weft	5	4
Warp	5	4
Colour fastness to Washing		
Change in color	2	
Staining on Cotton	4-5	

The colour fastness test conducted on the dyed fabrics gave the results as shown in Table 03. The sample had excelled dry fastness to rubbing and good fastness to wet rubbing. The change in colour of dyed sample to wash test was poor until 3 washes after which the dyed fabric had a fastness rating of 4.

CONCLUSION

Now a days Environmentally friendly product are the most preferred in all fields and it is a trend to follow. Environmental friendly product is also good for us and the surrounding for the better living. In fashion, natural fabric and dyeing is getting more popular as fashion plays a major role in our environment. When it comes to infants and kids people are more conscious as in that case infant carry bed is used for almost 80-90% of the babies around the world. Carry bed is used for babies to keep them secure from germs and dust, for a good sleep, close to parent and this carry bed is easy and safe for baby while travelling. Aloe Vera fabric is encapsulated with aloe vera gel which is released when it touches the skin which helps in improving skin texture and also keep allergies away from baby. This fabric is breathable and lightweight. This fabric has large pores which allows a good air flow and is easy for evaporation of sweat, water and other fluid where this eliminates the bad odor also. The main advantage of this fabric is it makes the baby feel warm when its cold outside and cool when its warm outside. On keeping environmental friendly things as the priority the dyeing process with pomegranate peel is also natural and sustainable. Fashion industries play an important role in water pollution. The main need of textile industry is water and so the textile industry are located near the water bodies where they consume lot of water and the industry waste are the major source of water contamination because the dyes, detergent and many more chemicals are getting mixed with the water. Synthetic dyes are very harmful to humans, to our surroundings, environment, and also other living organisms. On the result of this many industry and other cooperates are working on more sustainable products to minimize the negative effect on the ecosystem.

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REFERENCES

1. <http://www.madehow.com/Volume-6/Baby-Carrier.html>
2. <https://www.greateratlantababywearing.org/carrier-types-and-descriptions.html>
3. <https://raisingchildren.net.au/newborns/safety/equipment-furniture/baby-carrier-sling-safety>
4. <https://en-n.decorexpro.com/odeyala/iz-evkalipta/>
5. https://en.m.wikipedia.org/wiki/Baby_sling
6. <https://fidella.org/en/origins-of-baby-carriers>
7. Blois, M, MD. (2005). *Babywearing: The Benefits and Beauty of This Ancient Tradition*. Pharmasoft Publishing.
8. "Anatomy of An Amauti". Up Here Publishing (in Catalan). Retrieved 2021-05-22.
Rankin, Camilla. "The basics of attachment parenting". Parent. Retrieved 2022-08-05.
9. "Regulation of anxiety during the postpartum period", Lonstein, Joseph S., *Frontiers in Neuroendocrinology*, Volume 28, Issues 2-3, August–September 2007, Accessed 2009-05-09
10. Morris, D. (1992). *What Comforts a Baby?* In *Babywatching* (pp 80-82). New York: Crown Publishers Inc.
11. Anisfeld, E., Casper, V., Nozyce, M., & Cunningham, N. (Oct., 1990). Does Infant Carrying Promote Attachment? An Experimental Study of the Effects of Increased Physical Contact on the Development of Attachment. *Child Development*, Vol. 61, No. 5, 1617-1627.
12. "Developmental dysplasia of the hip". nhs.uk. 2017-10-18. Retrieved 2022-09-14.
13. "Babywearing: Types of Slings and Carriers". Baby Centre. September 2016.
14. "The T.I.C.K.S. Rule for Safe Babywearing - Baby Sling Safety" (PDF). babyslingsafety.co.uk. Retrieved 6 November 2022