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EVALUATION OF WOUND HEALING ACTIVITY OF *VELLAVARAI PINCHU* (TENDER LEGUME OF *Dolichos lablab*) POWDER ON WISTAR ALBINO RATS

[*1]Miss. M. Devamanojini, [2]Dr. S. Janani

Faculty of Siddha Medicine, Trincomalee Campus, Eastern University, Sri Lanka.

***Corresponding Author: Miss. M. Devamanojini**

Faculty of Siddha Medicine, Trincomalee Campus, Eastern University, Sri Lanka.

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ABSTRACT

Wounds are unavoidable events of life. In Siddha medicine Wound known as *Punn* or *Viranam*. The term *"punn"* refers to any break in the integrity of the skin. An appropriate method for healing wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional of the skin. Many medicinal plants are claimed to be useful for wound healing. These plant remedies have been used since ancient times but few of them have been evaluated scientifically. Stanza about general character of Tender legume of *Dolichos lablab* mentioned in the Siddha text book of *Kunapadam* was indicated that, *Vellavari pinchu* (Tender legume *Dolichos lablab)* plant can cure the wound, based on that I selected the Tender legume of this plant for the study hence the study focusses to Evaluate the Wound healing activity of Tender legume of *Dolichos lablab* on Wister albino rats and Compare the wound healing activity of Tender legume and Unripe Legume (Matured Legume) of *Dolichos Lablab*. In this study healing activity was studied for 14 days in four groups and Data was collected once in two days from each four groups. Data was converted into Bates-Jensen Wound assessment Tool. Statistical analysis was done by one way ANOVA for the circumference of wound. Tender legume of *Dolichos lablab* has Significant wound healing Activity (less than 0.05) and Unripe legume of *Dolichos lablab* show comparatively lower wound healing activity.

KEYWORDS: Wound Healing Activity, Antioxidant activity, *Dolichos lablab.*

1. INTRODUCTION

Traditional medicine plays an important role in meeting global healthcare needs. Traditional medicine is the combination of Knowledge, Skills, and practices that consists of theories, beliefs and experiences specific to various cultures that are used to prevent diagnosis, improve, and treat.[1]

The Siddha medical system provides Preventive, Promotive, Curative, Rejuvenate and Rehabilitative health care by adopting scientific and holistic approaches. The Siddha system has four main divisions: Chemistry/Iatrochemistry alchemy, Treatment, Yogic Practices, Wisdom.[2] The World Health Organization reported that approximately 70%–80% of the world's population depends on traditional therapies primarily from natural sources. Herbal medicine's extensive application is due to the vast natural source, easy accessibility, and healing potential, which is also proven by numerous investigations. Plant species are becoming more important in the pharmaceutical sector because of biodiversity and certain biological functions on the human body and animals. These various medicinal properties are attributed to active constituents that differ from plant to plant.[3]

A wound is defined as any break in the integrity of skin, mucous membranes, or organ tissue. Wounds can be caused by mechanical, thermal, chemical, or radiogenic stress.[4] Wound healing is comprised of four highly interconnected and overlapping phases: hemostasis, inflammation, proliferation, and tissue remodeling or resolution. These phases and their biophysiological functions must occur in the correct order, at a specific time, and continue for a specific duration at an optimal intensity.[5]

Lablab is an ancient, domesticated crop, widely distributed in the Indian sub-continent and Southeast Asia, where it has been used as a grain legume and vegetable for more than 3500 years. Lablab is now widely distributed throughout the tropics and subtropics. Dolichos bean belongs to family Leguminosae which is commonly known as Indian bean, Hyacinth bean, Egyptian kidney bean and *Avarai* is one of the most popular traditional vegetables.[6]

JUSTIFICATION

Wounds are unavoidable occurrences in life. In modern medical science, there are numerous external and internal drugs accessible for wound healing. However, with Sri Lanka's current economic crisis, ordinary people are struggling to cover medical expenses. Several drugs from plants are known to have wound healing properties. Some of these plants have been Screened scientifically for evaluation of wound healing activity but the potential of most remains unexplored. *Dolichos lablab* is a well-known plant among Sri Lankans because it is a vegetable which is use for food. If it is commonly available plant Ordinary people also get benefit. Hence, I Select the wound healing activity of *Dolichos lablab* from Siddha text called Siddha material medica medicinal plant division. However, there is a requirement for scientific validation, standardization and safety evaluation of plants of the traditional medicines before these could be advised for healing of the wounds.

1. OBJECTIVES

2. 1 General objectives

To evaluate the Wound healing Activity of *Vellavarai pinchu* (Tender legume of *Dolichos lablab*) powder on Wister albino rats.

2. 2 Specific objectives

1. To compare the Wound healing effect of *Vellavarai pinchu* (*Dolichos lablab*) powder with Standard drug.
2. To Compare the Wound healing activity of Tender legume powder of *Dolichos lablab* and Unripe (Matured) legume Powder of *Dolichos lablab.*
3. To Explore the scientific evidence for the usage of Tender legume powder of *Dolichos lablab* for wound healing.

2. MATERIALS AND METHODOLOGY

3.1 Study design

Experimental Animal study

3.2 Study Materials

Powder of *Vellavarai Pinchu* and *Vellavari kai (*Tender lengume and Unripe legume of *Dolichos lablab)*
Wister albino rats
Standard Drug - Cicatrin powder

3.3 Plant Material

3. 3.1 Selection of the plant

The plant *Vellavarai pinchu* was selected through quotation of general character of the plant from the book, *Kunapadam* by Dr. K. S. Murugesa mudhaliyar. Page No: 45-46.

"கங்குலுணவிற்கும் கறிக்கும் உறைகளுக்கும்
*பொங்குதிரி தோடத்தோர் **புண்**சுரத்தோர் - தங்களுக்குங்*
கண்முதிரை பில்ல நோய் காருக்குங் காழுறையா
வெள்ளவரை பிஞ்சாம் விதி" (தே.கு)

"Kangulunavitkum karikum uraigalukkum
*Ponguthiri thodathor **pun**sursthor thangalukkum*
Kanmudhirai pillanoai kaararukkung kaaluraiya
Venmudhirai pincham vidhi"

According to above Stanza, *Vellavarai pinchu* is used for preparation of food, wound healing, fever and eye diseases.

3. 3.2 Authentication of plant

The plant *Dolichos lablab* was authenticated by Supervisor and Department of *Gunapadam* Faculty of Siddha medicine, TC, EUSL.

3. 3.3 Collection of plant material

Tender Legumes and Unripe Fruits of *Dolichos lablab* was collected from Vegetable Garden in Nuwara-Eliya.

3. 3.4 Preparation of Fine Tender legume and Unripe fruit powder of *Dolichos lablab*

The Fresh tender legumes and Unripe fruit of *Dolichos lablab* were collected in Vegetable Garden in Nuwara-eliya and it was authenticated by the Supervisor and *Kunapadam* department. After that it was washed well in running water and allowed to dry under the sunshade for one week. Then it was made as powder using mechanical grinder and the fine powder was obtained after sieve by a white cloth which is called *vasthrakayam* in siddha text the powder was stored in a clean airtight glass container and label.

3.4 Animal Model

3.4.1 Collection of Test animal

Sex of Healthy Wister albino rats weighing 150-200g was obtained from Medical Research Institute, Colombo 9.

3.4.2 Preparation of Test animal

The animals were Habit in clean polypropylene cages at standard environmental conditions of 12h light/dark cycle air-conditioned well-ventilated room at 25 ± 2^0C for 14 days of period and fed with pellets thrice a day

and watered per hour, The cages of every group were cleaned once in three days.

3.5 METHOD

3.5.1 Grouping of animals

Twenty-four Rats were divided into four groups, each group containing 6 rats.

- Group I: Control - Considered as Control group and was untreated.
- Group II: Standard - Considered as Standard group and received Cicatrin powder externally.
- Group III

Test A: Considered as Test group and was receive *Dolichos lablab* Tender legume powder externally.
Test B: Considered as Test group and was receive *Dolichos lablab* Unripe legume powder externally.

3.5.2 Excision wound model

- Divided into each group, animals were anaesthetized by giving ketamine hydrochloride (50mg/kg, IP)
- Hairs were Shaved from the dorsal thoracic region of the rats and 70% of ethanol applied on the region before making the wound. An impression will be made on the Dorsal thoracic region 1cm away from the ear on the rat and a circular excision of 314 mm^2 created on the dorsal thoracic region of the rats. The animals were kept in Separate cage.

3.5.3 Treatment procedures

- The animals of group I were left untreated and considered as a control.
- The animals of group II served as a standard and received Cicatrin Powder.
- The animals of group III A and B were considered as test and treated with prepared Tender legume powder, and Unripe Legume powder of *Dolichos lablab* respectively.

3.5.4 Assessment

Data was collected once in 2 days from each four groups and recorded clearly. Wounds were measured in width and length in mm once in two days until 14th day. The direct observation wound circumference, edges, exudate type and amount, Skin coloration around wound recorded and converted into Bates- Jensen Wound assessment Tool which is easy to obtain the statistical results.

Rate of wound closure was calculated as below calculation.

$$\text{Percentage of wound contraction} = \frac{(\text{Initial wound size} - \text{Wound area on specific day})}{\text{Initial woun area}} \times 100$$

3. RESULT AND OBSERVATION

The wounds were measured in width and length in mm once in two days. The direct observation wound circumference, edges, exudate type, exudate amount and skin coloration around wound were recorded.

4.1 Wound Size

Table 4.1 ANOVA one way statistic for the circumference of the wound.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
DAY_00	Between Groups	72.950	3	24.317	.742	.542
	Within Groups	524.000	16	32.750		
	Total	596.950	19			
DAY_02	Between Groups	105.750	3	35.250	1.128	.367
	Within Groups	500.000	16	31.250		
	Total	605.750	19			
DAY_04	Between Groups	1054.800	3	351.600	.702	.565
	Within Groups	8016.000	16	501.000		
	Total	9070.800	19			
DAY_06	Between Groups	219.600	3	73.200	2.162	.132
	Within Groups	541.600	16	33.850		
	Total	761.200	19			
DAY_08	Between Groups	204.950	3	68.317	2.183	.130
	Within Groups	500.800	16	31.300		
	Total	705.750	19			
DAY_10	Between Groups	696.150	3	232.050	4.755	.015
	Within Groups	780.800	16	48.800		
	Total	1476.950	19			
DAY_12	Between Groups	2092.950	3	697.650	13.686	.000

	Within Groups	815.600	16	50.975		
	Total	2908.550	19			
DAY_14	Between Groups	1067.400	3	355.800	9.980	.001
	Within Groups	570.400	16	35.650		
	Total	1637.800	19			

One-way ANOVA analysis of the initial circumference of the wound for test, standard and control groups indicate the significant value of the initial circumference of the wound of the four different groups is .542 which is much higher than the p value of 0.05 where the null hypothesis of there is no significant differences between the mean value of the four different groups is accepted. In the analysis, the significant value reached 0.15 in day 10. The significant value of day 14 is 0.001, which is less than the p value of 0.05 where the null hypothesis of there is no significant differences between the mean values of the four different groups is rejected. Which means the final circumferences of the wound show the significant differences statistically between the four groups Therefore the test analysis interprets the test drug shows an efficient wound healing property.

Table 4.2 Post Hoc Test ANOVA one way statistic for the Change of circumference of the wound between groups.

Multiple Comparisons							
Tukey HSD							
Dependent Variable	**(I) Rat**	**(J) Rat**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
						Lower Bound	**Upper Bound**
DAY_00	CONTROL	STANDARD	-1.20000	3.61939	.987	-11.5552	9.1552
		TEST Tender legume	-4.60000	3.61939	.593	-14.9552	5.7552
		TEST Unripe legume	-4.00000	3.61939	.692	-14.3552	6.3552
	STANDARD	CONTROL	1.20000	3.61939	.987	-9.1552	11.5552
		TEST Tender legume	-3.40000	3.61939	.784	-13.7552	6.9552
		TEST Unripe legume	-2.80000	3.61939	.865	-13.1552	7.5552
	TEST Tender legume	CONTROL	4.60000	3.61939	.593	-5.7552	14.9552
		STANDARD	3.40000	3.61939	.784	-6.9552	13.7552
		TEST Unripe legume	.60000	3.61939	.998	-9.7552	10.9552
	TEST Unripe legume	CONTROL	4.00000	3.61939	.692	-6.3552	14.3552
		STANDARD	2.80000	3.61939	.865	-7.5552	13.1552
		TEST Tender legume	-.60000	3.61939	.998	-10.9552	9.7552
DAY_02	CONTROL	STANDARD	3.60000	3.53553	.741	-6.5152	13.7152
		TEST Tender legume	4.20000	3.53553	.643	-5.9152	14.3152
		TEST Unripe legume	-1.20000	3.53553	.986	-11.3152	8.9152
	STANDARD	CONTROL	-3.60000	3.53553	.741	-13.7152	6.5152
		TEST Tender legume	.60000	3.53553	.998	-9.5152	10.7152
		TEST Unripe legume	-4.80000	3.53553	.542	-14.9152	5.3152
	TEST Tender legume	CONTROL	-4.20000	3.53553	.643	-14.3152	5.9152
		STANDARD	-.60000	3.53553	.998	-10.7152	9.5152
		TEST Unripe legume	-5.40000	3.53553	.445	-15.5152	4.7152
	TEST Unripe legume	CONTROL	1.20000	3.53553	.986	-8.9152	11.3152
		STANDARD	4.80000	3.53553	.542	-5.3152	14.9152
		TEST Tender legume	5.40000	3.53553	.445	-4.7152	15.5152
DAY_04	CONTROL	STANDARD	5.60000	14.15627	.978	-34.9014	46.1014
		TEST Tender legume	6.60000	14.15627	.965	-33.9014	47.1014
		TEST Unripe legume	19.80000	14.15627	.518	-20.7014	60.3014
	STANDARD	CONTROL	-5.60000	14.15627	.978	-46.1014	34.9014
		TEST Tender legume	1.00000	14.15627	1.000	-39.5014	41.5014
		TEST Unripe legume	14.20000	14.15627	.750	-26.3014	54.7014
	TEST Tender legume	CONTROL	-6.60000	14.15627	.965	-47.1014	33.9014
		STANDARD	-1.00000	14.15627	1.000	-41.5014	39.5014
		TEST Unripe legume	13.20000	14.15627	.788	-27.3014	53.7014
	TEST Unripe legume	CONTROL	-19.80000	14.15627	.518	-60.3014	20.7014
		STANDARD	-14.20000	14.15627	.750	-54.7014	26.3014
		TEST Tender legume	-13.20000	14.15627	.788	-53.7014	27.3014

DAY_06	CONTROL	STANDARD	5.00000	3.67967	.541	-5.5276	15.5276
		TEST Tender legume	7.40000	3.67967	.225	-3.1276	17.9276
		TEST Unripe legume	-.40000	3.67967	1.000	-10.9276	10.1276
	STANDARD	CONTROL	-5.00000	3.67967	.541	-15.5276	5.5276
		TEST Tender legume	2.40000	3.67967	.913	-8.1276	12.9276
		TEST Unripe legume	-5.40000	3.67967	.478	-15.9276	5.1276
	TEST Tender legume	CONTROL	-7.40000	3.67967	.225	-17.9276	3.1276
		STANDARD	-2.40000	3.67967	.913	-12.9276	8.1276
		TEST Unripe legume	-7.80000	3.67967	.189	-18.3276	2.7276
	TEST Unripe legume	CONTROL	.40000	3.67967	1.000	-10.1276	10.9276
		STANDARD	5.40000	3.67967	.478	-5.1276	15.9276
		TEST Tender legume	7.80000	3.67967	.189	-2.7276	18.3276
DAY_08	CONTROL	STANDARD	7.40000	3.53836	.198	-2.7233	17.5233
		TEST Tender legume	6.00000	3.53836	.358	-4.1233	16.1233
		TEST Unripe legume	.80000	3.53836	.996	-9.3233	10.9233
	STANDARD	CONTROL	-7.40000	3.53836	.198	-17.5233	2.7233
		TEST Tender legume	-1.40000	3.53836	.978	-11.5233	8.7233
		TEST Unripe legume	-6.60000	3.53836	.281	-16.7233	3.5233
	TEST Tender legume	CONTROL	-6.00000	3.53836	.358	-16.1233	4.1233
		STANDARD	1.40000	3.53836	.978	-8.7233	11.5233
		TEST Unripe legume	-5.20000	3.53836	.477	-15.3233	4.9233
	TEST Unripe legume	CONTROL	-.80000	3.53836	.996	-10.9233	9.3233
		STANDARD	6.60000	3.53836	.281	-3.5233	16.7233
		TEST Tender legume	5.20000	3.53836	.477	-4.9233	15.3233
DAY_10	CONTROL	STANDARD	15.80000*	4.41814	.012	3.1596	28.4404
		TEST Tender legume	12.00000	4.41814	.066	-.6404	24.6404
		TEST Unripe legume	7.20000	4.41814	.391	-5.4404	19.8404
	STANDARD	CONTROL	-15.80000*	4.41814	.012	-28.4404	-3.1596
		TEST Tender legume	-3.80000	4.41814	.825	-16.4404	8.8404
		TEST Unripe legume	-8.60000	4.41814	.249	-21.2404	4.0404
	TEST Tender legume	CONTROL	-12.00000	4.41814	.066	-24.6404	.6404
		STANDARD	3.80000	4.41814	.825	-8.8404	16.4404
		TEST Unripe legume	-4.80000	4.41814	.702	-17.4404	7.8404
	TEST Unripe legume	CONTROL	-7.20000	4.41814	.391	-19.8404	5.4404
		STANDARD	8.60000	4.41814	.249	-4.0404	21.2404
		TEST Tender legume	4.80000	4.41814	.702	-7.8404	17.4404
DAY_12	CONTROL	STANDARD	27.60000*	4.51553	.000	14.6810	40.5190
		TEST Tender legume	15.00000*	4.51553	.020	2.0810	27.9190
		TEST Unripe legume	7.20000	4.51553	.409	-5.7190	20.1190
	STANDARD	CONTROL	-27.60000*	4.51553	.000	-40.5190	-14.6810
		TEST Tender legume	-12.60000	4.51553	.057	-25.5190	.3190
		TEST Unripe legume	-12.50000	4.51553	.067	-33.3190	-7.4810
	TEST Tender legume	CONTROL	-15.00000*	4.51553	.020	-27.9190	-2.0810
		STANDARD	12.60000	4.51553	.057	-.3190	25.5190
		TEST Unripe legume	-7.80000	4.51553	.343	-20.7190	5.1190
	TEST Unripe legume	CONTROL	-7.20000	4.51553	.409	-20.1190	5.7190
		STANDARD	-12.50000	4.51553	.067	-33.3190	-7.4810
		TEST Tender legume	7.80000	4.51553	.343	-5.1190	20.7190

Post Hoc Test ANOVA one way statistic shows on 12th day there are Significant value of Standard Shows 0.00 and Test Tender legumes show 0.020 and Between Unripe Legume Shows 0.409.

Exudates type of wound

Score for Exudates Type of wound in Bates-Jensen Wound assessment Tool

- None = 1
- Bloody = 2
- Serosanguineous: Thin, Watery, Pale red/pink = 3
- Serous: Thin, Watery, Clear = 4
- Thin or thick, opaque, tan/yellow with or without odor = 5

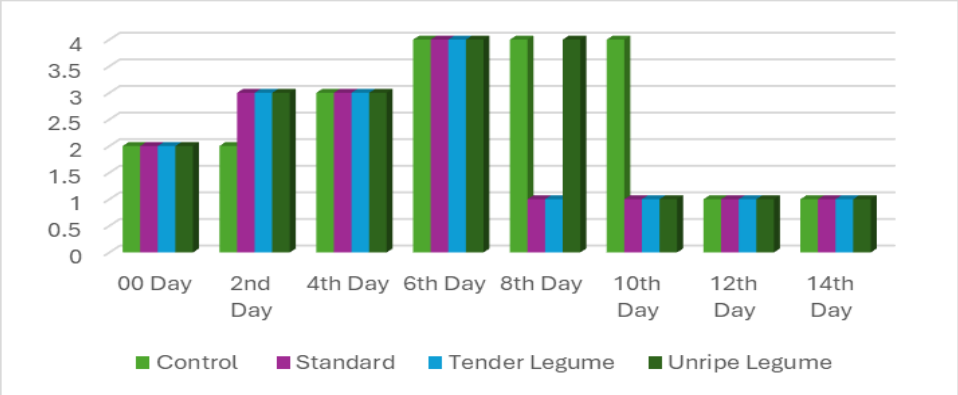


Figure 3.1Exudate type variations with days.

Exudate type of wound with days according to Bates-Jensen wound contraction tool, before treatment all groups have been observed as 2 according to the score. Initially all group wounds showed bloody discharge and gradually discharge reduced for all group.

4.2 Exudate amount

- None, Dry Wound = 1
- Scant, Wound moist but no observable exudate = 2
- Small = 3
- Moderate = 4
- Large = 5

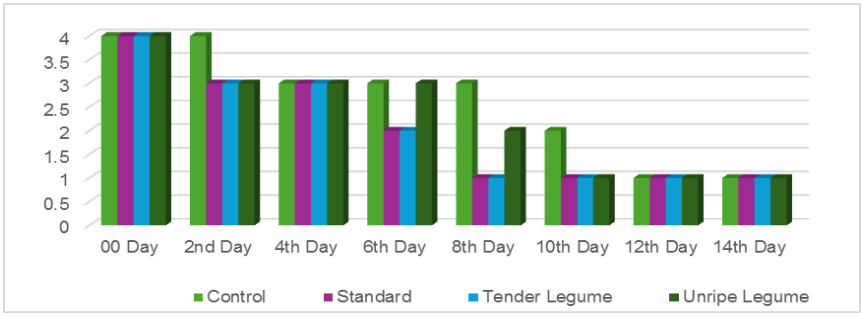


Figure 3.2 Exudate amount variations with days.

Exudate amount of wound with days according to Bates-Jensen wound contraction tool, before treatment all groups have been observed as 4 according to the score. Initially all group wounds showed moderate discharge and gradually discharge reduced for all group. On 14th Day no Discharge in all groups.

4.3 Skin Coloration surrounding the wound

- Pink or normal for ethnic group = 1
- Bright red&/or Blanches to touch = 2
- White or gray pallor or Hypo pigmented = 3
- Dark red or purple&/or non-bleachable = 4
- Black/ hyperpigmented = 5

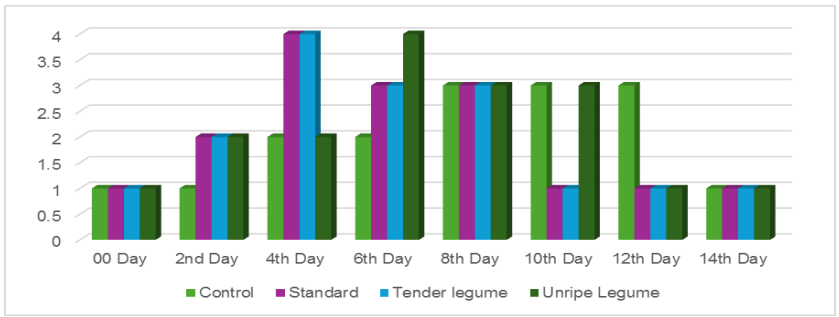


Figure 3.3 Skin coloration surrounding the wound variations with days.

Skin coloration surrounding the wound days according to Bates-Jensen wound contraction tool, before treatment all groups have been observed as 1 according to the score. Initially all group wounds showed pink coloration in Surrounding the wound.

4.4 Percentage of Wound Contraction

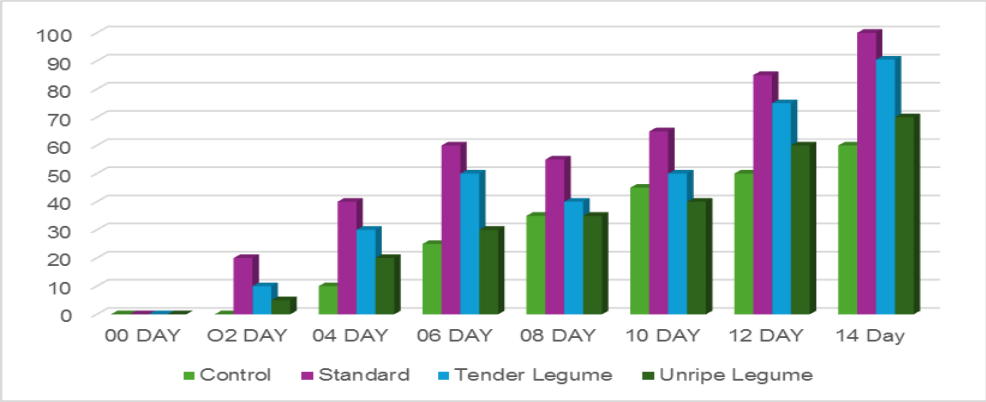
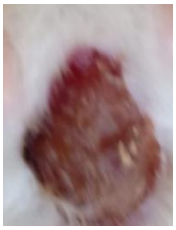
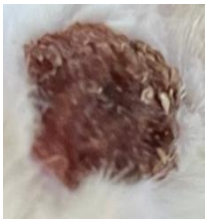
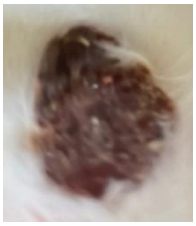
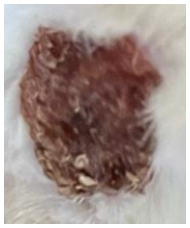
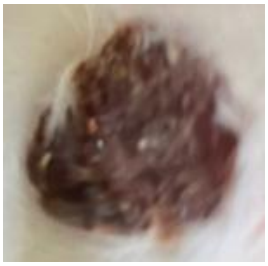


Figure 3.4 Percentage of Wound Contraction.

4.2 Table: Size of wound variation with days.

	Control	Standard	Tender legume	Unripe legume
Day 00				
Day 02				
Day 04				

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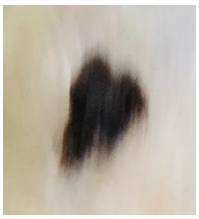
Day 08				
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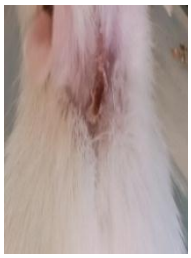
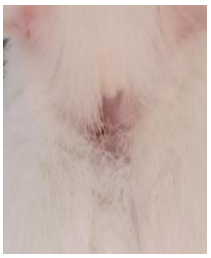
Day 14				

4. DISCUSSION

Our skin is highly adapted, multifunctional organs that shield us from daily onslaught Mechanical, Chemical, and Thermal damages. Wounds are known as any break in the integrity of the skin, mucous membrane or organ tissue and it was Unavoidable occurrence in day-to-day life. Wound healing is Physiological process of restoring the damage tissue by reinstating the skin integrity.[7] An appropriate method for healing of wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional of the skin.

Many medicinal plants are claimed to be useful for wound healing. These plant remedies have been used since ancient times but few of them have been evaluated scientifically. Stanza about general character of *Vellavari pinchu* (Tender legume of *Dolichos lablab*) mentioned in the Siddha text book of *Kunapadam* was indicated that, *Vellavari pinchu* can cure the wound, based on that I selected the Tender legume of this plant for the study hence the study focusses to Evaluate the Wound healing activity of Tender legume of *Dolichos lablab* on Wister albino rats and Further I decided to Compare the wound healing activity of Tender legume and Unripe Legume (Matured) of *Dolichos Lablab*.

In this study healing activity was studied for 14 days in 4 groups. Cicatrin powder is used as Stand drug for Wound Healing and *Dolichos lablab* Tender legume and Unripe legume Considered as Test groups. Meanwhile the control group were left untreated. Cicatrin powder, *Dolichos lablab* Tender legume and Unripe legume powder were topically applied to cover the wound surface every day till 14th day.

Data was collected once in 2 days from each four groups and recorded clearly. The wound width and length were measured once in two days until 14 days. The direct observation wound circumference, edges, exudate type, exudate amount and skin coloration around wound are converted into Bates-Jensen Wound assessment Tool which is easy to obtain the statistical results. Statistical analysis was done by one way ANOVA by using IBM, SPSS Version 28 for the circumference of wound. Initial circumference of the wound of the four different groups is 0.542 which is much higher than the p value of 0.05 However, on 10thday the significant value of circumference of the wound in the four different groups is 0.015 which is lesser than the p value of 0.05. Which means the final circumferences of the wound show the significant differences statistically between the four groups.

Figure 4.1 reveals the variation in exudate type of wound with time. Initially all group wounds showed bloody discharge. Then gradually discharge reduced for all group. On the second day of observation, the control group had bloody discharge, while the standard and test groups had Serosanguinous (Pink, thin, watery) discharge. On 4th day all 4 groups had Serosanguinous Discharge and on 6th day it becomes Serous (Clear, thin, watery) discharge in all groups. On 8th day Standard and Tender Legume Group as none and Serous discharge remains in Control and Unripe legume. On 10th day Serous discharge remains in Control, but other groups had none. On 12th and 14th Day all groups with non-discharge.

Exudate type of Wound is first bloody, then it became Serosanguinous, Serous and Finally all groups had none. But The exudate of the wound first disappeared in Standard and Tender legume group in 8th day Then it disappeared in Unripe legume in 9th day and Finally Control group had Non discharge. That Could indicate Fast wound Healing process of Standard and Tender legume Test group than Unripe legume Test group and Control group.

Figure 4.2 Shows Variation in Exudate amounts over time, prior to treatment, all groups exudate quantity was regarded moderate. On the second day, all groups' exudates were gradually decreased exclude Control it remains in same moderate amount of Discharge. On 6th day Standard and Tender legume Wound moist but not observable exudate, while the Control and Unripe legume show small amount of Discharge. That Could indicate Quick Wound Healing of Standard and Tender legume Test group than Unripe legume Test group and Control group. On 8th day Tender legume and Standard groups became Dry wound but no change in Unripe legume and Control group, it shows Scanty discharge. On 10th day Unripe legume group became Dry wound while Control Group was moist. On 12th and 14th day all groups were dry, and none exudate.

In figure 4.3 reveals surrounding skin colour variation with the day, before the treatment all groups observed normal pink colour. On 2nd day in the control group no colour changes and in other all group gradually surrounding skin colour changed to red colour with hyper pigmented and Colour decreased gradually until 14th day and shows light pink colour. But in control group mild redness was observed until 14th day.

In figure 4.4 show rate of wound closure, In Standard group wound closure was 100% on 14th day. In test group, Tender legume shows 90.5% wound closure, Unripe legume shows 70 % and Control group shows 60% of wound contraction. It indicates Test group had Higher Wound Healing activity than Control group and little less than Standard Group. In test group Tender legume shows High concentration rate than Unripe legume.

According to Table 4.2 (Post Hoc Test ANOVA one way statistic for the Change of circumference of the wound between groups) Shows, the Significant value of Tender legume of *Dolichos lablab* is 0.02. That indicates Tender legume of *Dolichos lablab* has Significant wound healing Activity (less than 0.05) and Significant value of Unripe legume is 0.409, Which is Higher than the p value 0.05 that indicates Unripe legume of *Dolichos lablab* show comparatively lower wound healing activity than Tender *Dolichos lablab*.

Premature legumes are richer sources of antioxidants than the matured legumes. Higher antioxidant activities of Tender legumes are due to the higher carotenoid, chlorophyll and phenolic contents compared to Matured legume. Legumes in their premature stage possess green appearance and contain substantial number of phytochemicals. During advanced maturity the contents

of many of the phytochemicals with nutraceutical qualities decrease considerably due to biotransformation.[8]

Oxidants act as free radicals, a highly reactive species that steal electrons from nearby molecules to satisfy their valence electron needs. The removal of electrons by free radicals produces damage within the healthy cells of tissue. Antioxidants can be used to reduce this oxidative stress and establish the necessary environment for wound healing by donating electrons to the free radicals, sparing the damaging effects oxidation causes to other molecules.[9]

Polyphenols have been proven to exhibit strong pro-inflammatory activities and play an important role in recruiting inflammatory cells to the site of inflammation, accelerating the entire healing process. In addition, polyphenols can promote the proliferation and migration of endothelial cells and fibroblasts. The unquestionable antioxidant and antimicrobial properties make these bioactive agents excellent candidates for controlling infection and promoting healing.[10]

According to this study, Tender legume of Dolichos lablab has Significant Wound healing and activity and Unripe legume of *Dolichos lablab* shows comparatively lower wound healing activity than Tender *Dolichos lablab* So, the Reason Could be the Hight Polyphenols, Fibers, Chlorophyll and its High Antioxidant power than the Unripe Legume. Also, it is clearly denoting that the Tender legume of *Dolichos lablab* is effective on wound healing which stated on siddha *Kunapadam* Text.

5. CONCLUSION

Tender *Dolichos lablab* powder was found to have considerable wound healing activity in exist wound model in albino rats with significant value is lower than 0.05. While Comparing with the Unripe Legume, Unripe legume of *Dolichos lablab* show comparatively lower wound healing activity than Tender *Dolichos lablab*.

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6. REFERENCES

1. Reddy BR, Rao N, Vijeepallam K, Pandey V. Phytochemical, pharmacological and biological profiles of Tragia species (Family: Euphorbiaceae). Asian J Pharm Clin Res. 2017; 10(6): 1–8.
2. Thas J. Siddha medicine: background, principles and applications for skin diseases. Clin Dermatol. 2007; 25(4): 405–408.
3. Roy S, et al. Assessment of membrane stability, central nervous system depressant, and gut motility effects of Lablab purpureus seeds. J Ethnopharmacol. 2022; 289: 115015.
4. Kujath P, Michelsen A. Wounds: from physiology to wound dressing. CME J. 2008; 6: 1–9.
5. Guo S, DiPietro LA. Factors affecting wound healing. Crit Rev Oral Biol Med. 2010; 89(3): 219–229.
6. Reddy BR, Pandey M, Singh J, Singh PM, Rai N. Principal component analysis and stability of genotypes in French bean (Phaseolus vulgaris L.). Legume Res. 2021; 44(6): 1–6.
7. Bass S, Chowdhury M, Raj S, Chaudhary N. Effects of phytomedicines on wound healing. Eur J Exp Biol. 2021; 11(2): 1–7.
8. Bhattacharya S, Malleshi NG. Physical, chemical and functional characteristics of pressure-processed and matured green legumes. J Food Sci Technol. 2011; 48(2): 174–179.
9. Underdown MJ. Antioxidants and wound healing [Undergraduate honors thesis]. Johnson City (TN): East Tennessee State University; 2013.
10. Guimarães I, Silva S, Pintado M, Oliveira A. Polyphenols: promising avenues in therapeutic solutions for wound care. Pharmaceutics. 2021; 13(7): 1007.
11. Priya D, et al. Antibacterial activity of the volatile oil of Lablab purpureus against some burn isolates. Int J Pharm Bio Sci. 2013; 4(2): 123–129.
12. Parvin D, Uddin N, Shahriar M. Phytochemical screening, thrombolytic activity and antimicrobial properties of the leaf extracts of Lablab purpureus. Am J Res Commun. 2013; 1(5): 128–140.
13. Rahman S, Akhter S. Antibacterial and cytotoxic activity of seeds of white hyacinth bean (Lablab

purpureus L. Sweet ‘white’). J Adv Biotechnol. 2018; 7(3): 1130–1137.
14. Kumari M, Eesha BR, Amberkar M, Babu S, Kumar N. Phytochemical analysis of Lablab purpureus L. seed extracts. Int J Pharm Sci Rev Res. 2019; 54(1): 45–49.
15. Al-Snafi AE. The pharmacology and medical importance of Dolichos lablab (Lablab purpureus) – A review. IOSR J Pharm. 2017; 7(2): 22–30.
16. Devi M, Kumar S. Evaluation of wound healing activity of polyherbal Siddha formulation. J Pharm Biomed Sci. 2011; 11(11): 1–5.
17. Don T, Soosairaj S. Evaluation of wound healing effects of herbal lotion in albino rats and its antibacterial activities. Clin Phytosci. 2018; 4: 10.
18. Gautam M, Purohit V, Agarwal A, Goel K. In vivo healing potential of Aegle marmelos in excision, incision and dead space wound models. Sci World J. 2013; 2013: 1–7.
19. Kumari M, et al. Wound healing activity of aqueous extract of Crotalaria verrucosa in Wistar albino rats. Asian Pac J Trop Med. 2010; 3(9): 713–716.
20. Malviya K, Tyagi C, Sharma H. Antioxidant, antimicrobial and wound healing activity of polyherbal formulation – A brief review. Asian J Pharm Educ Res. 2020; 9(1): 45–52.
21. Momoh MA, Adikwu MU, Eraga SO. Effect of cast films of bovine mucin and Prosopis gum containing cicatrin powder on wound healing. Dhaka Univ J Pharm Sci. 2008; 7(2): 101–106.
22. Murugesa Muthaliyar KS. Gunapadam Muthal Paakam – Mooligai Vaguppu. Chennai: Indian Medicine and Homeopathy Dept; 2008.
23. Nagar H. Pharmacological investigation of wound healing activity of Cestrum nocturnum L. ointment in Wistar albino rats. J Pharm. 2016; 2016: 1–8.
24. Okur ME. Recent trends on wound management: new therapeutic choices based on polymeric carriers. Asian J Pharm Sci. 2020; 15(6): 661–684.
25. Saha K, Rahman R, Das S. Screening of ayurvedic medicinal plant extracts for antioxidant and cytotoxicity. J Pharmacogn Phytochem. 2013; 2(3): 47–53.
26. Samraj K, Kannan M, Sathiyarajeswaran P. Case report on Siddha management of diabetic foot ulcer. Int J Res Ayurveda Pharm. 2019; 10(1): 138–141.
27. Ugandar R. Evaluation of wound healing activity of Piper betel leaf and stem extract in experimental Wistar rats. Am J PharmTech Res. 2014; 4(2): 443–452.
28. Uthamarayan KS. Siddhar Aruvai Maruthuvam. Chennai: Indian Medicine and Homeopathy Institute; 2013.
29. Vinubharthi K, Vidya R, Mahalaxmi V, Muthukumar N. Conceptual study on the role of Siddha parasurgical procedures in chronic wound management. World J Pharm Sci. 2019; 7(8): 1175–1181.
30. Wilkinson HN, Hardman MJ. Wound healing: cellular mechanisms and pathological outcomes. Open Biol. 2020; 10(9): 200223.

Dr. Mahendran Devamanojini