

# Experimental Evaluation of *Karpasa Beeja* (*Gossypium herbacum* Linn.) With special reference to its Galactagogue Effect

## Research Article

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### Abstract

Increased urbanization created lack of authentic and genuine drug for the management of ailments of human beings; similarly the urbanization has fashioned myths in society that lactation and feedings of the babies leads to loss of beauty, along with this stress, strain and modern style of living affects the milk production in human being. Galactogouges are most used and prescribed drugs in the medical practice. As per *Ayurveda* galactogouges are termed as *stanyajanana dravya*, which increase the milk production. *Karpasa beeja* (*Gossypium herbacum* Linn) belongs to Malvaceae family is medium sized tree consists *madhura rasa* (sweet taste), *sheeta veerya* (cold potency), and *madhura vipaka* (under goes sweet metabolism). It acts as *vata*, *pitta shamaka*, *kapha vardhaka*, and *stanyajanana* (increases lactation). The *Karpasa beeja* was subjected for morphological and physico-chemical evaluation according to the parameters explained in *Ayurveda* Pharmacopeia of India and galactagogue activity was carried out for 15 days by using 24 Albino rats divided into four groups i.e. two trial groups (*Churna* and Extract of *Karpas Beeja*), one standard group (*Shatavari churna*) and one control group (Normal saline water). The drug shows presence of carbohydrate, proteins, sterols, reducing sugar, tannins, flavonoids, alkaloids. The drug in the form of *churna* and 90% Ethyl alcohol extract shows similar effects with known standard drug *Shatavari* (*Asparagus racemosa*).

**Key Words:** *Karpasa beeja*, *Gossypium herbaceum* Linn, *Experimental*, *Galactogouges*.

### Introduction

Urbanization has fashioned myths in society that lactation and feedings of the babies leads to loss of beauty, along with this stress, strain and modern style of living affects the milk production in human being. Galactogouges (*Stanyajanana*) are most commonly used and prescribed drugs in the medical practice (1). There are many *stanyajanana dravyas* are explained in classics, among those *Karpasa* (*Gossypium herbaceum* Linn) is one of the well known drug since Veda and belongs to the family Malvaceae. It is used to prepare *Vastra* and *Picchu* (2). *Karpasa* is mentioned in different *Dupana yogas* (Fumigation). It is used in the treatment of *vataja ashmari* (Renal calculi), *adhika raktasrava* (Bleeding disorders), *atisara* (Diarrhea) and *nutrakriccha* (Dysurea). *Pushpas* (Flowers) are used in the preparation of *kushtanashaka lepas* (Application useful in skin diseases) (3). It is mentioned in *vatasamshamana gana* (*vata* mitigating). It is used in the treatment of *Karna srava* (Otorrhea), *Trishna* (Excessive thirst) (4). It is mentioned in *Yantra vidhi adhyaya* and used in the form of *bandha* (Bandage),

*pakva atisara* (Dysentery) (5). *Beeja* (seeds) acts as *Balya* (strengthening), *Brihmaneeya* (Nutrient), *stanyajanana* (galactagogue), *vrishtya* (aphrodisiac) due to its *madhura rasa* (sweet taste), *sheeta veerya* (cold potency) and *madhura vipaka* (sweet biotransformation) (6). It is also called as *Acchadanaphala*, *Ananta*, *Badari*, *Devadalika*, *Tundi*, *Samudranta* (7) etc. It is a Perennial shrub or medium sized tree grows up to 5-7 fts height, possess simple, alternate, lobed, cordate, entire-wavy leaf, cymose inflorescence, solitary flower and globose capsule fruit contain cotton in it(8).

### Materials and Methods

Healthy female adult Albino rats weighing from 200gms to 350gms were used for testing galactagogue effect of *Churna* (Powder) and Extract of *Karpasa beeja* (*Gossypium herbaceum* Linn), *Shatavari* (*Asparagus racemosa*) *Churna* and Distilled water in selected model according to Azizha Mahmood et al method (2012)(9). Female adult Albino rats of 3 months old were housed and mated with adult male rats. The female rats were allowed to deliver their young's and the day of parturition was designated as day 1. All the lactating rats were randomly divided into four groups of six rats each. The milk production was measured daily after 12hrs of treatment starting from day 6 to day 15. The weight of litters before and after 60 min of sucking was measured to estimated milk yield. The measurement of milk production and weight gain of litter mates along the experimental period was compared between the groups.

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**Group I** - Treated with *Karpasa beeja* Extract,  
**Group II**- Treated with *Karpasa beeja Churna*,  
**Group III** - Standard group treated with *Shatavari Churna*,  
**Group IV** - Control group treated with Normal saline.  
 Drug was given as, dose per kg body weight calculated by using animal dose conversion formula.

**Observations and Results**

All the lactating rats were randomly divided into four groups of six rats each. The milk production was measured daily after 12hrs of treatment starting from day 6 to day 15.

**Table No. 01: Table showing mean of milk yield in gms on 6<sup>th</sup> day (Graph- I)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	0.20	0.10	0.55	0.10
2	0.50	0.10	1.20	0.50
3	0.65	0.42	0.65	0.15
4	0.20	0.20	0.28	0.05
5	0.40	0.35	0.55	0.15
6	0.20	0.45	0.20	0.05
<b>Mean</b>	<b>0.35</b>	<b>0.27</b>	<b>0.57</b>	<b>0.16</b>

**Table No. 2: Table showing mean of milk yield on 7<sup>th</sup> day (Graph-II)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	0.15	0.35	0.28	0.20
2	0.60	0.10	0.95	0.10
3	0.20	0.20	0.70	0.10
4	0.20	0.20	0.60	0.20
5	0.46	0.20	0.70	0.20
6	0.20	0.53	0.90	0.10
<b>Mean</b>	<b>0.30</b>	<b>0.26</b>	<b>0.68</b>	<b>0.15</b>

**Table No. 3: Table showing mean milk yield on 8<sup>th</sup> day (Graph-III)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	0.22	0.43	1.10	0.04
2	0.35	0.30	1.40	0.08
3	0.33	0.62	1.10	0.15
4	0.37	0.42	0.72	0.15
5	0.52	0.50	0.85	0.35
6	0.30	0.41	0.88	0.27
<b>Mean</b>	<b>0.34</b>	<b>0.44</b>	<b>1.00</b>	<b>0.17</b>

**Table No. 4: Table showing Mean Milk yield on 9<sup>th</sup> day (Graph-IV)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	0.23	0.31	1.10	0.10
2	0.21	0.38	1.20	0.20
3	0.52	0.41	1.23	0.07
4	0.43	0.65	1.05	0.10
5	0.40	0.44	0.95	0.15
6	0.43	0.65	1.40	0.24
<b>Mean</b>	<b>0.37</b>	<b>0.47</b>	<b>1.15</b>	<b>0.14</b>

**Table No. 5: Table showing mean milk yield on 10<sup>th</sup> day (Graph-V)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	0.35	0.35	1.08	0.05
2	0.20	0.36	1.40	0.07
3	0.35	0.27	1.15	0.20
4	0.50	0.60	1.10	0.20
5	0.55	0.60	1.40	0.30
6	0.85	0.90	1.25	0.15
<b>Mean</b>	<b>0.46</b>	<b>0.51</b>	<b>1.23</b>	<b>0.16</b>

**Table No. 6: Table showing mean milk yield on 11<sup>th</sup> day (Graph-VI)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	0.60	0.42	1.18	0.15
2	0.40	0.52	1.15	0.31
3	0.47	0.25	1.13	0.49
4	0.70	0.80	1.12	0.35
5	0.95	1.10	0.83	0.45
6	0.85	1.45	1.10	0.60
<b>Mean</b>	<b>0.66</b>	<b>0.75</b>	<b>1.08</b>	<b>0.39</b>

**Table No. 7: Table showing mean milk yield on 12<sup>th</sup> day (Graph-VII)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	1.40	0.93	1.02	0.65
2	1.39	1.35	1.15	0.88
3	2.00	1.95	1.32	0.75
4	1.74	1.65	1.20	0.60
5	1.42	1.65	1.23	0.70
6	1.35	0.80	1.07	0.50
<b>Mean</b>	<b>1.55</b>	<b>1.38</b>	<b>1.16</b>	<b>0.68</b>

**Table No. 8: Table showing mean milk yield on 13<sup>th</sup> day (Graph-VIII)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	3.22	2.73	1.12	2.10
2	1.75	1.33	1.45	0.78
3	2.55	2.65	1.80	0.85
4	2.92	3.20	1.77	1.35
5	2.82	2.45	3.13	0.66
6	3.39	3.66	3.30	1.02
<b>Mean</b>	<b>2.77</b>	<b>2.66</b>	<b>2.09</b>	<b>1.12</b>

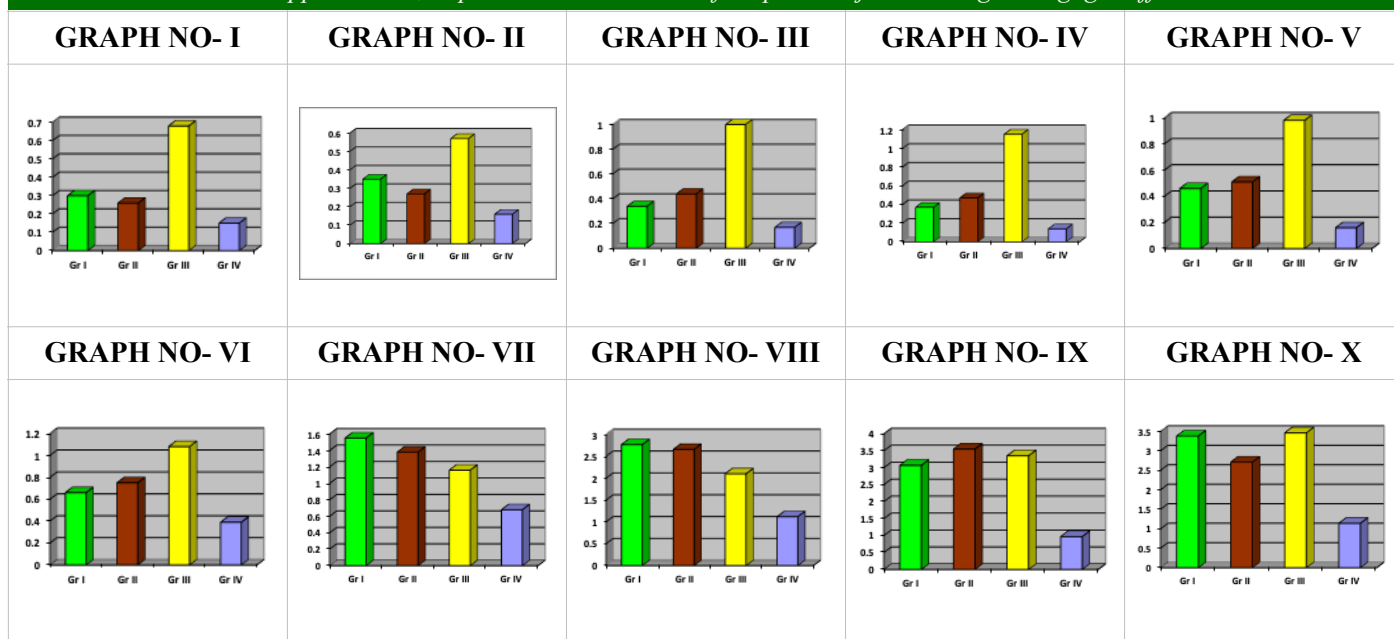
**Table No. 9: Table showing mean milk yield on 14<sup>th</sup> day (Graph-IX)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	3.12	3.36	3.13	1.10
2	2.70	4.04	3.18	1.60
3	4.25	4.14	3.70	1.23
4	3.27	3.45	3.63	0.55
5	2.85	3.13	3.10	0.55
6	2.25	3.23	3.41	0.80
<b>Mean</b>	<b>3.07</b>	<b>3.55</b>	<b>3.35</b>	<b>0.97</b>

**Table No. 10: Table showing mean milk yield on 15<sup>th</sup> day (Graph-X)**

Sl.No	Gr I	Gr II	Gr III	Gr IV
1	3.25	3.70	2.99	0.90
2	2.87	2.00	3.26	1.15
3	3.01	2.90	3.61	0.80
4	3.75	1.35	3.22	1.25
5	3.13	3.18	3.98	2.00
6	4.32	3.13	3.70	0.75
<b>Mean</b>	<b>3.38</b>	<b>2.71</b>	<b>3.46</b>	<b>1.14</b>

*Dhulappa M et.al., Experimental evaluation of karpasa beeja w.s.r. its galactagogue effect*



**Statistical analysis**

**Table No.11: Showing Statistical analysis of Group -I**

Sl. No.	Mean	SD	SEM	t	p	Remarks
6 <sup>th</sup>	0.35	0.19	0.07	0.69	0.5179	NS
7 <sup>th</sup>	0.30	0.18	0.07			
6 <sup>th</sup>	0.35	0.19	0.07	0.12	0.900	NS
8 <sup>th</sup>	0.34	0.09	0.04			
6 <sup>th</sup>	0.35	0.19	0.07	0.14	0.89	NS
9 <sup>th</sup>	0.37	0.12	0.05			
6 <sup>th</sup>	0.35	0.19	0.07	0.72	0.50	NS
10 <sup>th</sup>	0.46	0.22	0.09			
6 <sup>th</sup>	0.35	0.19	0.07	2.10	0.08	S
11 <sup>th</sup>	0.66	0.21	0.08			
6 <sup>th</sup>	0.35	0.19	0.07	12.59	0.0001	HS
12 <sup>th</sup>	1.55	0.26	0.10			
6 <sup>th</sup>	0.35	0.19	0.07	8.08	0.0005	HS
13 <sup>th</sup>	2.77	0.58	0.28			
6 <sup>th</sup>	0.35	0.19	0.07	11.30	0.0001	HS
14 <sup>th</sup>	3.07	0.67	0.27			
6 <sup>th</sup>	0.35	0.19	0.07	10.63	0.0001	HS
15 <sup>th</sup>	3.38	0.54	0.22			

**Table No.12: Showing Statistical analysis of Group -II**

Sl No.	Mean	SD	SEM	t	p	Remarks
6 <sup>th</sup>	0.27	0.15	0.06	0.09	0.92	NS
7 <sup>th</sup>	0.26	0.15	0.06			
6 <sup>th</sup>	0.27	0.15	0.06	3.55	0.01	S
8 <sup>th</sup>	0.44	0.10	0.04			
6 <sup>th</sup>	0.27	0.15	0.06	3.14	0.02	S
9 <sup>th</sup>	0.47	0.14	0.05			
6 <sup>th</sup>	0.27	0.15	0.06	2.82	0.03	S
10 <sup>th</sup>	0.51	0.23	0.09			
6 <sup>th</sup>	0.27	0.15	0.06	2.96	0.03	S
11 <sup>th</sup>	0.75	0.45	0.18			
6 <sup>th</sup>	0.27	0.15	0.06	6.11	0.0001	HS
12 <sup>th</sup>	1.15	0.25	0.08			

*International Journal of Ayurvedic Medicine, Vol 11 (1), 35-43*

12 <sup>th</sup>	1.38	0.44	0.18	0.11	0.0001	HS
6 <sup>th</sup>	0.27	0.15	0.06	8.22	0.0004	HS
13 <sup>th</sup>	2.67	0.78	0.32			
6 <sup>th</sup>	0.27	0.15	0.06	16.94	0.0001	HS
14 <sup>th</sup>	3.55	0.42	0.17			
6 <sup>th</sup>	0.27	0.15	0.06	7.13	0.0008	HS
15 <sup>th</sup>	2.71	0.86	0.35			

**Table No.13: Showing Statistical analysis of Group –III**

SI No.	Mean	SD	SEM	t	p	Remarks
6 <sup>th</sup>	0.57	0.35	0.14	0.78	0.47	NS
7 <sup>th</sup>	0.68	0.24	0.09			
6 <sup>th</sup>	0.57	0.35	0.14	6.23	0.001	S
8 <sup>th</sup>	1.00	0.24	0.90			
6 <sup>th</sup>	0.57	0.35	0.14	3.59	0.015	S
9 <sup>th</sup>	1.15	0.15	0.06			
6 <sup>th</sup>	0.57	0.35	0.14	5.27	0.007	HS
10 <sup>th</sup>	1.23	0.14	0.05			
6 <sup>th</sup>	0.57	0.35	0.14	3.50	0.017	S
11 <sup>th</sup>	1.08	0.12	0.05			
6 <sup>th</sup>	0.57	0.35	0.14	4.10	0.009	HS
12 <sup>th</sup>	1.16	0.10	0.04			
6 <sup>th</sup>	0.57	0.35	0.14	3.33	0.02	S
13 <sup>th</sup>	2.09	0.90	0.36			
6 <sup>th</sup>	0.57	0.35	0.14	13.30	0.0001	HS
14 <sup>th</sup>	3.35	0.26	0.10			
6 <sup>th</sup>	0.57	0.35	0.14	12.65	0.0001	HS
15 <sup>th</sup>	3.46	0.36	0.14			

**Table No.14: Showing Statistical analysis of Group -IV**

SI No.	Mean	SD	SEM	t	p	Remarks
6 <sup>th</sup>	0.16	0.16	0.06	0.20	0.84	NS
7 <sup>th</sup>	0.15	0.05	0.02			
6 <sup>th</sup>	0.16	0.16	0.06	0.69	0.94	NS
8 <sup>th</sup>	0.17	0.11	0.04			
6 <sup>th</sup>	0.16	0.16	0.06	0.35	0.73	NS
9 <sup>th</sup>	0.14	0.06	0.02			
6 <sup>th</sup>	0.16	0.16	0.06	0.05	0.95	NS
10 <sup>th</sup>	0.16	0.09	0.30			
6 <sup>th</sup>	0.16	0.16	0.06	2.13	0.085	S
11 <sup>th</sup>	0.39	0.15	0.06			
6 <sup>th</sup>	0.16	0.16	0.06	15.40	0.0001	HS
12 <sup>th</sup>	0.68	0.13	0.05			
6 <sup>th</sup>	0.16	0.16	0.06	3.78	0.0128	S
13 <sup>th</sup>	1.12	0.53	0.21			
6 <sup>th</sup>	0.16	0.16	0.06	6.49	0.0013	HS
14 <sup>th</sup>	0.97	0.41	0.16			
6 <sup>th</sup>	0.16	0.16	0.06	5.01	0.004	HS
15 <sup>th</sup>	1.14	0.46	0.18			

**Between the groups**  
**Table No.15: Showing Statistical analysis of data between groups on 6<sup>th</sup> day**

Sl No.	Mean	SD	SEM	t	p	Remarks
Gr I	0.35	0.019	0.007	0.87	0.40	NS
Gr II	0.27	0.15	0.06			
Gr I	0.35	0.019	0.007	1.30	0.22	NS
Gr III	0.57	0.35	0.14			
Gr I	0.35	0.019	0.007	1.84	0.09	NS
Gr IV	0.16	0.16	0.06			
Gr II	0.27	0.15	0.06	1.90	0.08	NS
Gr III	0.57	0.35	0.14			
Gr II	0.27	0.15	0.06	1.09	0.29	NS
Gr IV	0.16	0.16	0.06			

**Table No.16: Showing Statistical analysis of data between groups on 7<sup>th</sup> day**

Sl No.	Mean	SD	SED	t	p	Remarks
Gr I	0.30	0.18	0.07	0.39	0.70	NS
Gr II	0.26	0.15	0.06			
Gr I	0.30	0.18	0.07	3.13	0.01	S
Gr III	0.68	0.24	0.09			
Gr I	0.30	0.18	0.07	1.94	0.08	NS
Gr IV	0.15	0.05	0.02			
Gr II	0.26	0.15	0.06	3.65	0.004	S
Gr III	0.68	0.24	0.09			
Gr II	0.26	0.15	0.06	1.70	0.11	NS
Gr IV	0.15	0.05	0.02			

**Table No.17: Showing Statistical analysis of data between groups on 8<sup>th</sup> day**

Sl No.	Mean	SD	SED	t	p	Remarks
Gr I	0.34	0.09	0.04	1.65	0.12	NS
Gr II	0.44	0.10	0.04			
Gr I	0.34	0.09	0.04	6.16	0.001	HS
Gr III	1.00	0.24	0.09			
Gr I	0.34	0.09	0.04	2.79	0.01	S
Gr IV	0.17	0.11	0.04			
Gr II	0.44	0.10	0.04	5.18	0.004	HS
Gr III	1.00	0.24	0.09			
Gr II	0.44	0.10	0.04	4.23	0.001	HS
Gr IV	0.17	0.11	0.04			

**Table No.18: Showing Statistical analysis of data between groups on 9<sup>th</sup> day**

Sl No.	Mean	SD	SED	t	p	Remarks
Gr I	0.37	0.12	0.05	1.33	0.21	NS
Gr II	0.47	0.14	0.05			
Gr I	0.37	0.12	0.05	9.62	0.001	HS
Gr III	1.15	0.15	0.05			
Gr I	0.37	0.12	0.05	3.97	0.002	HS
Gr IV	0.14	0.06	0.02			
Gr II	0.47	0.14	0.05	7.84	0.001	HS
Gr III	1.15	0.15	0.05			
Gr II	0.47	0.14	0.05	5.11	0.005	HS
Gr IV	0.14	0.06	0.02			

**Table No.19: Showing Statistical analysis of data between groups on 10<sup>th</sup> day**

SI No.	Mean	SD	SED	t	p	Remarks
Gr I	0.46	0.22	0.09	0.35	0.73	NS
Gr II	0.51	0.23	0.09			
Gr I	0.46	0.22	0.09	6.99	0.0001	HS
Gr III	1.23	0.14	0.05			
Gr I	0.46	0.22	0.09	3.06	0.011	S
Gr IV	0.16	0.09	0.03			
Gr II	0.51	0.23	0.09	6.38	0.0001	HS
Gr III	1.23	0.14	0.05			
Gr II	0.51	0.23	0.09	3.42	0.006	HS
Gr IV	0.16	0.09	0.03			

**Table No.20: Showing Statistical analysis of data between groups on 11<sup>th</sup> day**

SI No.	Mean	SD	SEM	t	p	Remarks
Gr I	0.66	0.21	0.08	0.46	0.65	NS
Gr II	0.75	0.45	0.18			
Gr I	0.66	0.21	0.08	0.415	0.002	HS
Gr III	1.08	0.12	0.05			
Gr I	0.66	0.21	0.08	2.49	0.03	S
Gr IV	0.39	0.15	0.06			
Gr II	0.75	0.45	0.18	1.70	0.11	NS
Gr III	1.08	0.12	0.05			
Gr II	0.75	0.45	0.18	1.86	0.09	NS
Gr IV	0.39	0.15	0.06			

**Table No.21: Showing Statistical analysis of data between groups on 12<sup>th</sup> day**

SI No.	Mean	SD	SEM	t	p	Remarks
Gr I	1.55	0.26	0.10	0.76	0.46	NS
Gr II	1.38	0.44	0.11			
Gr I	1.55	0.26	0.10	3.32	0.007	S
Gr III	1.16	0.10	0.04			
Gr I	1.55	0.26	0.10	7.27	0.0001	HS
Gr IV	0.68	0.13	0.05			
Gr II	1.38	0.44	0.11	1.18	0.26	NS
Gr III	1.16	0.10	0.04			
Gr II	1.38	0.44	0.11	3.70	0.004	S
Gr IV	0.68	0.13	0.05			

**Table No.22: Showing Statistical analysis of data between groups on 13<sup>th</sup> day**

SI No.	Mean	SD	SEM	t	p	Remarks
Gr I	2.77	0.58	0.23	0.26	0.79	NS
Gr II	2.67	0.78	0.32			
Gr I	2.77	0.58	0.23	1.54	0.15	NS
Gr III	2.09	0.90	0.36			
Gr I	2.77	0.58	0.23	5.10	0.005	HS
Gr IV	1.12	0.53	0.21			
Gr II	2.67	0.78	0.32	1.17	0.26	NS
Gr III	2.09	0.90	0.36			
Gr II	2.67	0.78	0.32	3.97	0.002	S
Gr IV	1.12	0.53	0.21			

**Table No.23: Showing Statistical analysis of data between groups on 14<sup>th</sup> day**

SI No.	Mean	SD	SEM	t	p	Remarks
Gr I	3.07	0.67	0.27	1.48	0.16	NS
Gr II	3.55	0.42	0.17			
Gr I	3.07	0.67	0.27	0.96	0.035	NS
Gr III	3.35	0.26	0.10			
Gr I	3.07	0.67	0.27	6.48	0.0001	HS
Gr IV	0.97	0.41	0.16			
Gr II	3.55	0.42	0.17	0.97	0.35	NS
Gr III	3.35	0.26	0.10			
Gr II	3.55	0.42	0.17	10.63	0.0001	HS
Gr IV	0.97	0.41	0.16			

**Table No.24: Showing Statistical analysis of data between groups on 15<sup>th</sup> day**

SI No.	Mean	SD	SEM	t	p	Remarks
Gr I	3.38	0.54	0.22	1.61	0.13	NS
Gr II	2.71	0.86	0.35			
Gr I	3.38	0.54	0.22	0.26	0.79	NS
Gr III	3.34	0.36	0.12			
Gr I	3.38	0.54	0.22	7.67	0.001	HS
Gr IV	1.14	0.46	0.18			
Gr II	2.71	0.86	0.35	1.95	0.07	NS
Gr III	3.34	0.36	0.12			
Gr II	2.71	0.86	0.35	3.90	0.002	HS
Gr IV	1.14	0.46	0.18			

## Discussion

Galactagogue effect *Karpasa beeja* was carried out by using two trial groups and compared with a standard and control group. *Karpasa beeja* extract was administered to Group I, Group II was administered with *beeja churna*, Group III- administered with *Shatavari churna* and Group IV- administered with normal saline water by oral route with help of metallic syringe. Each mother rat was adjusted to have only six litters within 48hrs. The milk production was measured daily after 12hrs of treatment starting from day 6 to day 15. The weight of litter before and after 60mins of sucking was measured to estimated milk yield. The measurement of milk production and weight gain of litter mate along the experimental period was compared between the groups.

The mean weight gain before and after feeding was measured on 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup> after this data was compared using bar diagram. The mean milk yield on 6<sup>th</sup> and 15<sup>th</sup> day for Group – I was 0.35, 3.35 and t value was 10.63 and p value was 0.0001 shows statistically significant results. The mean milk yield on 6<sup>th</sup> and 15<sup>th</sup> day for Group – II was 0.27, 2.71 and t value was 7.13 and p value was 0.0008 shows statistically significant results. The mean milk yield on 6<sup>th</sup> and 15<sup>th</sup> day for Group – III was 0.57, 3.46 and t value was 12.65 and p value was 0.0001 shows statistically significant results. The mean milk yield on 6<sup>th</sup> and 15<sup>th</sup> day for Group – IV was 0.16, 1.14 and t value was 5.01 and p value was 0.0004 shows statistically significant results.

The mean milk yield between Group- I & Group – II on 15<sup>th</sup> day was 3.38, 2.71 and t value was 1.61 and p value was 0.13 shows statistically no significant difference between Group – I & Group - II. The mean milk yield between Group- I & Group – III on 15<sup>th</sup> day was 3.38, 3.34 and t value was 0.26 and p value was 0.79 shows statistically no significant difference between Group – I & Group - III. The mean milk yield between Group- I & Group – IV on 15<sup>th</sup> day was 3.38, 1.14 and t value was 7.67 and p value was 0.001 shows statistically significant difference between Group – I & Group - IV. The mean milk yield between Group- II & Group – III on 15<sup>th</sup> day was 2.71, 3.34 and t value was 1.95 and p value was 0.07 shows statistically no significant difference between Group – II & Group - III. The mean milk yield between Group- II & Group – IV on 15<sup>th</sup> day was 2.71, 1.14 and t value was 3.90 and p value was 0.002 shows statistically significant difference between Group – II & Group - IV. By comparing these results, the trial drug in both the extract and powder form shows the equipotent activity with standard drug (*Shatavari Churna*) GI =GII =GIII.

### Probable mode of action of Karpas beeja

Among so many drug actions galactagogue increases the rate of milk production. *Karpasa beeja* is having *madhura rasa, snigdha guna, sheeta veerya*, and *madhura vipaka*, leads to *stanyajanana karma*. *Madhur rasa, snigdha guna, sheeta veerya* and *madhura vipaka* acts as *kapha vardhaka* and *dhatu poshaka*. According to *samanya siddhanta* and by its *santarpaka* action, it increases the quantity of *jalatwa amsha* in *stanya* and



leads to *sthanyajanana* karma. According to modern science it reveals that the trial drug *Karpasa beeja* (*Gossypium herbaceum* Linn) has active constituents as sterols, alkaloids, flavonoids, glycosides, proteins, sugars, vitamins, minerals which are having galactogogue effect.

## Conclusion

The following conclusions can be drawn from the study:

1. *Karpasa beeja churna*, extract and *Shatavari churna* shown equipotent activity.
2. Experimental study proved that the drug *Karpasa beeja* (*Gossypium herbaceum* Linn) is having significant galactogogue property.

## Acknowledgment

This research work was funded by Rajiv Gandhi University of health Science Bangalore Karnataka, **RGUHS ORDER NO.** RGU: ADV. Res. Proposal –Ay-265: 2015-16 dated 07-01-2016. I am thankful to Vice Chancellor, Registrar, *Research Director of RGUHS Bangalore* and Prof. **Dr. N. G. Mulimani** Dean / Principal of the institution for supporting in all aspects and providing expertise insight.

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