

Studies On Lactogenic Property Of *Leptadenia Reticulata* (Jivanti) And Leptaden Tablets In Goats, Sheep, Cows And Buffaloes

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Leptadenia reticulata with synonyms in Indian languages as Jivanti (Sanskrit) ; Dodi, Jivanti (Hindi); Kharkhodi (Gujarati) ; Jibai. Jivanti, (Bengali); Dodi, Raidodi (Marathi); Pallaiykoddi, Payimunai (Tamil); Paltige (Telugu); Hariahali (Kannada); is a creeper plant freely available in Khasi hills, Gujarat, South India and many other parts of India. As stated by manufacturers, each Leptaden tablet contains *Leptadenia reticulata* (Jivanti) 134 mg. *Breynia patens* 184 mg and excipient.

The mention of Jivanti, dates back to Atharvaveda Charaka Sanhita and many Ayurvedic works and Nighantus have described a variety of properties, out of which one is mentioned as "Stanya Garbha Prada". This is suggestive of Jivanti having a lactogenic property.

Trivedi (1956) and Malati and Manju (1962) reported the use of Leptaden tablets as a galactagogue by trying the drug on mothers in maternity hospitals. Mangeshikar (1957) reported its beneficial use on habitual abortions and Naik (1957) used the tablets in uterine haemorrhages. Moulvi (1963) tried Leptaden tablets on some clinical cases in buffaloes and reported its beneficiary use as a galactagogue.

As no reports are available in the present day literature regarding any work on the lactogenic property of *leptadenia reticulata* (Jivanti), it was considered worth while to attempt to assess its lactogenic value comparatively with that of Leptaden tablets, for which also no controlled experiments are reported.

MATERIALS AND METHODS

Ths Drugs and mode of administration : Five kg *Leptadenia reticulata* dry plant duly authenticated was obtained and pulverised in a mechanical pulveriser, mixed well and stored in jars. Leptaden tablets were crushed fresh and used in the same way as powder.

The following dose schedule was maintained for all setof experiements and the drugs were administered twice daily.

Sp of animal	<i>Leptadenia reticulata</i>	Leptaden tablets
Sheeps & Goats	536 mg	4 tabs
Cows & Buffaloes	1340 mg	10 tabs

Leptadenia reticulata Powder was given equivalent to Leptadenia reticulata contents of the Leptaden tablet.

For sheep and goats the drugs were put on the back of the tongue and then a little concentrate was offered. The controls received the same quantity of concentrate without the drugs. For cows and buffaloes the drugs were put on the top of concentrates in their feed buckets.

EXPERIMENTAL

The animals of each species were arranged in three identical groups of four each with respect to their age, date of kidding or calving and body weight to their closest proximity. One group was treated with powder, the other with tablets and the third was kept as control. The animals were kept on a uniform routine with respect to their feeding concentrates, watering, grazing and milking. Only one attendant was employed throughout the experiment to milk them. The milk records were taken for first six days (four days in case of sheep-expt. No. 2) in pre drug period (P1), for 12 days in drug period (P2) and for 6 days (4 days in sheep) in post-drug period (P3).

EXPERIMENT NO. 1 - GOATS

Twelve Barbari goats, after two months of kidding were weaned and were arranged in three identical groups of four animals each. Milk was weighed on Avery double pan balance to one gram sensitivity.

Quantitative milk analysis was done. Specific gravity, total solids and ash were estimated after AOAC (1960), fat percentage by Gerber's method, lactose by micro method of Follin Wu (Hawk et al 1954) and crude proteins by formal titration method after Sokkary and Hasan (1953). Three sets of estimations were done, one in P1 four days before administration of the drug, another after five days of drugging in P2 and the third 3 days after stopping the drug in P3.

Following estimations were done for blood : blood sugar by Fan Wu method (Hawk of al 1954), blood urea after Boutwell (1962) and total RBC, WBC, and differential leucocytic court as per standard methods. Three sets of estimations were done, one in P1 sixth day of pre-drug period, second after six days of drugging in P2 and 3rd after 4 days of stopping the drug in P3.

Blood and milk sampling, preserving and processing were done promptly and with due precautions.

EXPERIMENT NO. 2 - SHEEP

Twelve Bikaneri sheep, after two weeks of lambing were arranged in three identical groups of four animals each, The ewes were with only one lamb under each.

An indirect method of milking was followed after Barnicoat et al (1949) and Munro (1955). The lambs were allowed to suckle three times a day, weighed before and after suckling and addition of weight increments gave the total milk yield for the day. A beam balance of 25 gm. sensitivity was used.

EXPERIMENT NO. 3 - COWS

Six Harijana cows in second lactation, after two and half months of calving were arranged in three identical groups of two animals each.

EXPERIMENT NO. 4 - BUFFALOES

Six Murrah buffaloes, three in 2nd lactation and three in 4th lactation were taken, after about 15 days of calving and they were arranged in three identical groups of two animals each.

For experiments No. 4 and 5, as the cows and buffaloes were accustomed to milk letting in presence of its calf, the calf was shown for milk letting and then removed and total milking was practiced.

RESULTS

The daily milk yield records of four experiments Nos. 1 to 4, giving per day average milk yield for periods P1, P2 and P3 and percent variation from the initial yield are shown in Table 1.

Goats and sheep were in a declining phase of lactation. In Expt. No. 1, one goat of control group died due to an accident and hence that group represents the average yield of three animals. In experiments No. 3 and 4, cows were in stable phase and buffaloes were in increasing phase of lactation, During these experiments, a severe climatic stress due to cold wave was experienced and milk yield of controls dropped while the treatment groups dropped less, In the treatment period P2.

Average per day per animal milk yield in goats, sheep, cows and buffaloes for the periods P1 (Pre drug period), P2 (Drug period) and P3 (Post drug period), Powder = Leptadenia reticulata powder : Tablet = Tablet Leptaden

Observation period	Milk yield of goats in gm			Milk yield of sheep in gm			Milk yield of cows in kg			Milk yield of buffaloes in kg		
	Control	Powder	Tablet	Control	Powder	Tablet	Control	Powder	Tablet	Control	Powder	Tablet
P1	544.41	572.2	699.79	957.81	803.43	795.31	3.06	3.62	3.296	3.416	2.716	3.25
P2	454.75	568.8	602.06	834.19	814.68	741.87	2.87	3.854	3.479	3.8	3.193	4.07
P3	405	470.91	518.04	720.31	690.62	557.81	2.037	2.833	3.558	4.25	3.053	4.066
Variation between P1 and P2	-89.66	-3.4	-97.73	-23.02	11.25	-63.44	-0.19	0.229	0.183	0.384	+ 0 477	0.82
Per cent variation initial yield in P2	-16.46	-0.39	-13.96	-12.34	1.4	-6.72	-6.2	6.81	5.55	+11.24	+17.56	+25.23
Variation between P2 and P3	-49.75	-97.89	-84.02	-114.48	-124.06	-84.06	-0.833	-1.021	-0.921	0.45	-0.14	-0'004
Per cent variation from P2 in P3	-10.94	-17.2	-13.95	-13.71	-15.22	-11.33	-29	-26.49	-25.47	11.84	-4.38	-0.098
Variation between P1 and P2	-439.41	-101.29	-181.75	-237.5	-112.81	-137.5	-1.023	-0.792	-0.738	0.834	0.337	0.816
Per cent from P1 in P3	-26.6	-17.7	-25.97	-24.79	-14.04	-17.28	-38.43	-21.84	-22.39	24.41	12.4	15

The net drug response is shown in Table 2. It was observed that average net gain in milk yield in relation to that of control was 12.31% with powder and 8.79% with tablet.

TABLE 2

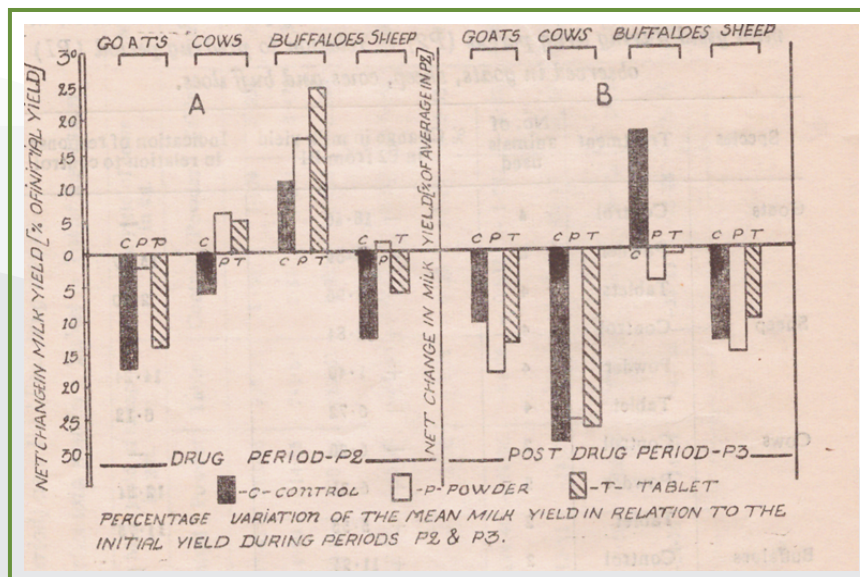
Galactopoietic response of drugs as indicated by percentage variation in milk yield during drug period (P2) in relation to predrug period (P1) observed in goats, sheep, cows and buffaloes.

Species	Treatment	Number of animals used	Change in milk yeild in P2 from P1	Indication of response in relation to control
Goats	Control	4	-16.46	-
	Powder	8	-0.59	15.87
	Tablets	4	-13.96	2.5
Sheep	Control	4	-12.84	-
	Powder	4	1.4	14.24
	Tablets	4	-6.72	6.12
Cows	Control	2	-6.2	-
	Powder	2	6.31	12.51
	Tablets	2	5.56	11.75
Buffaloes	Control	2	11.24	-
	Powder	2	17.56	6.32
	Tablets	2	25.28	13.99
Average	Powder	-	-	12.31
	Tablets	-	-	8.59

The results were evaluated statistically. The analysis of variance and t test were done. Highly significant (PL +0.01) results were seen in most of the experiments for Powder and Tablets. 'F' ratio for tablets was not found significant in case of buffaloes and only 't' value gave a significant (PL 0.05) result. In case of sheep, even though there was a visual rise in milk yield, the results were not significant statistically.

DISCUSSION

The results observed in 4 sets of experiments, when compiled, present a gross picture of the effect of the drugs as depicted in the Fig. It seems evident from the pattern of the bars obtained that in all sets of experiments, both Powder and Tablet groups have shown a galactopoietic response, which is corroborated by statistical analysis. The net galactopoietic response of Powder and Tablet groups, roughly assessed by comparing with that of controls as given in Table 2, is clearly indicative of the galactopoietic effect of the drugs.



The drugs were given to mature virgin rabbits in groups of 3 each for 12 days in the dose of 187.5 mg. daily and no change and development of mammary glands was observed by daily visual examination. This is suggestive that the drugs may not possess an oestrogenic nature of action for their lactogenic activity. In pharmacological experiments on dogs, the drugs produced a prolonged hypotensive action. This may probably be due to peripheral vasodilation. On chemical investigation, the drugs were found to possess sterols and sugars.

Leptaden tablets, in addition to *Leptadenia reticulata* also contain *Breynia patens*. Inclusion of *Breynia patens* in Leptaden tablets, does not seem to produce any favourable effect on the galactopoietic property of *Leptadenia reticulata* in the tablets and moreover *Leptadenia reticulata* powder alone is shown to produce better galactopoietic response, and less hypotensive effect. However to find out the part played by *Breynia patens* in Leptaden, it is necessary to conduct experiments on *Breynia patens* alone, which, unfortunately could not be procured during the present study.

The experiments on four different species of lactating animals for galactopoietic activity; on mature virgin rabbits on mammary development; on dogs, showing prolonged hypotension and presence of sterols on chemical investigation, are some interesting findings which may have a bearing on the lactogenic property of these drugs. Further work is still necessary to know the model of galactopoietic action of the two drugs.

SUMMARY

Leptadenia reticulata powder and Leptaden tablets were tried on goats, sheep, cows and buffaloes to assess their lactogenic property. The experiments were conducted on identical sets of animals in each group.

Leptaden tablets, 4 twice daily in goats and sheep, 10 twice daily in cows and buffaloes; and *Leptadenia reticulata* powder, 536 mg. (equivalent to the *Leptadenia reticulata* content of 4 Leptaden tablets) in goats and sheep, 1340 mg. (equivalent to the *Leptadenia reticulata* content of 10 Leptaden Tablets) in cows and buffaloes were given for 12 days. Both drugs produced significant galactopoietic response in most of the experiments. No significant changes were produced in the contents of milk and blood of goats as shown by their analysis during the experimental period.

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