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Pharmacological Studies on Dasamula Kvatha – Part II

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ABSTRACT

Research done on the rats with the *Ghanasatva* of decoction prepared from *Dashmula* (root bark of *Brhat Panchmula* and roots of *Laghupanchmula* about its analgesic, febrifuge and antiphlogestic activities. It showed the following results. It exhibited analgesic properties similar to aspirin. It also showed febrifuge as well as slightly antiphlogestic activities.

Keywords: Albino-rats; Hot plate; Phenylquinone; D.K. extract; Phenylbutazone; *Dashmula kwatha.*

INTRODUCTION

The word Dasamula is not mentioned in Vedic Literature. Some of the components of this group find place in different references. Caraka has not mentioned its components; though he has used the term Dasamula in different formulations. Susruta has described the components of Dasamula . They are the same as described by Caraka under Sayathuhara Mahakasaya. (C.S.4:l3(38); S.su. 38:66, 68,70. Vagbhatta has also used the term Dasamula , but he has also not described its components. The components are Bilva (Aegle marmelos coir) Agnimantha (Premna integrifolia Linn), Syonaka (Oroxylum indicum/vent), Patala (steriospermum suave lens DC.), Gambhari (Gmelina arboren Linn.), Salaparni (Desmodium gangatilum DC.), Prisn/Iparni (Uraria picta Desv). Brihati (Solanum indicum Linn). Kantakari (Solanum xanthocarpums chw. & Lndl.) and Goksura (Tribulus terrestris Linn).

Dasmula is described as Jvarahra (anti-pyretic), Sothahara (anti-inflammatory and anti-oedema) and Vataghna (C.SU.4:3(38), S.SU.38:71, A, S.su.15:44, Dh.Nigh.7:20, 22, 24) S.Nigh.2:158-159). It is useful in cases of SULA(colic), Siroruja (Headache), Sotha (Inflammation & oedema), Ruja (pain), Vatarakta(gout), Gridhasi (sciatica) Parsvasula (pleurodynia) and Katisula (backache) (C.ci.1.7:65-67.8:93-98,9:52-56,13:112-114,18:43-46,25:77, 28:124-127, 29:61-70, 81, 30:111; s.su.38:67, ci.5:7, 38:67-70:A.S.su.15:44, ci.2:13-15, 4:6-8, 27, 28, 6:25, 63-67, 7:31-3211:14, 16:38, 24:5,9, ut.10:17, 28:3, 30:20, 52:42-47 :Dh. Nigh:7:20-24, S.Nigh.2:159; K. Nigh. Ausadhivarga 73-74; Bh. Va4:49; Ci. 1:570-571, C.Datta.ci 1:169: YR:Dasamule : 1-4, B.R. 5:238-240. Prisni Parni (Uraria picta.Desv) is reported useful in healing of fractures (Prasad et.al.1964, Sankaran et.al.1964; Prasad et.al.1965).

MATERIALS AND METHODS

Botanical identity of each drug of Dasamula Gana was established at pharmacognosy laboratory, department of Dravyaguna, State Ayurvedic College Lucknow. The identified roots of the drugs of Dasamula Gana were taken (S.S. Purvakhanda 1:60:B.R.4.107 & Bh.Ci.1:572). They were dried in shade and

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reduced to a coarse powder 50 gms of each of this powder was taken and mixed together. The mixed powder was boiled in sixteen times of its volume of water to the extent that it remained 1/8th part of its volume (S.S. Madhyakhanda 2:1, Y.R. Kvatha:1). The decoction thus obtained was filtered through cotton gauze piece and again through filter paper. This filtered decoction was evaporating on a water bath. The extract was kept in tight air plastic bottles in a refrigerator .The extract is called Dasamula Kvatha extract (D.K. extract). This D.K. extract was dissolved in distilled water and was administered in animals for different experimental studies.

Analgesic activity in mice

(A) Hot plate method

The technique of Eddy & Leimback (1953) was followed. Albino-mice were placed on a thermostatically controlled hot plate (Techno) one by one. The hot plate was maintained at 55^{0}c to 55.5^{0}c. The reaction time was noted with the help of a stop watch before and after 30,60,90 and 120 minutes after the administration of drug (D.K. extract 1000 mg/kg p.o.) The increase in reaction time was taken as the criterion of analgesia.

(B) Phenylquinone writhing test

The technique of Hendershot and Forsaith (1959) was followed. Previously screened writhing positive five mice were taken. They were injected D.K. extract 500 mg/kg i.p. After one hour 0.2ml of 0.02% aqueous solution of phenylquinone was injected in each mouse, they were observed for a period of 30 minutes for production of writhe. The study was repeated in the doses of 1000 mg/kg, 250 mg/kg and 125 mg/kg. The protection at each dose level was calculated. ED58 values were calculated graphically.

Anti -pyretic activity in rats

Albino-rats were divided in to three groups. They were kept in the laboratory for 7 days for acclimatization. The sigmoidal temperature of each rat was recorded by tale-thermometer (Aplab.) before administration of yeast suspension. 2 ml of 20% suspension of yeast was injected subcutaneously in each rat. The sigmoidal temperature of each rat was recorded at half hourly intervals for 8 hours. After 5.5 hours of administration of yeast suspension, when the temperature was raised, first group was administered D.K. extract 500mg/kg. p.o., second group aspirin 300 mg/kg. p.o. and third group normal saline p.o.

Anti-inflammatory activity

Effect on oedema in rats

Adult albino rats weighing between 110gms to 160gms were used. They were kept in the laboratory for acclimatization for 7 days. They were divided in three groups. Paw volumes were measured with the help of plethysmograph devied by Udupa and Singh (1970) D. K. extract was administered in the dose of 750mg/kg p.o. and phenylbutazone 20mg/kg p.o. Oedema was produced as per technique of Winter et al (1962). Oedema developed in each group of rat and percent in hibitio of oedema were calculated.

Effect on granuloma pouch in rats

Young adult albino-rats of either sex weighting between 100 to 135gms were taken. They were kept in laboratory for 7 days for acclimatization. They were divided in three groups. Granuloma pouch was produced as per technique of Selye(1953). The drugs were administered 24 hours before production of the pouch and were continued daily till tenth day in the doses of D.K. extract 500 mg/kg p.o. and phenylbutazone 20mg/kg.p.o. The pouch of each animal was carefully dissected out intact. The volume of inflammatory exudated and weight of each pouch was measured.

Observation and Results

The crude drug yielded 7.7% extract. The Author of extract yielded in different extractions are summarised in Table 1.

Analgesic activity in mice

(A) Hot plate method

D.K. extract was devoid of any appreciable analgesic activity as tested by Eddy's hot plate method in the doses of 5oo mg/kg p.o. However it increased the reaction time to 1.8 times at 90 minutes interval. The reaction time is summarised in Table 2.

(B) Phenylquinone writhing test

D.K. extract produced dose dependent antagonism to phenylquinone writhing. The protection was 20% in 125 mg/kg, 40% in 250 mg/kg, 60% in 500mg/kg and 80% in 1000mg/kg i. p. doses. The result is summarises in Table 3.

Anti-pyretic activity in rats

The temperature of albino-rats started rising 4 hours after yeast administration. It rose about 1.5 to 2°C. After drug administration it reduced suddenly in D.K. treated group and gradually in aspirin treated group. The duration of action was short and fall of temperature was greater than in aspirin treated group.

Anti-inflammatory activity

(a) Effect on oedema in rats

D.K. extract (750mg/kg p.o.) produced 11.4% inhibition of the oedema induced by Author while phenylbutazone produced 17.1% inhibition at 20mg/kg p.o. dose level. Result is summarised in Table-5

(b) Effect on granuloma pouch in rats

D.K. extract did not show any anti-inflammatory effect against the carriage in induced granuloma pouch in rats. The result is summarised in Table 5.

DISCUSSION

The D.K. extract was subjected to various pharmacological tests to find out whether it possesses any such activity and to substantiate its clinical usefulness using various laboratory models. The results indicated that it effectively produced analgesic effect on the phenylquinone writhing test. However, it had no significant analgesic effect as tested by Eddy's hot plate method. Its activity to antagonize the phenylquinone induced writhing suggests an analgesic effect like

Table 1: Extract fielded from crude drug

Sr. No.	Wt. of crude drug (gms)	Wt. of extract (gms)	% extract obtained	Mean
1	500	36	7.2	7.7
2	500	41	8.2	

Table 2: Analgesic activity (hot plate method) in mice

			Reaction time in seconds after				
Dose	Code No.	Wt. of Mice (gms)	0 Min	30 Min	60 Min	90 Min	120 Min
D.K. extract (1000mg/kg p.o.)	H	20	6	7	4	12	5
	B	22	9	6	5	14	6
	T	21	4	11	5	15	9
	HB	23	7	4	4	11	10
	HT	18	10	8	5	12	6
	Mean		7.2	7.2	4.5	12.8	7.2
	SD		±2.38	±2.58	±0.54	±1.64	±2.16
	SE		1.06	1.15	0.24	0.73	0.96

Table 3: Showing Analgesic activity (phenylquinone writhing test) in mice

Doses	Code No.	Wt. of mice in gms	% Protection
125mg/kg i.p.	H	18	20
	B	18	
	T	19	
	HB	21	
	HT	18	
250mg/kg i.p.	H	20	40
	B	19	
	T	18	
	HB	18	
	HT	21	
500mg/kg i.p.	H	18	60
	B	22	
	T	20	
	HB	22	
	HT	22	
1000mg/kg i.p.	H	23	80
	B	18	
	T	21	
	HB	23	
	HT	23	

Table 4: Showing effect on oedema in rats

Groups & Doses	Code No.	Oedema (Div)	Mean ± S.E.	Inhibition %
I-D.K. treated (750 mg/kp p.o.)	H	10	6.2	11.4
	B	7	SD+3.11	
	T	3	SE-1.39	
	HB	3		
	HT	8		
II-Phenylbutazone treated (20mg/kg p.o.)	H	6	5.8	17.1
	B	7	SD±1.09	
	T	6	SE-0.48	
	HB	6		
	HT	4		
III-Control	H	6	7	
	B	10	SD+1.73	
	T	6	SE-0.77	
	HB	7		
	HT	6		

Table 5: Showing Effect on granuloma pouch

Group & Dose	Code No.	Vol. of exudate (ml)	Mean ±SE	Wt. of pouch (gms)	Mean±SE
I-D.K treated	H	8	6.8	4.9	3.84
(500mg/kg p.o.)	B	6.5	SD±0.75	3.6	SD±0.72
	T	6		2.9	
	HB	7	SE 0.33	3.8	SE 0.32
	HT	6.5		4	
II-Phenylbutazone treated					
(20mg/kg p.o.)	H	4	4.52	2.2	2.56
	B	5.4	SD±0.64	3.4	SD±0.68
	T	4.2		2	
	HB	5	SE 0.28	3.2	SE 0.30
	HT	4	SE 0.30	2	
III-Control	H	7	7.6	3	3.27
	B	7	SD±0.54	3.1	SD±0.32
	T	8		3.1	
	HB	8	SE 0.24	3.35	SE 0.14
	HT	8		3.8	

aspirin (siegmurd, et al 1957). The extract significantly reduced pyrexia induced by yeast (P=0.001) in rats. The aspirin like effect is further supported by the significant (p=0.001) anti–pyretic effect and a mild anti-inflammatory effect.

tory effect in rats against carragi in induced oedema. Gupta, et.al. (1982) reported that D.K extract significantly reduces the spontaneous body temperature (p=0.001) and produced a tranquillo sedative effect by blocking the condition avoidance response like a major tranquillizer (Byck. 1975). The ataractic or tranquilizing activity is further supported by significant (p=0.001) potentiating of pentobarbitone hypnosis and an antagonism of the amphetamine induced hyperactivity. (Weise, b.et.al, 1962).

RESULTS AND CONCLUSION

There are several anti-inflammatory agents of synthetic origin. Although they are very effective & potent, but none of them are satisfactory due to the 2toxicity like gastric irritation and bone marrow depression etc. In spite of the extensive studies for years together, a comprehensive, effective, non-steroidal, indigenous anti-inflammatory drug of plant origin and without any side effects has yet to be searched, so that it can be used in various inflammatory clinical conditions. With this aim in view, this study was undertaken to evaluate the effectiveness and potentiality of DASAMULA KVATHA described in our Ayurvedic texts as SVAYATHUHARA for its anti-inflammatory, analgesic and anti-pyretic studies. The results indicate that DASAMULA KVATHA extract effectively produced analgesic effect like aspirin. The aspirin like effect is further supported by the significant anti-pyretic effect and a mild anti-inflammatory effect in rats against carriage in induced oedema It supports the recommended use of DASAMULA KAVTHA in various clinical condition like pain, pleurodynia, backache, gout, pyrexia, sciatica, headache and sotha (inflammation & oedema).

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