TABLE 2: ESTIMATION OF ITRACONAZOLE IN PHARMACEUTICAL FORMULATIONS.

Sample	Labelled amount (mg)	Amount obtained (mg)		% recovery of the proposed method*	
		Proposed methods			
		A	B	A	B
1	100	99.8	101.0	100.04	100.21
2	100	100.2	99.6	99.86	100.17
3	100	99.7	100.1	99.94	98.99

* Average of five determinations.

Interference studies revealed that the common excipients and other additives usually present in the dosage form such as parabens, lactose, sucrose, starch, sodium benzoate, sodium phosphate, calcium gluconate, gelatin, talc, magnesium stearate did not interfere in the proposed methods.

The blood red coloured complex formed in method A may be due to the fact that each of the two nitrogen atoms in 1,10-phenanthroline has an unshared pair of electrons that can be shared with Fe (II) ion [formed by reaction of ITCZ with Fe (III)]. Three such molecules of 1,10-phenanthroline attach themselves to the metallic ion (ferroin complex). In method B, under reaction conditions MBTH loses two electrons and one proton on oxidation with $FeCl_3$ to give an electrophilic intermediate, which has been postulated to be the active coupling species. This intermediate couples with the drug molecule to form the green coloured complex. In conclusion, the methods developed are simple, sensitive, economical and accurate and can be used for the routine determination of ITCZ in bulk as well as in pharmaceutical preparations.

REFERENCES

1. William, K.N., In; Gennaro, A.R., Eds., Remington: The Science and Practice of Pharmacy, 19th Edn., Vol. II, Mack Publishing Company, Easton, Pennsylvania, 1995, 1330.
2. Bai. L., Lu, Y., Chen, X., Ha, Y. and Du, M., **Zhongguo Yiyuan Yaoxue Zazhi,** 1999, 19, 7.
3. Compas, D., Touw, D.J. and De Croede, P.N.F.C., **J. Chromatogr., Biomed. Appl.,** 1996, 687, 453.
4. Allenmark, S., Edebo, A. and Lindgren, K., **J. Chromatogr,** 1990, 532, 203.

Analgesic and Antipyretic Activity of *Pergularia extensa* in Rats

S. S. JALALPURE[1], P. V. HABBU*, M. B. PATIL[1], R. V. KULKARNI[2], C. C. SIMPI[2] AND C. C. PATIL[2]

B. V. V. S's H. S. K. College of Pharmacy, Bagalkot-587 101.

[1]K. L. E's College of Pharmacy, Belgaum-590 010.

[2]B. L. D. E. A's College of Pharmacy, Bijapur-586 103.

Accepted 11 April 2002

Revised 3 April 2002

Received 30 June 2001

The presence of flavanoids, steroids and saponins was detected in the preliminary phytochemical investigation of different leaf extracts of *Pergularia extensa*. The ethanolic extract and petro-

***For correspondence**

leum ether extracts of dried leaves have shown significant analgesic activity, where as ethanolic, butanolic and petroleum ether extracts of dried leaves showed significant antipyretic activity in rats.

Pergularia extensa (Family: Asclepidiaceae), commonly known as *juttuveballi, phalakantaka,* is one of the important plants of Ayurveda system of medicine. The plant is cultivated in tropical continents like Africa, Asia, and throughout India. The whole plant is used as anthelmentic, laxative, in the treatment of asthma, and useful in eye problems and urinary discharge[1,2]. Literature survey revealed that ethanolic extract of the whole plant exhibited moderate to appreciable antimicrobial activity against *E.coli* and *Proteus mirabilis*[3] and the chemical investigation of hexane extract of the whole plant yielded new triterpene esters, lupeol-3β-trans crotonate along with the acetates of α-amyrin, β-amyrin, oleanolic acid and β-sitosterol. No systematic study on the analgesic and antipyretic activity has been reported in the literature. The objective of the present study was to assess the leaves of *Pergularia extensa* for analgesic and antipyretic activity in rats.

Paracetamol (200 mg/kg) was used as a standard for comparison of antipyretic activity, and aspirin (200 mg/kg) for comparison of analgesic activity. All the test samples were prepared in propylene glycol and were administered at a dose of 200 mg/kg, all control animals received propylene glycol. Wistar rats of either sex (150-180 g) maintained under standard husbandry conditions were used throughout the study. The animals were allowed access to standard laboratory feed and water *ad libitum.*

The leaves of *Pergularia extensa* were collected from Diggewadi village, Belgaum district and authenticated at the Department of Botany, RLS Science College, Belgaum. Leaves were shade dried and reduced to a fine powder. The dried powder (1 kg) was exhaustively extracted with ethanol (95%) in a Soxhlet extractor. The total ethanolic extract obtained was further fractionated by using different solvents like petroleum ether, butanol, solvent ether and ethyl acetate. The solvent from each fraction was evaporated to get semisolid mass. Then the preliminary phytochemical investigation and screening of analgesic and antipyretic activity was carried out for all extracts.

The analgesic activity of the extracts was screened by employing tail flick method[4]. Rats of either sex weighing between 150 to 180 g were taken in seven batches of each having six animals. Aspirin (200 mg/kg) was used as standard drug for comparison of analgesic activity. Tail flick response was evoked by placing rat tail over a wire heated electrically. The intensity of heat was adjusted so that the baseline tail flick latency averaged 3-4 s in all the animals. Cut off period of 20 s was observed to prevent the damage to the tail.

The antipyretic activity of the extracts was screened by using yeast-induced hyperpyrexia method[5]. Wistar rats of either sex weighing between 150 to 180 g were selected

TABLE 1: EFFECT OF DIFFERENT LEAF EXTRACTS OF *PERGULARIA EXTENSA* ON ANALGESIC ACTIVITY IN RATS.

Time (min)	Control	Standard	EE	PE	BE	SEE	EAE
0	2.2±0.21	2.4±0.23	2.1±0.32	2.2±0.16	2.1±0.25	2.1±0.15	2.0±0.21
30	2.1±0.21	4.2±0.12	3.2±0.23	2.5±0.15	2.2±0.11	2.2±0.32	2.2±0.35
60	1.9±0.12	9.1±0.31	4.1±0.32	2.3±0.26	2.4±0.25	2.4±0.33	2.3±0.31
90	2.3±0.13	6.3±0.31	5.3±0.32	2.6±0.14	2.1±0.31	2.6±0.14	2.6±0.25
120	2.1±0.18	5.1±0.25	4.2±0.21	2.8±0.32	2.4±0.26	2.5±0.13	2.8±0.31
180	2.5±0.23	4.6±0.31	6.5±0.23*	2.8±0.36*	2.2±0.10	2.9±0.36	2.7±0.11

Data obtained from analgesic activity of *pergularia extensa.* EE stands for ethanolic extract, PE is petroleum ether extract, BE denotes butanol extract, SEE represents solvent ether extract and EAE denotes ethyl acetate extract. Aspirin as Standard. Each value is a mean ± standard error for group of six animals (n=6). * indicates significant analgesic activity compared with control.

TABLE 2: EFFECT OF TOTAL LEAF EXTRACTS OF *PERGULARIA EXTENSA* ON YEAST INDUCED PYREXIA IN RATS.

Time (min)	Control	Standard	EE	PE	BE	SEE	EAE
0	39.4±0.17	38.1±0.22	38.4±0.23	38.6±0.31	38.4±0.15	39.2±0.23	39.2±0.09
30	38.2±0.12	37.5±0.12	37.8±0.23	38.1±0.30	38.3±0.25	39.1±0.43	39.2±0.08
60	38.31±0.23	37.4±0.23	37.6±0.26	37.7±0.28	38.1±0.15	38.9±0.11	39.1±0.27
90	38.5±0.14	37.3±0.11	37.7±0.15	37.4±0.14	37.9±0.27	38.8±0.21	38.9±0.15
120	38.6±0.17	37.4±0.26	37.4±0.27	37.8±0.13	37.6±0.10	38.8±0.28	38.9±0.28
180	38.9±0.16	37.2±0.36	37.2±0.17*	37.4±0.19*	37.4±0.26*	38.9±0.21	38.8±0.29

Data obtained from analgesic activity of *pergularia extensa*. EE stands for ethanolic extract, PE is petroleum ether extract, BE denotes butanol extract, SEE represents solvent ether extract and EAE denotes ethyl acetate extract. Paracetamol as Standard. Each value is a mean ± standard error for group of six animals (n=6). * indicates significant analgesic activity compared with control.

and divided into seven groups each having six animals. They were maintained at constant temperature of 24-25° for 24 h before pyrexia was induced by subcutaneous injection of 2 ml of 15% brewer's yeast suspension in saline solution[6]. After 18 h of yeast injection, the extracts were administered orally to each group as a suspension in propylene glycol. Paracetamol (200 mg/kg) was used as a standard drug for comparison of antipyretic activity and all control animals received propylene glycol. Rectal temperatures were noted at 30 min intervals. All the values were expressed as mean ± S.E. Statistical significance was determined using student's't' test[7] at a probability level of $P \leq 0.001$.

Preliminary phytochemical investigation of all the leaf extracts of *Pergularia extensa* showed presence of flavonoids, steroids and saponins as major phytoconstituents. Ethanolic extract and petroleum ether leaf extracts of *Pergularia extensa* exhibited significant analgesic activity, as expressed in Table 1, whereas butanolic extract, solvent ether extract and ethyl acetate leaf extract did not show any significant analgesic activity. Ethanolic extract, petroleum ether extract and butanolic leaf extracts exhibited significant antipyretic activity, whereas solvent ether extract and ethyl acetate leaf extracts did not show any antipyretic activity as given in Table 2.

Thus it can be concluded from the study that, in the preliminary screening of leaf extracts of Pergularia extensa, the ethanolic and petroleum ether leaf extracts exhibited significant analgesic and antipyretic activity, further there exists a scope to screen the plant for other claimed activities.

REFERENCES

1) Wealth of India, Raw Materials Vol. IA, CSIR, New Delhi, 1992, 309.
2) Kirtikar, K.R. and Basu, B.D., Eds., In; Indian Medicinal Plants, 2nd Edn., Vol. III, Shiva Publishers, Dehradun, 1991, 1616.
3) Elango, V. and Ambujavalli, L., **Fitoterapia,** 1985, 56, 300.
4) Davies, L.L., Raventos, J. and Walpole, A.L., **Brit. J. Pharmacy,** 1946, 1, 246.
5) Pal, P.C. and Nandy, A., **Indian Drugs,** 1999, 36, 106.
6) Brownlee, G., **J. Pharm. Pharmacol,** 1937, 10, 609.
7) Armitage, P., Eds., In; Statistical Methods in Medical Research, Blackwell Scientific Publication, London, 1971, 217.