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NOTE

Medicinal Study of Indigenous Plants of Family Leguminosae on Bronchial Asthma

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Tephrosia purpurea has been used in ayurvedic system of medicine for asthma and various other diseases. The crude powdered material in two different doses of 250 mg/day for a months period, given orally, has cured persons belonging to different age-groups suffering from chronic bronchial asthma without any side effect. An effort has been made to give a scientific view to the folk medicine used in villages and tribal pockets of India. As such 70% ethanolic extract prepared by soxhleting the dried powdered material of the whole herb showed a 'saponin' like compound based on preliminary screening tests. The complete chemical structure of the compound is yet to be determined.

In India very rich wealth of medicinal plants are available. These plants have made good contribution to the development of ancient medicine in India. *Tephrosia purpurea* (Leguminosae) has been used as traditional medicine for bronchial asthma. A saponin isolated from *Clenodendron serratum* and *Gardinia latifolia* has been proved quite effective as bronchodilator in experimental guinea pigs[1,2]. Palit *et al.*[3] have also reported anti-asthmatic plant drugs from *Ocimum sanctum* and *Terminalia bearica* which were used in ancient India.

Recently, Bergondroff *et al.*[4] have reported eight European plants for *in vitro* antispasmodic activity in guinea pigs.

Tephrosia purpurea plant has been reported to be used in asthma and other remedies in folk medicine in India. But there is no report available so far on the use of this plant and the active ingredients present in it. Therefore, it was thought essential to reinvestigate the use of this plant for bronchial ashtma and to know its phytochemical composition.

Plant Materials: The medicine was prepared from an indigenous whole plant of *Tephrosia purpurea* (family Leguminaseae). The plant materials after collection from the field were identified in Botany Department of S.S.L. Jain P.G. College, Vidisha. A voucher specimen was deposited in the herbarium of the laboratory at S. No. 17. They were dried in shade, cut into pieces and disintegrated for preparation of the extract and isolation of the compound.

Shade-dried powdered material (500 g) was extracted with 70% ethanol in soxhlet for 48 h. The extract was concentrated *in vacuo* at 40°C. It create a lot

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of difficulty in getting it concentrated by vacuum evaporation. There was persistent foam during extraction and evaporation, suggesting the presence of saponin.

Purification and Isolation of Active Compound: The residue obtained after evaporating was washed with successive portions of N–HCl for 2–6 h. The decanted acid fluid was filtered and treated with excess of liquid ammonia. The precipitate was finally extracted with petroleum. The extract was dried and the residue dissolved in chloroform. They were further purified on glass column and TLC on silica gel (E. Merk) using solvents chloroform : methanol : water (13 : 7 : 2) as reported by Kawasaki and Migahaxa[5]. The isolated compound was crystallized and the spectral analysis was done at RSIC, Madras, India for IR, UV, ^{13}C NMR, ^{1}H NMR and mass spectra.

Clinical Trials: The paper reports the findings based on clinical trials of the patients suffering from asthma. Over 300 patients were tried under 3 categories, *viz.*, acute, subacute and chronic. They were given 250 mg and/or 500 mg/day doses for 30 days period. Chronic patients were given higher doses whereas rest required lower doses.

The pathological examination tests were conducted in pathological laboratory for blood cells before and after the complete treatment.

The results based on clinical trial are depicted in Tables 1–3. Table-1 reports 3 groups according to age (1–65 years) and are sex-wise distribution. Table-2 reports the three categories of patients (acute, subacute and chronic). Table-3 shows the relief in percentage taking three parameters into consideration. It is quite clear that group A comprises of 1–13 years aged children who got over 95% relief followed by group B and group C patients.

TABLE-1
AGE AND SEX-WISE DISTRIBUTION OF PATIENTS

	Age group (year)	Male	Female	Total
A	1–13	50	50	100
B	14–45	38	62	100
C	46–65	60	40	100
	Total	148	152	300

The pathological parameters also revealed to be quite normal after the patients got relief from asthma. The various parameters as mentioned in Table-4 showed considerably altered criteria, than the previous condition, for example WBCs got reduced from 100 to 80 and so is the case with other parameters.

TABLE-2
CATEGORIES OF PATIENTS

Acute	50
Sub-acute	90
Chronic	160

TABLE-3
SHOWING CLINICAL IMPROVEMENT IN DIFFERENT CATEGORIES OF PATIENTS

Clinical Parameters	Group A (%)	Group B (%)	Group C (%)
Cough catarrah	95	74	62
Throat ache and irritation	98	91	86
Headache, body ache, loss of appetite and fever	99	96	92

TABLE-4
PATHOLOGICAL EXAMINATION

WBC	from 100 to 80
Neutrophil	from 100 to 65
Eosinophils	from 40 to 75
Lymphocyte	from 60 to 30

The relief caused to the patient is due to the 'saponin' present in the powdered from the active principle is not yet obtained. Gupta[6] has also reported the 'saponin' from extract of *Tylophora indica* which showed antispasmodic activity in five plant extracts out of eight plants they tested on guinea pigs. Similar results have been reported recently by Bergendroff *et al.*[4] who noticed antispasmodic activity in five plants extracts out of eight plants they tested on guinea pig trachea. They have noticed a close dependent relaxation in the trachea of guinea pigs with the extract of the aerial part of *Artimisia abrotarum* and *Hijssopus officinalis* as well as in leaves of *Glechoma herdracea* but reported no active principles. The clinical results of the present study are in accordance with the results already mentioned by Khare[7] but this time 'no cure' condition was not observed.

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REFERENCES

1. S.S. Gupta, *J. Pharm. Pharmac.*, **20,** 801 (1968).
2. _____, *Aspect Aller. Appl. Immunol.*, **5,** 31 (1971).
3. G. Palit, S.P. Singh, N. Singh, R.P. Kohli and K.P. Bhargava, *Aspect Aller. Appl. Immunol.*, **16,** 34 (1983).
4. O. Bergendorff, C. Franzen, A.B. Jeappson, O. Sterner and B. Waldeck, *International J. Pharmacognosy*, **33,** 356 (1995).
5. T. Kawasaki and K. Miyahara, *Chem. Pharm. Bull.*, **11,** 1546 (1963).
6. S.S. Gupta, *Aspect Aller. Appl. Immunol*, **9,** 95 (1975).
7. M.L. Khare, Chemistry and Biology of Herbal Medicine, pp. 61–62 (1997).

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