TABLE I

CO_2 compensation concentration, photosynthetic rate and CO_2 evolution into CO_2-free air in light/darkness

Measurements were made at 30° C and a light intensity of *800* μE $m^{-2}s^{-1}$ on the surface of the photosynthetic chamber

Plant species	CO_2 compensation concentration $\mu l\,l^{-1}$	Apparent photosynthesis, mg CO_2 $dm^{-2}\,h^{-1}$	CO_2 evolution, light/dark
Parthenium hysterophorus	28–35*	35·8±4·2	0·15±0·02
Flaveria australasia	0–5	54·0±3·9	0·08±0·02
Eclipta alba	55–65	31·5±4·7	0·41±0·07

All values are mean of five determinations on five different days ± standard error.

* Range of CO_2 compensation concentration observed on five different days irrespective of age of the leaves.

The activities of PEP carboxylase in the leaf extracts was also considerably higher than any other C_3 species reported so far (Table II)[6–8]. The activity of PEP carboxylase observed in *P. hysterophorus* is perhaps responsible for efficient trapping of CO_2 released in light resulting in a decrease in CO_2 compensation concentration and photorespiratory ratio. Therefore, the results of the present investigation indicate that *P. hysterophorus* is a low photorespiratory tropical weed species having a luxurious growth and high survival potential under arid environment.

TABLE II

PEP and RuBP carboxylase enzyme activities in the leaf extracts of three different plant species.

All assays were made at 30° C.

Plant species	Carboxylase enzyme activity, μmol mg^{-1} (Chl) min^{-1}	
	RuBP	*PEP*
Parthenium hysterophorus	3·58	2·10
Flaveria australasia	3·95	9·75
Eclipta alba	3·21	0·33

Each value is the mean of three determinations on different days.

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1. Crookston, R. K. and Moss, D. N., *Plant Physiol.*, 1973, **52**, 397.
2. Willmer, C. M., Pallas Dr., O. E. and Black, C. C., *Ibid.*, 1973, **52**, 448.
3. Hesketh, O. D. and Moss, D. N., *Crop Sci.*, 1963, **3**, 107.
4. El-Sharkawy, M. A. and Hesketh, O. D., *Ibid.*, 1965, **5**, 517.
5. Raghavendra, A. S. and Das, V. S. R., *Z. Pflanzenphysiol.*, 1978, **87**, 297.
6. Downton, J. and Slatyer, R. O., *Planta*, 1971, **96**, 1.
7. Wirth, E., Kelly, G. J., Fischbech, G. and Latzko, E., *Z. Pflanzenphysiol.*, 1977, **82**, 78.
8. Wada, Y., *Bot. Mag.* (*Tokyo*), 1971, **84**, 1959.

A NOTE ON THE CHEMOTAXONOMY OF *STAUROGYNE*

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THE delimitation and sub-division of Acanthaceae is very much debated[1,6,8,9]. Bremekamp.[2–4] transferred Nelsonioideae to the vicinity of Rhinantheae of Scrophulariaceae and ever since, there has been considerable disagreement from different disciplines. Recently Narayana and Sarma[7] studied the chemotaxonomy of *Elytraria acaulis* (Linn. f.) Lindau and *Nelsonia campestris* R. Br. of Nelsonioideae and the present study on the chemotaxonomy of five species of *Staurogyne, viz.*, *S. angustifolia* Wall., *S. malaccensis* C. B. Clarke, *S. racemosa* Kuntze, *S. thyrsioides* (Nees) Kuntze and *S. zeylanica* Kuntze, is taken up to fill the gap.

Standard tests have been carried out to detect the presence of various chemical constituents. Uniformly negative results are obtained for Ehrlish test, Juglone test, HCl/methanol test, HCN test 'A', indoles, Labat test, lignans, quinones and saponin test 'A'. Uniformly positive results are obtained for cigarette test, hot water test, Molisch test, Shinoda test and phenols. All the above tests are in conformity with the results obtained for *E. acaulis* and *N. campestris*[7],

Positive reaction for Liebermann–Buchard test indicating the presence of triterpenoids/steroids is obtained for *S. racemosa*, *S. thyrsioides* and *S. zeylanica* as in *E. acaulis*[7]. While *S. thyrsioides* and *S. zeylanica* show positive reaction for salkowski test (steroids) and *E. acaulis*[7] for Nollers test (triterpenoids), *S. racemosa* shows positive reactions for both the tests. The other species of *Staurogyne* and *Nelsonia campestris*[7] show negative reactions for the same. Maule test is positive in *S. racemosa*, *S. thyrsioides* and *S. zeylanica* as in *Nelsonia*[7] and negative in the rest. *S. racemosa* and *S. thyrsioides* resemble *Elytraria*[7] in the presence of alkaloids.

However, some of the species of *Staurogyne* stand apart from rest of the Nelsonoideae in the doubtfully positive reaction for syringin test (*S. angustifolia* and *S. zeylanica*) as evidenced by the development of green colour in the wood, in the presence of leucoanthocyanins (*S. racemosa*) and tannins (*S. racemosa*, *S. thyrsioides* and *S. zeylanica*).

Staurogyne (present study) *Elytraria* and *Nelsonia*[7], closely resemble one another and also resemble Acanthaceae rather than Rhinantheae/Scrophulariaceae[5] in chemical characters. Besides the significant morphological features, the previous[5,7] and the present chemotaxonomic data and the data from other disciplines such as cytology, embryology, floral anatomy, foliar anatomy, palynology and stomatal ontogeny justify the retention of Nelsonioideae in Acanthaceae and negate the view of transfer to the vicinity of Rhinantheae of Scrophulariaceae as suggested by Bremekamp.[2–4] and his supporters.

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1. Bentham, G. and Hooker, J. D., *Genera Plantarum*, *London*, 1862–1883.
2. Bramekamp, C. E. B., *Proc. K. Ned. Acad. et.* (*Sci. C.*), 1953, **56**, 533.
3. —, *Reinwardtia*, 1955, **3**, 157.
4. —, *Bu'l. Bot. Surv. India*, 1965, **7**, 21.
5. Gibbs, R. D., *Chemotaxonomy of Flowering Plants* I–IV, McGill-Queen's Univ. Press. Montreal and London, 1974.
6. Lindau, G., "Acanthaceae In A. Engler and K. Prantl," *Die Naturlichen Pflanzenfamilin*, 1895. **4**, 274.
7. Narayana, L. L. and Sarma, V. V. L. N., *J. Indian Bot. Soc.*, 1980, **59**, 48.
8. Van Tieghem, P. H., *J. Bot.* (*Paris*) *Ser.* 2, 1908, **1**, 5.
9. Wettstein, R. V., *Handbuch der Systematischen otanie Botanik*, *Wien*, 1935.

PRODUCTION OF PHENOLICS IN *ACROSTICHUM AUREUM* L. DURING GROWTH *IN VITRO*

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Introduction

Phenolic substances, the active products of cellular metabolism, are of great commercial importance. Besides being precursors for lignin biosynthesis, they have been regarded as contributors to disease resistance (Cruickshank and Perrin[4]). Phenolic compounds have also been implicated in plant—plant alleopathic interactions. Their formation in chloroplasts, active catabolism (Barz and Hosel[1]) and high reactivity in various biological systems *in vitro* (McClure[8]) reveal the importance of polyphenols in plant life. The presence of phenolic compounds *in vivo* ferns has been reported by Bohm and Tryon[3] and Bohm[2].

The present investigation deals with the estimation of phenolics during various developmental stages of *Acrostichum aureum* L. grown *in vitro* from the spores.

Materials and Methods

Spores were surface sterilized with 5% sodium hypochlorite washed with sterile distilled water and inoculated on Knudson's basal medium as modified by Steeves *et al*[8]. The culture flasks were incubated in continuous light at 26 ± 2° C. After every 4 weeks, the gametophytes were transferred on the freshly made medium in absence or presence of (2%) sucrose. After incubation for 8 weeks, the gametophytes produced sex organs. At this stage they were flooded with sterile distilled water to ensure fertilization. The sporophytes were thus raised sexually and were grown on (2%) sucrose medium in continuous light at 26 ± 2° C. The sporophytes were also induced apogamously on high sucrose (4%) medium (Kshirsagar and Mehta[5]). Gametophytes and sporophytes were harvested every four weeks, dried and polyphenols were extracted and estimated by Folin method of Swain and Hills[9]. The standard curve was prepared using chlorogenic acid and all the phenolic contents were expressed in mg per 100 mg of tissue dry weight.

Results and Discussion

Total polyphenols estimated in the dry tissue of gametophytes and sporophytes during the course of their growth in culture and at different developmental stages are presented in Table I. Clearly a close correlation was observed between the stage of development of plant and the phenolic content of the tissue. Higher level of phenolic compounds in apogamously