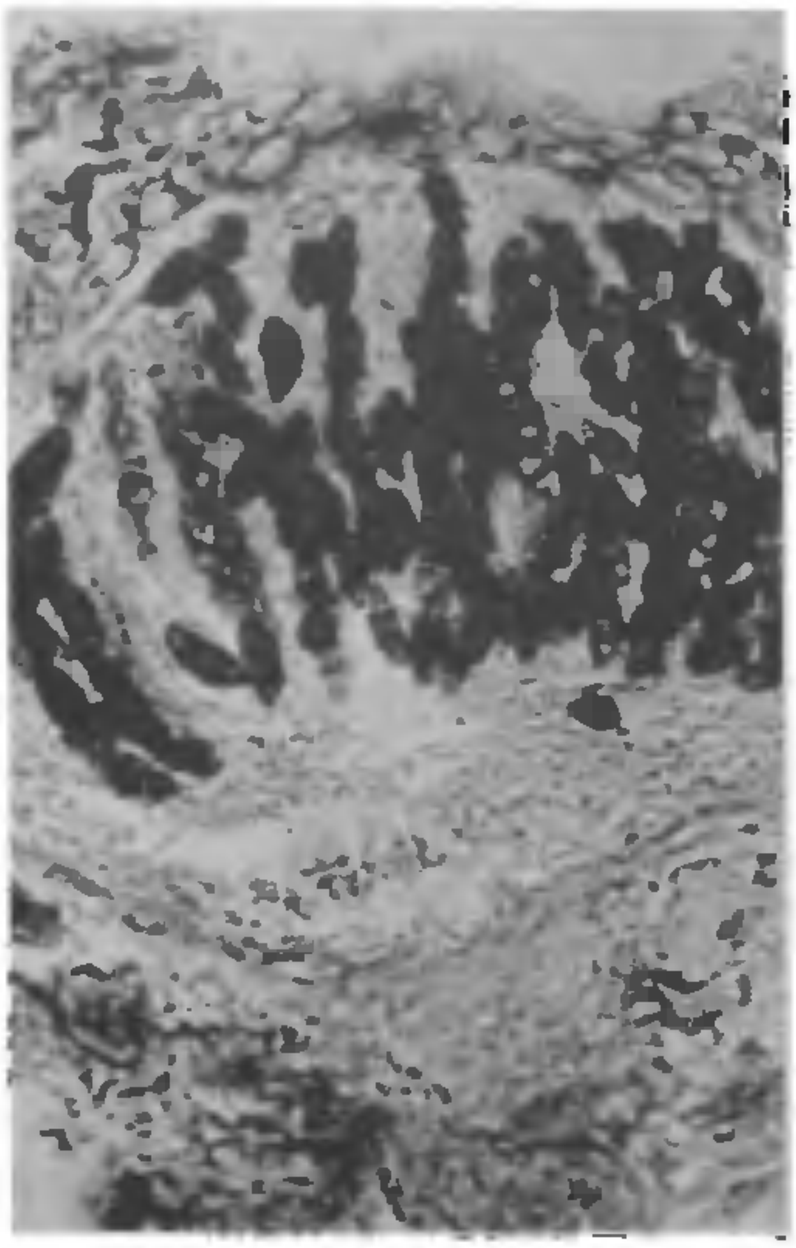

FIG. 1. Photomicrograph showing a perithecium with asci and ascospores, × 300.

basal hyaline cell acute, tapering into a short pedicel upto 4·5 μm long.

Perfect stage

Perithecia subglobose to globose, carbonaceous, immersed with erumpent ostiole 88·8–222·0 μm in diam.; outer wall composed of 3–4 light-brown to black polygonal pseudoparenchymatous cells, inner 2·3 layers of hyaline pseudoparenchymatous cells; asci numerous, bitunicate, cylindric to clavate 72·9–99·9 × 8·1–10·8 μm; ascospores 8, uniseriate, 3-celled, light brown, middle cell slightly darker, fusoid to ellipsoidal, obtuse at both end, 13·5–20·25 × 4·05–6·75 μm in size (Fig. 1).

Earlier Bilgrami and Purohit[1] and Hansen *et al.*[2] have also reported the perithecial stage of *Pestalotia osyridis* Thuem. and *P. palmarum* corresponding to genus *Leptosphaeria.*

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PARTHENIUM HYSTEROPHORUS L. (ASTERACEAE) EXHIBITING LOW PHOTORESPIRATION

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THE efficient photosynthetic system, suspected in the leaves of *Parthenium hysterophorus*, probably allows it to have uncontrolled luxurious spreading. Hence it is worth while tracing some of the reasons for its luxurious growth under arid environment.

Materials and Methods

Plants of *Parthenium hysterophorus* L. were collected from the campus of University of Hyderabad (approximately 11th photoperiod with temperatures regime of 31° C by day and 23° C by night). The other two plant species of the same family, *Flaveria australasia*, a C_4 plant and *Eclipta alba*, a C_3 plant were selected for comparison.

Free-hand sections cut from fresh and fixed leaf tissues were used for light microscopic studies. Paradermal view of the leaf tissue was observed by the method of Crookston and Moss[1]. CO_2 compensation concentration was determined in a closed system using IRGA-20 (Grubb Parsons, England) calibrated for carbon dioxide on an absolute mode. Photorespiratory ratio (CO_2 released in light/dark) was calculated by measuring CO_2 evolution into CO_2-free air using an open IRGA system. Apparent photosynthesis measurements were made with IRGA system on an absolute mode. Activities of PEP and RuBP carboxylases in the leaf extracts were determined following the incorporation of $H^{14}CO_3$ into acid stable products[2].

Results and Discussion

Light microscopic observation of the leaf tissue of *P. hysterophorus* showed a layer of parenchymatous cells with substantial number of chloroplasts around the vascular tissue. A paradermal view of the leaves also showed a layer of parenchymatous cells around the vascular tissue with positive reaction for I_2-KI solution in addition to other mesophyll cells. However, a low CO_2 compensation concentration and photorespiratory ratio revealed that the species in exhibiting a low magnitude of photorespiration compared to *E. alba*, a C_3 plant (Table I). The rate of apparent photosynthesis was approximately similar to the other C_3 plants reported by others but significantly lower than *F. australasia* or any other known C_4 plants (Table I)[3–6].

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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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],