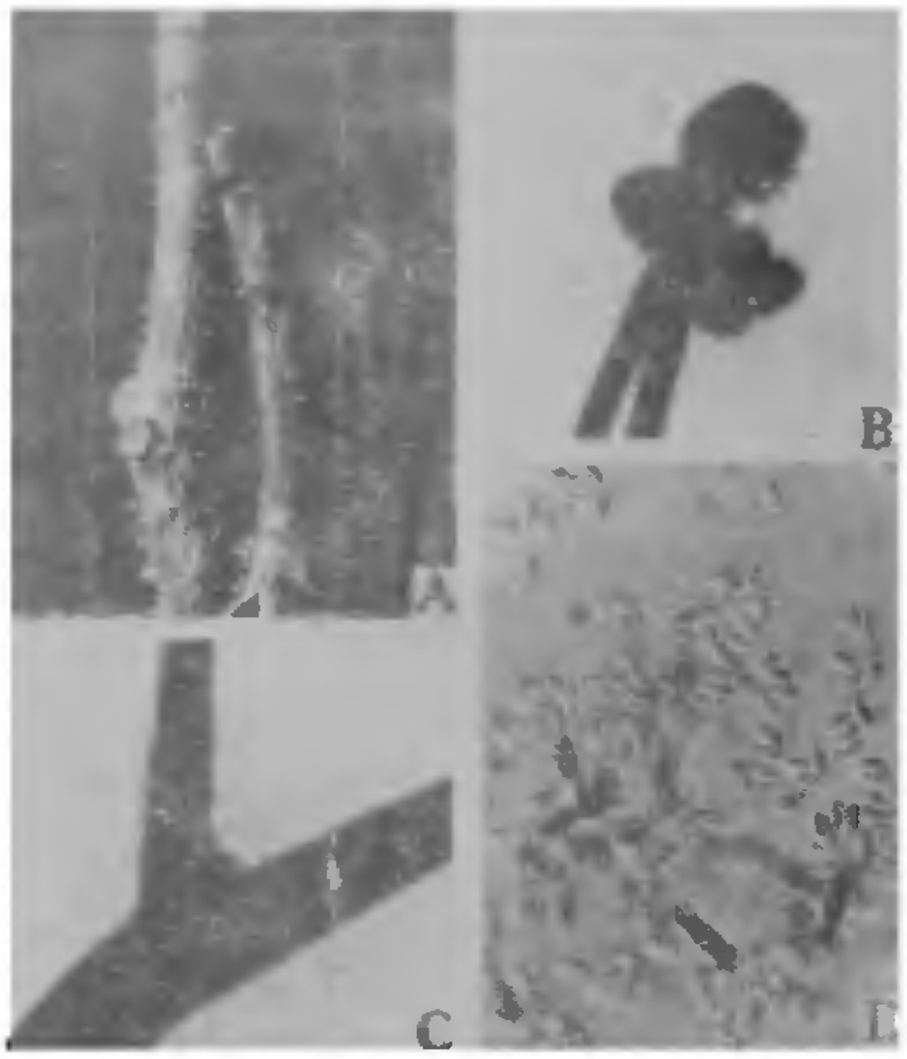


FIG. 1. *Sarbhoyomyces biguttulatus.* A, Habitat; B, Heads of individual synnemata, × 225; C, Divergent stalk, × 225; D, Conidia, × 2,000.

vel interdum binatis enata, saepe e basi communi composita ; synnemata eramosae stipite rigido et capitulo apicali constructa ; stipes (864·5–) 997·0–1935·0 μm longo, ad basim (39 9–) 61·0–77·0 (–93·1) μm, ad apicem 46·5–93·1 μm, ad centrum 38 5–61·6 μm latus, primc subrcseus deinde aureovel interdum atro-brunneus, ad apicem subreseus ; capitula globosa vel subglobosa, subrosea vel roseorubra (106·4–) 133·0–246·4 μm diam., 93·1–246·4 μm alta, globulum conidiorum in muco ferentia, synnema quodque e stipitibus 2–3 divergentibus cylindricis 11·5–38·5 (–53·9) μm latis compositum, synnemate quoque capitulum sphaericum 61·6–184·0 μm diam., 57·7–134·7 μm lengus ferente ; stipite singulari e filis pluribus 0·7–1·4 μm latis parallelibus pallide brunneolis vel pallide flavo-brunneis septatis globris, ad latera et apices ramosis ; conidia ellipsoidea vel ovalia, interdum sphaerica utrinque rotundata biguttulata, separata, hyalina vel brunneo tincta, in massa subrosea vel roseo-brunnea, glabra, usque 5-catenulata, muco tecta, in guttulis ad apices terminalium cohaerentia, massulas globosas (2·1–) 4·2–4·5 (–5·6) μm × 1·4–1·75 (–2·1) μm efformantia.

Hab. in–*Nerio indico*, Salikihat, Golaghat, Assam, 22–10–1977 coll. U. N. Saikia (HCIO 32703 typus).

Fruiting body stipitate, consists of erect, straight to slightly curved, terete synnemata. Synnema consists of a rigid, main stalk with a head at its apex. Stalk 864·5–1935 0 μm long, 39·9–93·1 μm wide at the base, 46·5–93·1 μm at the apex, at first pinkish, later turning golden brown to olivaceous brown with a pinkish tinge. Heds globose to subglobose, pinkish, 106·4–246·4 μm in diam., 93·1–246 4 μm in height bearing a globule of conidia in mucous. Synnema consists of 2–3 divergent cylindrical stalks measuring 11·5–53·9 μm in thickness each of which in turn bear a spherical to subspherical head measuring 61·6–184·0 μm in diam. Individual stalk consists of many, closely compact, pale to light brown 0·7–1·4 μm thick, septate, parallel hyphae. Conidia ellipsoidal to oval, occasionally spherical, rounded at the two ends, biguttulate, individually hyaline, pinkish brown *en masse*, smooth, borne in chains of upto 5, interconnected by some mucilaginous materials and covered with mucous cohering in droplets at the apices of the terminal branches forming globose to subglobose pinkish masses on the heads, measuring (2·1–) 4·2–4·9 (–5·6) μm long, 1·4–1·75 (–2·1) μm wide.

On *Nerium indicum* L. Salikihat, Golaghat, Assam, coll. U. N. Saikia 20–10–1977 (HCIO 32703, type).

The author is grateful to Dr. A. K. Sarbhoy, Chief Mycologist, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi–12, for the identification of the above genus and for his most valuable suggestions. Thanks are due to Dr. V. V. Chenulu, Head, Division of Mycology and Plant Pathology, I.A.R.I., New Delhi–12, for providing the facilities, to Dr. B. C. Borthakur, Director of Research, Assam Agricultural University, Jorhat–13, for encouragement and also to Dr. E. Cash, Binghamton, New York, for the Latin diagnosis.

September 12, 1980.

1. Ellis, M. B., *Dematiaceous Hyphomycetes*, C.M.I., Kew, 1971, pp. 608.
2. —, *More Dematiaceous Hyphomycetes*, C.M.I., Kew, 1976, pp. 507.
3. Morris, E. F., *The Synnematous Genera of the Fungi Imperfecti*, Macomb, Illinois, 1963, pp. 143.

VEXILLARY AESTIVATION IN FABACEAE : A RE-APPRAISAL

BIR BAHADUR AND M. MADHUSUDANA RAO
Department of Botany, Kakatiya University
Warangal 506 009, India

VEXILLARY aestivation is characteristic of Fabaceae. Jackson[1] defines vexillary aestivation as "A form of inflorescence (Papilionaceaous flower) in which the vexillum is folded over the petals". Several taxonomists[2–4] have described this aestivation with reference to the position of the vexillum, wings and keel petals. Rendle[5] has described it as 'the corolla consisting of

five unequal petals : a posterior vexillum, two long clawed wings and an anterior keel, with the petals showing descending imbricate aestivation'. Thus, the interpretation of vexillary aestivation is not complete, since the overlapping of the margins of different petals is not described. This needs a careful study and hence this re-appraisal. Rao *et al.*[6] have first reported the twisting of vexillum petal either to the left or to the right, thus enveloping all other petals. But, a close examination of the vexillary aestivation reveals that apart from the contortion of the vexillum, the margins of the wing petals also show overlapping either to the left or to the right. In this communication we report our observations on vexillary aestivation with reference to the twisting of the margins of vexillum and wings in typical species of Fabaceae.

On the basis of the overlapping of the vexillum or the wing petals, or both, corolla handedness in Fabaceae is tentatively classified into four distinct types, designated after the species in which it was first observed.

1. *Butea type* : In this type none of the petals including the vexillum and the wings exhibits contortion ; hence corolla handedness is absent, *e.g.*, *Butea* sp. and *Medicago* sp. (Fig. 1).

2. *Cajanus type* : In *Cajajanus cajan* and in several other genera, only the vexillum petal shows contortion either to the left or to the right (Figs. 2 and 3).

3. *Phaseolus type* : In *Phaseolus* and related genera, the wing petals only show contortion and the vexillum is open. Hence, handedness can be described in wing petals but not in the vexillum (Figs. 4 and 5).

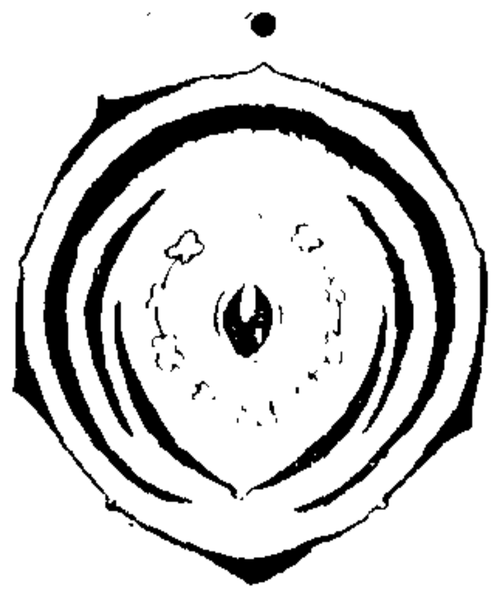
4. In the fourth type, both the vexillum and the wing petals show handedness, within this, two subtypes are recorded :

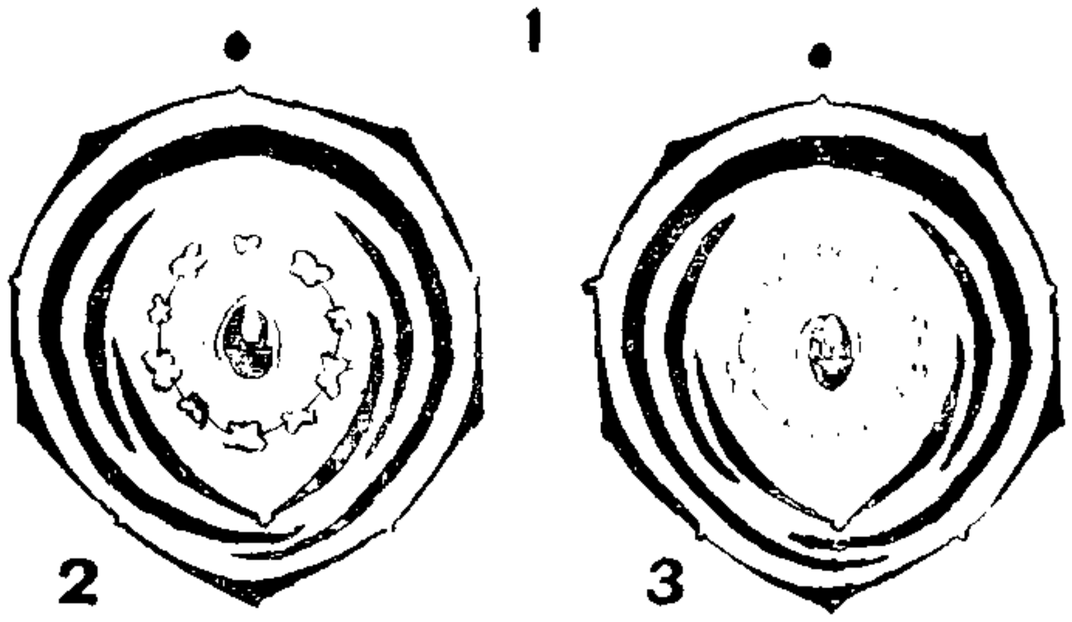
(*a*) *Crotalaria type* : In this type both the vexillum and the wing petals show contortion but in the opposite direction, *e.g.*, *Crotalaria* sp., *Erythrina* sp. and *Heylandia* sp. (Figs. 6 and 7).

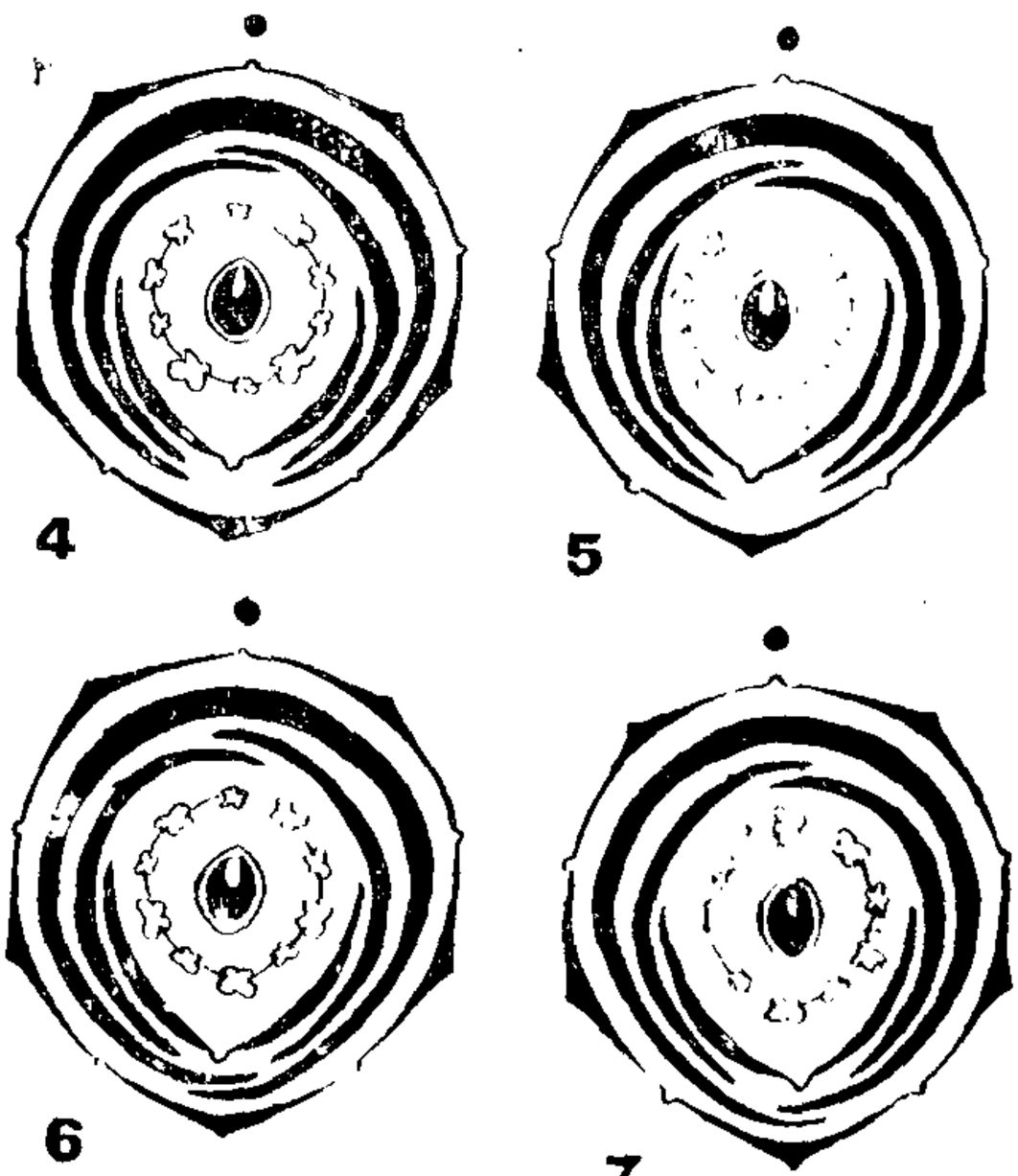
(*b*) *Gliricidia type* : Both the vexillum and the wing petals show contortion in the same direction (left or right), *e.g.*, *Gliricidia* and some other genera (Figs. 8 and 9).

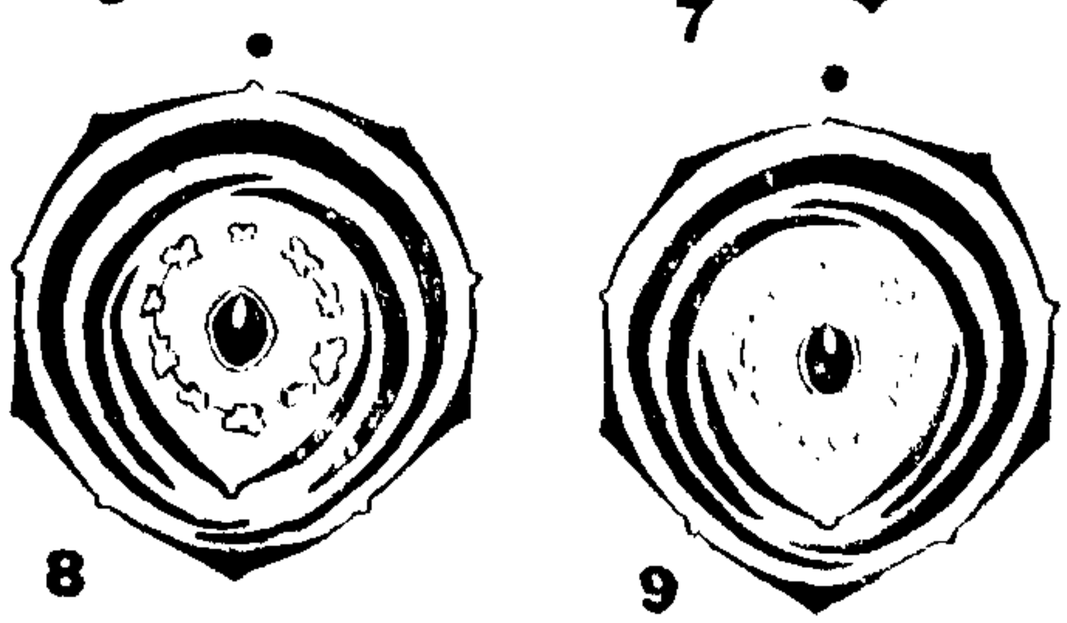
From the foregoing account the types of vexillary aestivation in Fabaceae presently reported are different from the one reported in Malvaceae[7], Bombacaceae[7], Euphorbiaceae[8] and Caricaceae[9].

Hutchinson[4] has employed the twisting of the keel petal and styles for distinguishing different tribes of Fabaceae. Rao *et al.*[6] have earlier noted that the presence or absence of corolla handedness can be used as taxonomic pointer in delimiting taxa. Hence, the different types of corolla handedness along with the re-examination of vexillary aestivation presently studied may well serve this purpose to re-classify the genera in a large family like Fabaceae.









Regarding the significance of corolla handedness the remarks of Schoute[10] are of interest. According to him, "perhaps the *contortion* has *some biological* advantage in promoting an even and undisturbed development of the petals in the bud by the even space filling; perhaps the advantage may be in the easier opening of the bud or some thing like that".

As for the evolutionary significance of the various types of corolla handedness, not much is understood, but this might have evolved under different ecological *conditions to promote autogamy*. Regarding the functional significance of corolla handedness in pollination biology, this phenomenon may be one of the contrivances for *promoting self-pollination* as Fabaceae is mostly autogamous[11]. Frankel and Galun[12] also observed: "Adjustment in structure, position and size of anthers, stigmata and perianth are often associated with the change of the breeding system."

Finally the comments of Schoute[10] are worth mentioning: "The task of investigating the contort corolla as to its secrets at first sight seems to be a rather helpless one, the form in which all margins overlap is not such as to give starting point for any research".

One of us (MMR) is grateful to CSIR for the award of a Post-Doctoral Fellowship.

October 3, 1980.

1. Jackson, B. D., *A. Glossory of Botanic Terms*, Duckworth, London, 1900 (Re-printed, 1971).
2. Lawrence, G. H. M., *Taxonomy of Vascular Plants*, Macmillan, N.Y., 1951.
3. Cronquist, A., *The Evolution and Classification of Flowering Plants*, Thomos Nelson, London, 1968.
4. Hutchinson, J., *The Genera of Flowering Plants*, Oxford University Press, 1964, 1.
5. Rendle, A. B., *The Classification of Flowering Plants (Dicotyledons)*, Cambridge University Press, 1971, 2.
6. Rao, M. M., Rao, K. L. and Bahadur, B., *Curr. Sci.*, 1979, **48**, 408.
7. Davis, T. A. and Ramanujacharyulu, T., *Sankhya, Indian J. Stat.*, 1971, **33**, 259.
8. Bahadur, B. and Venkateshwarlu, T, *J. Indian Bot. Soc.*, 1976 *a*, **55**, 30.
9. — and —, *Ibid.*, 1976 *b*, **55**, 89.
10. Schoute, J. C., *Ver. Akad. Wet. Afd. Naturkunde (b)*, 1935, **34**, 1.
11. Knuth, P., *Handbook of Flower Pollination*, Oxford University Press, 1906.
12. Frankel, R. and Galun, E., *Pollination Mechanism, Reproduction and Plant Breeding*, Springer Verlag, Berlin, 1977.

PORE FORMATION IN CYPERACEAE: A NEW REPORT

O. P. Sharma and R. Shiam
School of Plant Morphology
Department of Botany, Meerut College
Meerut, India

Not only in *Cyperus*, but throughout Cyperaceae the pore formation has not been earlier reported in any member (Mehra and Sharma[1,2] and Metcalfe[3]). While investigating the epidermal features of 22 Indian species of *Cyperus* (Sharma[4]), crater-like pores have been observed, surprisingly quite commonly, in the culm epidermis of *Cyperus flabelliformis* Rottb. syn. *C. alternifolius* Linn. Such pores, however, have neither been observed in the leaf epidermis nor in the epidermal cells of leafy bracts of any of the investigated species (Sharma[4]). The leafy bracts which are positioned at the top of the culm and base of the inflorescence, as well as the vegetative leaf, are hypostomatic in *C. flabelliformis*.

Cyperus flabelliformis is one of the few ornamental species of this wild and economically less important genus. The epidermal cells of the culm are rectangular in shape and arranged in longitudinal files (Fig. 1). Their anticlinal or longitudinally oriented wall is sinuate. The epidermis is divisible into two regions, *i.e.*, the "strand region" which lies over the fibre strands and contains comparatively narrow cells having conical silica bodies, and "interstrand region" having stomata and comparatively larger cells. The average number of epidermal cells per sq.mm is $3280 \pm 132{\cdot}2$ while the stomatal frequency is $358{\cdot}4 \pm 43{\cdot}6$. The stomatal index is 9·8.

Besides the normal conical silica bodies in most of the cells of the strand region (Fig. 1), few cells contain nodular silica bodies (Figs. 2 and 8) with the deposition of silica at their pointed tips. The anticlinal walls of the adjacent epidermal cells at this stage appear conspicuously silicified (Fig. 2). Silica of these nodular bodies is being later on deposited, regularly or irregularly, on the anticlinal as well as periclinal walls (Fig. 3), thus leaving a 'pore' in the centre. These pores appear as craters in the epidermis. They may be oval (Figs. 3, 6 and 9) or pentagonal to hexagonal (Figs. 4 and 5) in shape. Rarely pores are formed in two adjacent cells of the strand region (Fig. 7) besides their neighbouring cells containing normal conical silica bodies. Sometimes many cells of the strand region (Figs. 8 and 9) undergo this process of deposition of silica of their nodular bodies on their anticlinal walls, resulting into a group of pores (Fig. 10).

According to Metcalfe[3] nodular silica bodies, in general, are seldom the only type to be present in an