ON THE ANDROECIUM OF *CANNA INDICA* L.

B. B. SHARMA AND D. D. AWASTHI

Department of Botany, Lucknow University, Lucknow

ABSTRACT

The morphology of the androecium of *Canna indica* L. has been discussed. The labellum and the one/two fertile stamens have been considered to comprise the inner whorl.

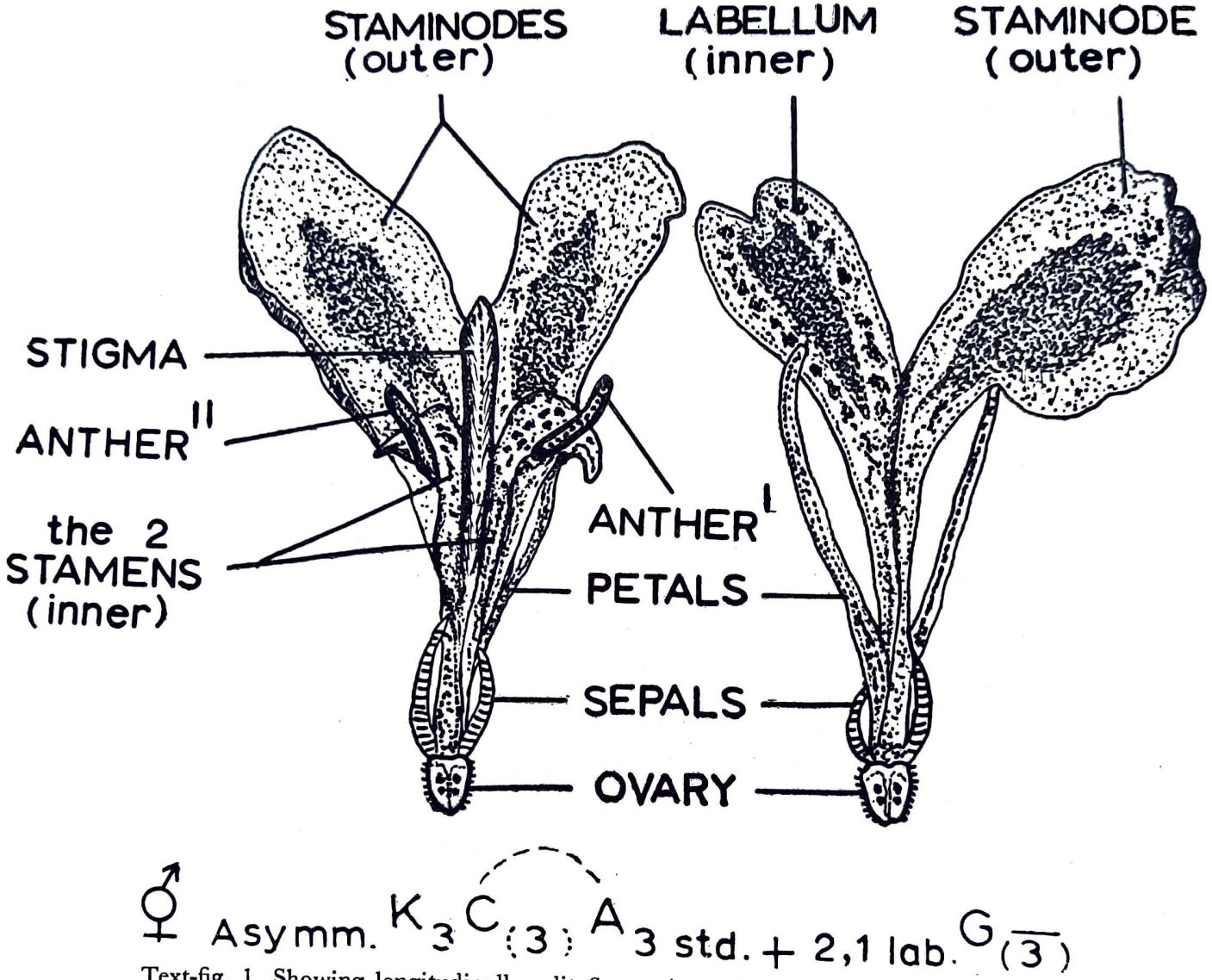
INTRODUCTION

The monotypic family Cannaceae, one of the four closely related families of the order Scitamineae (RENDLE, 1930) or Zingiberales (HUTCHINSON, 1959) is widely represented in the gardens by its cultivated ornamental herb *Canna indica* L. The flowers of *C. indica* are in dense complex terminal spikes, each unit of which is generally a 2-flowered cincinnus. The species is represented by several horticultural varieties, the more common of which have red-streaked yellow or yellow-streaked scarlet-red flowers, which are hermaphrodite, asymmetric, epigynous and trimerous. The three sepals are free, green, imbricate and persistent. The 3 petals, connate at base, are long, narrow, pointed, purple-red and imbricate. The androecium is represented by 4-5 (or 6) large, petaloid, spotted or streaked structures, connate at base. One of these bears a pollen producing half-anther adnate along the margin, the others are petaloid staminodes. The inferior gynoecium comprises a 3-locular ovary with numerous ovules in each locule on axile placentae, a flat clavate style terminate by the stigma.

RENDLE (1930) describes the androecium to consist of a petaloid stamen bearing a half-anther on one edge and a number of flat petaloid structures one of which, the 'labellum', is rolled back on itself. BAILEY (1951) and WILLIS (1966) also do not mention about the androecium being arranged in whorls; the former recognizing these enlarged and broadened structures as forming the main "petals". According to the older view, the fertile stamen, the 'labellum' and one of the staminodes are considered to represent the inner whorl, while the remaining staminodes belong to the outer whorl. But Eichler considers 'labellum' to represent a lateral stamen of the inner whorl, and, the fertile stamen with 2-3 staminodes (which are united at base with the stamen) together represent the posterior stamen of the same whorl; the second lateral stamen of the inner whorl and the entire outer whorl are considered to be suppressed (ENGLER & PRANTL, 1889; RENDLE, 1930 and WILLIS, 1966). Of the six (or four) members constituting the androecium according to LAWRENCE (1951) the 'labellum' is the largest, reflexed and is a member of the outer whorl. HUTCHINSON (1959) is silent over 'labellum'.

Our observations made on a large number of flowers of the two varieties (yellow and scarlet flowered) of *C. indica* growing in the departmental garden, have shown that the androecium is generally represented by 5 members (and only sometimes it may be of 4 or 6) of which the 'labellum' and the fertile stamen belong to the inner whorl (free margin of the latter covers the former) while, the remaining three petaloid staminodes comprise

the outer whorl. During the course of these observations, a flower was found to possess two distinct petaloid stamens (instead of the usual one) with lateral half-anther on each (Pl. 1, Fig. 1). These along with the 'labellum' were united to form the inner whorl and enclosed the style. In the longitudinally split flower, the anther bearing margins of these petaloid stamens are extrorse (Text-fig. 1), each being the complete counterpart of the other. Occurrence of these two stamens and the 'labellum' in the inner whorl along with the three staminodes in the outer whorl substantiates the view that they are arranged in two whorls. The description of the androecium would thus be as follows:



♀ Asymm. $K_3 C_{(3)} A_{3\ std.} + 2,1\ lab. G_{(\overline{3})}$

Text-fig. 1. Showing longitudinally split flower (nat. size) and the floral formula.

In *Canna indica*, the androecium constitutes the most prominent part of the flower and consists generally of 5 (in some 4 or 6) members. There is only one (rarely two) fertile stamen represented by a linear 1-celled anther, adnate over the outer margin of a narrow, coiled, spotted, petaloid portion. The rest four are large, flat, nearly clawed, petaloid staminodes, which are scarlet-red or yellow, and variously spotted. One of these, the 'labellum' or 'lip' belongs to the inner whorl and is included by the free margin of the petaloid part of the stamen. The 'labellum' is differently spotted, is narrower, reflexed, and may be apically notched. The remaining three comprising the outer whorl are large, broad, brightly petaloid, placed alternating to corolla and are imbricate. The 'labellum' and the stamen are basally united together to form a tube which in turn is connate with the three outer staminodes and the thus formed base of the androecium is adnate to the base of the petals. The clavate style

in the centre is enclosed by the tube formed by the connation of the stamen(s) and the 'labellum'.

REFERENCES

BAILEY, L. H. (1951). *Manual of Cultivated Plants.* The Macmillan Co., New York.

ENGLER, A. & PRANTL, K. (1889). *Die Natürlichen Pflazenfamilien.* **2,** Abt. 6. Verlag von Wilhelm Engelmann, Leipzig.

HUTCHINSON, J. (1959). *The Families of Flowering Plants.* **2.** *Monocotyledons.* Clarendon Press, Oxford.

LAWRENCE, G. H. M. (1951). *Taxonomy of Vascular Plants.* The Macmillan Co., New York.

RENDLE, A. B. (1930). *The Classification of Flowering Plants.* **1,** University Press, Cambridge.

WILLIS, J. C. (1966). *A Dictionary of Flowering Plants and Ferns.* University Press, Cambridge.

EXPLANATION OF PLATE 1

Fig. 1. The arrows point to the 2 half-anthers, one of each stamen, in the dissected flower. x ca. 2.5.