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STUDIES ON FLORAL BIOLOGY IN CASHEW, *ANACARDIUM OCCIDENTALE* LINN.

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ABSTRACT

Sexual phase specificity in anthesis in cashew inflorescence indicated three distinct phases: (1) the first male phase, (2) the mixed phase, and (3) the second male phase. The magnitude of pollen loss due to a prolonged first male phase has been indicated. A longer mixed phase with abundant flowering could ensure high sex ratio. An intrinsic balancing system controlling such a mixed phase would be of immense value for increasing yield in cashew. Genotypic selection for appropriate sexual phase specificity in anthesis may be possible in cashew and this may help in designing an idiotype for this crop plant.

THE cashew, being highly cross fertilised, shows high degree of heterozygosity and thereby provides much scope for genotypic selection. One of the characters which is considered to contribute to yield in cashew, as in mango, is the sex ratio (Aiyadurai and Koyamu, 1957; Rao and Hassan, 1957; Damodaran, Abraham and Alexander, 1965; Sriram, 1970, in cashew; Pepenoe, 1917; Naik and Mohan Rao, 1942; Musahib-ud-din and Dinsa, 1946; Mukherji, 1949; Singh, 1954, in mango). The cashew inflorescence is an indeterminate panicle of polygamomonoecious type (Rao and Hassan, 1957; Damodaran, Abraham and Alexander, 1965) requiring four and even five months to complete the sequential anthesis in the panicle. New criteria for genotypic selection for enhanced sex ratio and effective pollination have been suggested here based on the pattern of sequence of anthesis in the inflorescence.

MATERIALS AND METHODS

Eight trees of approximately ten years age were chosen at random from the cashew population available in the Calicut University campus. Five uniform twigs from different sides of each tree were selected before floral initiation for observing flowering patterns. Flower counting was made daily. The sequence and duration of anthesis were considered for visualising the sexual phases.

RESULTS AND DISCUSSION

Blossom biology in cashew has indicated that early formed flowers in a panicle are mostly male (Morada, 1941; Aiyadurai and Koyamu, 1957; Rao and Hassan, 1957; Damodaran, *et al.*, 1965; Northwood, 1966). No more detailed observation on the pattern of anthesis is available. There distinct phases were observed in trees. They were (1) the first male phase during which only staminate flowers opened; (2) the mixed phase during which both staminate and hermaphrodite flowers opened, but mostly male flowers; and (3) the second male phase during which few male flowers only opened. The trees showed considerable variation in the duration of different phase. One tree showed only male phase. The second male phase was highly reduced in all the trees.

The inflorescence being indeterminate requires long duration for all the flowers to develop and open. The magnitude of pollen loss due to a prolonged first male phase is, probably, great. The mean percentage of male flowers for trees varied from 19·2% to 100·0% in the inflorescence during the first male phase, from nil to 60·1% during the mixed phase and from nil to 6·7% during the second male phase. The number of hermaphrodite flowers ranged from nil to 20·0% during the mixed phase. There was no relationship between the total number of flowers in a panicle and the sex ratio (Table I). Trees having short male phase and longer mixed phase with abundant flowering produced more hermaphrodite flowers. An intrinsic balancing system controlling such a mixed phase would produce hermaphrodite and male flowers sufficient enough to effect maximum pollination among a synchronously flowering

TABLE I

Male and hermaphrodite flowers (in percentage) during the three flowering phases and the mean duration of different phases

Tree No.	Male phase I		Mixed phase			Male phase II		Mean No. of flowers per panicle
	Duration (days)	Male flowers	Duration (days)	flowers ♂	flowers ♂/♀	Duration (days)	Male flowers	
1	12·60	19·17	64·40	60·15	20·02	4·00	0·67	326·60
2	21·40	31·57	60·80	42·13	19·63	11·20	6·66	549·20
3	41·40	57·50	50·20	27·08	13·93	7·60	1·49	336·00
4	38·60	94·59	1·40	3·38	0·59	1·20	1·44	236·80
5	40·80	96·01	0·60	1·14	0·14	2·60	2·71	421·20
6	33·20	61·14	39·20	33·35	4·01	3·80	1·50	319·60
7	19·00	100·00	0·00	0·00	0·00	0·00	0·00	68·00
8	26·00	87·24	1·80	6·64	0·70	4·20	5·42	114·40

population. It is indicated that genotypic selection for appropriate sexual phase specificity in anthesis would be possible in cashew and it might help to build up the plant idiotype of this crop.

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