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### A REPORT ON TRANSITION IN THE STOMATAL SIZE WITH AGING OF LEAVES IN *CLEOME VISCOSA* LINN.

POLYMORPHISM in the stomata has been recorded in a few plants<sup>1-4</sup>. During survey of stomata in arid zone plants, it was discovered that there is a distinct variation in stomatal size of *Cleome viscosa*. This is a very common plant growing wild in the rainy season. Plants were demarcated from different habitats under different conditions in the Jodhpur University campus. Three types of leaves were graded according to their maturity or aging (young, adult and old). Epidermal peelings were made from the abaxial surface of the leaf and stomatal measurements were made with the help of precalibrated microscope. The measurements are tabulated in Table I.

number of epidermal cells with the maturity of the leaves. Epidermal cells form a beak like structure on both the edges of stomata. Stomata with a single functioning guard cells were also

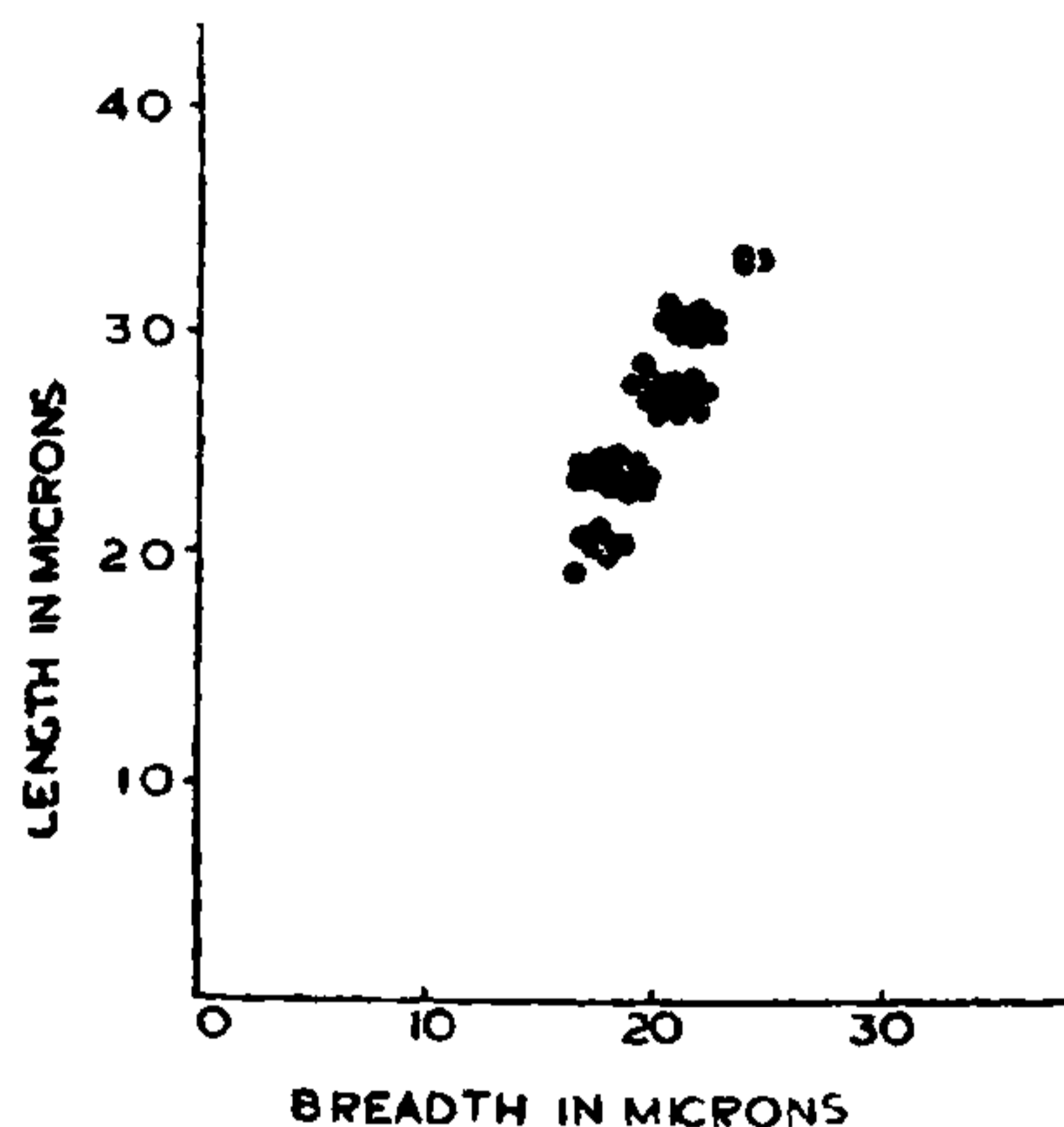


FIG. 1

TABLE I

Size of stomata, the epidermal content and the stomatal index of leaves of *C. viscosa*

Age of leaf	No. stomata per sq.mm	Size of stomata in microns								No. epi. cells per Sq.mm	Stomatal index
		1		2		3		4			
		<i>l</i>	<i>b</i>	<i>l</i>	<i>b</i>	<i>l</i>	<i>b</i>	<i>l</i>	<i>b</i>		
Young	833 ± 61	27	21	24	18	21	18	18	15	2320 ± 243	26.4
Adult	593 ± 54	30	21	27	21	24	18	21	18	2070 ± 193	22.3
Old	340 ± 46	33	24	30	21	27	21	24	18	1293 ± 154	20.8

*l* = Length of stomata; and *b* = Breadth of stomata.

It is evident from Table I that the number of stomata and epidermal cells per unit area decrease with the maturity or aging of leaves. Old leaves have fewer stomata and epidermal cells as compared to young ones. It is a well known fact that stomata continue to develop through a considerable part of the epidermal extension of the leaf by cell enlargement<sup>5</sup>, and new stomata would hardly arise when a leaf has attained full maturity. As per stomatal measurements, the stomata appear to fall in more than one group. It may appear that hardly new stomata arise in a mature leaf. Stomatal measurements at random show four distinct groups. The smallest stomata were seen only in the young leaves and the largest in the old ones only. Stomata of four sizes were seen common in all ages of leaves. The number of stomata of size 27 × 21 μ and 24 × 18 μ were common to all ages of leaves (Fig. 1). This indicates that there is an increase in the size of stomata and decrease in the

observed. Thus from the present study a correlation can be made between: (1) the number of stomata and number of epidermal cells; (2) number of stomata and maturity of leaf; (3) size of the stomata and maturity of leaf in this species.

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**ON THE IDENTITY OF *HABENARIA*  
*GRANDIFLORIFORMIS* BLATT. McC.**

*Habenaria grandifloriformis* Blatt. McC. and *H. grandiflora* Lindl. are considered to be duplicates taxonomically on the basis of similarities in the floral structure (Santapau and Kapadia, 1966). It was the hope of the author to evaluate the position of these species on their growth habits, morphology and anatomy of the vegetative organs.

The plants possess a very short stem that emerges out from a globose-ellipsoid special tuberous mother root, bearing usually a single leaf lying flat on the ground (Fig. 1). The stem bears a few short but stout roots and one among them has a swollen tip and forms the special tuberous root. In all the special tuberous roots studied, a single bud or two buds are initiated endogenously at the basal part of the tuber enclosed within a cavity. At a later stage these bud initials enlarge and get exposed as small protuberances.

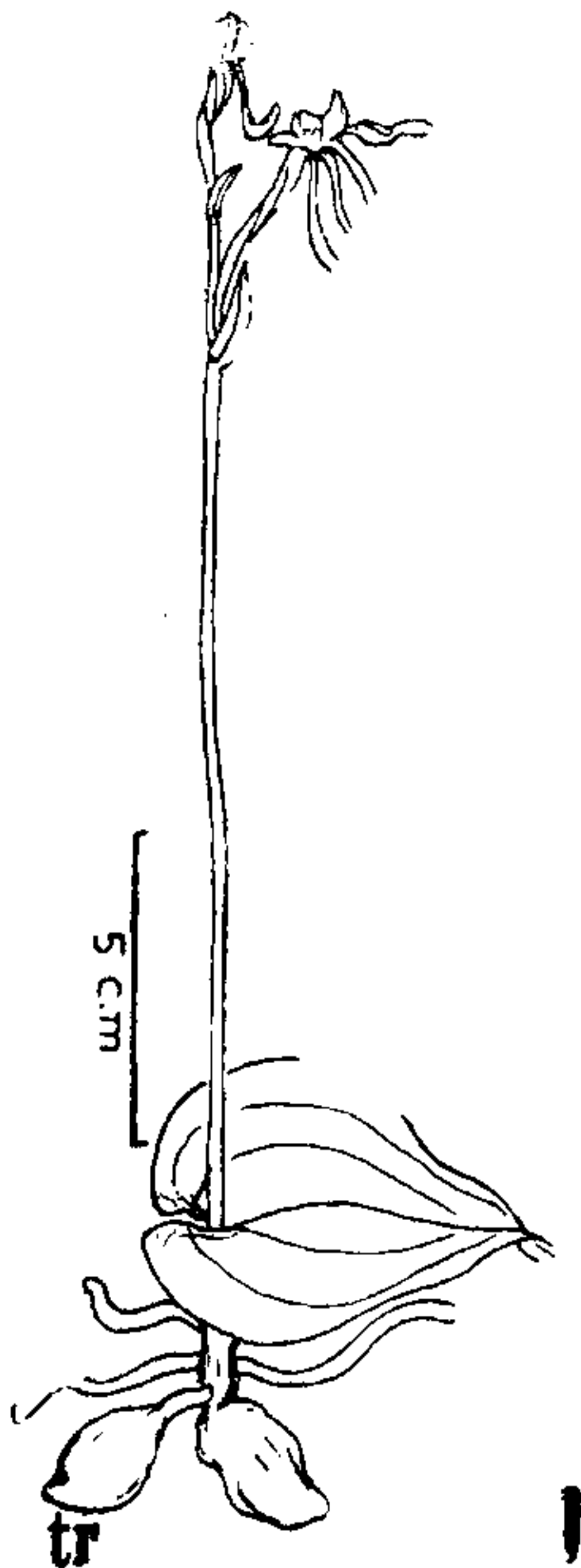


FIG. 1. *Habenaria grandifloriformis* Blatt. McC., entire plant; *tm*, tuberous mother root; *tr*, tuberous root.

Towards the end of the season the stem along with the wrinkled spongy special tuberous root remains underground, alive till the next monsoon when it develops a new plant. Then this special

tuberous root turns out to be the special tuberous mother root of that plant. This growth habit is repeated in the following seasons.

The specimens collected for the present investigation befit the taxonomical descriptions of both *H. grandifloriformis* and *H. grandiflora*, and revealed identical features of the corresponding vegetative organs. The morphology and anatomy of the vegetative organs, viz., root, special tuberous roots, stem and leaf, as brought out by this study, invariably show striking similarities between the two plants and a distinction of the two species becomes impossible.

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**NEW RECORD OF LONG GRAIN IN RICE**

VARIATION in grain length in rice has been reported by number of workers. The longest (14.23 mm) grain was obtained in Ac. 27 an introduction from China<sup>1</sup>. The variety SML 128/4 from Surinam had been reported to have a grain length of 14.40 mm<sup>2</sup>.

During a study carried out at the Central Rice Research Institute, Cuttack, on grain size, two long grained varieties Ac. 27 and Roti (grain length—13.15) from Madhya Pradesh were crossed in Kharif—1972.

The average grain length of Ac. 27 is 14.19 mm (range—13.98 to 14.50 mm). The grain length of Roti ranged from 12.68 to 13.58 mm with a mean of 13.15 mm. In the F<sub>1</sub> plants the grains were intermediate in length (13.25 mm). In the F<sub>2</sub> generation grain length ranged from 9.57 to 16.17 mm. Out of 530 plants studied 8 were in the transgressive class for longer grain. These 8 plants were carried over as plant progenies and in the F<sub>4</sub> generation, one culture possessing average grain length 16.09 mm, was isolated. This was further studied in F<sub>5</sub> and found to breed true. The grain development is normal. This is now being maintained. The detailed information about this culture as well as the parents is furnished in Table I.

The variation in grain type in F<sub>2</sub> is shown in Fig. 1 along with that of F<sub>1</sub> and parents.

Grain length exceeding 14.4 mm had not been reported earlier and the present observation is first of its kind. The test weight (1000 grain) was, however, less than Ac. 27 and this may probably be due to reduced breadth and thickness in addition