ECOTYPIC DIFFERENTIATION IN *ELEUSINE INDICA* (L.) GAERTN.

DURING recent cytological investigations in grasses, collections were made from Gorakhpur, Eastern Uttar Pradesh, and ecotypic variation was suspected to be present in quite a few grass species. Experiments conducted to establish the ecotypic nature of the variation in *Eleusine indica* are communicated in this paper.

Six morphological variants of *Eleusine indica* were collected and cytologically examined. It was found that all of them were diploid with $n = 9$. The observations indicated that even the extreme types were not cytological races and that the differences were at the genic level. From additional evidences about the habitats in which the different morphological variants were found growing, it was suspected that at least the extreme types could be ecotypes.

The two extreme types for convenience were called "erect type" and "prostrate type". The "erect type" was found growing in favourable conditions, *i.e.*, in moist, shady and undisturbed habitats. They were, therefore, also found as a weed in flower-beds in the gardens. The "prostrate type" was found under conditions of drought, grazing and extreme pressures of trampling. Most common habitats for the "prostrate type" were footpaths on roadsides and sites which were under constant biotic influence.

Plants belonging to both ecotypes were transplanted from the fields in the neutral medium in garden pots in August 1967. The performance of these variants was observed for a year and it was found that the plants maintained their morphological identity. In order to have further confirmation, the plants were raised from the seeds. Somewhat prostrate and erect natures of the two variants were observed in these cultures also (Fig. 1). It was,

FIG. 1. "Erect" and "Prostrate" ecotypes raised from seed in culture.

therefore, established that the variants were not ecads, but definite ecotypes. The morphological characters of the ecotypes in field and in culture are given in Table I. It is obvious that for most of the characters listed, the differences, which were recorded between the ecotypes in the field, persisted in culture also.

The experiments and the result, presented in this paper, demonstrated that the differences between "prostrate" and "erect" types were at the genic level. However, plants

TABLE I

Morphological characters in two ecotypes in Eleusine indica

Character \ Ecotype	From field		From culture	
	Prostrate	Erect	Prostrate	Erect
Habit				
1. Height of plant	Complete prostrate 83·0	230·0–645·0	81·0–164·0	385·0–507·0
	36·4	435·2	147·0	453·0
2. Length of culm	57·0–155·0	250·0–657·0	87·0–195·0	38·0–504·0
	96·6	466·5	128·4	453·2
1st leaf				
3. Sheath length	14·0–42·0	58·0–120·0	29·0–55·0	72·0–103·0
	29·4	88·7	40·0	81·8
4. Blade length	24·0–105·0	122·0–260·0	28·0–98·0	144·0–188·0
	72·8	202·9	66·0	164·8
Inflorescence				
5. Number of racemes per inflorescence	1–3	1–7	2–5	4–9
	2·0	4·9	3·4	7·0
6. Length of racemes	22·0–41·0	6·4–13·5	33·0–46·0	74·0–110·0
	31·5	92·9	36·4	86·8
7 Length of primary axis	0·0–5·0	0·0–44·4	0·0–22·0	11·0–31·0
	1·2	16·1	0·7	23·8

Note: 1. All measurements in mm.
2. Upper rows range and lower rows mean.

intermediate between "prostrate" and "erect" types were observed both in the fields and in culture. The presence of these intermediate types demonstrated firstly that there was no isolating mechanism operating between the two types and secondly that there could be more than one gene responsible for this difference. Only crossing experiments between the "erect" and the "prostrate" types would reveal the number of genes and the type of inheritance involved.

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