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EFFECT OF CUTTING ON THE GROWTH AND FLOWERING BEHAVIOUR OF *TYPHA ELEPHANTINA* ROXB.

Typha elephantina are serious weeds of waterlogged soils and shallow waters almost throughout North India. The leaves are removed annually for thatching and rope making. Generally, this cutting is practised soon after the flowering is over during November. After cutting, the growth remains negligible during the winter months (up to February). Later, the vegetative growth occurs rapidly. The flowering starts during late June continues up to August.

It has been indicated earlier[1] that repeated cutting of the shoots may help in control of weeds (*Phragmites*). Therefore, an experiment was performed to study the effect of repeated removal of aboveground shoots (leaves) during the growth period on the overall growth and reproduction of this weed.

The study was performed in a naturally occurring large stand of *T. elephantina* at Government Agriculture Farm, Durgapura, Jaipur. A portion of the stand was kept undisturbed and the remaining was subjected to annual cutting during November, 1975. A portion of the annually cut stand was cut for the second time during the second week of June, 1976 just before flowering, and again a part of the twice cut stand was cut for the third time during September, 1976. It was observed that the density in the undisturbed stand decreased, as compared to that in the annually cut stand. In the twice cut stand also the density remained unchanged but in the thrice cut stand it decreased appreciably. The density and biomass of the plants other than *Typha* increased in the twice and thirice cut stands.

The vigor of the plant in the undisturbed and annually cut stand remained normal while it decreased in the twice and thrice cut stands. The height and number of leaves is also reduced[2].

Most interesting observations have, however, been made on the flowering behaviour. In the twice cut stand all the plants flowered synchronously during the end of July 1976 while in the annually cut and undisturbed stand the plants flowered over a long period from late June to August 1976 as is normally observed. The annually cut stand produced normal inflorescences with the male spike borne above the female spike. But in the twice cut stand a number of abnormalities appeared such as production of oniy a male spike, or the replacement of the lower female spike also by the male spike or the development of a very much reduced female spike. In most cases the gap between the male and female spikes was very much increased as compared to that in the undisturbed and annually out stands (Fig. 1).

FIG. 1. Inflorescences showing different degree of abnormality.

The quantitative data on the inflorescence size in the twice cut and annually cut stands, have been given in Table 1.

TABLE 1

Effect of cutting on the size of inflorescence

Inflorescence parameter	Undisturbed and annually cut stand	Stand cut twice
Male spike		
Length (cm)	34·3±4·0	20·9±7·2
Diameter (cm)	2·2±0·3	1·5± ·03
Gap between male and female spike (cm)	7·1±1·2	15·9±7·4* 4·6±1·8
Female spike		
Length (cm)	22·5±3·7	13·4±2·8* 8·2±3·5
Diameter (cm)	2·8±0·03	2·6±0·07

* Two categories were made because of more than 50% differences in their sizes.

T. elephantina have an elaborate rhizome system with a horizontal sympodially branched system lying at a depth of 1 to 2 meters and a vertical rhizome which bears number of lateral buds near the apex, and terminates into a shoot. These lateral buds remain inactive in the presence of terminal shoots. Annual cutting allows the growth of new shoots from lateral buds which remain dormant in the undisturbed stands. Thus, the density in the undisturbed stand decreases by the death of old shoots which have flowered already. The synchronous flowering in the twice cut stand as against the scattered flowering in other stands, can be explained on the basis of sensitivity of leaves of different age to photoperiodic induction.

Various studies have shown that the photoperiodic sensitivity of leaves increases with their ontogenetic rank, and that the first formed leaves may be entirely insensitive to photoperiodic induction. Therefore, the plants become more sensitive to photoperiodic induction as they age[3–6].

The cutting of shoots for a second time just before flowering results in the growth of several new leaves simultaneously in all the plants These leaves being more sensitive to photoperiodic induction, and being of the same age, become sensitized at the same time and result in the synchronous flowering within a month. In the other stands, the presence of old leaves appears to be a detriment to the photoperiodic induction of flowering.

The abnormalities in the inflorescence structure and size in the twice cut stand can be explained by the fact that most of the reserved food material stored in the rhizomes is used in the development of photosynthetic organs i.e. leaves. The small amounts of photosynthetes produced in the short period before flowering and the little reserves left in the rhizomes are insufficient for proper development of reproductive organs. Since the development of the male spike precedes the development of female spike, it is least affected. The development of female spike also appears to require an assured supply of more food material to ensure seed setting, and its shortage results in the small female spikes or their replacement by male spike or even their complete absence.

Since repeated cutting reduces the vigor of plant, its density and the seed production, the study suggests that a weed like *T. elephantina* can be controlled by repeated cutting of the stand at short intervals.

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OCCURRENCE OF *COLLETOTRICHUM GLOEOSPORIOIDES* ON CAPSULARIS JUTE PLANTS

DURING 1976–1977, a *Colleto.richum* species having straight spores was found to occur on leaves and stems of a considerable number of capsularis jute plants (*Corchorus capsularis* L. cultivar. D–154), grown in some experimental plots of our Botanical Garden.

Affected leaves showed brownish necrotic lesions which were mostly marginal. Initially the lesions were small but these gradually increased in size with age. At the late stage of the disease, conspicuous dark acervuli developed in the affected parts of the leaves (Fig. 1). Parts of the stem with infection also showed dark brown lesions which were dotted with dark acervuli during later stages of the disease (Fig. 2).

The fungus associated with such necrotic lesions was isolated on potato dextrose agar (PDA) following the tissue planting method[1], and it was identified as *Colletotrichum gloeosporioides*. Penz.[2]. Although *C. gloeosporioides* is known to infect a large number of hosts, including olitorius jute plants (*C. olitorius* L.)[3], it has not been recorded earlier on capsularis jute plants. In the following paragraphs the fungus has been described with a note on its parasitic effects on artificially inoculated capsularis jute plants.

Microscopic details of the fungus were recorded from freshly collected material as well as cultures. The specimens cited are preserved in the Mycological Herbarium, Department of Botany, University of Dacca, Bangladesh. A culture of *C. gloeosporioides* (IMI 215081) has also been deposited at C.M.I., Kew, England, U.K.

Colletotrichum gloeosporioides Penz. in *Fungi Agrum.* 2, 6 (1882) (Figs. 3–4).

Acervuli (on host tissue) scattered, raised, circular or oval, dark coloured; setae lacking or very few when present, arising from the margin of the acervuli, thick walled, dark brown, 50·4–75·6 μ long, 4·2–5·6 μ wide at the middle, slightly bulbous at the base, up to