

# VEGETATIVE AND REPRODUCTIVE GROWTH OF *CASSIA OCCIDENTALIS* UNDER THE INFLUENCE OF ACUTE ENVIRONMENTAL POLLUTION†

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## ABSTRACT

The paper deals with the effects of air pollution on *Cassia occidentalis*, a member of Caesalpinoidae. A comparative study on the vegetative and reproductive growth of the species from Kasimpur, a heavily polluted area and Aligarh Muslim University campus, presumably less polluted one, was carried out. The data obtained clearly indicate that the species growing at Kasimpur shows luxurious and vigorous growth as compared to the one at Aligarh. Data on the size and weight of the plant, shoot, root, fruit and leaves were obtained from both the places and a ratio was worked out which was higher for the species growing at Kasimpur as compared to Aligarh.

## INTRODUCTION

During the past hundred years or so many botanical and chemical investigations have revealed the significant and sometimes devastating effects of air pollutants from cities and factories on vegetation. CHAMBERLAIN (1936) was one of the early workers to observe the harmful effects of air pollutants on conifers. TODD (1956) described the 'Hidden Damage' to plants caused by air pollutants. FEDER (1970) recorded a decrease in floral productivity and branching to oxidant-type pollutants. Recently, AMANI *et al.*, (1977) while working on *Cassia tora*, have recorded interesting data and showed that in the species growing under the stress of air pollution, total productivity was increased comparatively to those which grow in less polluted areas. The present study deals with the performance of another common weed.

## MATERIAL AND METHODS

*Cassia occidentalis*, a common leguminous weed, grows luxuriently in the wild state. Two sites were selected, one at Kasimpur where one of the major Thermal Power Stations of U.P. is situated, emitting huge amount of particulate matter, various oxidants and other smog gases and the other at Aligarh, a place 20 kilometers south of Kasimpur, and presumably free of such pollutants. Fifty plants were up-rooted from each site and data on the average size and weight of plant shoot/root ratio with reference to size and weight, and average number of leaves per plant were recorded. Reproductive growth was also observed in terms of number of fruits per plant and average weight and size per fruit were also recorded.

## OBSERVATION

The data thus obtained were summarized and plotted in Table-1. It showed that the vegetative growth at Kasimpur in terms of average size and weight of the whole plant

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and mean ratio of shoot/root with regards to size and weight was significantly higher as compared to the one growing at Aligarh. Similarly, the reproductive growth in terms of average size and weight were found to be more at Kasimpur than at Aligarh.

Table-1—Vegetative and reproductive growth of *Cassia occidentalis*

Traits	Aligarh	Kasimpur
Shoot/ Root Ratio (Weight)	1.2	1.8
Shoot/Root Ratio (Size)	.3	.5
Number of leaves per plant	23	48
Weight in gram per plant	110.0	156.0
Size in cm per plant	118.0	148.0
Number of fruits per plant	20	35
Weight per fruit	1.5	1.8
Size per fruit	9.0	9.0

#### DISCUSSION

Our data showed that *Cassia occidentalis*, although growing luxuriently in both sites, shows a remarkable increase in the performance, both in its vegetative and reproductive phases, at Kasimpur site which is highly polluted than the one at Aligarh which is presumably free of pollution. It appears that this particular weed as in *Cassia tora* (AMANI, *et al.*, 1977) makes use of carbon-di-oxide rich atmosphere of Kasimpur and grows better in that area than at Aligarh where the concentration of CO<sub>2</sub> is normal.

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