PATH ANALYSIS OF SOME GROWTH PARAMETERS IN SORGHUMS

PATH analysis technique was first developed in crop by Wright (1921), for further analysis of correlation coefficients of dependent and independent variables. According to Dewey and Lu (1950) such an analysis together with regular correlation coefficients helps to visualise the importance of each yield attribute in a given crop variety. Several attempts have been made in this direction, taking mostly the grain yield components (Lal and Hague, 1971 ; Singh and Mehndiralla, 1970) as independent variables. Nevertheless, such a study is lacking on growth components and yield, despite the fact that the growth components are equally important (Krishnamurthy *et al.,* 1974).

The total photosynthate produced by any crop plant is generally dependent on both leaf area duration and net assimilation rate. This measures the total area available and the photosynthetic efficiency of leaves in providing dry matter to grain which is similar to NAR. With this background, relationship of these growth components, with grain yield in sorghum, has been worked out through path analysis.

Data involving both growth and yield analyses of several sorghum experiments conducted on red sandy loam soils at the PL–480 Project, Main Research Station, UAS, Bangalore, have been used for this study. The growth parameters, *viz.,* Leaf area duration (D), NAR (Ea) and grain-leaf-ratio (G) were computed for all the experiments and correlated with grain yield. The authors in their earlier paper have already discussed the photosynthetic efficiency of Sorghum genotypes after heading (Krishnamurthy *et al.,* 1973). Here the relationship of the three growth parameters with grain yield have been studied following path analysis. The diagram (Fig. 1) shows the path analysis results of grain yield and growth components along with the direct correlation coefficients. It may be observed that while

Path coefficients		Correlation matrix			
$P_{14} = 0{\cdot}4403$		D	G	Ea	Y
$P_{24} = 1{\cdot}0020$	D	1·000	−0·367	−0·550	0·020
$P_{34} = 0{\cdot}0957$	G		1·000	0·684	0·906
$P_{a4} = 0{\cdot}1789$	Ea			1·000	0·539
	Y				1·000

the direct correlation result obscured the relationship of yield with D, the path analysis showed a better relation. As regards the relationship of yield with G it was best as observed through both the correlation and path analysis results. The yield was highly correlated positively with 'G'. Contrary to this, the relationship of yield and NAR was low, as observed from both correlation and path analysis results.

This study further confirms the finding of Watson (1963) and Krishnamurthy *et al.* (1973), that (G) is relatively better related to yield than either NAR or LAD. Although the importance of LAD is by no means small, however in all growth analysis studies G will give a better picture of grain yield in genotypes.

P.L. 480 Project,
Department of Agronomy,
University of Agricultural Sciences,
Hebbal,
Bangalore 560024,
September 25, 1974.

M. K. JAGANNATH.
K. KRISHNAMURTHY.
B. G. RAJASHEKARA.
G. RAGHUNATHA.
A. BOMMEGOWDA.
N. VENUGOPAL.

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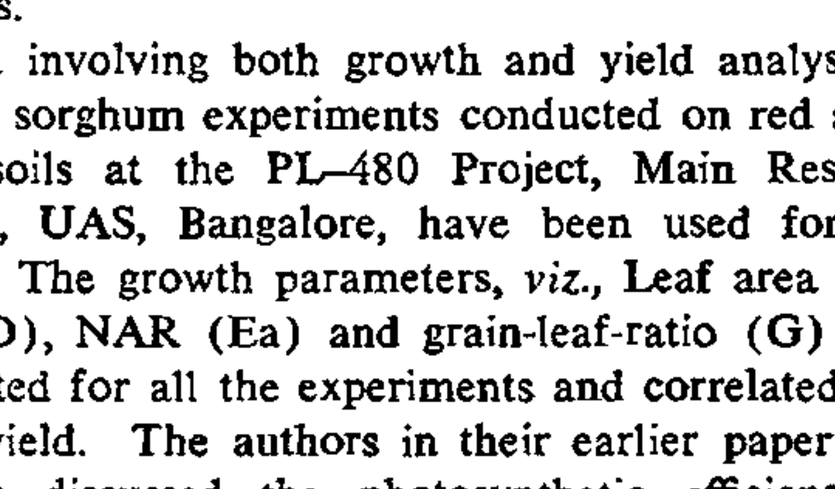

FIG. 1. Path diagram of growth components and yield. (1) Leaf area duration (D) ; (2) Grain-leaf ratio, (G) ; (3) Net assimilation rate (Ea) ; (4) Grain yield (Y) ; (X) Extraneous factors.

CHROMOSOME NUMBER OF *ACRAEA VIOLAE* (LEPIDOPTERA : ACRAEIDAE)

IN India the family Acraeidae is represented only by the genus *Acraea* with two species, viz., *A. issoria* (Hübner) and *A. violae* (Fabr.) : (Talbot[1]). The former is reported to occur only in North India ; even though the latter was often considered to be a peninsular form, Wynter-Blyth[2] notes that it was earlier reported from North India also. The chromo-

some number of either of these species has not been reported.

The first record of the chromosome number in this genus is that of De Lesse and Condamin[3] who reported the haploid number of chromosomes as 32 in *A. bonasia* F. They[4] also reported 31 haploid chromosomes in *A. natalica pseudegina*. The present report of the chromosome number is the sixth in this genus.

Acetic-orcein squash preparations, without prefixation, of the testes of *A. violae* show 31 bivalents in metaphase I (Fig. 1). Little variation in size among the different bivalents was noted.

FIG. 1. Metaphase I chromosomes of *A. violae*.

The most common haploid chromosome number in Lepidoptera is 31 (Suomalainen[5]), although it is reported to vary from 8 to 191. The chromosome number of the genus *Acraea* seems to fall near the mean for the order.

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Department of Zoology,
A.U. Postgraduate Centre,
Guntur 522005,
March 7, 1975.

N. NAGESWARA RAO.
A. S. MURTY.

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EFFECTS OF SEED EXTRACT OF *LATHYRUS* ON THE SOMATIC CHROMOSOMES OF *MUS MUSCULUS*

A GOOD deal of work has been done on the effect of lathyrogens on different tissues of mammals[1]. Their effect on the hereditary vehicles of animals remains almost unexplored. However, an account on the cytological effects of the lathyrogen on somatic and germinal chromosomes of the plant and the animal has recently been reported[2,3]. Some neurotoxic substances and other chemical components have been isolated from the seeds of *Lathyrus sativus*[4-10] but their actual role in causing the disease is still a riddle. The present studies have been undertaken with a view to finding out the effects of the seed extract of *L. sativus* on the bone marrow chromosomes of the mouse, *Mus musculus*.

The seeds of *L. sativus* (25 g) were boiled with 100 ml distilled water for two hours. The supernatant fluid was cooled and filtered through No. 1 filter paper, and then injected intraperitoneally into mice weighing about 25 g at the rate of 0·25 ml per individual. The treated specimens were sacrificed after 4, 12, 24 and 48 hours respectively, after a short pre-treatment with 0·25 ml of 0·04% colchicine solution for 1½ hour. Control animal injected with identical volumes of distilled water were sacrificed after similar periods as in the case of the experimental series. The standard air drying method of preparing the bone marrow chromosomes was employed and the slides were stained in Giemsa using the phosphate buffer of a pH of 7·2[11,12]. Four specimens of either sex were used for each fixation period and fifty well spread metaphases were examined from each animal.

In the control series an examination of 800 metaphases from four fixation period revealed approximately 0·88% abnormalities in the form of fragments, gaps, achromatic lesions and chromatid constrictions (Table I). In the treated series, on the other hand, almost all common aberrations were noticed in the form of chromatid and sub-chromatid breaks (Fgigs. 1–3), chromatid constrictions, fragments of unknown origin (Fig. 4), gaps and achromatic lesions in all the time intervals. Apart from these common aberrations, some physiological effects, mainly in the form of loose spiralization of chromosomes were also noticed (Fig 4) in the cells of some mice. The details of the number and distribution of various types of aberrations in the treated series are given in Table I.

The occurrence of different aberrations in the reated series, as compared to those in the control eries, indicates that the components, present in he seed extract of *L. sativus*, are responsible for he induction of chromosome aberrations in the