Indian J. Genet., **53** (3): 315–317 (1993)

CORRELATION AND REGRESSION STUDY OF FLOWER PRODUCTION AND ITS COMPONENTS IN KEWDA (*PANDANUS FASCICULARIS* LAM.)

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(Received: November 20, 1992; accepted: January 2, 1993)

ABSTRACT

Correlation and regression of flower production and its seven component traits in kewda (*Pandanus fascicularis* Lam.) were studied. Flower production per plant was found to be significantly positively correlated with leaf width (0.93) and negatively with flower weight (–0.81). Regression study revealed that an increase of one cm in leaf width increased flower production by 15.09 per plant, while an increase of 1 g in flower weight and 1 mm in leaf thickness decreased the flower production by 0.18 and 34.78 per plant, respectively. However, regression analysis indicated that only leaf width had recorded the maximum significant value (15.09) out of seven independent variations studied.

Key words: Correlation, regression, kewda, *Pandanus fascicularis* Lam.

Male spadices (commonly known as flowers) of kewda (*Pandanus fascicularis* Lam.) are industrially important in the preparation of kewda water in food flavouring and related perfumery products, which have a growing demand in India and abroad, especially in Arab countries. Hence, the ultimate economic value of kewda plantation depends on the quantity of flower production and the plant normally takes nearly 5 years after planting for flowering initiation [1]. The relationship of flower production to its attributing characters is of great importance for effective selections. It will also help for development of appropriate cultural practices for boosting high flower production. Therefore, the present investigation was undertaken to know the degree of association between flower production and its component traits in kewda.

MATERIALS AND METHODS

The present investigation was carried out during 1989-1990 on six distinct morphotypes of kewda (viz. large thorn dark green, large thorn light green, small thorn dark green, small

thorn light green, thornless, mala or dwarf types) plantations selected basing on leaf pigmentation and presence or absence and size of thorns on leaf margin, under the farmer's field condition at Chhatrapur area of Ganjam district, Orissa, to study the relationship between flower production and its attributing characters. Observations were recorded on length, width and thickness of mature leaf, thorns per 10 cm of leaf margin, number of bracts per flower, length and weight of flower, and flower production per plant from five randomly selected plants of 25 years age group per entry and the mean data were analysed for correlation and regression studies [2].

RESULTS AND DISCUSSION

Results on simple correlation coefficients (Table 1) revealed that flower production was significantly and highly positively correlated with leaf width (0.93) and had a positive relation with leaf length, number of thorns and bracts. In turn, leaf width had no significant association with any other character. The high significant negative association of flower production with flower weight indicated that an increase in weight of flower would lead to decrease in flower production. Flower weight had also a high significant negative relation with number of thorns on leaf margin (–0.84). The studies indicated that a plant type of broad leaves with thorny margin and less flower weight was expected to produce more flowers.

The linear regression equations between flower production and other pertinent characters (Table 2) showed that an unit increase in leaf length (cm) and breadth (cm),

Table 1. Correlation coefficients for flower production and its attributing traits in kewda

Characters	Leaf width	Leaf thick-ness	Thorns/ 10 cm leaf margin	Flower length	Flower weight	Bracts/ flower	Flower production/ plant
Leaf length	0.32	– 0.81	– 0.52	0.65	0.21	0.71	0.36
Leaf width		– 0.46	0.57	– 0.03	– 0.71	0.49	0.93**
Leaf thickness			0.24	– 0.26	0.18	– 0.35	– 0.54
No. of thorns/10 cm leaf margin				– 0.74	– 0.84*	– 0.19	0.58
Flower length					0.69	0.50	– 0.22
Flower weight						– 0.04	– 0.81*
No. of bracts/flower							0.51

*,** Significannt at 5% and 1% levels, respectively.

Table 2. Regression coefficients (b values) of different component traits on flower production in kewda along with their standard errors, t values and linear regression equations

Character (Xi)	b value	Standard error	t value	Linear regression equation (Y=flower production/plant)
Leaf length (cm)	0.53	0.678	0.783	$Y = -16.873 + 0.531\ X_1$
Leaf width (cm)	15.09*	2.854	5.288	$Y = -33.997 + 15.094\ X_2$
Leaf thickness (mm)	-34.78	27.115	1.283	$Y = 37.463 - 34.783\ X_3$
No. of thorns/10 cm leaf margin	1.09	0.773	1.410	$Y = 7.878 + 1.091X_4$
Flower weight (g)	-0.18	0.067	2.712	$Y = 37.953 - 0.182X_5$
Flower length (cm)	-0.23	0.499	0.455	$Y = 29.778 - 0.227\ X_6$
No. of bracts/flower	2.13	1.804	1.178	$Y = -16.915 + 2.126\ X_7$

*Significant at 5% level.

number of thorns on leaf margin and bracts led to increase the flower production per plant by 0.53, 15.09, 1.09 and 2.13, respectively, and 1 mm increase in leaf thickness, flower weight (g), and flower length (cm) led to decrease in flower production by 34.78, 0.18 and 0.23, respectively. Further, out of seven flower production attributing traits studied, the regression coefficient of leaf width alone showed high significant value inferring its significant impact on flower production, the remaining characters had no significant influence, although a high significant negative association of flower weight was observed with flower production. Therefore, we infer that selection indices based on broad leaved plants is most important factor in the first cycle and the plants bearing flowers of least weight in the second cycle of selections to identify high flower producing cultures in kewda.

ACKNOWLEDGEMENTS

The authors are grateful to the Indian Council of Agricultural Research, New Delhi, for providing financial assistance.

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