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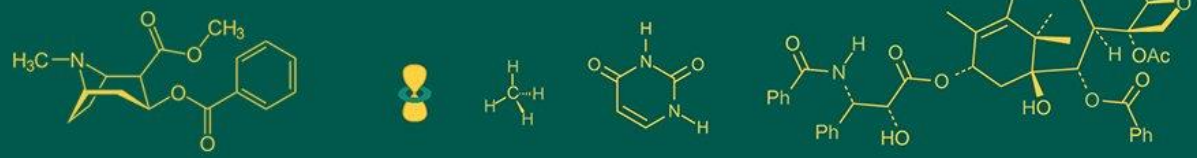

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# Principal component analysis of 55 rice (*Oryza sativa* L.) germplasm

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**Abstract**
Major problem analysis had been finished in rice germplasm for 8 characters. The experiment grow to be done at instructional cum studies Farm, department of Genetics and Plant Breeding, college of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) all through kharif 2017 to access association evaluation of the fifty five germplasm accessions of rice at the side of popular widespread assessments Chhattisgarh Zinc rice 1, Samleshwari Danteshwari, Indira Barani Dhan and Indira Aerobic1. On the basis of predominant component evaluation the primary issue PC1 differentiated those accessions having excessive loading factor for 50% flowering, plant pinnacle, panicle length and adulthood and 2d factor PC2 differentiated those accessions having high loading detail for grain yield steady with plant, 100 grain weight and kind of effective tillers in line with plant and 1/three component PC3 differentiated those accessions having immoderate loading issue for grain duration : width ratio and plant top.

**Keywords:** Rice Bowl of India, principal component, germplasm, extensive variability

## Introduction
Rice (*Oryza sativa* L.), (2n=24) is the maximum essential cereal crop that has been referred as "worldwide Grain" due to its use as pinnacle staple food in approximately a hundred international places of the sector. In international, rice has occupied an area of 160.6 million hectares, with an entire production of 738.20 million tonnes and productivity 3424.41 kg/ha. In India rice is cultivated spherical the twelve months in a single or the other a part of the USA of a in numerous ecologies spread over forty three.38 million hectares with a production of 104.32 million tonnes in the course of 2015-sixteen. Chhattisgarh popularly called "Rice Bowl of India" occupies an area around 37.73 lakh hectares with the producing of 60.28 lakh tonnes and productivity 1597 kg/ha. In any crop, germplasm plays as an essential position as a supply and gives scope for extensive variability.

## Materials and Approach
The accessions of rice were evaluated inside the subject at some point of kharif 2017 at studies Cum educational Farm, Department of Genetics & Plant Breeding, university of Agriculture, IGKV, Raipur. The sector trials were conducted under irrigated transplanted situation. The plant substances were sown in raised mattress nursery on second July 2017. Twenty 5 days vintage seedlings had been sooner or later transplanted into the sphere in augmented layout (handiest checks are replicated) in kharif -2017. Every access changed into transplanted in two rows with 20 cm of spacing among row to row and 15 cm among plant to plant. The take a look at types had been randomized within blocks. Fertilizer dose @ of 80 N: 50 P: 30 okay kg/ha changed into applied. The entire dose of phosphorus and potassium along side half of of the dose of nitrogen became completed as basal dose earlier than transplanting. The last dose of nitrogen modified into accomplished in two splits, first at the time of starting of tillering and second one week after it. The usual agronomic practices have been followed for regular crop increase.

## Results and Discussion
Inside the present research, PCA changed into completed for 8 agronomic in promising rice accessions. As consistent with the criteria set via Brejda *et al*. (2000) [1],

The pc with Eigen Values > 1 and which defined at least 5% of variant within the records had been considered in present observe. Out of 8, handiest 3 primary components (Computer Systems) exhibited greater than 1 Eigen Price and defined as a minimum 5% of version at the side of 70.Seventy seven % cumulative variability many of the tendencies studied. So, the ones 3 computers were given due importance for similarly clarification. The primary number one component PC1 exhibited more than 37% of universal variance. Here extensive style of days to 50% flowering, plant top, panicle length and days to adulthood were the variables that contributed most undoubtedly and tremendously loaded. As a end result, the primary element PC1 differentiated those accessions having high loading aspect for 50% flowering, plant top, panicle duration and maturity. The second most essential detail PC2 accounted for 19.86% of trendy variability and is pretty surely correlated with grain yield consistent with plant, 100 grain weight and range of powerful tillers consistent with plant. PC2 is rather loaded with genotype having extended grain yield and its attributing inclinations. As a end result PC2 differentiated the ones accessions having excessive loading issue for grain yield in keeping with plant, one hundred grain weight and quantity of powerful tillers consistent with plant. The most vital factor PC3 explained 13.23% of the range. As a quit result, the PC3 differentiated those accessions having excessive loading element for grain period width ratio and plant top. These results are corroborated via Nachimuthu *et al*. (2014) [6] and Sinha and Mishra (2013) [8].

Scree plot described the proportion of version associated with every foremost detail obtained by manner of drawing a graph amongst Eigen values and fundamental trouble numbers. The PCI showed 37.Sixty nine % variability with eigen fee three.02 which then declined step by step. Elbow kind line is received which after third laptop tended to immediately line with little variance found in every laptop. From the graph it is clean that the most variation turned into discovered in PC1 (Fig-1).

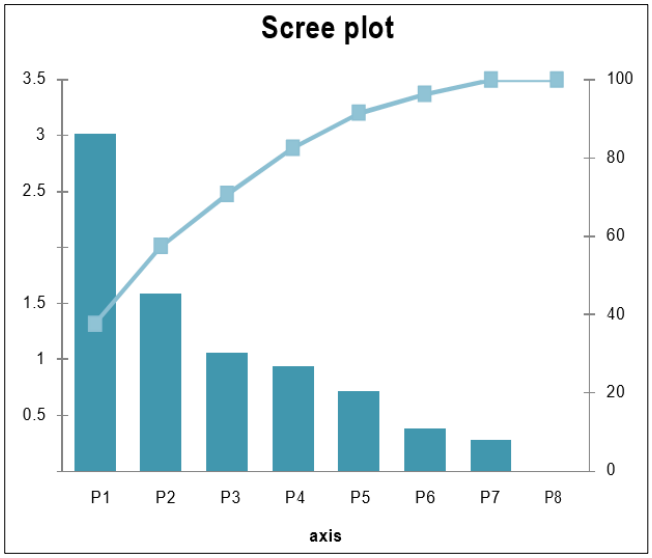


**Fig 1:** Scree plot showing Eigen value and percentage of cumulative variability

**Table 1:** Principal component analysis of 8 yield attributing traits for 55 accessions of rice

| Traits | Factor loading after varimax rotation | | |
|---|---|---|---|
| Day to 50% flowering | 0.886 | -0.265 | -0.164 |
| Number of effective tiller number | 0.013 | 0.458 | 0.204 |
| Plant height | 0.842 | 0.066 | -0.609 |
| Panicle length | 0.624 | 0.136 | -0.354 |
| Days to maturity | 0.897 | 0.238 | 0.206 |
| Grain length width ratio | -0.022 | 0.421 | 0.636 |
| 100 grain weight | -0.393 | 0.688 | 0.136 |
| Grain yield per plant | -0.415 | 0.761 | -0.166 |
| **Principal components (PC)** | | | |
| | PC1 | PC2 | PC3 |
| Eigen value | 3.02 | 1.59 | 1.06 |
| Variability % | 37.69 | 19.86 | 13.23 |
| Cumulative variability % | 37.69 | 57.54 | 70.77 |

In table bold letter showed highly loaded traits/character in respective PC

## Conclusion

On the idea of essential factor evaluation the first issue PC1 differentiated those accessions having excessive loading issue for fifty % flowering, plant height, panicle duration and adulthood and 2nd factor PC2 differentiated the ones accessions having excessive loading thing for grain yield per plant, a hundred grain weight and wide variety of effective tillers according to plant and 1/3 aspect PC3 differentiated those accessions having excessive loading issue for grain duration : width ratio and plant height.

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