

# Identification of Some Genera of Family Cucurbitaceae based on Characters of Seeds

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**Abstract:** *Cucurbitaceae* family represented by 94 species from 31 genera throughout India. Present paper deals with classical and morphological studies of seeds of some species from family *Cucurbitaceae* (gourd family) to determine and analyze the seed characters which would help to differentiate distant genera of the family providing photographs, character analysis chart and taxonomic key.

**Keywords:** Cucurbitaceae, Seeds, Distant Genera, Taxonomic Key, etc.

## I. INTRODUCTION

Cucurbitaceae family representing 122 genera and about 900 species throughout the world (Simpson, 2010), Chakravarty (1982) reported 36 genera and ca. 100 species in India and 94 species and 31 genera throughout the India are reported by Renner & Pandey (2013). *Cucurbitaceae* is characterized by prostrate herb bearing tendrils; leaves palmately lobed, surface hispid; flowers pentamerous, unisexual, monoecious or less commonly dioecious; stamens five, usually less, anthers free or connate, ovary inferior, trilobular, parietal placentation, fruit fleshy, pepo. Vascular bundles bicollateral and in two alternating rows. As seed is very distinct reproductive character, seed morphology of the members of family *Cucurbitaceae* is required critical study; by undertaking this view in the mind we keenly observed the characters of seeds. The aim of present study was to investigate the range of variability of seed characters in 18 genera (20 species). In order to delimit the taxa of family, collection of seeds was objected as it would help in identification of taxa at generic level. This aspect has been studied by Heneidak and Khalik (2015) to distinguish different tribes of the family *Cucurbitaceae* based on seed diversity. Present work will help to prepare simple key to the family *Cucurbitaceae* to delimit different genera. Such type key will also help to make different clades of the species and to predict the evolutionary trends.

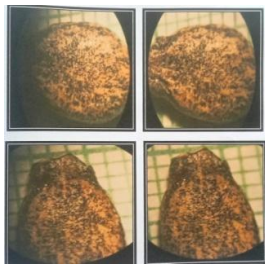
## II. MATERIALS AND METHODS

During our field exploration 20 taxa belonging to 18 genera of family *Cucurbitaceae* were collected from Western Maharashtra and Marathwada region of Maharashtra state. Most of them are under cultivation. We objected towards the collection of seeds of different species and varieties. The plant material brought to the laboratory and compared with the herbarium specimens deposited in BAMU, Aurangabad and Herbarium, Department of Botany, Shri. Vijaysinha Yadav College, Pethvadgaon and studied thoroughly by using pertinent literature (Naik, 1998 and Yadav & Sardesai, 2002) for confirmation and correct identification of taxa. For the observation and measurements of seeds stereo microscope, scale, thread, digital camera, graph paper was used. All observations are tabulated as length and width of seeds, shape, colour and texture. Based on observed characters of the seeds of different species, the simple bracketed taxonomic key to the genera of family *Cucurbitaceae* was prepared. Specimens were deposited in BAMU, Aurangabad.

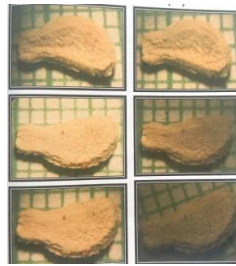
## III. OBSERVATIONS

Sr. No.	Name of species	Length of Seeds (mm)	Width of Seeds (mm)	Colour of Seeds	Texture of Seeds	Shape of Seeds	Local Name
1	<i>Benincasa hispida</i> (Thunb.) Cogn.	10	6	White or Yellowish	Distinctly Marginate	Compressed, Ovoid	
2	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai.	6	3	Black or Brownish	Rough	Ovate-Oblong	Tarbooz
3	<i>Coccinia grandis</i> (L.) Voigt.	8	4	Yellowish brown	Rough	Oblong	Tondali
4	<i>Corallocarpus epigaeus</i> (Rottl.) Hook. f.	5	3	Brownish	Smooth, Margined, Turgid	Pyriiform	Mirchi Kand
5	<i>Ctenolepis garcinii</i> (L.) C. B. Clarke.	7	3	Yellowish	Smooth, Rounded at apex with a deep pit on the face	Oblong	
6	<i>Cucumella ritchiei</i> (Chakr.) Jeffrey. ( <i>Cucumis indicus</i> Ghebret. & Thulin.)			Yellowish	Smooth	Ovoid	
7	<i>Cucumis melo</i> L.	10	5	Whitish yellow	Smooth	Ovate-Oblong	Kharbooz
7a	<i>Cucumis sativus</i> L.	5	3	Dull white, Straw coloured	Smooth	Obovoid-Oblong	Kakdi
8	<i>Cucurbita maxima</i> Duch.	10	4	White	Smooth, Narrowly margined	Obovoid, rounded at apex and narrowed at base	Bhopla
8a	<i>Cucurbita pepo</i> L.	11	10	Whitish yellow	Smooth, Margined	Ovoid	Kashibhopla
9	<i>Dicaeospermum ritchiei</i> Cl.			Whitish brown	Rough, Beaked, Ribbed	Ovoid	Ghugarya
10	<i>Diplocyclos palmatus</i> (L.) C. Jefferey	7	4	Yellow brown	Rough, Sculptured on margin	Ovoid	Shivlingi
11	<i>Kedrostis foetidissima</i> (Jacq.) Cogn.	5	4		Turgid, granular, marginate	Obovoid	
12	<i>Lagenaria siceraria</i> (Molina) Standl.			White	Smooth	Obovate-oblong, Truncate or bidentate at apex	Dudhi Bhopla
13	<i>Luffa cylindrica</i> (L.) M. Roem.	10	5	Pale yellow	Smooth, margined	Ovate	Gilka
14	<i>Momordica charantia</i> L.	10	9	Dull white	Smooth, Sculptured on face	Oblong, quadrate, subtridentate at apex	Karla
15	<i>Mukia maderaspatana</i> (L.) M. Roem.	5	3	Grey	Prominently sculptured	Ovoid Oblong	
16	<i>Solena amplexicaulis</i> (Lam.) Gandhi	5	3	White	Smooth	Obovoid	
17	<i>Trichosanthes cucumerina</i> L.	11	5	Brownish	Smooth, compressed	Ellipsoid, truncate at apex, narrowed at base	Padwal
18.	<i>Zehneria scabra</i> Sond.	7	4		Smooth	Much flattened	

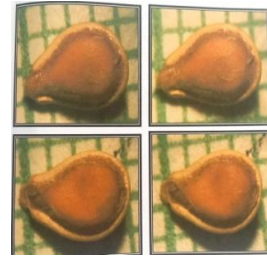
IV. PHOTO PLATES



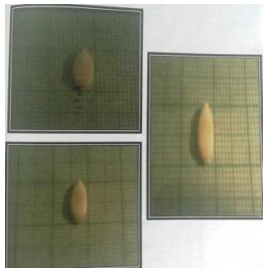
**A. Citrullus Lanatus**



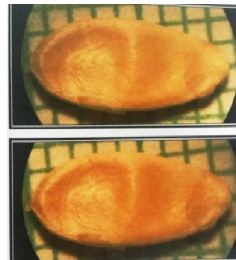
**B. Coccinia Grandis**



**C. Corallocarpus Epigaeus**



**D. Cucumis Melo**



**E. Cucumis Sativus**



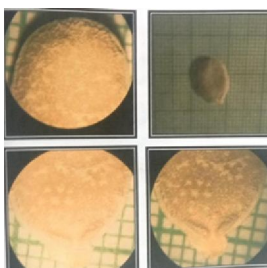
**F. Cucurbita Maxima**



**G. Cucurbita Melo**



**H. Diplocyclos Palmatus**



**I. Luffa Cylindrica**



**J. Momordica Charantia**



**K. Mukia Maderaspatana**

**Taxonomic Key to the Genera Based on Characters of Seed.**

- |  |             |
|--|-------------|
| 1a. Seeds distinctly margined.....     | 2           |
| 1b. Seeds not margined.....            | 7           |
| 2a. Margins distinctly sculptured..... | Diplocyclos |
| 2b. Margins not sculptured.....        | 3           |
| 3a. Seeds turgid .....                 | 4           |

3b. Seeds compressed .....	5
4a. Seeds pyriform.....	Corallocarpus
4b. Seeds obovoid.....	Kedrostis
5a. Margins distinct.....	Benincasa
5b. Margins narrow.....	6
6a. Seeds obovoid, white.....	Cucurbita
6b. Seeds ovoid, pale yellow.....	Luffa
7a. Seeds prominently sculptured.....	8
7b. Seeds not sculptured.....	9
8a. Seeds sculptured throughout, ovoid.....	Mukia
8b. Seeds sculptured only on the face, quadrate.....	Momordica
9a. Seeds rough.....	10
9b. Seeds smooth.....	12
10a. Seeds beaked.....	Dicaeospermum
10b. Seeds not beaked.....	11
11a. Seeds black.....	Citrullus
11b. Seeds yellow.....	Coccinia
12a. Seeds truncate or bidentate at apex.....	13
12b. Seeds acute or rounded at apex.....	14
13a. Seeds obovate-oblong, white.....	Lagenaria
13b. Seeds ellipsoid, brownish.....	Trichosanthes
14a. Seeds with deep pit on the face.....	Ctenolepis
14b. Seeds without pit on the face.....	15
15a. Seeds much flattened.....	Zehneria
15b. Seeds adequately compressed.....	16
16a. Seeds obovoid.....	Solena
16b. Seeds ovoid-oblong.....	17
17a. Seeds dull white.....	Cucumis
17b. Seeds yellowish.....	Cucumella

#### V. RESULTS AND DISCUSSION

The seed characters of the species from the genera *Benincasa*, *Citrullus*, *Cucumis*, *Coccinia*, *Corallocarpus*, *Ctenolepis*, *Cucumella*, *Cucurbita*, *Dicaeospermum*, *Diplocyclos*, *Kedrostis*, *Lagenaria*, *Luffa*, *Momordica*, *Mukia*, *Solena*, *Trichosanthes* and *Zehneria* are critically studied in this small piece of work. Seed size, shape, texture and colour shows variability among different genera which can help delimit easily. The genera like *Cucumis* and *Cucumella* are showing similarity in their seed characters and other correlated characters and are merged recently. The genera having perfectly margined seeds (*Diplocyclos*, *Corallocarpus*, *Kedrostis*, *Benincasa*, *Cucurbita* and *Luffa*) are clearly separated from non-margined seeds. *Mukia* and *Momordica* shows prominently sculptured seeds and are clearly differentiate from non-sculptured seeds. Pyriform, obovoid and ellipsoid shapes of the seeds are uniquely found in some genera like *Corallocarpus*, *Solena* and *Trichosanthes*. Seed shape, texture, sculpture and margin are significant characters are found in the family Cucurbitaceae to delimiting the genera.

#### VI. CONCLUSION

The morphological characteristics of seeds are very distinct in their size, shape, sculpture and texture at generic level of the family *Cucurbitaceae*. The comparison of the species within the genera is appeared closely similar morphologically. All characters of seeds are satisfactorily facilitated to prepare a taxonomic key of the genera of family *Cucurbitaceae*.

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