

A study of seed morphology of fruit plants of valsad district in Gujarat state, India

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ABSTRACT

The ability to recognize seeds is always important in farming. It has become even more essential in modern scientific agriculture, without it there would be little merit in perfecting methods of growing useful plants. Ability to identify the seed is of particular importance to the agriculturist, biologist, forester, horticulturist, ethnobotanist, pharmacist and others interested in land-use programs to identify the seeds in their particular ecological fields of interest. Though seeds are physiologically important for they provide fairly reliable attributes, seed characters are largely ignored except for a few cursory references in classic as well as contemporary floras (Cook, 1901-1903; Shah, 1978).

Key words : Seed. Fruit plant

INTRODUCTION

Valsad is a district town situated south of Tapi River on 72° 50' E and 20° 35' N in the southern part of the Gujarat state about 194 KM. North of Mumbai on Ahmedabad-Mumbai broad gauge railway line. About 3 KM. west of Valsad town is an Arabian Sea and in the east there is Ahmedabad-Mumbai national Highway. Geographically Valsad belongs to the western coastland of the Deccan peninsula. The area is traversed by Daman Ganga, Purna, Auranga, Kaveri and Ambica rivers and several small tributaries. The area consists of hills and plain lands. The area is a plain land about 12 km above minimum sea level.

The soil is several feet deep and rich in organic matter. In the plains where black cotton soil is noticed, the drainage is poor and the soil deeply cracks in the dry seasons. The average depth of water from ground level is about 20-30 feet. The climate of this area is of subtropical type. The average annual rainfall of last five years in the area is 1785.4 mm. The pH of the soil ranges between 7.10 – 8.30.

Some notable workers on the seed are Scurti (1948), Berggren (1974), Brisson and Peterson (1976), Corner (1976), Gavit (1990), Cooke (1908), Kigel and Galili (1995), Shah (1978), Martin and Barkley (1961) and Bailey (1949).

MATERIALS AND METHODS

Seed is a small embryonic plant enclosed in a covering called seed coat and usually with some stored food. It is the product of the ripened ovule of gymnosperm and angiosperm plants occurring after the process of fertilization within the mother plant.

During the tenure of this work the author had visited different villages of the area. The specimens of fruit plants were collected to prepare herbarium specimens along with the seed. Seeds were collected, dried and were stored for further study. Some of the seeds were mounted in different positions over a card slide with the help of domestic adhesive – like Fevicol. The seed slides were then subjected to detailed observation. Each and every collection was supported with the voucher specimen of the herbarium. Collected seeds were either dried in sun or were dried by using incubator / oven at a temperature of 28°C - 30 °C.

The most useful clues for recognition of seed are usually the seed shape, coloring, hilum shape, seed/fruit, seed weight etc. Colour of the seeds were compared with standard colour shade charts of RHS (Royal Horticultural Society, London). Seed weight of individual seed or a unit of 10 seeds were made with the help of analytic balance and also Monopan balance.

RESULTS AND DISCUSSION

This paper presents 31 fruit plants and its seed morphology from the study area.

An earnest attempt has been made here to exploit the seed characters for taxonomic purpose. The descriptive accounts are rather lengthy. Much of the critical observation such as an attempt to mention nearer to the correct colour shade using RHS colour charts and the seed weight determination are more of academic interest rather than their particular utility to be used as a tool for the identification of taxa under investigation. This is the limitation. Above morphological characters of seeds are used for plant identification from seeds.

Sr. No.	Plant species, local name and family	Seed shape	Seed colour	Hilum shape	Seed/ fruit	Weight of seed
1.	<i>Annona muricata</i> L. "Manasphal" (Annonaceae)	Biconvex, oblong	Brown to reddish brown,	Oval	18 - 25	160 - 180 mg/seed
2.	<i>Annona reticulata</i> L. "Ramphal" (Annonaceae)	Biconvex, ovate	Grayish brown or dark brown	Oval	15 - 30	190 - 205 mg/seed
3.	<i>Annona squamosa</i> L. "Sitaphal" (Annonaceae)	Biconvex, ovate	Grayish brown, dark brown	Oval	12 - 20	190 - 258 mg/seed
4.	<i>Hibiscus sabdariffa</i> L. "Khatibhindi" (Malvaceae)	Sub reniform	Reddish brown	Oblong	Indefinite	26 - 27 mg/seed
5.	<i>Grewia tiliaefolia</i> Vahl var. <i>tiliaefolia</i> "Dhaman" (Tiliaceae)	Ovate	Orange brown	Oval	2 - 6	12 - 16 mg/seed
6.	<i>Aegle marmelos</i> L. Corr. "Bili" (Rutaceae)	Obovate, oblong	Yellowish brown	Circular	Indefinite	15 - 20 mg/seed
7.	<i>Citrus limon</i> (L.) Burm.f. Fl. "Limbu" (Rutaceae)	Ellipsoid	Pale yellow, brownish yellow	Wedge shaped	Indefinite	70 - 100 mg/seed
8.	<i>Citrus medica</i> var <i>medica</i> L. "Bijoru" (Rutaceae)	Elliptic to oblong	Grayish orange	Circular	Indefinite	90 - 95 mg/seed
9.	<i>Limonia acidissima</i> L. "Kothu" (Rutaceae)	Broadly elliptic, ovate	Pale yellow, yellowish brown	Oval	Indefinite	18 - 22 mg/seed
10.	<i>Zizyphus mauritiana</i> Lam. "Khati Bor, Bordi" (Rhamnaceae)	Obovate, suborbicular	Reddish brown	Oval	1 - 3	18 - 20 mg/seed
11.	<i>Zizyphus nummularia</i> (Burm. f.) W & A "Chani Bor" (Rhamnaceae)	Subspherical, ovate	Brownish orange	Oblong	1 - 2	20 - 22 mg/seed
12.	<i>Mangifera indica</i> L. "Ambo, Keri" (Anacardiaceae)	Reniform, oblong	Grayish brown	Oval to oblong	1	6000 - 8000 mg/seed
13.	<i>Tamarindus indica</i> L. "Khati Ambli" (Caesalpiniaceae)	Variable in shaped, obovate, obconical, oblong	Reddish brown, dark brown	Oval	4-10	490- 505 mg/seed
14.	<i>Pithecellobium dulce</i> (Roxb) "Goras Amali, Vilayti Amali" (Mimosaceae)	Obovate, ellipsoid	Dark brown to black	Linear	6 - 8	140 - 150 mg/seed
15.	<i>Psidium guajava</i> L. "Peru, Jamfal, Jamrukh" (Myrtaceae)	Obovate, sub reniform	Orange brown, yellowish brown	Circular to oval	Indefinite	8-12 mg/seed
16.	<i>Syzygium cumini</i> (L.) "Jambu." (Myrtaceae)	Oblong	Yellowish purple, reddish purple, pinkish red	Circular	1	1800 - 1900 mg/seed
17.	<i>Punica granatum</i> L. "Dadam" (Punicaceae)	Obconical, obovate	Pink, pinkish red	Circular	Indefinite	55 - 62 mg/seed
18.	<i>Trapa natans</i> L. var <i>bispinosa</i> (Roxb) Makino. "Shingoda" (Trapaceae)	Tingled, sub reniform	Brownish orange, greyish orange	Oval	1	6350 - 6600 mg/seed
19.	<i>Carica papaya</i> L. "Papaya" (Caricaceae)	Ellipsoid, ovate	Blackish brown, dark greyish brown	Circular	Indefinite	18 - 20 mg /seed
20.	<i>Citrullus lanatus</i> (Thunb) "Tarbuch" (Cucurbitaceae)	Obovate	Dark brown to black	Wedge shaped	Indefinite	58 - 65 mg/seed

Table 1 contd....

Contd... Table 1

21.	<i>Cucumis melo</i> L. var. <i>momordica</i> Duthie & Fuller "Shakkarteti" (Cucurbitaceae)	Elliptic, obovate	Grayish yellow, brownish yellow	Wedge shaped,	Indefinite	39.5 - 41.0 mg/seed
22.	<i>Manilkara hexandra</i> (Roxb.) "Rayan" (Sapotaceae)	Obovate, elliptic	Grayish brown, reddish brown	Oblong	1 - 2	171 - 192 mg/seed
23.	<i>Manilkara zapota</i> (L.) "Chikoo" (Sapotaceae)	Oblong, elliptic,	Dark brown to blackish	Linear	3 - 4	445 - 633 mg/seed
24.	<i>Diospyros melanoxylon</i> Roxb "Timbru" (Ebenaceae)	Oblong	Reddish brown, orange brown	Circular	4 - 5	930 - 1260 mg/seed
25.	<i>Carissa congesta</i> Wt. Icon. T "Karamda" (Apocynaceae)	Ovate, elliptic, concavo, convex	Coffee brown to blackish	Oblong	2	36 - 37 mg/seed
26.	<i>Cordia dichotoma</i> Frost. f. <i>Prodr</i> "Moto gundo, Vad gundo" (Boraginaceae)	Ovate, broadly elliptic	Whitish, yellowish white	Oval	2	205 - 350 mg/seed
27.	<i>Cicca acida</i> (L.) Merr. "Khata Ambla" (Euphorbiaceae)	Ovate, biconvex	Brownish orange, reddish orange	Oval,	3	2.5 - 3.2 mg/seed
28.	<i>Emblica officinalis</i> Gaertn. "Amla" (Euphorbiaceae)	Ovate, trigonous	Dark brownish red	Wedge shaped	6	27 - 29 mg/seed
29.	<i>Artocarpus heterophyllus</i> . Lam. "Fanas" (Moraceae)	Oblong, ovate	Yellowish white	Circular	Indefinite	2900 - 3100 mg/seed
30.	<i>Cocus nucifera</i> L. "Nariyeli" (Arecaceae)	Globose	Brown	Circular	1	500 - 1200 gram/seed
31.	<i>Phoenix sylvestris</i> (L.) Roxb. "Khajuri" (Arecaceae)	Oblong	Yellowish brown, orange brown	Oval	1	1100 - 360 mg/seed

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REFERENCES

- Bailey, L. H. (1949).** *Manual of Cultivated Plants*. Macmillan Co. New York.
- Berggren, G. (1974).** *Seed morphology of some Epilobium species in Scandanavia svensk.*
- Brisson, J.D. and Perterson, R.L. (1976).** A critical review of the use of scanning electron microscopy in the study of seed coat. Proc. Workshop on Plant Science applications of the SEM II T Res Inst. 477 - 495.
- Cooke, T. H. (1908).** *The Flora of Presidency of Bombay*. Vols I-III (Reprinted. ed. In 1958). Calcutta.
- Corner, E.J.H. (1976).** The seeds of dicotyledons vol. I.
- Gavit (1990).** A contribution to the study of systematic seed morphology of South Gujarat plants.
- Kigel, Jaime, and Galili, Gad (1995).** Seed development and germination. Books in soils, plants, and the environment. New York:
- Martin, Alexander C. and Barkley, William D. (1961).** *Seeds Identification Manual.*
- Scurti, J. (1948).** *An analytical key for the determination of weed from their seeds.*
- Shah, G. L. (1978).** *The Flora of Gujarat State*. Vols I and II. Registrar, S. P. Univ., Vallabh Vidyanagar.

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