International Journal of Advanced Research and Development
ISSN: 2455-4030
Impact Factor: RJIF 5.24
www.advancedjournal.com
Volume 2; Issue 5; September 2017; Page No. 514-518

Origins of naming plant cultivars in Indian context

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Abstract
Naming an object, whether living or non-living, is a natural human instinct. To avoid nomenclatural chaos, botanists adapted scientific method of binomial nomenclature as passed by ICBN for both wild and cultivated plants. With time, it became necessary to have names for variants of cultivated plants. It is, therefore, enacted International Code of Nomenclature of Cultivated Plants (ICNCP). Plant breeders or agriculturists eventually named plant cultivars. The bases of coining such names have not received proper attention. The present investigator is, therefore, inclined to shed more light on their naming especially in Indian context. The cultivars of edible fruits, vegetables and food grains are studied pinpointing the bases of naming of cultivated plants and discussed them pertinently.

Keywords: cultivars, nomenclature, bases

1. Introduction
Naming a plant, animal or any object was/is always necessary for convenience in communication. Man has constantly, since prehistoric times, endeavored to name them in his own language. Such names we call common name, vernacular name, local name, farmer's name, etc. We are also aware that for a single species or entity there can be more than one names in the same language or dialect. For the sake of uniform, international and unambiguous communication, scientific community adapted binomial nomenclature as enacted by ICBN. This rule is equally applicable to wild as well as cultivated plants. The naming of cultivated plants, however, needs further explanation as their variants occur after experimentation. The subject matter is, therefore, being dilated in this paper. The information has been freely borrowed from earlier literature cited and studied critically in the perspective of nomenclature of cultivated plants.

2. Enumeration
I. Edible Fruits
1. *Mangifera indica* L. (Anacardiaceae) Mango

a. Named after locality, city

cv. Rajapuri: After Rajapur city of Maharashtra state.
cv. Bombay Green: After Bombay (Mumbai presently), capital of Maharashtra State.
cv. Bangalore: After Bangaluru, capital of Karnataka State.

b. After eminent person

cv. Fazli: The great chronicler Abul Fazl during the region of Emperor Akbar who wrote 'Ain-i-Akbari' (Persian literature).

c. After Flavour

cv. Gulabkhas: Gulab means rose, named because of characteristic rose flavour.

d. After Colour

cv. Kesar: Kesar mean saffron, named because of attractive saffron colour. (Mujumdar and Sharma, 1996) [1, 12].

2. *Citrus reticulata* Blanco (Rutaceae) Mandarin, Santra

a. Named after locality or city

cv. Nagpur: After Nagpur city in Maharashtra State.
cv. Coorg: After Coorg city in Karnataka State.
cv. Khasi: Himalayan hilly region.

3. *Citrus limon* Burm *f*. (Rutaceae) Lemon

a. Named after region

cv. Assam lemon: Named after Assam region or state of India.

b. Named after Botanical features.

cv. Kaghzi Kalan: The ring being thin, papery, kagaz means paper.(Ghosh, 1996) [2]

4. *Musa paradisiaca* L. (Musaceae) Banana

a. Named after height of plant

cv. Dwarf Cavendish (Syn.Basrai): Being a dwarf variety.
cv. Giant Cavendish (Syn.Bongali: Being a giant plant Jahaji)

b. Named after Colour

cv. Harichal (Syn.Bombay Green): Hari means green, pericarp being usually greenish.
cv. Lalkela: Lal means red, fruit peel being purplish-red.

c. Named after Size

cv. Velchi: Velchi means cardamom (*Elettaria cardumomum* Maton), the fruits being small and shaped like the fruits of cardamom. (Abdul Khader *et al*., 1996) [3]

5. *Vitis vinifera* L. (Vitaceae) Grapes

a. Named after city

cv. Bangalore Blue: Named after Banguluru city, capital of

Karnataka State of India.

b. Named after eminent scientists

cv. Cheema Sahebi: This cultivar was selected by Dr. GS Cheema in India.

c. Named after colour

cv. Gold: The berries being golden coloured.

cv. Gulabi: The berries being deep purple as some varieties of roses (Gulab means rose). (Jindal, 1996) [4]

6. *Psidium guajava* L. (Myrtaceae) Guava

a. Named after locality or city, etc

cv.Lucknow: The Lucknow city, capital of Uttar Pradesh State in India is integrated in the name

cv. Allahabad Safeda: Allahabad, a religious, pilgrim city of Uttar Pradesh, India finds place in the name.

cv. Banarasi: Banaras, another religious, pilgrim city is used to name the cultivar.

b. Names after shape

cv. Pear-shaped: The fruits being pear-shaped or pyriform.

c. Names after colour

cv. Red-Fleshed: The colour flesh or pulp being dawn-pink or reddish. (Mitra and Bose, 1996)

7. *Cocos nucifera* L. (Arecaceae) Coconut

a. Names after locality

cv. West Coast Tall: The western coastal area is denoted the name.

cv. Lakshadweep Ordinary and Lakshadweep Micro: Both names denote an island Lakshadweep of India.

cv. Andaman Ordinary: Another Island Andaman is integrated in naming the cultivar.

b. Names after characteristic feature

cv. Macapuno: The entire cavity of coconut fruit is filled with soft, tender, jelly-like endosperm. (Thangaraj and Muthuswami, 1996) [6].

8. *Litchi chinensis* onn. (Sapndaceae) (Syn.Nephelium litchi Camb.) Litchi

a. Names after locality or city, etc.

cv. Bengal: Indian state Bengal find place in its nomenclature.

cv. Bombai: Bombay (Presently Mumbai), a state capital of Maharashtra state is selected for naming the cultivar.

b. Names after scent

cv. Rose scented: The fruits being rosy flavor in the aril is denoted in its nomenclature. (Maity and Mitra, 1996) [8]

9. *Annona squamosa* L. (Annonnaceae) Custard Apple, Sitaphal

a. Names after colour

cv. Red Sitaphal: Fruit pulp is erythrite-red and hence used in naming this cultivar. (Rathore, 1996) [9]

10. *Ziziphus mauritiana* Lamk. (Rhamnaceae) Ber

a. Names after Shape

cv. Ilaichi: The fruits are shaped like frits of Cardamom (*Elettaria cardamomum* Maton).

cv. Gola: The fruits are roundish and hence the name.

b. Names after city

cv. Banarasi Karaka: Banaras, a religious and pilgrim city in Uttar Pradesh state of India is denoted in the name.

11. *Punica granatum* L. (Punicaceae) Pomegranate

a. Names after locality or city, etc.

cv. Alandi: A city near Pune in Maharashtra State finds place in naming the cultivar.

cv. Kabul and Kandhari: These two names are quoted from Afghanistan for coining the names of cultivars.

cv. Ganesh: A Hindu elephant-headed god Lord Ganesh is used for naming the cultivar. (Patil and Karde, 1996) [10]

12. *Artocarpus heterophyllus* Lamk. (Moraceae) (Syn. A. integrifolia L.*f*.) Jackfruit

a. Named after foreign countries or cities

cv. Singapore: A name of foreign country *viz*., Singapore is used to coin the cultivar name.

b. Resemblance to other plant parts

cv. Rudrakshi: Rudraksh means fruits of *Elaeocarpus ganitus* Roxb. Some resemblance with this fruits is noted in the name of cultivar. (Somaddar, 1996).

II. Vegetables

1. *Brassica oleracea* L. var. *botrytis* L. (Brasicaceae) Cauliflower:

a. After shape and colour:

cv. Sutton's Snowball: Flowering head is snow-white and ball-like.

b. After season:

cv. Early-'Kunware': It flowers early in season.

cv. Midseason-'Aghani': It flowers in middle period of the season. (Dey, 2012) [15].

2. *Brassica oleracea* L. var. *capitata* L. (Brassicaceae) Cabbage:

a. After symmetry

cv. Express Flat: The Cabbage head is flat atop. (Dey, 2012) [15]

3. *Brassica oleracea* L. var.*gongylodes* L. (Brassicaceae) Knol-khol.

a. After folour and foreign city

cv. White Vienna: White colour and city Vienna of Austria is emphasized.

cv. Purple Vienna: Purple colour and city Vienna of Austria is emphasized. (Dey, 2012) [15]

4. *Phaseolus vulgaris* L. (Fabaceae) French Bean:

a. After goddess

cv. Pusa Parvati: Named after Agriculture Research Centre at Pusa (India) and Hindus goddess Parvati, consort of Lord Shankar.

b. After age of plant part

cv. Tender green: Tender green (fresh) pods are used as vegetable. (Dey, 2012) [15]

5. *Vigna unguiculata* (L.) Walp. (Fabaceae) Cowpea:

a. After season

cv. Pusa phalguni: Named after Agriculture Research Centre of Pusa (India) but cultivated from the month of Phalgun (Summar crop). (Phalgun is a month in Hindu Calender). (Dey, 2012) [15]

6. *Lagenaria siceraria* (Mol.) Standl. (Cucurbitaceae) Bottle Ground:

a. After season and shape

cv. Pusa Summer Prolific Round: Named Agriculture Research Centre of Pusa (India), round shape of the fruit and being cultivated in summer season. (Day, 2012)

7. *Cucumis sativus* L. (Cucurbitaceae) Cucumber:

a. After colour

cv. White Wonder: The Fruits being pale green (whitish). (Dey, 2012) [15]

8. *Lycopersicon esculentum* (L.) Karsten (Solanaceae) Tomato

a. Height of plant and maturing period.

cv. Pusa Early Dwarf: Pusa, Agriculture Research Centre (India), earliness and dwarfism of the cultivar is denoted. (Day, 2012) [15]

9. *Allium cepa* L. (Liliceae) Onion:

a. After city and colour

cv. Nasik Red & Nasik White: Nasik, a pilgrim city in Maharashtra, red and white colour of bulbs are denoted. (Dey, 2012) [15]

10. *Abelmoschus esculentus* (L.) Moench. (Malvaceae) Okra:

a. After length and colour:

cv. Long green : Fruits long and green.

b. After touch and colour:

cv. Velvet Green: Fruits are velvety to touch and green. (Dey, 2012) [15]

III. Grain Crops

1. *Sorghum bicolour* (L.) Moench (Poaceae) Sorghum

a. After Utility

cv. Hurda: Young ears can be baked and consumed directly.

cv. Pop Sorghum: Grains can be popped and consumed.

b. After Height

cv. Baddi Jowar: Plants are taller (Baddi-tall) (Elangoven *et al*., 2009)

c. After Size And Taset

cv. Shalu: Grains are small and tasty. (Patunkar, 1980) [19]

d. After colour

cv. Peelijola: Grainis are yellow.

cv. Tamboli Jwari: Grains are red. (Sharma *et al*., 1996; Elangoven *et al*., 2009) [1, 12]

2. *Pennisetum americanum* Schum. (Poaceae) Pearl Millet

a. After City

cv. Bikaner: Named after city Bikaner (Rajasthan State).

cv. Ratanpur: Named after city Ratanpur (Rajasthan State). (Elangoven *et al*., 2009)

3. *Eleusine coracana* L. Poaceae) Finiger Millet

a. After feature of fruiting heads

cv. Kari Muddunga Raagi: Earhead are compact and blackish.

cv. Dundakaya Koda: Earhead are like a closed fist.

b. After nature of culms

cv. Kaddi Ragi: Culms are rather woody. (Pradhan, 2013) [16]

4. *Amaranthus hypochondriacus* L. (Amaranthaceae) Graini Amaranth

a. After Yield

cv. Annapurna: It is a top yielder. (Krishnakumari, 2011)

5. *Triticum aestivum* Linn. (Poacee) Wheat

a. After utility

cv. Dawat chani: Grains are used particularly for feasts.

cv. Pakwani: Grains are used for high class dishes.

b. After nature and colour

cv. Dudhia: Grains are soft and white.

cv. Lalka: Grains are red.

cv. Potia: Grains are mottled.

cv. Safed Pissi: Grains are soft and white.

cv. Sharbati: Grains are amber-coloured and hard. (Anoynymous, 1948-1976).

6. *Zea mays* L. (Poaceae) Maize

a. After crop duration

cv. Sathi: It is a short duration variety.

b. After colour and city

cv. Basi: Grains are yellow.

cv. Jallandar Local: Grains are orange coloured and after Jalandhar city (Rajasthan State).

cv. Darjeeling: Grains are deep purple and after Darjeeling city (Sikkim State). (Anonymous, 1948-1976) [7]

7. *Lens culinaris* Medic. (Fabaceae) Lentil

a. After size of grains

cv. Malka Masur: Seeds are bold.

cv. Musri: Seeds are small. (Anonymous, 1948-1976) [7].

3. Discussion

The intimacy of mankind with the ambient plant world was/is obvious. He used plant, their parts or products gathered but from wild resources. Eventually, he domesticated and cultivated plants in his own surrounding or near abodes for his food security and to save time and labour. Thus some wild plant species turned, with age, into cultivated ones under human control. The so called 'Binomial Nomenclature' is applicable uniformly to both wild as well as cultivated plant species. The man is greedy by nature. He started selection amongst the cultivated plants for better yield, and some desired botanical *vis-à-vis* economic attributes.

The cultivated plant species were/are screened further on these bases. These selected ones we now refer as cultivar/s. These are obviously variants (although slightly). These variants are

then named by the cultivating community. But there is no set of rules for coining their names like those of ICBN. They are named rather haphazardly and the resultant name is generally a fancy. Cultivar is always referred by a single cultivar name.

Wherever, a variant amongst the cultivated species exhibit a better, profitable or desirable characteristic, it becomes a duty of the caltivator, whether horticulturist or agriculturist, to have a name to distinguish it from the cultivated plants of its own category or species, nay, it becomes his duty. There are no fixed criteria for naming such variant or cultivar. The coiners of name are free to name as they wish. The present literary survey indicates that usually the coiners of names emphasize some prominent features available only in the new variant. The variants are named randomly or even laying emphasis on some botanical characteristics. The present author noted characteristics of cultivated plants belonging to fruit yielding plants, vegetables, pulses, cereals, millets, etc.

It appears from the studied cultivated species that criteria for naming a cultivar depend upon the type of useful plant part, its size, height, shape, colour, taste aroma, height of plant, resemblance, unique features, besides unrelated fancy sources like name of popular cities, specific geographical region, eminent personalities, goddesses, season, age of plant part, surface feature, utility, nature of part (hard, soft), yield, crop duration and size of grains. The present author also surveyed such features useful for naming cultivars from literature. These are: (a) Saving of time (length of life span), (b) Mechanization useful in some countries and hence accordingly plant type, branching, height, etc. are favoured, (c) Colour selection for better marketing, (d) Saving of labour, (e) Possible mixed-crops in early stage of growth, (f) Cultivars suitable for certain regions or climate, (g) Method of propagation (i) by seeds-may show variability, (ii) vegetative method to have true types, (h) Cultivars suitable for particularly, processing, preserving, by-products etc., (i) Suitable size of useful parts (i) Industrial purpose, (ii) customer-friendly. (j) Water requirement (i) some need irrigation, (ii) less water availability or dry, semi-dry cultivars, (k) Soil types, (l) Disease resistant, drought resistant, hardy cultivars, (m) Shelf-life, suitability for transport and packing, (n) Being once or twice in a year and (o) Ripening period, proper phase of growth for collection.

In brief, the selections are related to ecological, economic, commerce, suitability for cultivation and harvesting, attractive feature for customars or users, product oriented, suitable for processing and preservation, resistency to diseases, pests and droughts, bearing time, ripening or maturity period, etc.

The biological kingdom was divided in past into two and described by two terms *viz*., 'flora' and 'fauna'. After Earth Summit (1992) [13], these terms are replaced by another term 'biodiversity' which explained the variation in biological kingdom at various levels. Agrobiodiversity is part of it and focuses mainly on biodiversity that has undergone selection and modification by mankind to serve better needs. Agrobiodiversity includes folk variety, landraces, traditional, farmer's varieties or simply called cultivars. Majority of cultivated species exhibit diversity. Only variant with beneficial and desired characteristic is promoted. This variant is usually noticed by the cultivators and named variously but with only a single name. The coiners of cultivar names may not belong to scientific community. Cultivars which are commonly grown commercially are generally named by scientific community. These names are mostly based on some criteria. Although, they are allowed to use 'fancy' name mostly they also use scientific, botanical, or agro-commercial characteristics while coining names of cultivars. These bases of coining cultivar names have not been reviewed. The present author therefore penned to shed more light on the trends of nomenclature.

In recent times, it has become imperative to know legal matters about biodiversity. This is so because 'The Convention of Biological Diversity' was signed at the Earth Summit in Rio de Janeiro in 1992 [13]. This convention asserts that natural resources belong to the sovereign state in which they exist. Liberal globalization of agriculture is likely to induce several shifts in the present system of doing agriculture. A diverse and biological resources rich country like India has to learn from experiences and hence need to legally protect the varieties or cultivars or landraces and use them globally as a trade. Some agencies have initiated programme to conserve, document, characterize and publicize cultivars or grmplasm adapted to local environment. Their focus is on conservation of crop diversity, conserving indigenous agriculture and traditional knowledge. It is, therefore, necessary to understand perception about the cultivars, varieties or landraces in our country before embarking upon legal issues about our agrobiodiversity.

Names of cultivated plants are governed for the most part by the same rules as those of wild plants. The rules of ICBN are applicable upto specific rank. There are, however, differences at infraspecific levels. A separate volume of the 'International Code of Nomenclature of Cultivated Plants (ICNCP) with 57 articles, is available produced by a committee of the International Union of Biological Sciences'. Most of the rules in the ICNCP are from the relevant ones in the ICBN. But below the species level there is a provision for the recognition of only one rank for cultivar, instead of the normal (taxonomic) hierarchy. Cultivars are entities at infraspecific levels and are of varied nature. They may be clones, self-fertilised pure-lines or corss-fertilised assemblages characterized by one or more attributes.

Cultivated plants differ from wild ones in that they generally do not occur in natural populations. They generally exist in artificial stands controlled by man. The taxonomic infraspecific categories (e.g. subspecies, varieties, etc.) are not really applicable to cultivated plants. They are replaced by the category 'cultivar', an international term. There are some provisions of ICNCP regarding cultivar names. They are: (i) After 01.01.1959 new cultivar names must be 'Fancy' names in modern languages. They can no longer be given Latin names. Previous to the said date Latin names were given and they are still in use. The only exceptions to this are names of botanical taxa reduced to cultivar rank, (ii) if the botanical name of the plant to which they belong to changed cultivar names, however, must remain unchanged, (iii) it is not permissible for two or more cultivars in the same cultivar class to bear the same names, (iv) new cultivar names must not now be the same as a botanical or common name of a genus or a species, (v) cultivar names must be published by the distribution of printed or duplicated matter dated at least to

the year. After 01.01.1959 they must be published with their description in any language, (vi) It is recommended that cultivar names be registered with a recognized registration authority which undertakes to keep a list of cultivars for the plants concerned. Cultivars are subject to national and international regulations protecting the rights of plant breeders.

4. Acknowledgements
I am thankful to authorities of S.S.V.P. Sanstha, Dhule and the Librarian, Agriculture College, Dhule for library help.

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