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ONION DIVERSITY, MULTIPLIER ONION AND ITS IMPORTANT

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Abstract

In the southern regions of India, multiplier onion (*Allium cepa var. aggregatum*), also known as shallot or potato onion, has been widely planted. With a few genotypes that generate seeds, it is primarily propagated through bulbs. It is well-known for being used in the crucial South Indian dish sambar. A cluster of 6 to 15 tiny bulbs is produced by the multiplier onion. This type of onion is also being called multiplying onion or shallot in the world. It is mostly used for its spiciness in the preparation of Sambar, which is an important onion dish in the South Indian cuisine. In India, Tamil Nadu occupies more than 70% of the total multiplier onion area and about 90% of the total production. This group (*Aggregatum*) comprises both shallots and multiplier onions which are become most difficult to distinguish from each other.

Key Words: Multiplier onion, Aggregatum genetic diversity

Introduction

Onion (*Allium cepa* L.) is the most important, widely grown bulbous vegetable crop belongs to the family Alliaceae. India is one of the largest onion producers and exporters in the world with an area of 1,624 thousand hectares, with an estimated total onion production of 266.41 Lakh tones. It is grown in most of the countries around the world from temperate to semi-arid regions. Due to its occurrence throughout the world, it possesses great variability within the species with respect to propagation, morphological and biochemical characters, bolting ability etc. Cultivated onion (*Allium cepa* L.) classified into two major horticultural groups depending on their reproduction: Common onion group which is propagated by seeds or from seed-grown sets and other is *Aggregatum* (Multiplier) group which is mainly reproduced by vegetative daughter bulbs. They are widely cultivated in Europe, North America, The Caucasus, Kazakhstan and the south-east of European Russia, Brazil and Thailand.

Multiplier onions are known for its pungency. They are used in the Indian kitchen for seasoning of curries. Multiplier onion peeling is an essential step in producing many of the products such as dehydrated, powder, pickled and canned products and is

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believed to have medicinal properties. As a folk medicine, it is used to bring down fever and to heal wounds. It is also consumed to reduce the blood sugar level. In India, multiplier onion (*Allium cepa* var *aggregatum* G. Don) has been grown extensively in southern states like Tamil Nadu, Andhra Pradesh and Karnataka on a large scale which produces smaller bulbs in an aggregated cluster of bulbs. In south India, it is a traditional onion type which has a long cultivation history amongst the farmers.

Onion and Types

Description and Variability in Important *Allium* Species

1) Allium altaicum

It is native to Asiatic Russia, Mongolia, Kazakhstan and Northern China. It produces narrowly egg-shaped bulbs up to 4 cm (1 1/2 inches) in diameter. Scape is round in cross-section, up to 100 cm (39 inches) tall. Leaves are round, up to 50 cm (20 inches) long. Flowers are pale yellow, up to 20 mm (13/16 inch) across. Ovary is egg-shaped; stamens longer than the tepals.

2) Allium ampeloprasum

This is commonly known as wild leek or broadleaf wild leek. Its native range is southern Europe to western Asia. It has been differentiated into three cultivated vegetables, namely leek, elephant garlic and kurrat. Wild populations produce bulbs up to 3 cm across. Scapes are round in cross-section, each up to 180 cm tall, bearing an umbel of as many as 500 flowers. Flowers are urn-shaped, up to 6 mm across; tepals white, pink or red; anthers yellow or purple; pollen yellow.

3) Allium fistulosum

Commonly known as bunching onion, long green onion, Japanese bunching onion, scallion, spring onion, Welsh onion, is a species of perennial plant. The species is very similar in taste and odor to the related *Allium cepa*, and hybrids between the two (tree onions) exist. The Welsh onion does not develop bulbs and possesses hollow leaves (fistulosum means hollow) and scapes. In addition to culinary uses, it is also grown as an ornamental plant.

4) Allium obliquum

Common name lop-sided onion or twisted-leaf onion is a Eurasian species of wild onion with a range extending from Romania to Mongolia. It is also widely cultivated as an ornamental. Allium obliquum produces an egg-shaped bulb up to 3 cm long. Scape is up to 100 cm tall, round in cross-section. Leaves are flat, shorter than the scape, up to 20 mm across. Umbels are spherical, with many yellow flowers crowded together.

Grouping of Onion

The grouping in onion genotypes is carried out by many scientists as the genepool of onion is more than 20000 in all over the

world. The genotypes were sub divided into Common group, Aggregatum group and Ever-ready onion groups.

1) Common Onion Group

This group is economically most important *Allium* crop. It includes open pollinated traditional and modern cultivars, hybrids and local races, cultivated in the world. The bulbs are large and normally single, and plants reproduce from seeds or from seed-grown sets. The majority of cultivars grown for dry bulbs belong to this group. Maximum diversity exists in North India, Pakistan, former Soviet Union, Europe, Middle East and in Mediterranean area.

2) Aggregatum Group

The group is of minor economic importance. The bulbs are smaller than in common onions, forming an aggregated cluster. Reproduction is exclusively vegetative through daughter bulbs. The cultivationis mainly in Europe, America and Asia for dry bulbs. In tropical areas, these are used as substitute's toonion. Shallots are the most important subgroup of the Aggregatum group and the only ones grown commercially to any extent. They produce aggregations of many small, narrowly ovoid to pear-shaped bulbs, which often have red-brown (coppery) skins. The plants have narrow leaves and short scapes.

Besides being used as vegetables or spices, shallot has been known for a long time as a medicinal plant. The health benefit of shallot is believed due to organo-sulfur compounds and quercetin, and also a number of mineral compounds including calcium, magnesium, sodium, potassium, selenium, and phosphorus. Quercetin, a flavonoid compound is found in shallot bulb, is the main element which gives various therapeutic properties, including anti-allergenic, anti-inflammatory, cardio-protective, vasodilatory, anti-carcinogenic, antioxidant, antibacterial and antifungal.

Due to its importance in these regions, several varieties of multiplier onions were developed in India and are most popular due to their size and attractive pink color. Different morphological traits have been suggested to compare shallots and multiplier onions, where the multiplier onions have typically larger bulb size, fewer and flattened daughter bulbs and remains intact to the skin of mother bulb. Most of the vegetatively propagated onions are said to be carrier of latent viruses hence, the variability within *Aggregatum* group is poorly represented in gene banks throughout the world.

3) **Ever-ready Onion Group**

This third group of *A. cepa* may be distinguished from the other two by its prolific vegetative growth and by the lack of a dormant

A B

A = Multiplier onion B= Common Onion

Table 2. Characters and yield of selected multiplier onion varieties

Characters	Varieties	
	CO (On) 5	Arka ujjwal
Plant height at 30 DAP (cm)	33.5	32.4
Diameter of leaf sheath at 45 DAP (cm)	1.52	1.41
Root length (cm)	4.8	4.5
Number of leaves/plant (Nos.)	9.2	6.5
Weight of bulb (g)	30	32
Number of bulblets per bulb (Nos.)	5.5	3.8
Diameter of bulb (cm)	4.1	4.3
yield (t/ha)	14.50	12.88
No. of bulblets/kg (Nos.)	78	62
yield/plant (g)	56	51
Basic colour of dry skin	Dark pink	Light pink
Colour of epidermis of fleshy scale	Whitish pink	Whitish pink

period. Bulbs or leaves can be gathered at all times of the year. It is used mainly as a salad onion and was commonly cultivated in British gardens in the mid-20th century.

Future prospectus

Not much work has been done regarding the *Allium cepa aggregatum* to explore more of its qualities. Considering that it is very useful more and more stress should

be put in to make nanoparticles from it as well as other medicines because it has a lot many medicinal properties.

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