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Distribution and Medicinal Properties of Syzygium species

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ABSTRACT

The native range of distribution of genus *Syzygium* extends from Africa and Madagascar to southern East Asia through the Pacific. Its highest species diversity occurs in Malaysia and northeastern Australia. Some edible species of *Syzygium* are also planted throughout the tropics worldwide. The genus has medicinal application in pharmaceutical, cosmetic, agricultural and food industry. Comparative study of the research carried out on species of *Syzygium* reveals their wide range of medicinal properties and uses such as digestive, anti-diabetic, astringent, anti-helmintic, anti-bacterial, analgesic, anti-inflammatory, ant-oxidant, anti-hyperglycemic, gastro-protective agents, stomachic activity, anti-scorbutic activity, diuretic, anti-carminative, anti-genotoxicity, anti-leishmanial and anti-fungal activity. The article analyzes the current status of research on different *Syzygium* species in the pharmacological field.

Keywords: *Syzygium* species, Myrtaceae, evergreen tree, distribution, medicinal uses

1. INTRODUCTION

The genus *Syzygium* (Myrtaceae) is named after a Greek word meaning "coupled", an illusion to the paired branches and leaves. The genus comprises about 1100 species, whose native range of distribution extends from Africa and Madagascar through southern East Asia and the Pacific[1-5]. Its highest diversity occurs in Malaysia and northeastern Australia, where many species are very poorly known and many are not described taxonomically. Some edible species of *Syzygium* are planted throughout the tropics worldwide. Earlier *Syzygium* was confused taxonomically with the genus Eugenia (ca. 1000 species). *Syzygium* and Eugenia are among the most poorly understood large (> 500 species) genera of the vascular plants[6-8]. Most species are evergreen trees and shrubs. Several species are grown as ornamental plants for their attractive glossy foliage, and a few produce edible fruit that are eaten fresh or used in making jams and jellies. *S. Aromaticum* (clove) is the most important species whose unopened flower bud is an important spice[9-15]. generally the lower portion of the tree trunk of all *Syzygium* species has rough, cracked, flaking and discolored, smooth and light-grey bark. The glossy, dark-green leaves are turpentine-scented, evergreen, opposite oblong-oval or elliptic, blunt or tapering with pointed apex[16-19]. Fruits produced in clusters are very juicy. The fruit is usually astringent, sometimes unpalatable, and the flavor varies from acid to fairly sweet. Single, oblong, green or brown seed is present in each fruit[20-24].

2. GEOGRAPHIC DISTRIBUTION

The genus is native to India, Malaysia, Myanmar, Philippines, Sri Lanka,Bangladesh, Pakistan, Guangc Guangxi and Thailand. It is considered as exotic in Algeria, Antigua, Barbuda, Australia, Bahamas, Barb Colombia, Cuba, Dominica, Ghana, Grenada, Guadeloupe, Guatemala, Guyana, Jamaica, Kenya, Martin Mexico, Montserrat, Nepal, Netherlands Antilles, Nicaragua, Panama, South Africa, St Kitts and Nevis, St Luc Vincent and the Grenadines, Sudan, Tanzania, Trinidad and United States of America[25-26].

It is also grown in southern and southeastern Asia including Philippines, Myanmar, and Afghanistan. Its known introduced ranges are Cook Islands, Fiji,French, Polynesia, Guam, Hawaii, Florida, New Caledonia, Niue, Palau, Tonga, China, Indonesia, Malaysia, Christmas Island, Caribbean, South America, Brazil etc. Its biophysical limits range from sea level to 800 m altitude. The genus has wide temperature limit ranging from mean annual temperature of -2^0 C to 48^0 C and grows where mean annual rainfall ranges between 900 and 1000 mm or more. *Syzygium* species grows in a great variety of soils and geological formations such as alluvial, lateritic, sandy alluvia, marl and olitic limestone. Some of them tolerate saline soil and are found on deep, rich, well-drained soils[27-30].

3. CONCLUSION WITH FUTURE PROSPECTS

Chomphu-mamieow (*Syzygium malaccense*) belongs to the Myrtaceae family. Like other species in the genus Syzygium. Fruit scientists have paid little attention to chomphu-mamieow, hence very little or no scientific research has been done on this crop. This may be due to the reputation of chomphu-mamieow as a home garden plant. They are not planted in orchards on a commercial scale. Also the short shelf-life of the fruit limits its possibilities for commercialization. At present, the fruit possesses value in local markets and there is a trend for increasing consumer demand for high quality fruits. It is suggested that pomologists should pay more attention to the growth and development of the trees to obtain a better insight into the growth rhythm including the timing and intensity of bloom, and quantitative aspects of yield as well as selection of superior clones.

All *Syzygium* species are shows rich medicinal applications. *Syzygium* is a hot tree today and number of studies has shown it to be a useful medicinal agent. Its potential as an effective anti diabetic agent cannot be ruled out. Large-scale clinical studies are required to justify *Syzygium* species has suitable phytopharmacetutical drug although initial data seems to be promising.

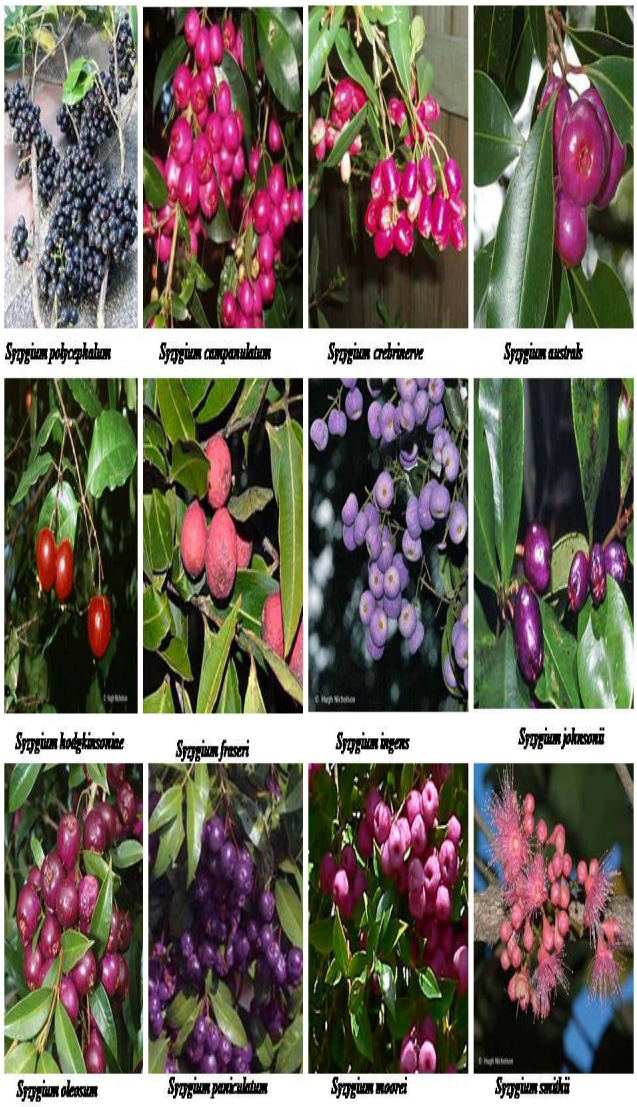

Figure 1: various *Syzygium* species

Figure 2: various *Syzygium* species

Figure 3: various *Syzygium* species

S. N.	Species	Common name	Habitats	Distribution	Medicinal properties	Plant parts used
1	*S. aqueum*	Water Apple, Bell fruit, Water cherry, Watery rose apple	Ornamental plant	India, Malaysia, Asia, Philippines	Astringent activity, Anti-oxidant activity of ethanol & aqueous extracts, Anthelmintic	Bark, leaf & root
2	*S. australe*	Brush cherry or Scrub cherry	Rain forest tree	Eastern Australia	Anti-microbial activity	Leaves
3	*S. aromaticum*	Clove, Lavang, Laung (Hindi)	Evergreen tree	Indonesia, Madagascar, Pakistan, India, Sri Lanka, China	Carminative, anodyne (painkiller) for dental emergencies anthelmintic, digestive, decreases pain	Flower bud (Clove), leaves, ripe fruits and oil
4	*S.corynanthum*	Sour cherry, Killarney Satinash, Australian red berry	Rain forest tree	Australia: New South Wales & Queensland	Antibacterial activity	Leaves, flowers, fruits & seeds
5	*S. courtallense*	-	Evergreen tree	Endemic to India & SriLanka	Antimicrobial activity	Leaves,bark, seeds & fruits
6	*S.cumini*	Jambul, Jambolan, Black plum, Duhat plum, Java plum etc.	Large evergreen, beautiful flowering tree	India, Malaysia, Myanmar, Philippines, Sri Lanka & Thailand	Anti- diabetic activity, diuretic, digestive, astringent, anti-hyperglycemic activity, antifungal activity, anti-inflammatory activity, gingivitis	Leaves, flowers, fruits, seeds & Roots
7	*S. curanii*	Lipote	Sole tree	Endemic to Philippines	Cure for high blood sugar	Fruits & Leaves
8	*S.cyclophyllum*	-		Endemic to SriLanka	Anti-microbial activity	Leaves & Bark
9	*S. densiflorum*	-	Montane forest	Endemic to India : Karnataka, Kerala, Tamil Nadu, Nilgiris, Anamalai and Palni Hills	Anti-microbial activity	
10	*S. diffusum*	-	A slender or spreading tree	Endemic to Fiji	Antimicrobial activity	
11	*S. erythrocalyx*	Red bud Satinash, Johnstone river Satinash	Rain forest tree	Australia: North Queensland	Preserves, sauces and beverages	Fruits
12	*S.fibrosum*	Rain cherry, Fibrous satinash	Rain forest tree	Indonesia, Guinea, Australia	Jams and confectionary	Fruits

13	*S.forte*	Crunchy, White Apple, Flaky barked satinash, Brown satinash	Rain forest tree	Northern Australia	Eaten fresh	Fruits & seeds
14	*S. francisii*	Giant water gum, Rose Satinash, and Francis Water Gum	Rain forest, tree	Morisset, New South Wales Gladstone, Queensland, Sydney, New Zealand and Oceania	Antimicrobial activity	Leaves, bark, fruits & seeds
15	*S. gambleanum*	-	Montane evergreen forest	Endemic to India: Tamil Nadu	Antibacterial and antifungal activity	Seeds,
16	*S. guehoi*	-	Grows on mountain slopes	Endemic to Mauritius	Antimicrobial activity	Leaves, bark, fruits
17	*S. guineese*	Water Berry, water boom, water pear, woodland Roof of Africa	Evergreen tree	Horn of Africa	Antibacterial activity, molluscicidal activity, antifungal activity	Leaves, bark, & seeds
18	*S.hodgkinsoniae*	Red lilly pilly, Smooth-bark Rose Apple	Rare subtropical rainforest tree	Northeast New South Wales and South east Queensland, Australia	Antibacterial activity,	Leaves, bark, fruits & seeds
19	*S. jambos*	Rose apple, Malabar plum, Malay apple, Plum rose, Water apple, Jambu	Evergreen tree	Southeast Asia, India, (Kerala), America, Australia, Africa, Malaya East Indies and Oceania	Tonic for the brain and liver, diuretic, reduce fever, diarrhea, dysentery, diabetics, anesthetic property and catarrh. The leaf decoction is applied to eyes sore, emetic and cathartic, relieve asthma, bronchitis and hoarseness, remedy for epilepsy	Fruits, flower, seeds, leaves, barks & Roots
20	*S. luehmannii*	Riberry, Cherry Satinash, Small Clove Lilli Pilli	Rain forest, Evergreen & ornamental tree	Australia	Fruit used in jam making	-
21	*S. lineare*	-		Endemic to India: Tamil Nadu	Antimicrobial and antifungal activity, Astringent, refrigerant, diuretic	Leaves & Bark
22	*S. maire*	Swamp Maire	Evergreen ornamental tree	Endemic to New Zealand: North Island, and top of the South Island	Antioxidant activity	Fruits

23	*S. malaccense*	Malay Apple, Malacca apple, Malay rose apple, Mountain apple, Otaheite cashew, Rose apple, Water apple	Flowering tree	Malaysia and Indonesia (Sumatra and Java) Philippines and Vietnam, South India, East Africa	Astringent, treat cracked tongue, itching, diuretic, alleviate edema dysentery, antibiotic, blood pressure and respiration	Bark, leaves, root & seeds
24	*S. makul*	-	Rainforest tree	Endemic to Sri Lanka (South-west)	-	-
25	*S. moorei*	Coolamon, Water melon tree, Durobby, Robby, Rose apple, Couchy Creek	Rainforest tree	Northeast New South Wales and south east Queensland, Sydney, Australia	Antimicrobial activity	Leaves
26	*S. myhendrae*	-	Submontai-ne forest	Endemic to India: Kerala, Tamil Nadu	-	-
27	*S. oleosum*	Blue Lilly Pilly	Rain forest ornamental tree	North Queensland through New South Wales, Australia	Eaten fresh and used in jams, jellies, preservatives in drinks, antifungal activity antioxidant activity	Fruits, bark & seeds
28	*S. polyanthum*	Indian & Indonesian bay leaf, Salam leaf, daun salam, Indonesian laurel, waplers	Evergreen, water-loving tree	India, Indonesia, China, Burma (Myanmar), Thailand & Malaysia	Antifungal and antibacterial activity	Leaves
29	*S.polycephalum*	Lipote	Highly ornamental tree	Philippine	Used for curing high blood sugar	fruit and leaves
30	*S.samarangense*	Java Apple, markopa, Java rose apple, Samarang rose apple, Water apple, Wax jambu, Wax apple	Deciduous tree	India	Antihyperglycemic activity, spasmolytic, immunomodulatory activity, antimicrobial activity	Bark, leaves, seeds & fruits
31	*S.sandwicensis*	-	Forest shrub	Endemic to Hawaii	Wood for fuel, bark for black, flower for white, leaves for dark green and fruits for red dye	Bark, seeds, fruits, leaves & flowers
32	*S. smithii*	Lilly Pilly	Evergreen tree	Queensland Endemic to Australia	Antimicrobial activity Eaten fresh and used in jams, jellies, preserves, drinks	Bark, seeds fruits & leaves
33	*S. wrightii*	Baker		Endemic to Seychelles, Mahe, Praslin, Silhouette, Curieuse, Felicite	Antimicrobial activity	Bark, leaves & fruits
34	*S.xerampelinm*	Mulgrave Satinash	Rainforest ornamental tree	Australia	Anti-microbial activity	Bark Fruits

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