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Development of QR code-based digital identification system for floriculture and medicinal plants

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Abstract

The development of QR code-based digital identification system offers an efficient approach for documenting and managing floriculture and medicinal plants. This system enables quick access to plant information such as taxonomy, medicinal value, cultivation practices and conservation status. It enhances plant identification accuracy, supports research, promotes awareness, and facilitates digital record-keeping for sustainable plant resource management.

Keywords: QR code, floriculture plants, medicinal plants

1. Introduction

Floriculture and medicinal plants play an important role in biodiversity conservation, traditional medicine, and horticultural development. Proper identification and documentation of plant species are essential for botanical research, education, and conservation programs.

QR codes have been widely used in various fields such as education, commerce and digital information systems. In botanical gardens and educational institutions, QR codes can be used to provide quick access to plant information including botanical classification, medicinal uses, and cultivation details. This digital approach enhances interactive learning and improves plant documentation methods.

With the advancement of digital technology, QR codes can be used to provide quick digital access to plant information through smartphones.

2. Objectives

- To develop a QR code-based digital identification system for selected plants.
- To document important information about floriculture and medicinal plants.
- To generate QR codes linked with plant information for easy access.
- To promote digital documentation and awareness about plant resources.

3. Materials and Methods

Plant species were selected from the botanical garden and surrounding areas of Deogiri College, Chhatrapati Sambhajanagar.

A total of fourteen plant species including medicinal and ornamental plants were documented.

Information related to botanical classification, fruit type and general plant description was collected from botanical literature and online plant databases. QR codes were generated using online QR code generators and linked with the digital plant information pages.

4. Workflow of QR Code-Based Plant Identification System

Plant Selection → Information Collection → Digital Database → QR Code Generation → QR Code Placement → Smartphone Scanning → Information Display

Fig 1: Workflow of QR Code-Based Plant Identification System.

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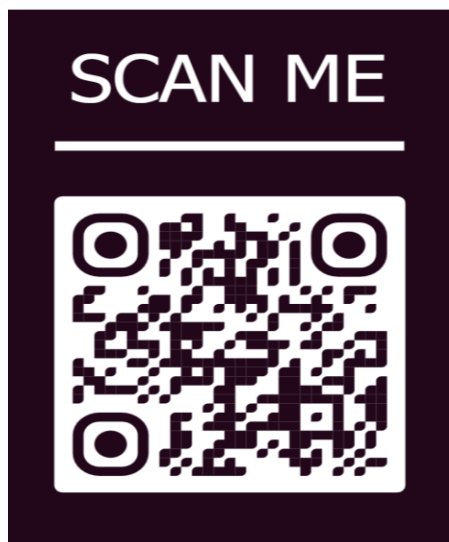


Fig 2: QR code generated for *Phyllanthus emblica* linking to the digital plant information page

5. Selected Plant Species Used in the Study

Table 1: Selected Plant Species Used In the Study

S. No	Botanical Name	Category
1	<i>Phyllanthus emblica</i>	Medicinal
2	<i>Terminalia catappa</i>	Medicinal
3	<i>Morus alba</i>	Medicinal
4	<i>Araucaria heterophylla</i>	Medicinal
5	<i>Dalbergia sissoo</i>	Medicinal
6	<i>Ravenala madagascariensis</i>	Medicinal
7	<i>Ocimum tenuiflorum</i>	Medicinal
8	<i>Brugmansia spp.</i>	Floriculture
9	<i>Euphorbia cotinifolia</i>	Floriculture
10	<i>Euphorbia milii</i>	Floriculture
11	<i>Grevillea robusta</i>	Floriculture
12	<i>Nyctanthes arbor-tristis</i>	Floriculture
13	<i>Tabebuia rosea</i>	Floriculture
14	<i>Plumeria rubra</i>	Floriculture

6. Example Structure of QR Code Plant Information

Table 2: Structure of Plant Information Stored in QR Code System

Data Field	Description
Plant Name	Common name of the plant
Botanical Name	Scientific name
Botanical Classification	Kingdom to Species
Fruit Type	Type of fruit produced
General Information	Description, uses and cultivation

7. Results and Discussion

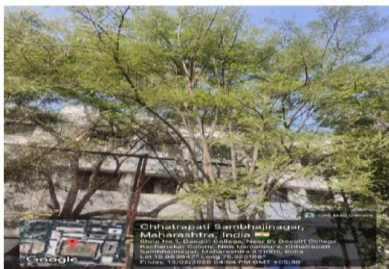
QR codes allowed instant access to plant information. The QR code-based plant identification system successfully enabled quick access to plant information. Each plant species was assigned a unique QR code linked to a digital

information page containing botanical classification, fruit type and general plant description. When scanned using a smartphone, the QR codes provided instant access to plant information. This system improves plant documentation and enhances learning opportunities for students and visitors.



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Development of QR code based digital identification system for floriculture and medicinal plants

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Aonla (Indian Gooseberry)

Botanical Name: *Phyllanthus emblica L.*

Botanical Classification

- Kingdom: Plantae
- Division: Magnoliophyta (Angiosperms)
- Class: Magnoliopsida (Dicotyledons)
- Order: Malpighiales
- Family: Phyllanthaceae
- Genus: *Phyllanthus*
- Species: *P. emblica*

Fruit Type: Drupe

General Information

Aonla, commonly known as Indian Gooseberry, is a medium-sized deciduous tree native to India and widely cultivated in tropical and subtropical regions. It is highly valued in Ayurveda for its rich vitamin C content and medicinal properties. The tree has feathery branchlets with small, simple leaves that resemble pinnate leaves. Flowers are small, greenish-yellow and unisexual. The fruit is nearly spherical, light green to yellow in color, and has a sour and astringent taste. Aonla fruits are used in pickles, juices, candies and herbal formulations such as chyawanprash. The plant prefers well-drained soil and full sunlight and is economically important in horticulture and traditional medicine.

Fig 3: Digital plant information page of *Phyllanthus emblica* accessed through QR code scanning.

8. Conclusion

QR codes allowed instant access to plant information.

The system can be effectively implemented in botanical gardens, educational institutions and plant conservation programs.

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