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Research Article

Floral diversity and medicinal plant resources of Ratnagiri: an archaeological heritage site of Odisha, India

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Abstract: Ratnagiri is one of the most sacred Buddhist sites associated with Gautam Buddha in Odisha state of India. It represents an important ecological and cultural landscape. A systematic floristic survey was conducted in January 2026 to document the plant diversity of the area with special emphasis on medicinally important species. The study enumerated 59 medicinal plant species occurring within the study area and analysed their medicinal significance based on standard botanical literature. The inventory of medicinal plants featured the floristic richness and medicinal plant wealth of Ratnagiri. The findings emphasize the role of sacred landscapes in conserving traditional medicinal flora and highlight the need for their sustainable management.

Keywords: Biodiversity, medicinal plants, Odisha, Ratnagiri, sacred landscape

Introduction

Sacred landscapes in India often serve as repositories of biological diversity due to long-standing cultural protection and restricted anthropogenic disturbance (Das et al., 2022). Ratnagiri, a renowned Buddhist archaeological site in Odisha, is not only of historical and spiritual significance but also harbors diverse variety of plant species adapted to the local agro-climatic conditions (Mahajan et al., 2024). Traditional knowledge systems have long recognized the medicinal value of many plant species growing in such areas (Pradhan et al., 2026). However, systematic documentation of plant diversity and their ethnomedicinal relevance from sacred Buddhist sites remains limited. The present study was undertaken as an initiative to enumerate the plant species of Ratnagiri and to compile their

medicinal uses, thereby contributing to baseline data for future ecological, pharmacological and conservation-oriented studies. Ratnagiri is located in the Jajpur district of Odisha (Nayak et al., 2017) and is situated within a tropical climatic zone characterized by warm temperatures and seasonal rainfall. The area comprises undulating terrain with archaeological mounds, patches of semi-natural vegetation, open grasslands and scattered trees. The site experiences a monsoonal climate with distinct summer, rainy and winter seasons, which supports a wide variety of herbaceous plants, shrubs, climbers and trees. Due to its sacred status and archaeological importance, large-scale exploitation of natural resources is minimal, allowing native and naturalized plant species to persist. Keeping the importance of study area, an attempt has been made to enumerate the available medicinal plants through field visits to highlight the area as a hub of local medicinal plants.

Methodology

A field survey was conducted in January 2026 (Plate 1). Plant specimens were observed, photographed and recorded directly in the field. Identification was carried out using standard floras, taxonomic keys (Saxena and Brahmam, 1994-1996) and published botanical literature. The scientific names were verified for nomenclatural accuracy and each species was categorized according to its family and common name. Information on medicinal value was compiled through an extensive review of existing literature (Kumar, 2025). The collected data were organized into a comprehensive table enumerating botanical name, common name, family and medicinal importance of each species (Sahu et al., 2026).

Plate 1: Field survey in Ratnagiri of Odisha

Results and discussion

The floristic survey of Ratnagiri revealed a rich assemblage of 59 medicinally important plants comprising herbs, shrubs, climbers and trees. The recorded species belonged to a diverse range of plant families with Asteraceae, Fabaceae, Acanthaceae, Apocynaceae, Moraceae and Rubiaceae being among the most represented. Herbs constituted a major proportion of the documented flora, followed by trees and shrubs, indicating favourable microhabitats for herbaceous growth. Several species with significant ethnomedicinal relevance were recorded, including plants used traditionally for treating gastrointestinal disorders, skin diseases, respiratory ailments, liver disorders, kidney problems, inflammation and infections. Both native and naturalized species were observed to contribute significantly to the medicinal plant wealth of the area (Table 1).

Table 1: List of enumerated plants during the field survey of Ratnagiri in Odisha, India

Botanical name	Common name	Family	Medicinal value(s)	Source(s)
Acmella paniculata (Wall. ex DC.) R.K. Jansen (Plate 2a)	Panicled spot flower (E)	Asteraceae	Useful in chronic inflammatory conditions like rheumatoid arthritis and osteoarthritis.	Sailo et al., (2018); Patel et al., (2019)
Adiantum philippense L.	Walking maidenhair fern (E)	Pteridaceae	Broad-spectrum antibacterial activity against foodborne pathogens.	Adnan et al., (2020)
Afrohybanthus enneaspermus (L.) Flicker	Ratan purush (H)	Violaceae	Protects the kidneys from drug-induced toxicity.	Rajsekhar et al., (2016)
Ailanthus excelsa Roxb.	Mahanimb (H)	Simaroubaceae	Potent against dysentery, diarrhoea and intestinal worms.	Mohammed et al., (2023)
Alangium salviifolium (L.f.) Wangerin	Stone mango (E)	Cornaceae	Possesses anti-ulcer and anthelmintic properties.	Shravya et al., (2017)
Alstonia scholaris (L.) R.Br.	Devil tree (E)	Apocynaceae	In Ayurveda, it is used as an astringent herb for treating skin disorders.	Verma et al., (2025)

Alternanthera sessilis (L.) DC. (Plate 2b)	Joyweed (E)	Amaranthaceae	Used as an herbal remedy to treat inflamed wound.	Bhuyan et al., (2018)
Annona reticulata L.	Ramphal (H)	Annonaceae	Traditionally used for the treatment of epilepsy.	Pathak and Zaman, (2014)
Azadirachta indica A.Juss.	Neem (E)	Meliaceae	The plant parts contain antifungal and antibacterial properties.	Devi and Sharma, (2023)
Bauhinia purpurea L.	Kaniar (H)	Fabaceae	The bark has fibrolytic property.	Arora et al., (2020)
Bergera koenigii L.	Curry leaf (E)	Rutaceae	The leaves are used in treating piles.	Balakrishnan et al., (2020)
Boerhavia diffusa L.	Punarnava (H)	Nyctaginaceae	Used in Martinican folk medicine for its analgesic and anti-inflammatory properties.	Nayak and Thirunavoukkarasu, (2016)
Cassia fistula L.	Golden shower tree (E)	Fabaceae	It has significant hepatoprotective properties.	Rahmani, (2015)
Centella asiatica (L.) Urb.	Indian pennywort (E)	Apiaceae	Used as a blood purifier and for memory enhancement.	Gohil et al., (2010)
Chromolaena odorata (L.) R.M. King & H. Rob.	Bitter bush (E)	Asteraceae	Used to treat wounds, burns and skin infections.	Sirinthipaporn and Jiraungkoorskul, (2017)
Cipadessa baccifera (Roxb. ex Roth) Miq.	Oriental purpleberry (E)	Meliaceae	Useful in the treatment of dysentery.	Kavitha et al., (2021)
Clerodendrum infortunatum L. (Plate 2c)	Hill glorybower (E)	Lamiaceae	In Indian folk medicine, it is used in the treatment of bronchitis.	Verma and Gupta, (2014)
Cynodon dactylon (L.) Pers.	Bermuda grass (E)	Poaceae	The root decoction is used in secondary syphilis and irritation of urinary organs.	Shendye and Gurav, (2014)

Dicliptera paniculata (Forssk.) I.Darbysh. (Plate 2d)	Panicled foldwing (E)	Acanthaceae	Traditionally used as an analgesic and antipruritic.	Raj et al., (2024)
Ecbolium viride (Forssk.) Alston (Plate 2e)	Green shrimp plant (E)	Acanthaceae	It possesses hepatoprotective properties.	Diyya et al., (2014)
Emilia sonchifolia (L.) DC.	Hirankhuri (H)	Asteraceae	In treatment of night blindness and sore throat.	Sankara et al., (2023)
Eranthemum purpurascens Wight ex Nees (Plate 2f)	Purple eranthemum (E)	Acanthaceae	The whole plant paste is used as an ointment for wound healing.	Kumar, (2020)
Evolvulus nummularius (L.) L.	Roundleaf bindweed (E)	Convolvulaceae	It is useful in the treatment of scorpion stings.	Iqbal et al., (2020)
Ficus benghalensis L. (Plate 3a)	Banyan (E)	Moraceae	Traditionally used in the treatment of leucorrhoea and menorrhagia.	Sahu et al., (2024)
Ficus hispida L.f.	Devil fig (E)	Moraceae	It has cardioprotective effects.	Ali and Chaudhary, (2011)
Holarrhena pubescens Wall. ex G. Don	Ivory tree (E)	Apocynaceae	Widely used in Indian medicine for treating liver disorders.	Zahara et al., (2020)
Holoptelea integrifolia (Roxb.) Planch.	Chilbil (H)	Ulmaceae	It has been used in tribal remedies as antiviral and abortifacient.	Kumar et al., (2012)
Indigofera tsiangiana Metcalf	Nine-leaved indigo (E)	Fabaceae	Useful in treating ulcer and solid tumors.	Sandhyavali et al., (2014)
Jatropha gossypiifolia L.	Bellyache bush (E)	Euphorbiaceae	It has significant antihemorrhagic property.	Felix-Silva et al., (2014)
Justicia adhatoda L.	Malabar nut (E)	Acanthaceae	In Ayurvedic medicine, used to treat tuberculosis.	Dhankar et al., (2011)

Lagerstroemia speciosa (L.) Martyn	Queen crape myrtle (E)	Lythraceae	It has remarkable antioxidant properties.	Tiwari et al., (2017)
Lepidagathis fasciculata (Retz.) Nees (Plate 3b)	Fascicled-flower (E)	Acanthaceae	It has significant antidiabetic potential.	Porika and Reddy, (2024)
Magnolia champaca (L.) Baill. ex Pierre	Champa (H)	Magnoliaceae	Useful as a diuretic in renal diseases and in gonorrhoea.	Raja and Koduru, (2014)
Mangifera indica L.	Mango (E)	Anacardiaceae	Possess gastro-protective and immunomodulatory properties	Rajasekaran and Soundarapandian, (2023)
Mikania micrantha Kunth	Chinese creeper (E)	Asteraceae	It is useful in the treatment of insect bites, rashes and itches of skin.	Ali et al., (2023)
Mimusops elengi L.	Indian medlar berry (E)	Sapotaceae	It possess gastroprotective properties.	Gami et al., (2012)
Morinda pubescens Sm. (Plate 3c)	Indian mulberry (E)	Rubiaceae	It possesses nephroprotective property.	Jedage and Manjunath, (2016)
Neolamarckia cadamba (Roxb.) Bosser	Burflower-tree (E)	Rubiaceae	The leaf and bark have antifungal property.	Dwevedi et al., (2015)
Oldenlandia corymbosa L.	Corymb diamond flower (E)	Rubiaceae	The root and aerial parts have antioxidant property.	Archana et al., (2021)
Ouret lanata (L.) Kuntze	Gorakhbuti (H)	Amaranthaceae	The plant parts are effective against parasite infections.	Goyal et al., (2011)
Oxalis corniculata L.	Amrul (H)	Oxalidaceae	Traditionally, used against digestive and urinary disorders.	Zhong et al., (2025)
Phoenix sylvestris (L.) Roxb.	Sugar palm (E)	Arecaceae	Roots are useful in toothache.	Jain et al., (2018)
Pilea microphylla (L.) Liebm.	Gunpowder plant (E)	Urticaceae	Traditionally, used to treat bacterial	Chahardehi et al., (2010)

			infection.	
Pongamia pinnata (L.) Pierre	Indian beech tree (E)	Fabaceae	It is applied in crude form for the treatment of tumors, piles and ulcers.	Muqarrabun et al., (2013)
Rungia pectinata (L.) Nees (Plate 3d)	Ulat kanghi (H)	Acanthaceae	It has significant antibacterial and antifungal properties.	Swain et al., (2008)
Sida cordata (Burm.f.) Borss.Waalk. (Plate 3e)	Long-stalk sida (E)	Malvaceae	In Ayurvedic medicine, it is used to treat bronchial asthma.	Jain et al., (2011)
Spathodea campanulata P.Beauv. (Plate 3f)	African tulip tree (E)	Bignoniaceae	Traditionally, it is used for the treatment of kidney and urinary system disorders.	Zhou et al., (2024)
Sphagneticola calendulacea (L.) Pruski	Chinese wedelia (E)	Asteraceae	It has been used in traditional ayurvedic medicine to treat digestive issues and respiratory ailments.	Palei et al., (2024)
Streblus asper Lour.	Sand paper tree (E)	Moraceae	It is used traditionally in leprosy, piles and elephantiasis.	Rastogi et al., (2006)
Synedrella nodiflora (L.) Gaertn	Pig grass (E)	Asteraceae	It is used as an external medicine to cure earache and inflammation.	Le et al., (2020)
Tabernaemontana divaricata (L.) R.Br. ex Roem. & Schult.	Crape jasmine (E)	Apocynaceae	In folk medicine, it is used as anti-epileptic and anti-mania.	Chanchal et al., (2015)
Tecoma stans (L.) Juss. ex Kunth	Yellow trumpet (E)	Bignoniaceae	It has antispasmodic properties.	Jeo and Raj, (2020)
Thelypteris	Mountain	Aspleniaceae	It has significant	Singh and

dentata (Forssk.) E.P.St. John	woodfern (E)		antibacterial properties.	Rajkumar, (2017)
Tilia cordata Mill.	Small leaved lime (E)	Malvaceae	The flowers are used for curing anxiety and fever.	Ali et al., (2022)
Tiliacora acuminata (Lam.) Miers	Bagamushada (H)	Menispermaceae	It is used as an antidote for snake bite.	Fang et al., (2025)
Tinospora cordifolia (Willd.) Hook.f. & Thomson	Giloy (H)	Menispermaceae	In traditional ayurvedic medicine, it is used for the treatment of jaundice.	Saha and Ghosh, (2012)
Trichosanthes tricuspidata Lour.	Mahakal (H)	Cucurbitaceae	It has antipyretic properties.	Duvey et al., (2012)
Tridax procumbens L.	Coat buttons (E)	Asteraceae	It is used as a drink to treat bronchial catarrh and liver diseases.	Andriana et al., (2019)
Ziziphus oenopolia (L.) Mill.	Wild jujube (E)	Rhamnaceae	In traditional system of medicine, it is used for healing uterus inflammation.	Srinivasan et al., (2020)

(E: English; H: Hindi)

The presence of a diverse array of medicinal plants in Ratnagiri reflects the ecological resilience of sacred landscapes and their role in biodiversity conservation. The dominance of families known for pharmacologically active compounds highlights the therapeutic potential of the local flora. Many of the recorded species are widely used in traditional systems of medicine such as Ayurveda and folk practices, suggesting that Ratnagiri serves as a valuable reservoir of ethnobotanical knowledge. The relatively undisturbed nature of the site, owing to its religious and archaeological importance, has likely facilitated the survival of several medicinally significant species that are declining elsewhere due to habitat loss and overexploitation. Documentation of such floristic wealth is essential for promoting conservation awareness and for supporting future studies on sustainable utilization and pharmacological validation.

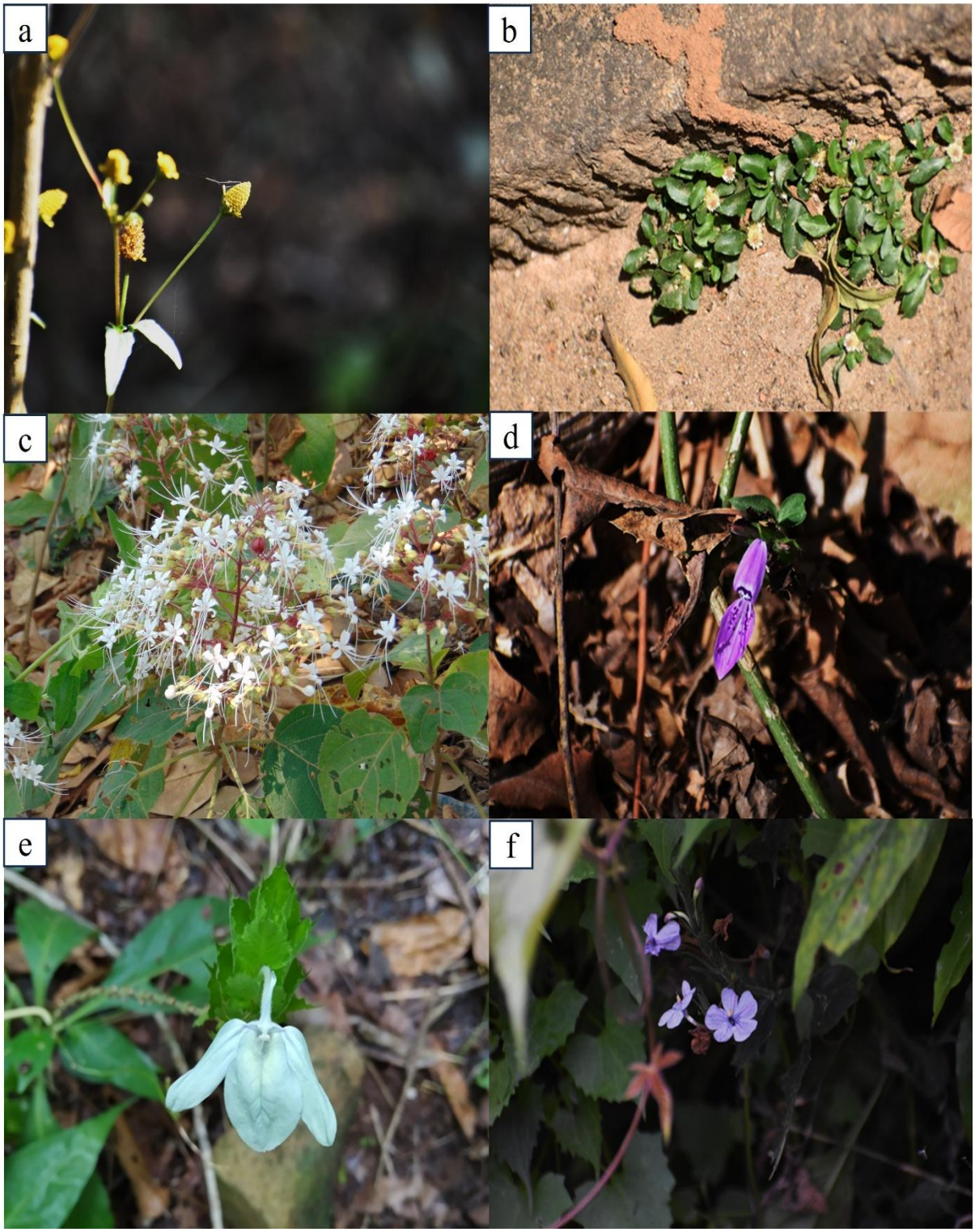

Plate 2: Study of floral diversity in Ratnagiri during field survey; a) *Acmella paniculata*, b) *Alternanthera sessilis*, c) *Clerodendrum infortunatum*, d) *Dicliptera paniculata*, e) *Ecbolium viride* and f) *Eranthemum purpurascens*

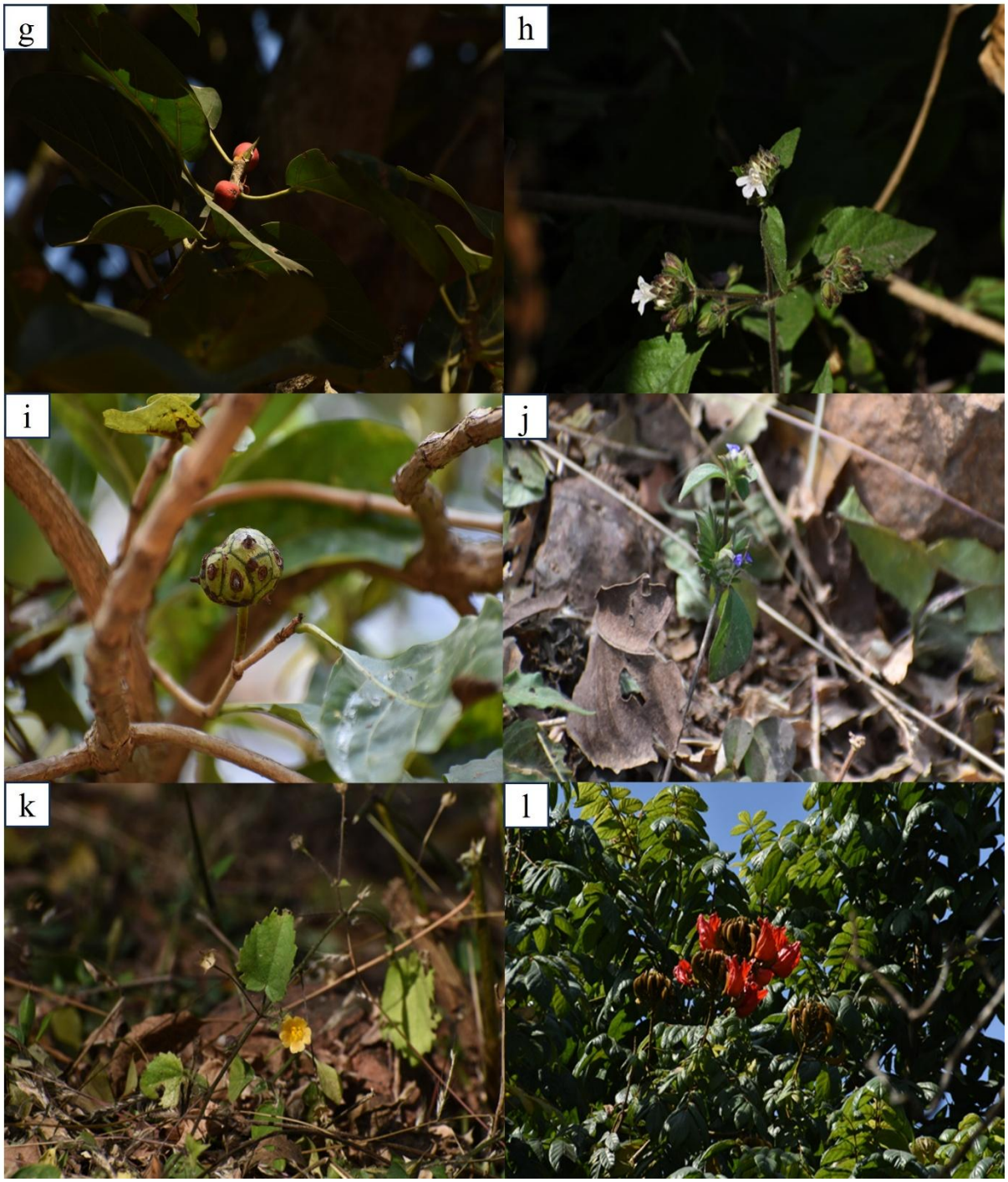

Plate 3: Study of floral diversity in Ratnagiri during field survey; a) *Ficus benghalensis*, b) *Lepidagathis fasciculata*, c) *Morinda pubescens*, d) *Rungia pectinata*, e) *Sida cordata* and f) *Spathodea campanulata*

Conclusion

The present study provides a systematic account of the 59 medicinal plant species of Ratnagiri, Odisha, emphasizing its dual significance as a sacred Buddhist site and a centre of biological richness. The enumeration of medicinally important plant species emphasizes the need to recognize and protect sacred landscapes as effective units of biodiversity conservation. Preservation of such

sites will not only safeguard cultural heritage but also ensure the continued availability of valuable medicinal plant resources. Further studies focusing on the population status, conservation threats and phytochemical evaluation are recommended to enhance the scientific value and practical utility of the documented flora.

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