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Cover: Freshly emerged Footman Moth *Nepita conferta* from the cocoon on a brightly painted wall in the Nilgiris. Digital art on Procreate. © Aakanksha Komanduri.



Floristic composition and plant functional types on the lateritic plateau of Panchgani Tableland, Maharashtra, India

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Abstract: The conservation zone of Panchgani Tableland lies within the Mahabaleshwar Panchgani Eco-sensitive Zone, Satara District, Maharashtra, India, in northern Western Ghats. The present paper reports 189 species across 54 families recorded throughout the year on this lateritic plateau. The most represented family is Poaceae, and it also shows the highest endemism (nine taxa). During the study, 78 endemic taxa were recorded, which makes up to 48% endemism. A total of 12 threatened taxa have been recorded during the study, of which four are 'Endangered' (*Dipcadi ursulae* var. *ursulae* Blatt., *Curcuma caulina* (J.Graham) Baker, *Iphigenia stellata* Blatt., and *Isachne swaminathanii* V.Prakash & S.K.Jain), two are 'Vulnerable' (*Eriocaulon tuberiferum* A.R.Kulkarni & Desai, *Utricularia albocaerulea* Dalzell) and six are 'Near Threatened' (*Arisaema murrayi* (J.Graham) Hook., *Euphorbia khandallensis* Blatt. & Hallb., *Habenaria grandifloriformis* Blatt. & McC., *Pinda concanensis* (Dalzell) P.K.Mukh. & Constance, *Utricularia praeterita* P. Taylor, and *Vigna khandalensis* (Santapau) Sundararagh. & Wadhwa). Though a large number of species are therophytes (73.4%), 12.5% of the taxa are geophytes, and 4.7% are carnivorous. Remaining taxa belong to other plant functional types viz. helophytes, hydrophytes, succulents, hemiparasites, and epiphytes. The study also explored the impact of anthropogenic pressures such as tourism, grazing, and soil alteration that threaten the diversity on the plateau. A comparison with floristic data by Blatter (1909) revealed the absence of 12 taxa in the existing vegetation, including the two rare species *Adelocaryum malabaricum* (C.B.Clarke) Brand., and *Smithia purpurea* Hook., and recorded another 129 species that were not recorded earlier.

Keywords: Carnivorous plants, disturbance, endemism, geophytes, Mahabaleshwar Panchgani Eco-sensitive Zone, natural heritage site, plant diversity, therophytes, threatened species.

पांचगणी टेबललॅण्डचे संवर्धन क्षेत्र हे उत्तर पश्चिम घाटातील महाबळेश्वर-पांचगणी या पर्यावरणरक्ष्य संवेदनशील क्षेत्रात (सातारा जिल्हा, महाराष्ट्र, भारत) स्थित आहे. सदर शोधनिबंधात या जांभ्याच्या पठारावरील 54 कुळांतील 189 रोपटेवजा सपुष्प वनस्पतींच्या प्रजातींची नोंद केली आहे. येथे पोएसी कुळातील सर्वाधिक प्रजाती आढळल्या असून त्यामध्ये प्रदेशनिष्ठ प्रजातींची संख्याही सर्वात जास्त (9) आहे. सदर अभ्यासात एकूण 78 प्रदेशनिष्ठ प्रजातींची नोंद केली असून त्या एकूण प्रजाती संख्येच्या 48% आहेत. एकूण 12 संकटग्रस्त प्रजातींपैकी 4 एंडेंजर्ड (लुप्तवस्त्येकडे जाणाऱ्या/ धोक्यात आलेल्या) (*Dipcadi ursulae* var. *ursulae* Blatt., *Curcuma caulina* (J.Graham) Baker, *Iphigenia stellata* Blatt., and *Isachne swaminathanii* V.Prakash & S.K.Jain), 2 व्हल्नेरेबल (संवेदनशील) (*Eriocaulon tuberiferum* A.R.Kulkarni & Desai, *Utricularia albocaerulea* Dalzell), 6 निअर थ्रेटनड (अली संकटग्रस्त) (*Arisaema murrayi* (J.Graham) Hook., *Euphorbia khandallensis* Blatt. & Hallb., *Habenaria grandifloriformis* Blatt. & McC., *Pinda concanensis* (Dalzell) P.K. Mukh. & Constance, *Utricularia praeterita* P. Taylor, and *Vigna khandalensis* (Santapau) Sundararagh. & Wadhwa) प्रजातींची नोंद या अभ्यासादरम्यान केली. वनस्पतींच्या प्रजातींपैकी जास्त प्रमाण थेरोफाईट (73.4%) यांचे असून 12.5% जिओफाईट्स तर 4.7% कानिक्वोरस वनस्पतींच्या प्रजाती आहेत. उरलेल्या प्रजाती हेलोफाईट्स, हायड्रोफाईट्स, सक्युलंट्स, हेमीपॅरॅसाईट्स आणि एपिफाईट्स या प्रकारच्या आहेत. सदर अभ्यासात पर्यटन, चराई, मातीची हलवाहलव अशा जैवविविधतेला घातक मानवनिर्मित दबावांचा (कृतींचा) प्रभाव अभ्यासला गेला. तसेच ब्लॅटर (1909) यांनी केलेल्या नोंदीशी तुलना करता असे आढळून आले की त्या काळी नोंदवलेल्या प्रजातींपैकी 12 प्रजाती आता आढळत नाहीत, यात दोन संकटग्रस्त वनस्पतींचा समावेश आहे. *Adelocaryum malabaricum* (C.B.Clarke) Brand., and *Smithia purpurea* Hook याशिवाय पूर्वी नोंद न झालेल्या 129 प्रजाती आता नव्याने आढळून आल्या.

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RANWA

INTRODUCTION

The famous hill station of Panchgani in Satara District, Maharashtra, is in the Mahabaleshwar Panchgani Eco-sensitive zone declared in 2001 (ESZ notification 2001). This region includes five different plateaus and Tableland, the largest of the five, spanning over 100 acres, is a major tourist attraction and the most visited location. All these plateaus are declared conservation zones as per the development plan of the region (Pandit 2014; Urban Development Department 2013).

The Tableland witnesses the challenges due to anthropogenic pressures like exploitative tourism, trampling, grazing, fires, littering, and the introduction of alien species. The High Court has ordered the preparation of a conservation plan for the plateau in 2006, but there are data gaps. Therefore, as a step towards minimizing the data gaps, this study aims to document the herbaceous angiosperm diversity of the Tableland with a specific focus on threatened and endemic taxa.

The Panchgani Tableland has a history of botanical study dating back to the British era. This historical context provides a valuable opportunity to assess changes in floristic composition over time. This paper presents data from the plateau for a complete monsoon season and compares it with previous work by Blatter (1909).

Rock outcrops are landscapes having large proportions of exposed bedrock and are of common occurrence in the Western Ghats (Watve 2006). The environment on rock outcrops ranges from very hot & arid most of the year to waterlogged in the wet season. Along with seasonal water availability, shallow soil cover, low nutrient availability, high light, and wind intensities are also key environmental features associated with rock outcrops (Deil 2005; Porembski 2007). Organisms inhabiting such environments have developed adaptive strategies to resist, avoid, and tolerate drought through morphological and physiological traits (Bell 2012; Bechtold 2018). The habitats on the plateau include exposed rock surfaces, ephemeral pools, soil-covered areas, and disturbed soil layers.

The present study identifies angiosperm diversity on the plateau along with their habit, habitats, plant functional types, endemism, and conservation status.

MATERIALS AND METHODS

Study area

Tableland is the largest among the five plateaus around Panchgani (Satara District, Maharashtra, India), and is a natural heritage site lying within the Mahabaleshwar–Panchgani Eco-sensitive Zone. It is located between 17.903° N, 73.845° E and 17.924° N, 73.803° E at an elevation of 1,330 m (Image 1).

Geology

High-level Ferricretes (HLF) occur between 15–18.333° N, extend inland to 74° E, and are located between 800–1,400 m (Widdowson & Cox 1996). The soil formation on the outcrops is extremely slow, and the soil depth varies from a few centimeters on flat areas to about a meter in deep cracks and depressions. The soil is sandy to sandy loam in texture, highly acidic, and poor in phosphates (Jalal & Jayanthi 2018). The Tableland is covered by ferricrete patches all over and is underlined with brown saprolite (chemically weathered rock). There are a few caves, towards the western edge of the Tableland, where the duricrust has a maximum thickness of 25 m, and where the saprolite has been eroded out (Deshpande 1998).

Climatic conditions

The climate is characterized by three distinct seasons: heavy rains during monsoon (June–September) along with strong winds, drier winters (October–January) and scorching hot summers (February–May). Panchgani Tableland receives an average annual rainfall of approx. 1,700 mm (Kale 2014), resulting in relative humidity often reaching up to 90% during monsoons. Nevertheless, humidity is only 14% during the dry period, when the temperature of the exposed rock surface is very high (58 °C) in summer (Watve 2009) (Image 2).

Methods

Scientific literature related to floristic diversity of lateritic plateaus in Satara District was consulted (Blatter 1909; Watve 2013) as a reference material. Monthly visits were conducted from early monsoon to early winter (June–November) from 2022–2024. The plants observed while exploring the plateau were recorded and identified using local and regional flora (Deshpande et al. 1995). Endemism was verified using Singh et al. (2015). The plant functional types (PFT) classification for vascular plants on rocky plateaus was adopted and modified from Kulkarni et al. (2021). The status of the species was listed as per the IUCN Red List (<https://www.iucnredlist.org>).

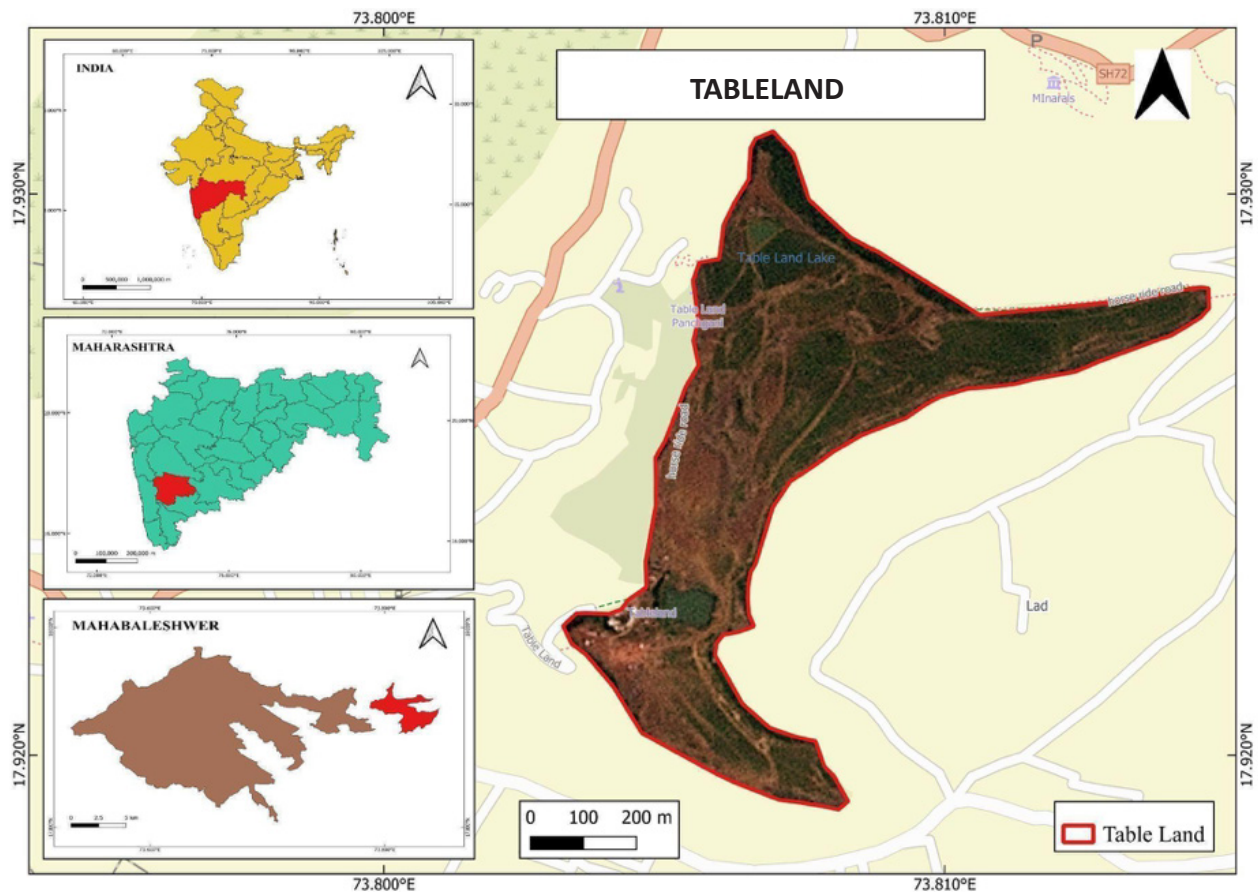


Image 1. Study Area (Panchgani Tableland, Satara Dist., Maharashtra).

RESULTS AND DISCUSSIONS

Types of microhabitats and vegetation

Plants on the plateaus are adapted to various microhabitats, and each microhabitat is unique in its edaphic properties, water availability, and species composition. The most common habitat types observed on plateaus are described below by following an established categorization for rock outcrops by Porembski & Barthlott (2000), and Jacobi et al. (2007) with some modifications (Image 3). Table 1 describes each of the habitats present along with the typical species found in that habitat. The habitats observed on the Tableland are: crust edges and cliffs, ephemeral flush vegetation, exposed rock surfaces, rock crevices & fissures, seasonal ponds, small ephemeral pools, soil-covered areas, soil-filled depressions, tree cover & tree associates, introduced compacted soil, disturbed soil layer, and soil introduced for plantation. Boulders were absent.

Floristic composition

A total of 189 species were observed on Panchgani Tableland, with 94% of them being herbs. The recorded species span 54 families. The most represented families are Poaceae (38 species), Fabaceae (16 species), Asteraceae (13 species), Acanthaceae (10 species), Commelinaceae (8 species), Orchidaceae (8 species), Lamiaceae (7 species), Lentibulariaceae (7 species), and Rubiaceae (7 species) (Figure 1).

The largest genus is *Utricularia* (7 species), followed by *Eriocaulon* (5 species). Most gregarious flowering is shown by *Utricularia arcuata* Wight, *Eriocaulon eurypleon* Körn., *Smithia hirsuta* Dalzell, *Exacum lawi* C.B. Clarke, *Linum mysorensense* B. Heyne ex Benth., and *Parasopubia delphinifolia* (L.) H.-P. Hofm. & Eb. Fisch.

Carnivorous plants observed are seven species of *Utricularia* and two species of *Drosera*. *Striga densiflora* (Benth.) Benth., *Striga gesnerioides* (Willd.) Vatke, *Rhamphicarpa fistulosa* (Hochst.) Benth., and *Parasopubia delphinifolia* (L.) H.-P. Hofm. & Eb. Fisch. are hemiparasitic plants observed on the plateau.



Image 2. Study area across seasons: Panchgani Tableland. left - August , right - December. © Sarita Gosavi.

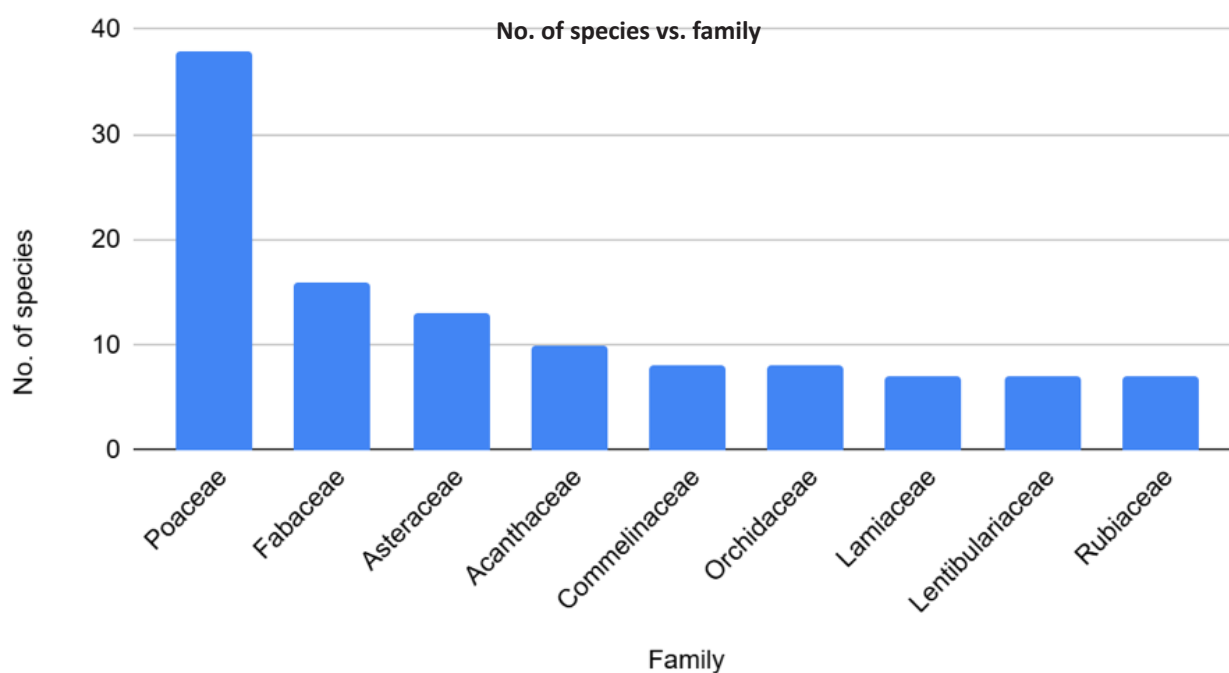


Figure 1. Most common families of angiosperms observed on the plateau- Panchgani Tableland.

Rare plants on the plateau

Between the year 2022 and 2024, 12 species of threatened plant species have been recorded. Four species are 'Endangered', viz., *Dipcadi ursulae* var. *ursulae* Blatt., *Curcuma caulina* (J.Graham) Baker, *Iphigenia stellata* Blatt., and *Isachne swaminathanii* V. Prakash &

S.K. Jain. Two species are 'Vulnerable', viz., *Eriocaulon tuberiferum* Kulkarni & Desai, *Utricularia albocaerulea* Dalzell. Six species are 'Near Threatened', viz., *Arisaema murrayi* (J.Graham) Hook., *Euphorbia khandallensis* Blatt. & Hallb., *Habenaria grandifloriformis* Blatt. & McC., *Pinda concanensis* (Dalz.) P.K.Mukh. & Constance,

Table 1. Habitats observed on Panchgani Tableland with their description and commonly observed species.

	Habitat Type	Description	Typical plants associated with the particular habitat
1	Crust Edges or Cliffs (C)	Edges of the plateau	<i>Begonia crenata</i> , <i>Pinda concanensis</i> , <i>Pimpinella adscendens</i>
2	Ephemeral Flush Vegetation (EFV)	Stretches of rock covered with a sheet of water through the rainy season with negligible soil deposition	<i>Utricularia arcuata</i> , <i>Eriocaulon sedgewickii</i> , <i>Rotala densiflora</i> , <i>Pogostemon deccanensis</i>
3	Exposed Rock Surfaces (ERS)	Flat or uneven rock surfaces exposed to direct sunlight with absence of soil. The tiny crevices accumulate soil that can host small plants	Moss, <i>Riccia</i> , <i>Indopoa paupercula</i> , <i>Eriocaulon eurypleon</i> , <i>Utricularia arcuata</i>
4	Rock Crevices (RC)	Present along the edge of the plateau, provides a unique niche	<i>Hitchenia caulina</i> , <i>Indigifera dalzellii</i> , <i>Nanotis foetida</i>
5	Seasonal Ponds (SP)	Small ponds formed only during the monsoon	<i>Marsilia</i> , <i>Scleria rugosa</i>
6	Small Ephemeral Pools (SEP)	Shallow depression inundated with water, with very little soil deposition	<i>Rotala densiflora</i> , <i>Fimbristylis bispicula</i>
7	Soil Covered Areas (SCA)	Soil thickness less than 20 cm	<i>Habenaria grandifloriformis</i> , <i>Hypoxis aurea</i> , <i>Iphigenia stellata</i> , <i>Peristylis densus</i> , <i>Euphorbia panchganiensis</i> , <i>Smithia hirsuta</i> , <i>Smithia bigemina</i> , <i>Drosera indica</i>
8	Soil Filled Depressions (SFD)	Depressions that accumulate soil and water	<i>Eriocaulon tuberiferum</i> , <i>Pogostemon deccanensis</i> , <i>Rotala densiflora</i>
9	Soil Rich Areas (SRA)	Stretches with soil thickness more than 20 cm	<i>Smithia hirsuta</i> , <i>Murdannia simplex</i>
10	Tree Cover And Tree Associates (T)	Some trees grow on the slopes of the plateau, the shady areas beneath the trees and the moist branches provide a unique habitat	Mosses, <i>Eria reticosa</i> , <i>Utricularia striatula</i>
11	Introduced Compacted Soil (ICS)	Soil introduced and compacted for making pathways shows a drastically different habitat	<i>Habenaria grandifloriformis</i> , <i>Exacum lawii</i>
12	Disturbed Soil Layer (DSL)	Soil excavated from pools is deposited on some stretches of plateau. It has invited weeds	<i>Argemone Mexicana</i> , <i>Nicandra physalodes</i> , <i>Amaranthus spinosus</i> , <i>Ageratum conyzoides</i> , <i>Alternanthera sessilis</i>
13	Soil Introduced For Plantation	High mounds of soil along the edges of lakes provide deep soil for the bigger introduced plants	<i>Ziziphus jujuba</i> , <i>Nerium oleander</i> , <i>Lantana camara</i>

Utricularia praeterita P. Taylor, and *Vigna khandalensis* (Santapau) Sundararagh. & Wadhwa) as per IUCN Red List (Table 2).

Two threatened species, *Adelocaryum malabaricum* (C.B.Clarke) Brand. (Endangered, B1ab(iii)+2ab(iii)) and *Smithia purpurea* Hook (Near Threatened, B1b(iii)+2b(iii)), observed by Blatter (1909), could not be recorded in the present exploration between 2022–2024.

Endemism

Among the species recorded (192) on Panchgani Tableland, 78 species are endemic, which constitute about 40% of the existing vegetation. Families with highest endemism are Poaceae (nine species), Fabaceae (nine species), Orchidaceae (six species), Commelinaceae (five species), Gentianaceae (five species), Apiaceae (four species), and Eriocaulaceae (four species) (Figure 2).

Plant Functional Types

The observed plants are classified into plant functional types according to Kulkarni et al. (2021). Cryptophytes have been further divided into geophytes, helophytes, and hydrophytes. Graminoids (Poaceae and

Cyperaceae) and leguminous plants have been identified separately, and other seed-bearing plants have been classified under therophytes. Analysis of life form shows that 82 plant species (42.7%) are therophytes (other than graminoids and leguminous), 43 species (22.4%) are graminoids, 24 species (12.5%) are geophytes, 16 species (8.3%) are leguminous, nine species (4.7%) are carnivorous, six species (3.1%) are helophytes, four species (2.1%) are hemiparasites, three species (1.6%) are hydrophytes, three species (1.6%) are succulents, and two species (1%) are epiphytes (Figure 3).

Seasonal succession and phenology

A chronological succession is observed among the plant communities observed on the plateau. Most of the plants start their growth with the advent of monsoon. Four major phases that can be identified are pre-monsoon, monsoon, post-monsoon, and summer. The early-monsoon phase (June–July) is characterized by the growth of grasses on the plateaus. The common grass genera are *Eragrostis*, *Glyphochloa*, *Indopoa*, *Isachne*, and *Paspalum*. Early flowering is seen in *Eria reticosa* Wight, *Habenaria grandifloriformis* Blatt. & McC., *Iphigenia stellata* Blatt., *Hypoxis aurea* Lour., and *Indigofera dalzellii* T.Cooke. The monsoon phase

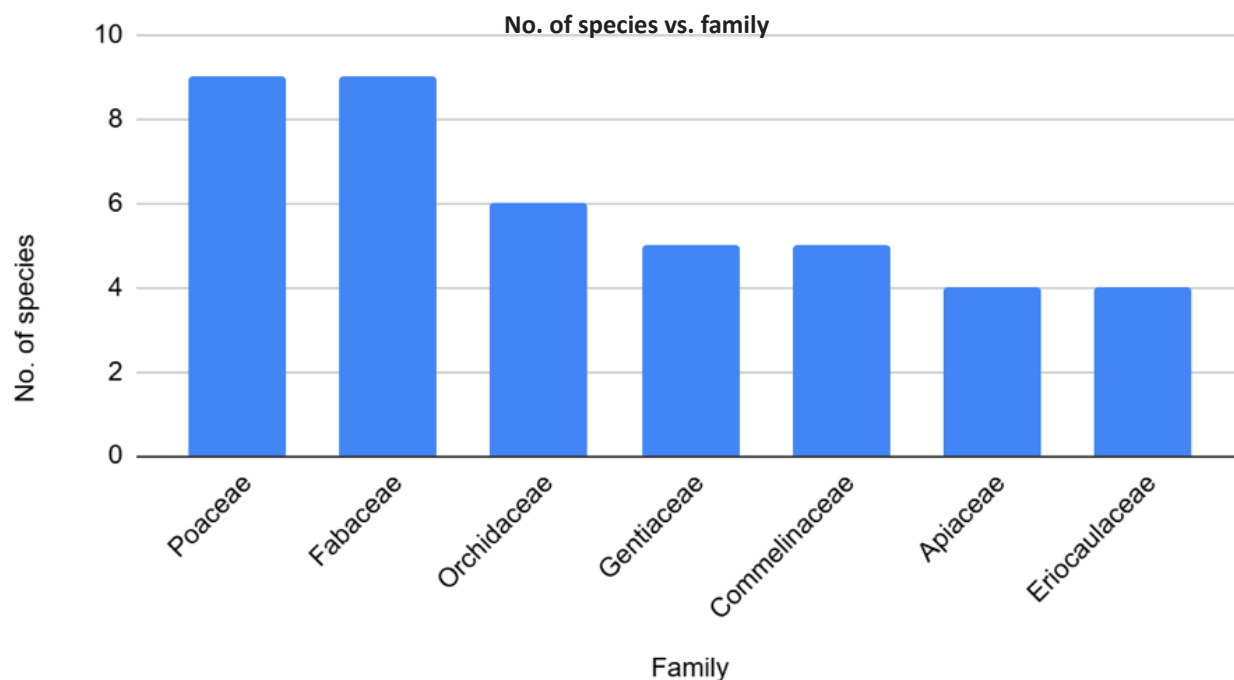


Figure 2. Endemism across topmost plant families recorded from Panchgani Tableland.

Table 2. Threatened plant species observed on the Panchgani Tableland.

	Species	IUCN status	Criteria	Population trend
1.	<i>Arisaema murrayi</i> (J.Graham) Hook.	NT	B2b(iii)	Unknown
2.	<i>Dipcadi ursulae</i> Blatt.	EN	B2ab(iii,v)	Stable
3.	<i>Eriocaulon tuberiferum</i> Kulkarni & Desai	VU	B1ab(ii,iii)+2ab(ii,iii);D2	Decreasing
4.	<i>Euphorbia khandallensis</i> Blatt. & McCann	NT	B1ab(iii)+2ab(iii)	Unknown
5.	<i>Habenaria grandifloriformis</i> Blatt. & McC.	NT	B2b(ii,iii,iv)	Decreasing
6.	<i>Hitchenia caulina</i> Baker	EN	B1ab(iii)	Unknown
7.	<i>Iphigenia stellata</i> Blatt.	EN	B2ab(i,ii,iii,v)	Decreasing
8.	<i>Isachne swaminathanii</i> V.Prakash & S.K.Jain	EN	B2ab(i,ii,iii)	Unknown
9.	<i>Pinda concanensis</i> (Dalz.) P.K.Mukh. & Constance	NT	B2b(iii)	Decreasing
10.	<i>Utricularia albocaerulea</i> Dalzell	VU	B1ab(i,ii,iii)+2ab(i,ii,iii)	Unknown
11.	<i>Utricularia praeterita</i> P.Taylor	NT	---	Unknown
12.	<i>Vigna khandalensis</i> (Santapau) Raghavan & Wadhava	NT	---	Unknown

(August–September) is characterised by mass blooming of mainly geophytes such as *Habenaria suaveolens* Dalzell, *Habenaria heyneana* Lindl., *Habenaria rariflora* A.Rich. and *Eriocaulon tuberiferum* Kulkarni & Desai. A few other abundant ephemerals that flower along with geophytes are *Smithia hirsuta* Dalzell, *Smithia bigemina* Dalz., *Utricularia arcuata* Wight, *Eriocaulon eurypleon* Körn., *Eriocaulon stellulatum* Körn., and *Striga gesnerioides* (Willd.) Vatke. In the post-monsoon phase (October–December), grasses like *Arundinella spicata* Dalzell, *Eulalia shrirangii* Salunkhe & Potdar,

Indopoa paupercula (Stapf) Bor ex Ramamoorthy, and *Ischaemum impressum* Hack enter flowering. *Rotala densiflora* (Roth) Koehne and *Swertia densifolia* (Griseb.) Kashyapa, are among few other taxa. The dry summer marks the fourth phase (January–May) during which only a few herbaceous species such as *Blumea lacera* (Burm.f.) DC., *Euphorbia khandallensis* Blatt. & Hallb., *Lepidgathis cuspidata* Nees, and *Alternanthera sessilis* (L.) DC. bloom. Few other shrubs that have been introduced to the plateau by anthropogenic activities also survive the dry summer; examples being *Lantana camara* L., *Nerium*

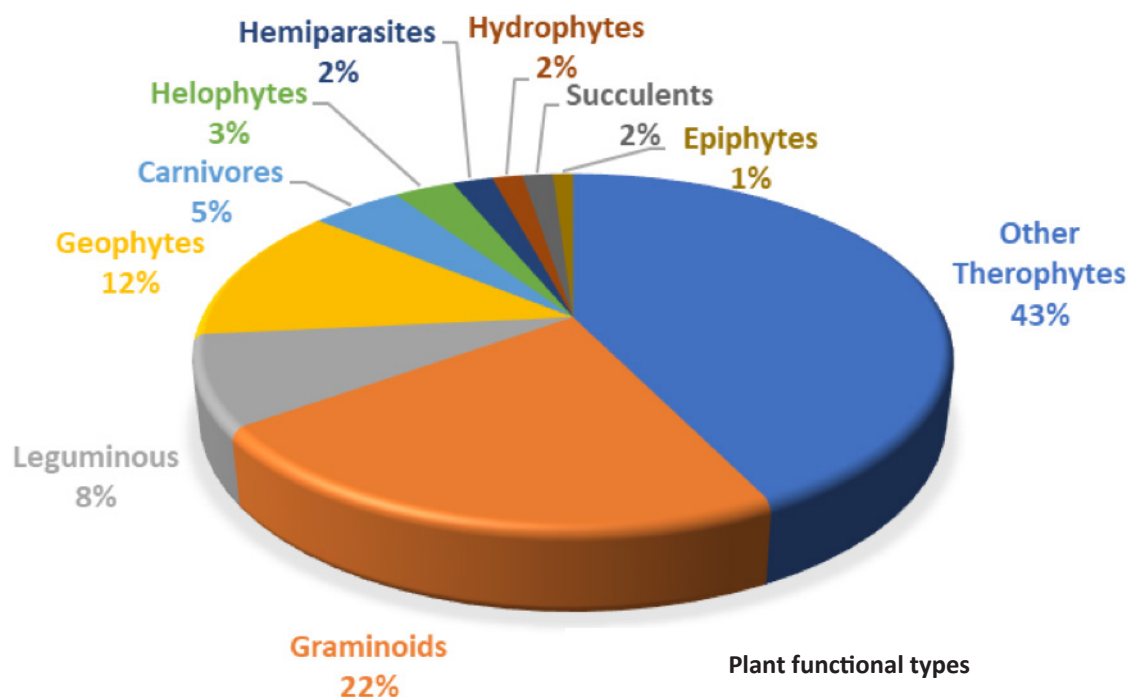


Figure 3. Plant functional types recorded from Panchgani Tableland.

Table 3. Comparison of species composition on Pachgani Tableland in 1909 and 2022–2024.

	Total no. of species	No. of species reported in 1909	No. of species reported in 2022–24
Total no. of species reported	189	62	177
Endemic	77	29	71
Rare species	15	7	12
Aliens	24	9	24

oleander L., and *Ziziphus jujuba* Mill. The phenological observations showed that approximately 93% of species complete their reproductive cycle between August and January. These annuals complete their life-cycle during the favourable edapho-climatic conditions before the onset of a long dry spell.

Adaptive traits

The plants on the plateau show certain traits that help them overcome the hot and dry summers, the light intensity, and the nutrient deficiency. A detailed account on the adaptation/ecophysiology of vascular plants of rock outcrops is provided by Kluge & Brulfert (2000). Some of the common adaptive traits that are observed on the Panchgani plateau are based on the description by Lekhak & Yadav (2012)

Table 4. Comparison of plant functional types recorded from Panchgani Tableland in 1909 and 2022–2024.

	Total no. of species	No. of species reported in 1909	No. of species reported in 2022–24
Other therophytes	82	37	74
Graminoids	43	4	43
Leguminous	15	3	14
Geophytes	26	9	26
Carnivores	8	2	8
Helophytes	6	0	6
Hemiparasites	4	2	4
Hydrophytes	3	2	1
Succulents	3	2	3
Epiphytes	2	1	2

Carnivory: The acidic soil conditions deficient in Nitrogen, Phosphorus, and Sulfur can support carnivorous plants like *Drosera* spp. and *Utricularia* spp. These species are abundant in areas with a negligible layer of soil.

Succulence: Succulent plants are known to store water in different organs which allow them to withstand the harsh climate. The typical leaf succulents on the plateau are *Cyanotis fasciculata* (B.Heyne ex Roth) Schult. & Schult.f., *Euphorbia khandallensis* Blatt. &

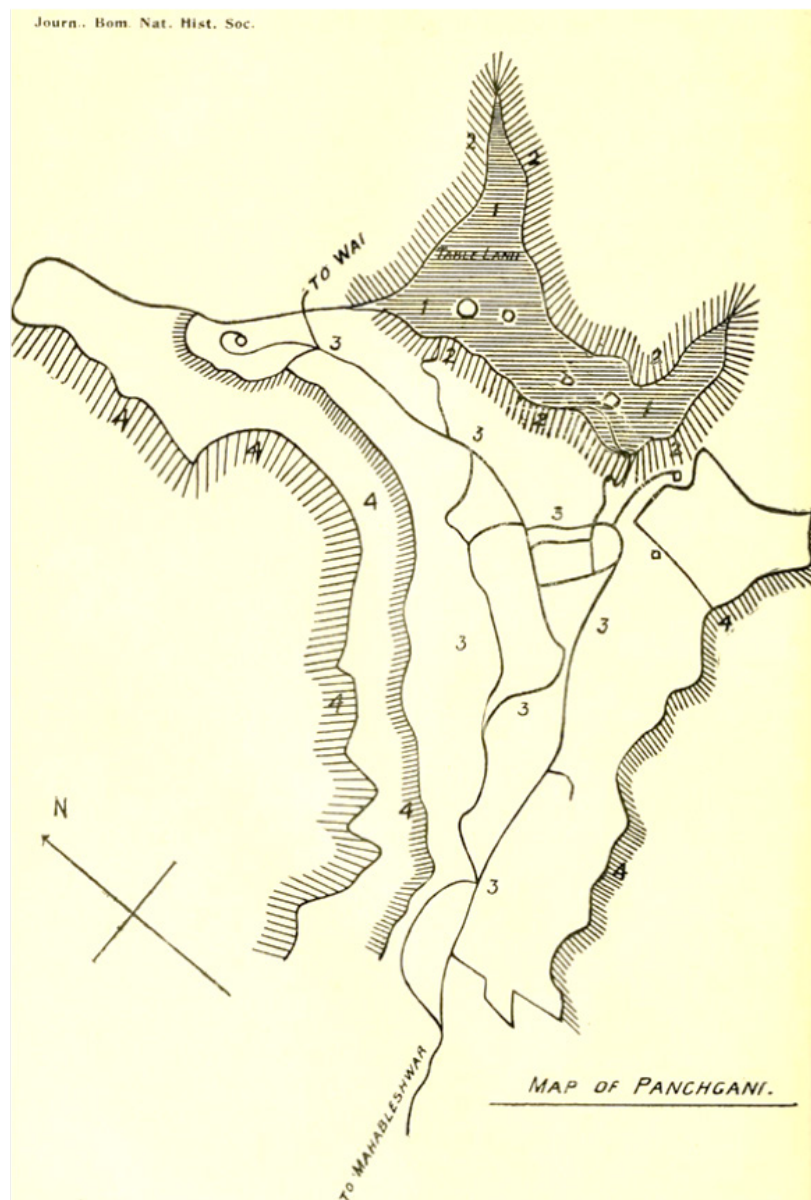


Figure 4. Old map of Panchgani showing table land and surroundings (Blatter 1909).

Hallb., and *Kalanchoe olivacea* Dalzell.

Poikilohydry: These plants can withstand dry climates by varying water content following the humidity in the environment. On the plateau, *Glyphochloa forficulata* (C.E.C.Fisch.) Clayton, *Indopoa paupercula* (Stapf) Bor ex Ramamoorthy, and *Tripogon bromoides* Roth are poikilohydrous grasses (Smrithy 2023) that can resurrect when sufficient moisture is available.

Subterranean perennating organs: These plants can survive the dry season by producing underground organs like corms, rhizomes, bulbs, and tubers. Geophytes like *Hypoxis aurea* Lour., *Dipcadi ursulae* Blatt., *Eriocaulon tuberiferum* Kulkarni & Desai, *Euphorbia khandallensis*

Blatt. & Hallb., *Flemingia nilgheriensis* (Benth. ex Baker f.) Wight ex T. Cooke, *Iphigenia* spp., *Habenaria* spp., *Peristylus* spp., and *Zingiber* spp. fall in this category.

Vegetative propagation: Some plants produce bulbs or bulbils at the leaf tips that can help them survive the dry season. *Curculigo orchioides* Gaertn. is one such species present on the plateau.

Anthropogenic influence: Panchgani Tableland, like most other plateaus in Maharashtra, is dominated by annual herbaceous vegetation, which is neglected as compared to the surrounding forest area. The plateau is also barren for a major part of the year, i.e., from December to May. This plateau has unique geological

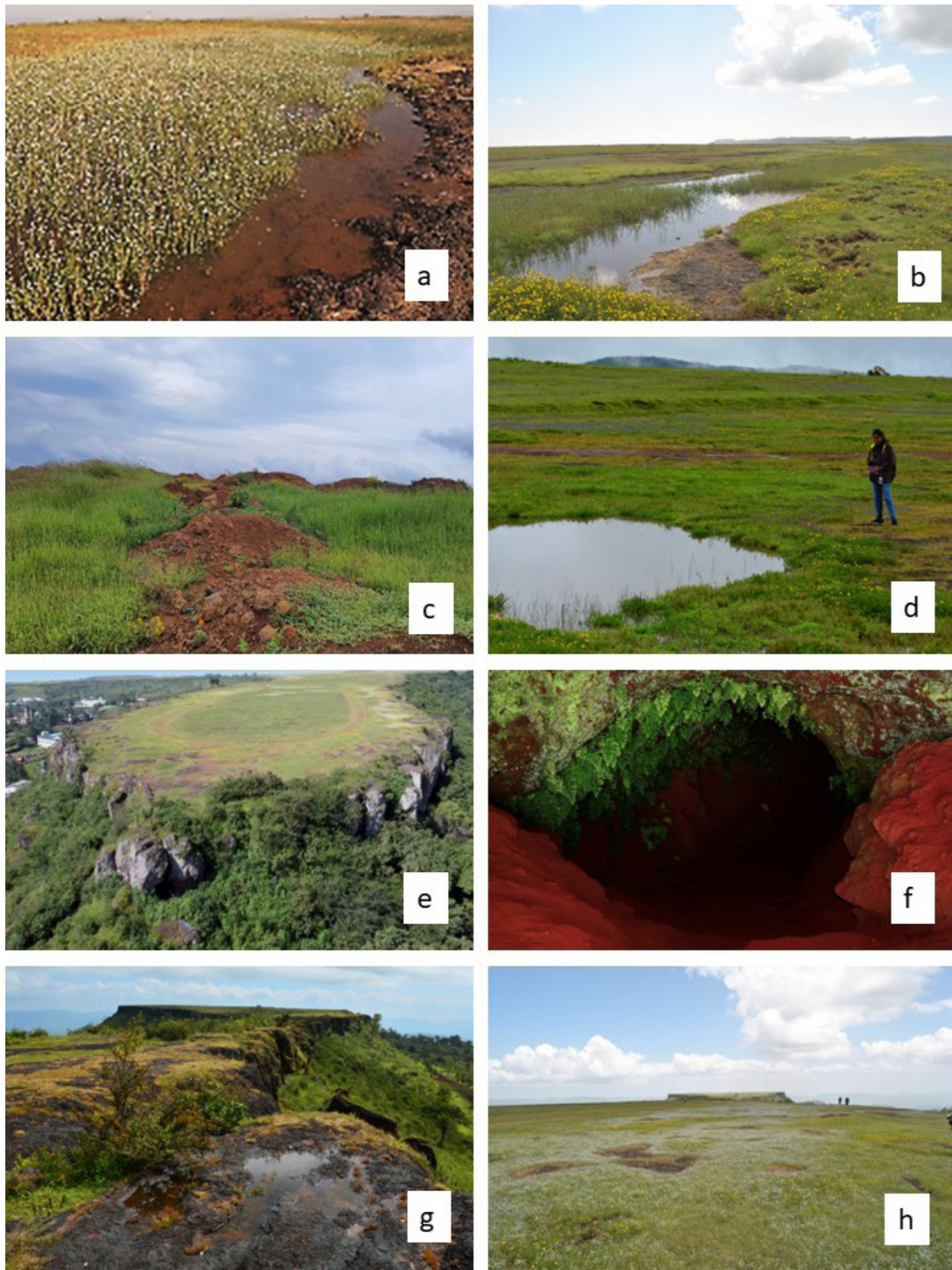


Image 3. Habitats on tableland: a—soil filled depression | b—small ephemeral pool | c—introduced soil | d—seasonal ponds | e—crust edge and cliffs | f—cave | g—exposed rock surface | h—soil covered area. © Ankur Patwardhan.

features like lateritic caves attracting tourists and the plateau is visited by nearly one lakh tourists every year throughout the year. The plateau features numerous food stalls and paved parking spaces, while continuous trampling has led to barren soil patches. Movement of horses, horse carts, and tourists across vegetated areas further exacerbates trampling and vegetation loss. Major anthropogenic disturbances apart from these are grazing by horses and cattle, fires, uprooting the herbs, garbage littering, and soil deposition by local authorities. The lakes on the plateau are also visited by locals for immersion of idols.

Aliens: Many alien species are observed on the plateau, which are not characteristic of the region. Many of them are found at sites where the soil layer is disturbed. The silt in the permanent ponds has been removed and deposited on the plateau. This has carried seeds of Marigold *Tagetes erecta*, which is offered to the idols immersed in water after the Ganesh Festival. *Ageratum conyzoides* L., *Alternanthera sessilis* (L.) DC., *Amaranthus spinosus* L., *Argemone mexicana* L., *Cardamine trichocarpa* Hochst. ex A.Rich., *Celosia argentea* L., *Polygonum plebeium* R.Br., *Verbascum coromandelianum* (Vahl) Hub. Mor., *Gynura bicolor* (Roxb.ex Willd.) DC., *Tagetes erecta* L., and *Nicandra physalodes* (L.) Gaertn. have been observed on the plateau. The aliens are slowly invading the undisturbed parts of the plateau.

Introduced plants: Some plants like *Ziziphus jujuba* Mill., *Lantana camara* L., and *Nerium oleander* L. have been introduced along the lakes for beautification.

Panchgani Tableland over the last century

The plateau was studied for flora by Blatter (1909) and the data was compared with observations in recent years (2022–2024). Blatter had identified four zones based on land use and marked the presence of species. Figure 4 shows an old map published in the paper by Blatter (1909).

Of the 192 species documented in this study, 62 were previously recorded by Blatter either on the plateau or in its vicinity. In 1909, only 31 of these species were reported as occurring directly on the plateau. The remaining species were documented from adjacent zones and were not known to inhabit the plateau at that time. The current occurrence of these species on the plateau suggests that they may have been introduced intentionally or have arrived through natural dispersal processes over the past century (Table 3). The data collection has been more exhaustive recently as is evident from the number of species recorded.

Out of the 62 species reported in 1909, 14 are not observed on the plateau in the recent past. Among these, there are three rare species *Adelocaryum malabaricum* (C.B.Clarke) Brand. (Endangered), *Adelocaryum coelestinum* (Lindl.) Brand., and *Smithia purpurea* Hook. (Near Threatened).

Comparison of plant life forms of species recorded in 1909 and 2022–24 (Table 4) sheds light on the number of species recorded by Blatter in 1909 and by the authors in 2024 along with the numbers and percentages for various life forms. It is further interpreted that the percentage of cryptophytes (geophytes, helophytes, and hydrophytes) among the recorded species has significantly increased in the recent past. Geophytes recorded by Blatter included nine species, the number has risen to 23 in present study; six helophytes are recorded now which were missing earlier; and a species of hydrophytes is missing now as the number reduces from two to one. Cryptophytes have a special advantage of surviving harsh climates with the help of subterranean perennating organs.

CONCLUSION

The ever-increasing popularity of Panchgani Tableland as a tourist place makes it susceptible to anthropogenic pressures. It has also been recently notified as a conservation zone within the Mahabaleshwar Panchgani Eco-sensitive zone. A comparison of data collected from the plateau nearly a century ago (Blatter 1909) with current data sheds light on some of the significant species that are not reported now. Notable amongst them are species like *Adelocaryum malabaricum* (Endangered), *Adelocaryum coelestinum* (Near Threatened), *Smithia purpurea* (Near Threatened), and *Nymphoides* sp. Therefore, these species should be given a key priority in restoration. The increasing percentage of cryptophytes may be correlated with edaphoclimatic data to conclude about the influence of the latter. A significant increase in the number of aliens is alarming. It is evident from observations that anthropogenic factors like the dumping of soil have largely aided the spread of aliens such as *Argemone mexicana* and *Alternanthera sessilis* that are not characteristic of lateritic plateau habitat. This study, therefore, provides a strong basis for guiding interventions on the plateau towards conservation and restoration.

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Appendix 1. Panchgani Tableland checklist of angiosperms.

Species name (Accepted as per POWO)	Synonyms	Family	Life form	Endem-icity	IUCN Red List	Recorded by Blatter (1909)	Recorded by authors in 2024
<i>Asystasia dalzelliana</i> Santapau		Acanthaceae	Therophyte	E			On Panchgani Tableland
<i>Asystasia gangetica</i> (L.) T. Anderson var. <i>gangetica</i>	<i>Asystasia violacea</i> Dalzell	Acanthaceae	Therophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Dicliptera</i> sp.		Acanthaceae	Therophyte				On Panchgani Tableland
<i>Nicotaba betonica</i> (L.) Lindau	<i>Justicia betonica</i> L.	Acanthaceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Rostellularia procumbens</i> (L.) Nees	<i>Justicia procumbens</i> L.	Acanthaceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Nicotaba trinervia</i> (Vahl) Lindau	<i>Justicia trinervia</i> Vahl	Acanthaceae	Therophyte	E		On Panchgani Tableland	On Panchgani Tableland
<i>Lepidagathis cuspidata</i> Nees		Acanthaceae	Therophyte				On Panchgani Tableland
<i>Rungia elegans</i> Dalzell & A.Gibson		Acanthaceae	Therophyte				On Panchgani Tableland
<i>Achyranthes aspera</i> L.		Amaranthaceae	Therophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Alternanthera</i> sp. (Pink)		Amaranthaceae	Therophyte				On Panchgani Tableland
<i>Alternanthera sessilis</i> (L.) DC.	<i>Alternanthera triandra</i> Lam.	Amaranthaceae	Therophyte			On Tableland cliff	On Panchgani Tableland
<i>Amaranthus spinosus</i> L.		Amaranthaceae	Therophyte				On Panchgani Tableland
<i>Celosia argentea</i> L.		Amaranthaceae	Therophyte		LC	In the vicinity of Tableland	On Panchgani Tableland
<i>Gomphrena serrata</i> L.		Amaranthaceae	Therophyte				On Panchgani Tableland
<i>Pinda concanensis</i> (Dalz.) P.K.Mukh. & Constance	<i>Heracleum concanense</i> Dalzell	Apiaceae	Geophyte	E	NT	On Tableland cliff	On Tableland cliff
<i>Pimpinella adscendens</i> Dalz.		Apiaceae	Therophyte	E			On Tableland cliff
<i>Pimpinella candolleana</i> Wight & Arn.		Apiaceae	Therophyte			On Tableland cliff	Absent
<i>Pimpinella wallichiana</i> (Miq.) Gandhi	<i>Pimpinella monoica</i> Dalzell	Apiaceae	Therophyte	E		On Tableland cliff	Absent
<i>Pimpinella tomentosa</i> Dalzell ex C.B.Clarke		Apiaceae	Therophyte	E		On Tableland cliff	Absent
<i>Nerium oleander</i> L.		Apocynaceae	Therophyte		LC		On Panchgani Tableland
<i>Arisaema leschenalutii</i> Blume		Araceae	Geophyte				On Panchgani Tableland
<i>Arisaema murrayi</i> (J.Graham) Hook.		Araceae	Geophyte	E	NT	On Tableland cliff	On Tableland cliff
<i>Dipcadi montanum</i> (Dalzell) Baker		Asparagaceae	Geophyte	E			On Panchgani Tableland
<i>Dipcadi ursulae</i> var. <i>ursulae</i> Blatt.	<i>Dipcadi ursulae</i> Blatt.	Asparagaceae	Geophyte	E	EN		On Panchgani Tableland
<i>Adenoon indicum</i> Dalzell		Asteraceae	Therophyte	E	LC	On Panchgani Tableland	Absent
<i>Ageratum conyzoides</i> L.		Asteraceae	Therophyte		LC	On Tableland cliff,3	On Panchgani Tableland
<i>Blumea lacera</i> (Burm.f.) DC.		Asteraceae	Therophyte		DD		On Panchgani Tableland
<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.		Asteraceae	Therophyte				On Panchgani Tableland
<i>Eschenbachia stricta</i> (Willd.) Raizadae	<i>Conyza stricta</i> Willd.	Asteraceae	Therophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Galinsoga parviflora</i> Cav.		Asteraceae	Therophyte				On Panchgani Tableland
<i>Gynura bicolor</i> (Roxb.ex Willd.) DC.		Asteraceae	Therophyte				On Panchgani Tableland

Species name (Accepted as per POWO)	Synonyms	Family	Life form	Endem-icity	IUCN Red List	Recorded by Blatter (1909)	Recorded by authors in 2024
<i>Gynura nitida</i> DC.		Asteraceae	Geophyte				On Panchgani Tableland
<i>Senecio bombayensis</i> Balakr.		Asteraceae	Therophyte	E			On Panchgani Tableland
<i>Synedrella nodiflora</i> (L.) Gaertn.		Asteraceae	Therophyte				On Panchgani Tableland
<i>Tagetes erecta</i> L.		Asteraceae	Therophyte				On Panchgani Tableland
<i>Tridax procumbens</i> L.		Asteraceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Impatiens balsamina</i> L.		Balsaminaceae	Therophyte				On Panchgani Tableland
<i>Impatiens dalzellii</i> Hook.f. & Thomson		Balsaminaceae	Therophyte	E		On Tableland cliff	On Panchgani Tableland
<i>Begonia crenata</i> Dryand.		Begoniaceae	Geophyte	E		On Tableland cliff	On Tableland cliff
<i>Cynoglossum zeylanicum</i> (Sw. ex Lehm.) Thunb. ex Brand	<i>Cynoglossum denticulatum</i> var. <i>zeylanicum</i> (Sw. ex Lehm) C.B.Clarke	Boraginaceae	Therophyte			On Panchgani Tableland	Absent
<i>Adelocaryum coelestinum</i> (Lindl.) Brand.	<i>Paracaryum coelestinum</i> (Lindl.) Benth. ex C.B.Clarke/ <i>Paracaryopsis coelestina</i> (Lindl.) R.R.Mill	Boraginaceae	Therophyte	E	NT	On Tableland cliff	Absent
<i>Adelocaryum malabaricum</i> (C.B.Clarke) Brand.	<i>Paracaryum malabaricum</i> C.B.Clarke / <i>Paracaryopsis malabarica</i> (C.B.Clarke) R.R.Mill	Boraginaceae	Therophyte	E	EN	On Tableland cliff	Absent
<i>Brassica</i> sp.		Brassicaceae	Therophyte				On Panchgani Tableland
<i>Cardamine trichocarpa</i> Hochst. ex A.Rich.	<i>Cardamine subumbellata</i> Hook. ex Hook.f.	Brassicaceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Wahlenbergia erecta</i> (Roth ex Schult.) Tuyn.	<i>Cephalostigma schimperii</i> Hochst. ex A.Rich.	Campanulaceae	Therophyte			On Panchgani Tableland	Absent
<i>Iphigenia pallida</i> Baker		Colchicaceae	Geophyte	E			On Panchgani Tableland
<i>Iphigenia stellata</i> Blatt.		Colchicaceae	Geophyte	E	EN		On Panchgani Tableland
<i>Murdannia simplex</i> (Vahl) Brenan	<i>Aneilema sinicum</i> Ker Gawl.	Commelinaceae	Geophyte	E	LC	On Panchgani Tableland	On Panchgani Tableland
<i>Commelina forskoolii</i> Vahl		Commelinaceae	Therophyte				On Panchgani Tableland
<i>Commelina</i> sp.		Commelinaceae	Therophyte				On Panchgani Tableland
<i>Cyanotis fasciculata</i> (B.Heyne ex Roth) Schult. & Schult.f.		Commelinaceae	Succulent	E	LC	On Tableland cliff	On Panchgani Tableland
<i>Cyanotis tuberosa</i> (Roxb.) Schult. & Schult.f.		Commelinaceae	Geophyte	E			On Panchgani Tableland
<i>Murdannia crocea</i> (Griff.) Faden		Commelinaceae	Therophyte	E			On Panchgani Tableland
<i>Murdannia lanuginosa</i> (Wall. ex C.B.Clarke) G.Brückn.		Commelinaceae	Geophyte	E	LC		On Panchgani Tableland
<i>Murdannia semiteres</i> (Dalz) Sant.		Commelinaceae	Therophyte		LC		On Panchgani Tableland
<i>Kalanchoe olivacea</i> Dalzell		Crassulaceae	Succulent	E		On Panchgani Tableland	On Tableland cliff
<i>Crotalaria</i> sp.		Crotariaceae	Therophyte				On Panchgani Tableland
<i>Cucumis</i> sp.		Cucurbitaceae	Therophyte				On Panchgani Tableland

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<i>Cyperus flavidus</i> Retz.		Cyperaceae	Graminoid		LC		On Panchgani Tableland
<i>Fimbristylis tenera</i> Schult		Cyperaceae	Graminoid				On Panchgani Tableland
<i>Bulbostylis densa</i> (Wall.) Hand.-Mazz.		Cyperaceae	Graminoid		LC		On Panchgani Tableland
<i>Fimbristylis bispicula</i> Govind		Cyperaceae	Graminoid	E			On Panchgani Tableland
<i>Scleria rugosa</i> R.Br.		Cyperaceae	Graminoid		LC		On Panchgani Tableland
<i>Drosera burmanni</i> (Vahl)		Droseraceae	Carnivores		LC		On Panchgani Tableland
<i>Drosera indica</i> L.		Droseraceae	Carnivores		LC		On Panchgani Tableland
<i>Eriocaulon odoratum</i> Dalzell		Eriocaulaceae	Therophyte	E	LC		On Panchgani Tableland
<i>Eriocaulon eurypleon</i> Körn.		Eriocaulaceae	Therophyte	E	LC		On Panchgani Tableland
<i>Eriocaulon sedgwickii</i> Fyson		Eriocaulaceae	Therophyte	E	LC		On Panchgani Tableland
<i>Eriocaulon stellulatum</i> Körn.		Eriocaulaceae	Therophyte	E	LC		On Panchgani Tableland
<i>Eriocaulon tuberiferum</i> Kulkarni & Desai		Eriocaulaceae	Helophyte	E	VU		On Panchgani Tableland
<i>Euphorbia khandallensis</i> Blatt. & Hallb.	<i>Euphorbia panchganiensis</i> Blatt. & McCann	Euphorbiaceae	Succulent/ Geophyte	E	NT		On Panchgani Tableland
<i>Desmodium belgaumensis</i> (Wight) A. Pramanik & Thoth.	<i>Alysicarpus belgaumensis</i> Wight	Fabaceae	Legume	E		On Panchgani Tableland,3	On Panchgani Tableland
<i>Alysicarpus monilifer</i> (L.) DC.	<i>Alysicarpus vaginalis</i> Hochst. ex Baker	Fabaceae	Legume				On Panchgani Tableland
<i>Alysicarpus tetragonolobus</i> Edgew.		Fabaceae	Legume				On Panchgani Tableland
<i>Desmodium rotundifolium</i> DC.		Fabaceae	Legume				On Panchgani Tableland
<i>Grona triflora</i> (L.) H.Ohashi & K.Ohashi	<i>Desmodium triflorum</i> (L.) DC.	Fabaceae	Legume				On Panchgani Tableland
<i>Flemingia nilgheriensis</i> (Benth. Ex Baker f.) Wight ex T.Cooke	<i>Flemingia nilgheriensis</i> (Baker) T.Cooke	Fabaceae	Legume/ Geophyte	E			On Panchgani Tableland
<i>Geissaspis cristata</i> var. <i>tenella</i> (Benth.) M.R.Almeida	<i>Geissaspis tenella</i> Benth.	Fabaceae	Legume	E			On Panchgani Tableland
<i>Indigofera dalzellii</i> T.Cooke		Fabaceae	Legume	E			On Panchgani Tableland
<i>Smithia bigemina</i> Dalz.	<i>Smithia agharkarii</i> Hem.	Fabaceae	Legume	E			On Panchgani Tableland
<i>Smithia hirsuta</i> Dalzell		Fabaceae	Legume	E	LC		On Panchgani Tableland
<i>Smithia purpurea</i> Hook.		Fabaceae	Legume	E	NT	On Panchgani Tableland	Absent
<i>Smithia setulosa</i> Dalzell		Fabaceae	Legume	E		On Panchgani Tableland	On Panchgani Tableland
<i>Tadehagi triquetrum</i> (L.) H.Ohashi		Fabaceae	Legume				On Panchgani Tableland
<i>Vigna khandalensis</i> (Santapau) Sundararagh. & Wadhwa		Fabaceae	Legume / Geophyte	E	NT		On Panchgani Tableland
<i>Zornia gibbosa</i> Span.		Fabaceae	Legume				On Panchgani Tableland
<i>Canscora diffusa</i> (Vahl) R.Br. ex Roem. & Schult.		Gentianaceae	Therophyte			On Tableland cliff	On Panchgani Tableland
<i>Exacum lawii</i> C.B.Clarke		Gentianaceae	Therophyte	E	LC	In the vicinity of Tableland	On Panchgani Tableland
<i>Exacum pumilum</i> Griseb.		Gentianaceae	Therophyte	E			On Panchgani Tableland

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<i>Swertia densifolia</i> (Griseb.) Kashyapa	<i>Swertia decussata</i> Nimmo ex C.B.Clarke / <i>Ophelia densifolia</i> Griseb.	Gentianaceae	Therophyte	E		On Panchgani Tableland	On Panchgani Tableland
<i>Lomatogonium minus</i> (Griseb.) Fernald	<i>Swertia minor</i> (Griseb.) Knobl. / <i>Ophelia minor</i> Griseb.	Gentianaceae	Therophyte	E		On Panchgani Tableland	On Panchgani Tableland
<i>Hydrocharita</i> sp.		Hydrocharitaceae	Hydrophyte				On Panchgani Tableland
<i>Curculigo orchoides</i> Gaertn.		Hypoxidaceae	Geophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Hypoxis aurea</i> Lour.		Hypoxidaceae	Geophyte				On Panchgani Tableland
<i>Coleus strobilifer</i> (Roxb.) A.J.Paton	<i>Anisochilus carnosus</i> (L.f.) Wall. ex Benth var. <i>glabrior</i>	Lamiaceae	Therophyte	E			On Panchgani Tableland
<i>Pogostemon stellatus</i> (Lour.) Kuntze	<i>Dysophylla stellata</i> (Lour.) Benth. ex Wall.	Lamiaceae	Therophyte	E	LC	On Panchgani Tableland	On Panchgani Tableland
<i>Isodon lophanthoides</i> (Buch.-Ham. ex D.Don) H.Hara		Lamiaceae	Therophyte				On Panchgani Tableland
<i>Leucas montana</i> (Roth) Spreng.		Lamiaceae	Therophyte	E		On Panchgani Tableland	On Panchgani Tableland
<i>Leucas stelligera</i> Wall. ex Benth.		Lamiaceae	Therophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Pogostemon deccanensis</i> (Panigr.) Press		Lamiaceae	Therophyte	E			On Panchgani Tableland
<i>Utricularia albocaerulea</i> Dalzell		Lentibulariaceae	Carnivores	E	VU	On Panchgani Tableland	On Panchgani Tableland
<i>Utricularia arcuata</i> Wight		Lentibulariaceae	Carnivores	E	LC		On Panchgani Tableland
<i>Utricularia caerulea</i> L.		Lentibulariaceae	Carnivores			On Panchgani Tableland	Absent
<i>Utricularia praeterita</i> P.Taylor		Lentibulariaceae	Carnivores	E	NT		On Panchgani Tableland
<i>Utricularia striatula</i> Sm.		Lentibulariaceae	Carnivores		LC		On Panchgani Tableland
<i>Utricularia uliginosa</i> Vahl		Lentibulariaceae	Carnivores		LC		On Panchgani Tableland
<i>Linum mysorens</i> B.Heyne ex Benth.		Linaceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Rotala belgaumensis</i> S.R. Yadav, Malpure & Chandore		Lythraceae	Helophyte	E			On Panchgani Tableland
<i>Rotala biglandulosa</i> Arun Pr. & Sardesai		Lythraceae	Helophyte				On Panchgani Tableland
<i>Rotala densiflora</i> (Roth) Koehne		Lythraceae	Helophyte		LC		On Panchgani Tableland
<i>Sida acuta</i> Burm.f.		Malvaceae	Therophyte	E		On Tableland cliff	On Panchgani Tableland
<i>Nymphoides hydrophyllum</i> (Lour.) Kuntze	<i>Limnanthemum cristatum</i> (Roxb.) Griseb.	Menyanthaceae	Hydrophyte		LC	On Panchgani Tableland	Absent
<i>Nymphoides indica</i> (L.) Kuntze	<i>Limnanthemum indicum</i> Thw.	Menyanthaceae	Hydrophyte		LC	On Panchgani Tableland	Absent
<i>Trigastrotheca pentaphylla</i> (L.)	<i>Mollugo pentaphylla</i> L.	Molluginaceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Oenothera rosea</i> L'Hér. ex Aiton		Onagraceae	Therophyte				On Panchgani Tableland
<i>Eria reticosa</i> Wight		Orchidaceae	Epiphyte	E			On Tableland cliff
<i>Habenaria grandifloriformis</i> Blatt. & McC.		Orchidaceae	Geophyte	E	NT		On Panchgani Tableland
<i>Habenaria heyneana</i> Lindl.		Orchidaceae	Geophyte	E		On Panchgani Tableland	On Panchgani Tableland
<i>Habenaria suaveolens</i> Dalzell	<i>Habenaria panchganiensis</i> Sant & Kap.	Orchidaceae	Geophyte	E		On Panchgani Tableland	On Panchgani Tableland

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<i>Habenaria rariflora</i> A.Rich.		Orchidaceae	Geophyte	E	L C		On Panchgani Tableland
<i>Peristylus densus</i> (Lindl.) Santapau & Kapadia		Orchidaceae	Geophyte	E			On Panchgani Tableland
<i>Peristylus stocksii</i> (Hook.f.) Kraenzl.		Orchidaceae	Geophyte				On Panchgani Tableland
<i>Porpax jerdoniana</i> (Wight) Rolfe	<i>Porpax lichenora</i> (Lindl.) T.Cooke	Orchidaceae	Epiphyte	E		On Panchgani Tableland	On Tableland cliff
<i>Striga densiflora</i> (Benth.) Benth.		Orobanchaceae	Hemiparasite				On Panchgani Tableland
<i>Striga gesnerioides</i> (Willd.) Vatke	<i>Striga orobanchoides</i> (R. Br.) Beth.	Orobanchaceae	Hemiparasite			On Panchgani Tableland	On Panchgani Tableland
<i>Biophytum sensitivum</i> DC.		Oxalidaceae	Therophyte				On Panchgani Tableland
<i>Oxalis corniculata</i> L.		Oxalidaceae	Geophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Argemone mexicana</i> L.		Papavaeraceae	Therophyte			In the vicinity of Tableland	On Panchgani Tableland
<i>Glossostigma diandrum</i> (L.) Kuntze		Phrymaceae	Helophyte		LC		On Panchgani Tableland
<i>Glossostigma elatinoides</i> (Benth.) Hook.f.		Phrymaceae	Helophyte				On Panchgani Tableland
<i>Arthraxon hispidus</i> (Thunb.)		Poaceae	Graminoid				On Panchgani Tableland
<i>Arthraxon raizadae</i> S.K.Jain, Hemadri & Deshp.		Poaceae	Graminoid	E			On Panchgani Tableland
<i>Arthraxon villosus</i> C.E.C.Fisch.		Poaceae	Graminoid				On Panchgani Tableland
<i>Arundinella spicata</i> Dalzell		Poaceae	Graminoid	E		In the vicinity of Tableland	On Panchgani Tableland
<i>Chloris pycnothrix</i> Trin.		Poaceae	Graminoid				On Panchgani Tableland
<i>Coelachne minuta</i> Bor.		Poaceae	Graminoid	E	LC		On Panchgani Tableland
<i>Cynodon dactylon</i> (L.) Pers.		Poaceae	Graminoid			On Panchgani Tableland	On Panchgani Tableland
<i>Dichanthium armatum</i> (Hook.f.) Blatt. & McCann		Poaceae	Graminoid				On Panchgani Tableland
<i>Dimeria ornithopoda</i> Trin.	<i>Dimeria ornithopoda</i> var. <i>megalantha</i> Bor	Poaceae	Graminoid		LC	On Panchgani Tableland	On Panchgani Tableland
<i>Dimeria</i> sp.		Poaceae	Graminoid				On Panchgani Tableland
<i>Echinochloa crus-galis</i> (L.) P.Beauv.		Poaceae	Graminoid		LC		On Panchgani Tableland
<i>Echinochloa crus-galli</i> subsp. <i>utilis</i>	<i>Echinochloa crus-galli</i> f. <i>aristata</i> (Vasinger) Morariu	Poaceae	Graminoid				On Panchgani Tableland
<i>Eleusine indica</i> (L.) Gaertn.		Poaceae	Graminoid		LC		On Panchgani Tableland
<i>Eragrostis nigra</i> Nees ex Steud.		Poaceae	Graminoid				On Panchgani Tableland
<i>Eragrostis tenella</i> (L.) P. Beauv. ex Roem. & Schult.		Poaceae	Graminoid	E			On Panchgani Tableland
<i>Eragrostis unioloides</i> (Retz.) Nees ex Steud.		Poaceae	Graminoid				On Panchgani Tableland
<i>Eulalia shrirangii</i> Salunkhe & Potdar		Poaceae	Graminoid	E			On Panchgani Tableland
<i>Pseudopogonatherum trispicatum</i> (Schult.) Ohwi	<i>Eulalia trispicata</i> (Schult.) Henrard	Poaceae	Graminoid				On Panchgani Tableland
<i>Glyphochloa forficulata</i> (C.E.C.Fisch.) Clayton		Poaceae	Graminoid	E			On Panchgani Tableland
<i>Heteropogon contortus</i> (L.) P.Beauv. ex Roem. & Schult.		Poaceae	Graminoid				On Panchgani Tableland
<i>Indopoa paupercula</i> (Stapf) Bor ex Ramamoorthy	<i>Tripogon pauperculus</i> Staph	Poaceae	Graminoid		LC		On Panchgani Tableland

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<i>Isachne elegans</i> Dalzell		Poaceae	Graminoid	E	LC		On Panchgani Tableland
<i>Isachne globosa</i> (Thunb. ex Murray) Kuntze		Poaceae	Graminoid	E	LC		On Panchgani Tableland
<i>Isachne lisboae</i> Hook.f.	<i>Isachne lisboae</i> Hook.f.	Poaceae	Graminoid	E			On Panchgani Tableland
<i>Isachne swaminathanii</i> V.Prakash & S.K.Jain		Poaceae	Graminoid		EN		On Panchgani Tableland
<i>Ischaemum impressum</i> Hack		Poaceae	Graminoid	E			On Panchgani Tableland
<i>Jansenella griffithiana</i> (C.Muell.) Bor		Poaceae	Graminoid				On Panchgani Tableland
<i>Oryza rufipogon</i> Griff.		Poaceae	Graminoid		LC		On Panchgani Tableland
<i>Panicum sumatrense</i> Roth		Poaceae	Graminoid	E	LC		On Panchgani Tableland
<i>Paspalidium</i> sp.	<i>Paspalidium</i> sp.	Poaceae	Graminoid				On Panchgani Tableland
<i>Paspalum canarae</i> (Steud.) Veldkamp	<i>Paspalum canarae</i> var. <i>fimbriatum</i> (Bor) Veldk	Poaceae	Graminoid		LC		On Panchgani Tableland
<i>Paspalum distichum</i> L.	<i>Paspalum paspalodes</i> (Michx.) Scribn.	Poaceae	Graminoid		LC		On Panchgani Tableland
<i>Paspalum scrobiculatum</i> L.		Poaceae	Graminoid		LC	In the vicinity of Tableland	On Panchgani Tableland
<i>Pseudanthistiria heteroclita</i> (Roxb.) Hook.f.		Poaceae	Graminoid				On Panchgani Tableland
<i>Setaria pumila</i> (Poir.) Roem. & Schult.		Poaceae	Graminoid				On Panchgani Tableland
<i>Sporobolus indicus</i> (L.) R.Br.		Poaceae	Graminoid		LC		On Panchgani Tableland
<i>Themeda quadrivalvis</i> (L.) Kuntze		Poaceae	Graminoid	E			On Panchgani Tableland
<i>Tripogon bromoides</i> Roth.	<i>Tripogon bromoides</i> Roem. & Schult.	Poaceae	Graminoid				On Panchgani Tableland
<i>Polygala persicariifolia</i> DC.		Polygalaceae	Therophyte	E		In the vicinity of Tableland	On Panchgani Tableland
<i>Persicaria chinensis</i> (L.) H.Gross	<i>Persicaria chinensis</i> (L.) Nakai	Polygonaceae	Therophyte				On Panchgani Tableland
<i>Persicaria nepalensis</i> (Meisn.) H. Gross	<i>Polygonum alatum</i> (Meisn.) H.Gross	Polygonaceae	Therophyte			On Tableland cliff	On Panchgani Tableland
<i>Polygonum plebeium</i> R.Br.		Polygonaceae	Therophyte		LC	On Tableland cliff	On Panchgani Tableland
<i>Anagallis arvensis</i> L.		Primulaceae	Therophyte			On Tableland cliff	On Panchgani Tableland
<i>Thalictrum dalzellii</i> Hook.		Ranunculaceae	Therophyte	E			On Panchgani Tableland
<i>Ziziphus jujuba</i> Mill.		Rhamnaceae	Therophyte		LC		On Panchgani Tableland
<i>Oldenlandia stocksii</i> Hook.f.	<i>Hedyotis stocksii</i> (Hook.f.) R.S.Rao & Hemadri	Rubiaceae	Therophyte				On Panchgani Tableland
<i>Neanotis subitilis</i> (Miq.) Govaerts ex Puneekar & Lakshmin.	<i>Neanotis foetida</i> (Dalzell) W.H.Lewis	Rubiaceae	Therophyte	E			On Panchgani Tableland
<i>Neanotis lancifolia</i> (Hook.f.) W.H.Lewis		Rubiaceae	Therophyte	E			On Panchgani Tableland
<i>Nicandra physalodes</i> (L.) Gaertn.		Rubiaceae	Therophyte				On Panchgani Tableland
<i>Spermacoce pusilla</i> Wall.		Rubiaceae	Therophyte				On Panchgani Tableland
<i>Spermadictyon suaveolens</i> Roxb.		Rubiaceae	Therophyte				On Panchgani Tableland
<i>Rhamphicarpa fistulosa</i> (Hochst.) Benth.	<i>Rhamphicarpa longiflora</i> (Arn.) Bth.	Scrophulariaceae	Hemiparasite	E	LC		On Panchgani Tableland

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<i>Parasopubia delphinifolia</i> (L.) H.-P.Hofm. & Eb.Fisch.	<i>Sopubia delphinifolia</i> (L.) G.Don	Scrophulariaceae	Hemiparasite			On Panchgani Tableland	On Panchgani Tableland
<i>Sopubia trifida</i> Buch.-Ham, ex D.Don		Scrophulariaceae	Therophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Verbascum coromandelianum</i> (Vahl) Hub.-Mor.	<i>Verbascum chinensis</i>	Scrophulariaceae	Therophyte				On Panchgani Tableland
<i>Solanum virginianum</i> L.		Solanaceae	Therophyte				On Panchgani Tableland
<i>Lantana camara</i> L.		Verbenaceae	Therophyte			On Panchgani Tableland	On Panchgani Tableland
<i>Curcuma neilgherrensis</i> Wight		Zingiberaceae	Geophyte				On Tableland cliff
<i>Curcuma caulina</i> (J.Graham) Baker	<i>Hitchenia caulina</i> (J.Graham) Baker	Zingiberaceae	Geophyte	E	EN	On Tableland cliff	On Tableland cliff



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