

# **Important Medicinal Plants Areas in Bhutan**

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# Floral Diversity

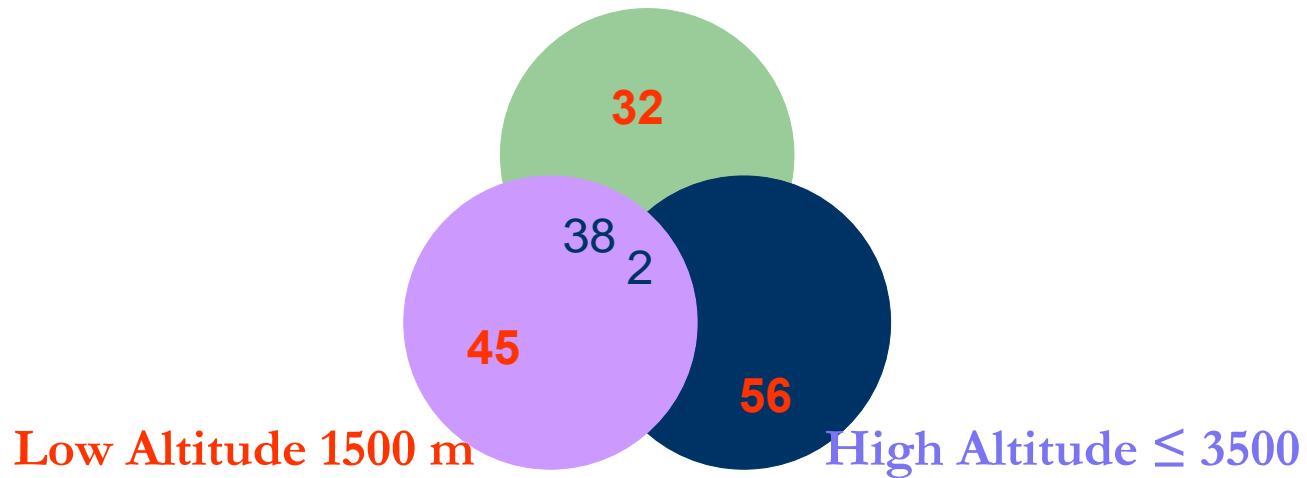
Group	Families	Genera	Species		Total Species
			Native	Introduced	
<b>Gymnosperms</b>	08	15	17	04	21
<b>Angiosperms</b>	217	1,399	4,148	242	4,390
Dicotyledons	176	1,075	2,841	178	3,019
Monocotyledons	41	324	1,307	64	1,371
<b>Total</b>	<b>225</b>	<b>1,414</b>	<b>4,165</b>	<b>246</b>	<b>4,411</b>

# Medicinal Plant Diversity

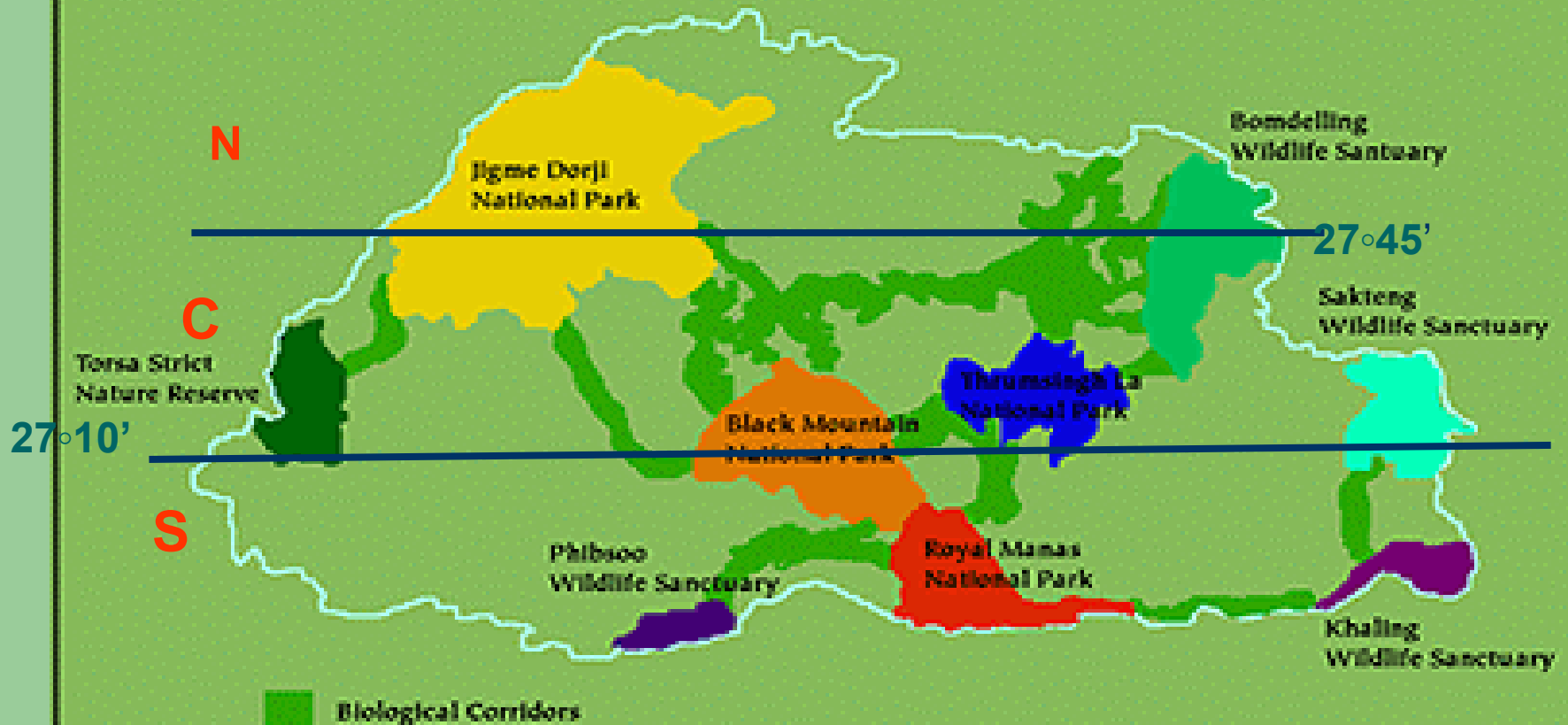
- Flora of Bhutan = 264 species
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- NITM = 222 species
  - Raling (1996) = 190 species
  - Total Species = 322 under 103 families and 219 genera
  - Four species are endemic, 4 species near endemic and 68 species are introduced
  - 7 species are considered extremely rare and 26 species are rare

# Altitudinal Distribution

Mid Altitude (1500- 3500)



## Biological Corridors linking Protected Areas of Bhutan



# Identifying important Areas of medicinal Plants in Bhutan



# Presence of threatened species

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- **Bhutan does not have globally threatened medicinal plant species**

## National endemic species with demonstrable threat

Species	Altitude range (m)	Distribution	Threat
<i>Lilium sherriffiae</i> Stearn	2740-3680	Dhur Chu & Lao	Restricted distribution



## near endemic species with demonstrable threat

Species	Altitude range (m)	Distribution	Threat
<i>Meconopsis primulina</i> Prain	3190-4600	Tremo la, Lingshi, Shinje La, Phile La, Yale La, Kangla Karchung La	Over collection
<i>Dipsacus atratus</i> Clarke	2500-3500	Bumthang, Soi & Laya	Restricted distribution

# Extremely rare species

Species	Altitude range (m)	Distribution
<i>Fritillaria delavayi</i>	4570-4880	Kang La to Ha, Yale la, Thugphu & Nelli La
<i>Neopicrorhiza scrophulariiflora</i>	3500-4880	Daga La, Mem La, Nele La
<i>Saussurea gossipiphora</i>	3950-5000	Kangla Karchu La, Lingshi La, Saga la, Waitang
<i>Aquilaria malaccensis</i>	150-1500	Samrang, Manas, Pangbang, Kheng

# Extremely rare species

Species	Altitude range (m)	Distribution
<i>Canarium sikkimensis</i>	500-1500	Deothang, Pankha, Kheng & Zhemgang
<i>Gentiana urnula</i>	4500-5000	Yale La, Nele La, Chhew La
<i>Cordyceps sinensis</i>	3500-4500	Laya, Lingshi, Bumthang, Me La

# Exceptionally Botanical Rich Areas (Northern High Altitude)

Botanical Districts	Exceptionally Botanical rich areas	PAS
Upper Mo Chu	Lingshi & Laya	Jigme Dorji National Park
Upper Pho Chu	Lunana	Jigme Dorji National Park
Upper Bumthang Chu	Pangothang, Kurmanthang & Dhur Chu	
Upper Kuru Chu	Narim Thang & Khoma Chu	Bomdeling Wildlife sanctuary
Upper Kulong Chu	Me La & Shingbe	Bomdeling Wildlife sanctuary

# Exceptionally Botanical Rich Areas (Central Mid Altitude)

Botanical Districts	Exceptionally Botanical rich areas	PAS
Ha	Chelai & Tare La	
Thimphu	Barshong, Phajoding & Naro	Jigme Dorji National Park
Trongsa	Rinchen Chu, Yotong la & Pele la	Jigme Singye Wangchuck National Park
Mongar	Ghijamchu & Dongla	Thrumshing La National Park & Bomdeling Wildlife Sanctuary
Trashigang	Balfi & Gamri Chu	Khaling Wildlife
Sakten	Orka La	Sakten Wildlife Sanctuary

# Exceptionally Botanical Rich Areas (Southern Low Altitude)

<b>Botanical Districts</b>	<b>Exceptionally Botanical rich areas</b>	<b>PAS</b>
Samchi	Torsa & Dorokha	Torsa Strict Nature Reserve
Chukha	Marichong & Gedu	
Sarbang	Phipsoo	Phipsoo wildlife Sanctuary
Gaylephu	Manas	Royal Manas National Park

# Presence of threatened habitats

Vegetation Type	Altitude range (m)	Reasons
Sub-tropical	200-1000 (-1200)	<ul style="list-style-type: none"><li>● Most of the settlements with agriculture activities</li><li>● Illegal trade due to porous border with neighbouring countries</li><li>● Commercial activities</li></ul>
Warm broad-leaved forest	1000-2000 (2300)	<ul style="list-style-type: none"><li>● Open grazing</li><li>● Timber harvesting</li></ul>
Fir forest	(3100-) 3300-3800	<ul style="list-style-type: none"><li>● Grazing</li><li>● timber harvesting</li><li>● Forest fire</li></ul>
Dry Alpine Scrub	4000-4600	<ul style="list-style-type: none"><li>● Over collections</li><li>● grazing</li></ul>

# Important Medicinal plant areas

Areas	Altitude range (m)	Vegetation type
Lingshi (N)	4000-5000	Fir-Alpine
Dhur Chu (C-N)	3000-4500	Blue-pine-Fir-Alpine
Dong La (C-N)	2700-3500	Blue-pine-Fir-Alpine
Chele La (C-N)	2500-4000	Blue-pine-Fir-Alpine
Yotong La (C-N)	3000-3500	Blue-pine-Fir-Alpine
Manas (S)	200-2000	Sub-tropical- Warm broad-leaved forest
Marichong (S)	400-2000	Sub-tropical- Warm broad-leaved forest
Torsa (C-S)	1600-3000	Subtropical-warm Broad-leaved forest
Phipsoo (S)	200-1400	subtropical
Sakden (C)	2300-4000	Warm broad-leaved forest-Alpine



# Threats

- Land conversion causing habitat destruction and fragmentation, resulting in the loss of biomes, ecosystems which depend on the habitats particularly in the sub-tropical zones of the south and the temperate zones of interior
- Overexploitation causing habitat degradation and direct attrition or loss of plant and animal species

# Threats

- Competition/replacement by domestic and/or exotic species and varieties; and
- Brown sector activities such as construction of roads, hydropower facilities, industries, urban infrastructure, mining etc.

# Threat at local level

- Poaching of endangered species that have high commercial values in international market. Easy money and high prices that are offered for these products have triggered people to take up poaching and if not controlled can threaten the viability of the species and can have devastating effect on nature

# Threat at local level

- Illegal exploitation for commercial purposes may lead to overexploitation
- Overgrazing by livestock mainly in broadleaf forest, may lead to attrition or loss of species, reduction of plant species and vegetation changes
- Unsustainable cropping practices and cropland expansion particularly deforestation and encroachment on steep slopes. This causes reduced forest areas and loss of biodiversity, and degradation of ecological services such as soil protection and erosion control.
- Forest fire which are mostly if not entirely, caused by human and which may causes large scale degradation of forests

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