

**AN ARUNACHAL PRADESH PERSPECTIVE ON THE CONSERVATION
OF RHODODENDRONS IN INDIA**

BY

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THE GENUS RHODODENDRON IN INDIA

TAXA KNOWN FROM INDIA

128 (73 spp., 24 subsp. and 26 var.) and 3 natural hybrids

TAXA KNOWN FROM ARUNACHAL PRADESH

118 (90%)

SIKKIM

MANIPUR & NAGALAND

MEGALAYA

TAMIL NADU



**SIKKIM RHODODENDRONS
R. NIVEUM, R. GRIFFITHIANUM**



SIKKIM RHODODENDRON CONSERVATION

- Kanchendzonga Biosphere Reserve 2619.92 km² (1829 to 8550 m amsl), most important for flora and fauna, ecological, geomorphologic importance and wild life potentiality in the area
- Barsey Rhododendron Sanctuary 104.00km² Singalila Range. Climate is wet and cold.
- Fambonglho Wildlife Sanctuary 51.76 25 km from Gangtok 1280 to 2652 m amsl. Black Bear, Red Panda, Civet cat and many varieties of birds and butterflies.
- Shingba Rhododendron Sanctuary 43.00km² North Sikkim Lachung Valley, known for its alpine meadow and hot spring. *R. niveum* the state tree of Sikkim endemic here.
- Maenam Wildlife Sanctuary 35.34km² Located in South Sikkim exceedingly rich in *R. griffithianum* and *R. dalhousiae* with some other species
- Kyongnpsla Alpine Sanctuary 31.00km² Located on the way of Nathula. The state tree of Sikkim (*R. niveum*) has been introduced here
- Singalila National Park 78.60km² With other rhododendrons an undergrowth of *R. arboretum*, *R. falconeri*, *R. hodgsonii* and *R. grande*.
- Neora National Park 88.00 Well known for the rhododendron, most of the rhododendrons are disappearing. The past glory can be visualized through remnants
- Sinchel Wildlife Sanctuary 39.45 Rare and endangered ground orchids and rhododendrons.

**JAPVO & SARAMATI
R. MACABEANUM & ELLIOTTII**



**TAMIL NADU,
SOUTH INDIA**



***R. ARBOREUM* SSP.
*NILAGIRICUM***



McMAHON LINE

★ Lhasa

TIBET

Migyitun

Longju

NORTH-EAST
FRONTIER AGENCY

Sadiya

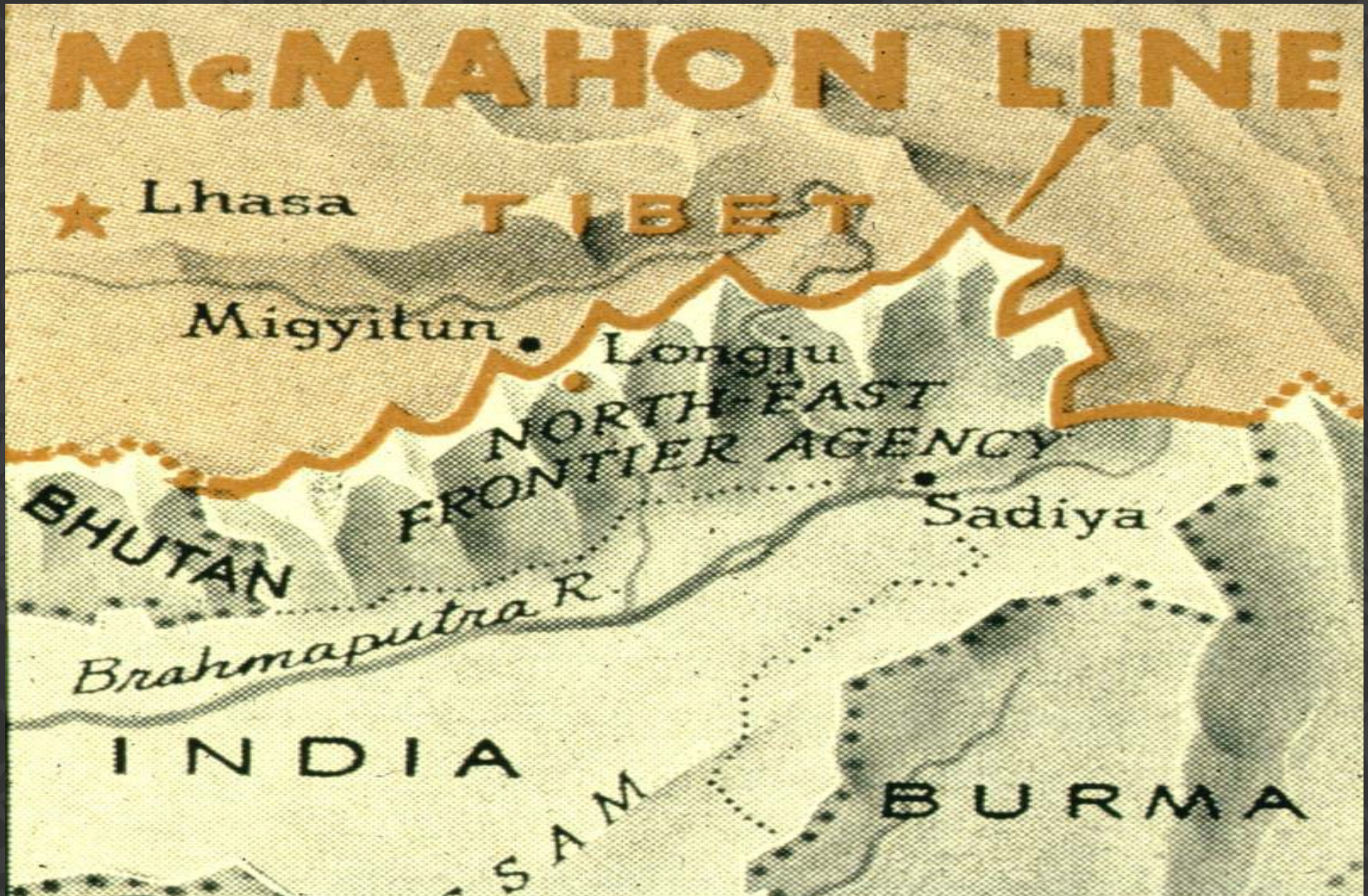
BHUTAN

Brahmaputra R.

INDIA

SAM

BURMA



Different ethnic groups of Arunachal Pradesh

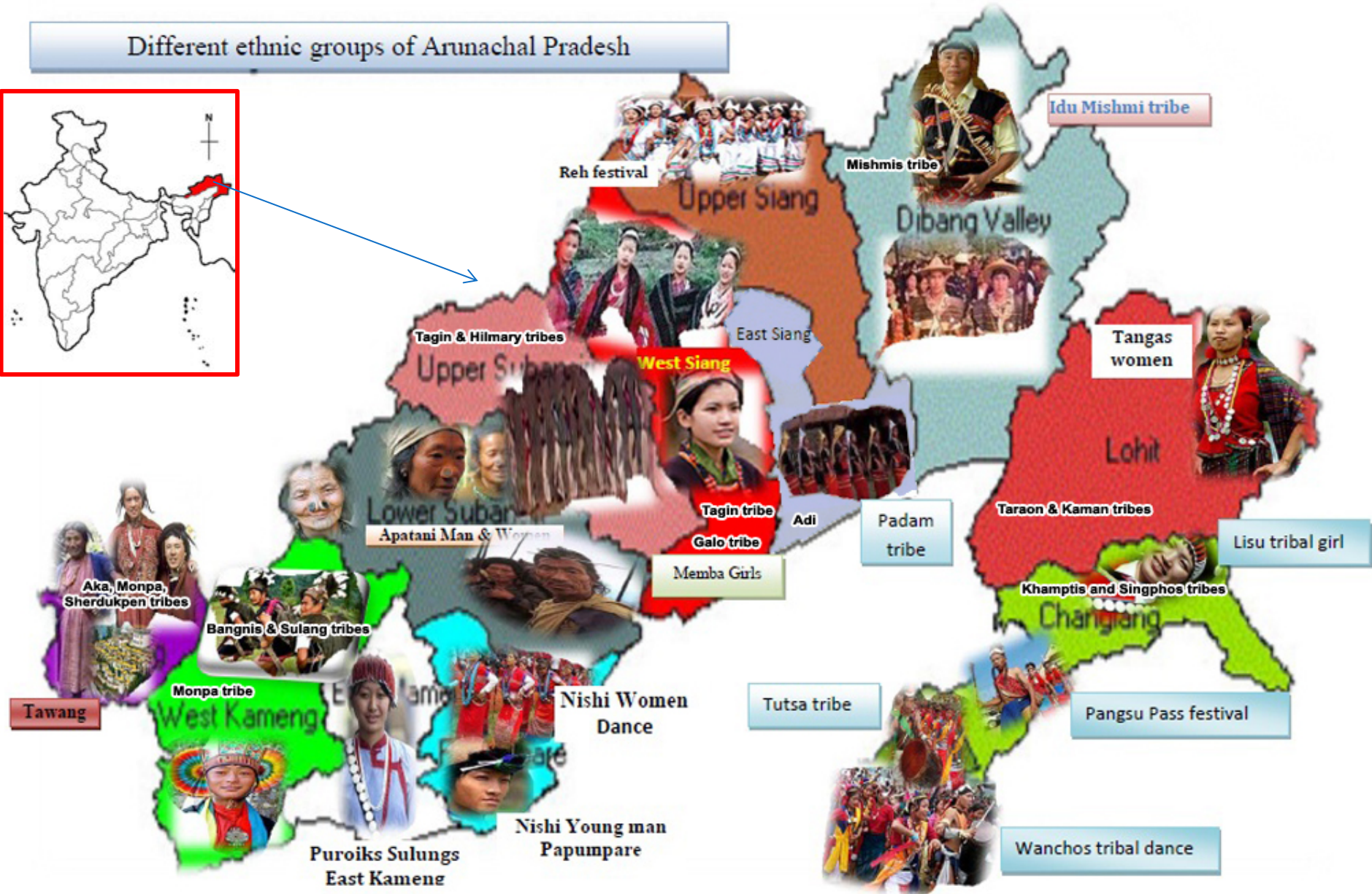


FIG. I - DIFFERENT ETHNIC GROUPS OF ARUNACHAL PRADESH

(Source: www.mapsofindia.com (Modified))

ARUNACHAL PRADESH

AREA: 83,743 SQ. KM.

ELEVATIONS: 130 TO 7090 M.

RAINFALL: 1000 MM TO 5750 MM

BOUNDARY

NORTH: CHINA

SOUTH: ASSAM & NAGALAND

EAST: MYANMAR

WEST: BHUTAN

BIODIVERSITY OF THE STATE

1. Rich biodiversity: the junction of the paleoartic, Indo-Chinese, and Indo-Malayan bio-geographic regions.
2. Very high rainfall = great biodiversity
3. The vegetation of Arunachal Pradesh
 - Tropical forests,
 - Sub-tropical forests,
 - Pine forests,
 - Temperate forests
 - Alpine regions

RHODODENDRON IN ARUNACHAL PRADESH

Locally the Monpas of West Kameng and Tawang districts call Rhododendron flowers '*Udung minto*' (red Rhododendrons particularly *R. arboreum*) and '*Tama minto*' (white flower Rhododendron).

Rhododendron is known as '*Seniyi Apu*' (red Rhododendron) and '*Gyai Apu*' (white Rhododendron) in Apatani,

'*Adi seni*' in Adi dialets.

'*Da Ma Medoc*' in Momba or Tibetan

Most of the species do not have specific name in local dialets.

EUROPEAN EXPLORERS WHO CONTRIBUTED TO THE KNOWLEDGE OF ARUNACHAL PRADESH RHODODENDRON

W. Griffith : October-December 1836 in *Mishmee Hills (Flora of Mishmee Hills)*

Thomas J. Booth : 1840-1850 in Daphla Hills

Burkill: 1924-1925 (*On Botany of the Abor Expedition*).

Kindon-Ward : 1929-1931 (*Botanical Expedition in the Mishmi Hills*)

Kingdon-Ward : 1953 (*Lohit Valley*).

N.L. Bor : **1938** (*A sketch of the vegetation of Aka Hills*).

Peter Cox and Peter Hutchinson : 1965 (*Subansiri, NEFA*)

Kenneth Cox : Upper Siang (2001) ; Subansiri-Siyom divide in West Siang (2002); Debang & Tawang, Kameng (2003), Upper Siang, Riutala pass and Kora (2005).

Peter Cox and team: Tawang, Kameng and Lower & Upper Subansiri (2004 & 2006)

Keith Rushforth and team: Delie valley in Mishmi hills (2006).

INDIAN BOTANIST

U.N. Kanjilal, the Chief Commissioner of Assam whose huge collection was responsible for the publication of the 'Flora of Assam' in five volumes (1934-1940) by P.C. Kanjilal with A. Das, C.S. Purakayastha and R.N. De of the Forest Department of Assam.

G.K. Deka of the Forest Department of Assam who later joined the Botanical Survey of India explored some parts of Kameng district mainly the foothills in 1951, while

K. Srinivasan in early 1955 surveyed along the Rupa valley in Kameng district.

R.S. Rao (1955) undertook plant exploration along the Rupa and Dirang valley and Apatani valley and surrounding areas of Subansiri district.

Contribution of Botanical Survey of India

A. Eastern Regional Centre, Botanical Survey of India, Shillong (Estd., 1955)

- Various parts of Arunachal Pradesh namely Kameng, Subansiri, Siang, Lohit, Tirap, etc., R.S. Rao (1957, 1958, 1973) and Panigrahi (1957,58) in West and Kameng and Tawang districts; R.S. Rao (1965) in West Siang FD; A.R.K. Sastry (1965) in Lower Subansiri.

B. Arunachal Pradesh Regional Centre, Itanagar (Estd., 1977)

- R.M. Dutta, A.K. Baishya, Jagadish Lal, G.D. Pal, H.J. Chowdhery, S.K. Das, G.S. Giri, etc. have surveyed some districts of Arunachal Pradesh and collected some specimens of Rhododendrons.

Dr. A.K. Pathak & Dr. M. Bhaumik

- Explored Upper Siang, Lower Dibang valley and Upper Dibang valleys districts.

Dr. A.A. Mao (2006-2012)

- Explored Tawang, West Kameng, East Kameng, Lower Subansiri, Kurung Kumey, Lower Dibang valley, Lohit, West Siang and Anjaw districts.

DR A.A. MAO PRESENT EXPLORATION

Comprehensive account of the genus in the state was carried out by the A. A. Mao from 2007-2012 while working on 'Ericaceae of Arunachal Pradesh' under the departmental Annual Action Plan.

AREAS EXPLOERD: West Kameng, Tawang, Lower and Upper Subansiri, Papume Pare, Kurung Kumey, West Siang, Lower Debang valley and Anjaw districts. Also, the author explored for the first time the alpine zone of Kurung Kumey District i.e. Vadse hills beyond Milli village of Sarli Circle for the first time in 2010 and collected over 20 species, many of which are collected for the first time by Indian botanist or new records.

ECOLOGY

RANGE OF RHODODENDRON OCCURRENCE:

ALTITUDE: 750m to 6000m

FOREST TYPES: FROM SUBTROPICAL EVERGREEN FOREST TO ALPINE

HABITAT AND LIFE FORM

22 TAXA ARE EPIPHYTIC (SOMETIMES TERRESTRIAL),

28 TAXA ARE MEDIUM SIZE TREE OR SHRUB

REST ARE SMALL SHRUBS.

PHENOLOGY

Species growing in the lower elevation (750-2500 m) start flowering from February to April and the majority of the species in the higher altitudes (3000-6000 m) flowers from end of April to June with the exception of two species (*R. kasoense* and *R. concinoides*) flowering in autumn.



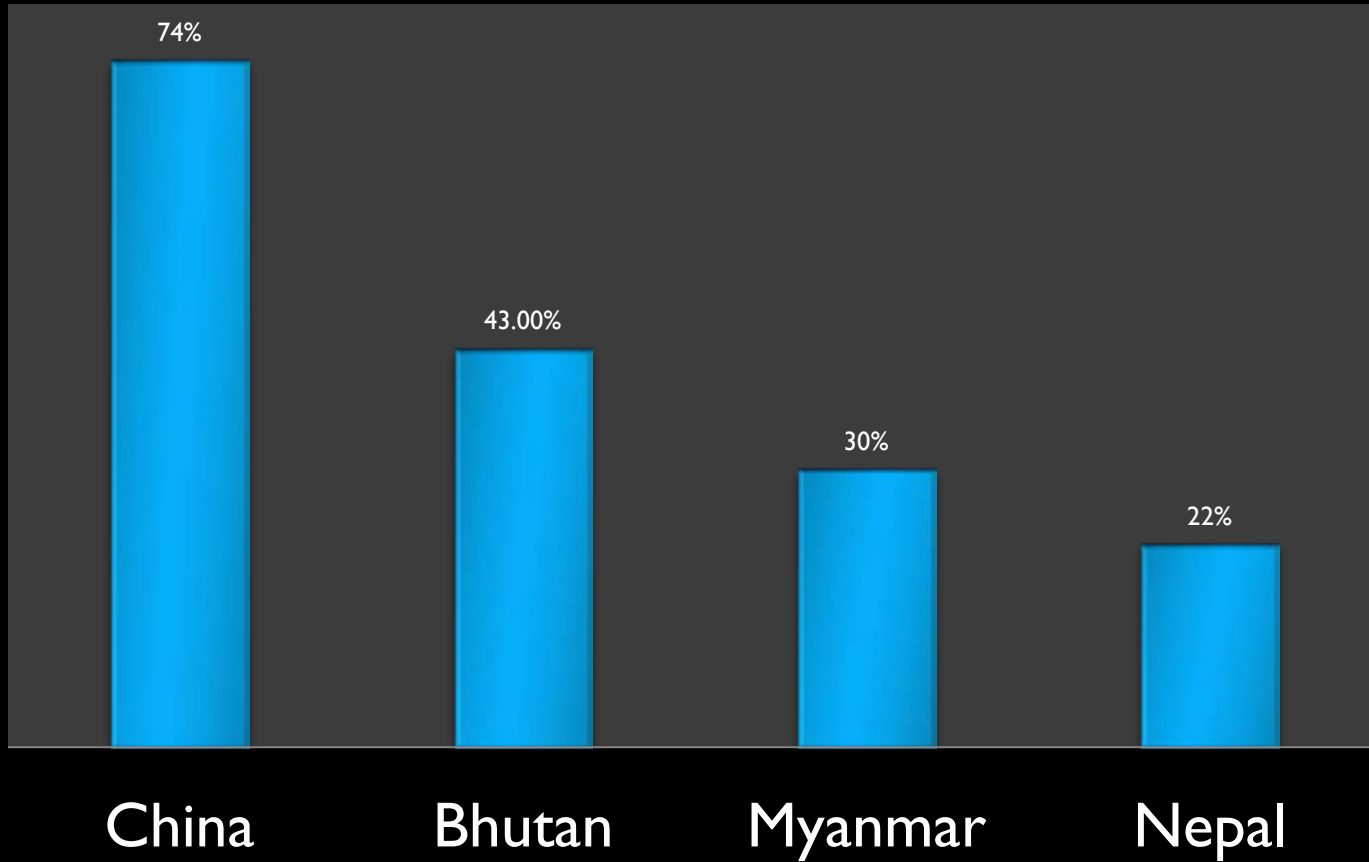
DOMINANT TAXA

R. arboreum which grows from the altitudes of 1500 m to 3500 m.

DISTRIBUTIONAL MAP OF THE GENUS RHODODENDRON IN ARUNACHAL PRADESH



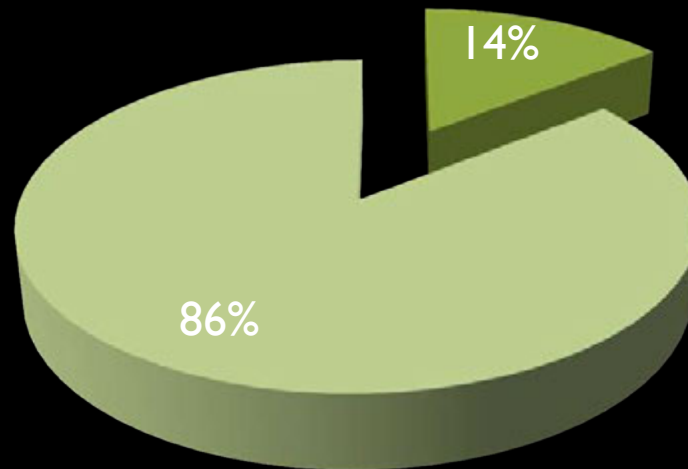
AFFINITY WITH FLORA OF NEIGHBOURING COUNTRIES



ENDEMIC TAXA

■ Endemic to Arunachal Pradesh

■ Not Endemic



TAXA ENDEMIC TO ARUNACHAL PRADESH

- *R. arunachalense*
- *R. concinnoides*
- *R. coxianum*
- *R. hookeri*
- *R. pangeanum* (newly described)
- *R. santapau*
- *R. subansiriense*
- *R. machukae* (newly described)
- *R. kasoense?*

RHODODENDRONS CONSERVED NATURALLY IN DIFFERENT PROTECTED AREAS

- Talle Wild Life sanctuary, Lower Subansiri district.
- Lal Ane hills (Community protected area), Papume Pare district
- Eagle Nest Sanctuary, East Kameng district
- Myodia hills under Mehao W.L.S., Lower Dibang valley
- Mouling National Park (West Siang, Upper Siang and East Siang districts)
- Dihang Dibang Biosphere – Lower Dibang valley
- Namdapha Biosphere Reserve, Changlang district

AREAS TO BE MARKED FOR IN SITU CONSERVATION SITES IN ARUNACHAL PRADESH

- Vadse hills – Kurung Kumey district
- Mandala to Nagajiji – West Kameng district
- Omaling lake – West Kameng district
- P.Tso Lake area, Tawang

SE LA ROAD AND MILITARY DEGREDDATION



UNEXPLORED AREAS WHERE EXPLORATION IS NEEDED

- Dapha Bum ridges – Changlang-Lohit
- High altitude areas of Namdapha Biosphere – Changlang district
- Jammu Pass – Kurung Kumey
- Mukla Pass – Kurung Kumey
- Lal Ane Hills – Papum Pare district

LAL ANE HILL, PAPUM PARE DISTRICT C.3700M.



Villagers standing in front of thick Rhododendron forest



MILI THE LAST INDIAN VILLAGE, BORDERING CHINA



KURUNG RIVER



VADSE HILL COVERED WITH SHRUBY RHODODENDRONS & DR. A.A. MAO WITH A LOCAL PORTER (C. 3700M)



MANDALA-NAGAJI AREAS RHODODENDRON FOREST, WEST KAMENG DISTRICT

R. MECHUKAE



R. TITAPURIENSE



R. PANGEANUM

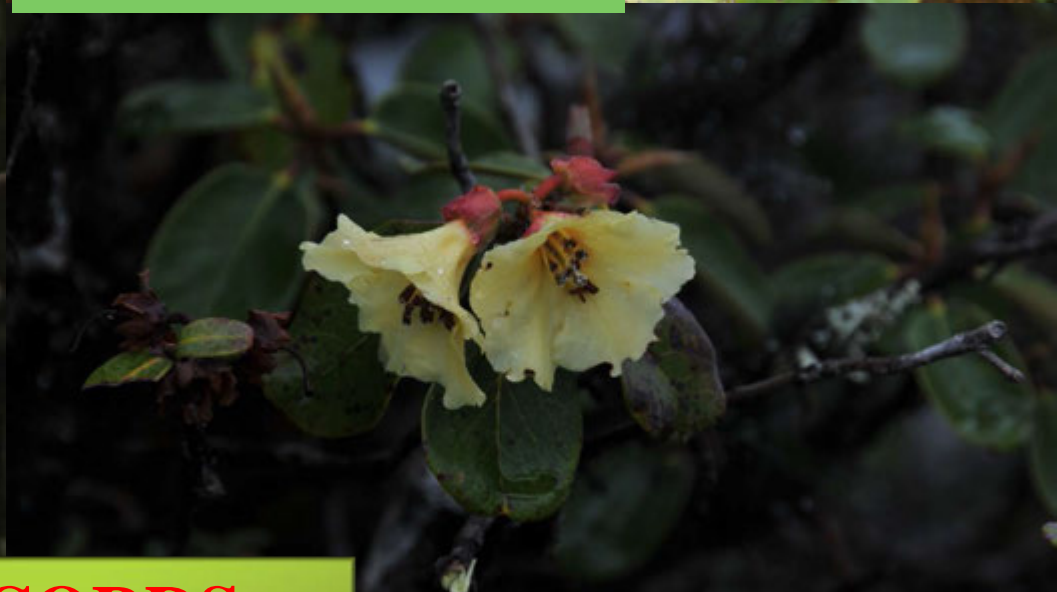
**NEW SPECIES
DISCOVERED**

R. HYLEUM



R. SANGUINUM

NEW RECORDS



R. DEKATANUM

R. THOMSONII



R. LANATUM



R. FULGENS



SPECIES FROM TAWANG DISTRICT

R. XANTHOSTEPHENUM GROWING ON HILL SLOPE



R. MEGACALYX
GROWING AS EPIPHYTE

SPECIES FROM
MYODIA HILLS



A VIEW OF TALLE VALLEY, W.L.S.



NATURAL HYBRIDS GROWING IN TALLE VALLEY



R. COXIANUM



R. NUTTALLII

SPECIES FROM LOWER SUBUNSIRI

R. KESANGIAE



R. KESANGIAE VAR. ALBA



R. HODGSONII



R. FALCONERI

BROAD LEAVED RHODODENDRON IN MANDALA – NAGAJIJI HILLS

R. ARBOREUM



R. GRANDE

**RHODODENDRON FROM
MANDALA AREA**



R. DALHOUSIAE VAR. RHABDOTUM



RHODODENDRON JUICE FACTORY, TAWANG



**THREAT TO NATURAL
HABITATS OF
RHODODENDRON**

A MIXED FOREST OF ABIES AND RHODODENDRONS AT NAGAJIJI



A photograph of a large, rugged mountain range. The upper sections are covered in snow and partially obscured by dark, jagged rock formations. The lower slopes are steep and appear to be covered in dense, dark green forest. The sky is a clear, bright blue. The overall scene is one of natural grandeur and wilderness.

THANK YOU

WEST SIANG