

List of Rare, Vulnerable and Endangered Species of Wild Flora and Fauna Endemic to Kachin State

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Introduction

Kachin State is flanked by Tibet and Yunnan of China and Assam of India. The Himalayan ranges (the Tibet-Myanmar frontier range in the north-west and the China-Myanmar frontier range in the north-east) are rich in flora and fauna and their biodiversities are among the most spectacular on Earth. Such diversity is a reflection of altitude, eco-geographical setting, climatic variation, and the fact that this state is situated in the transitional zone between tropical Indo-Malaysian flora and fauna in the south and temperate and alpine Sino-Himalayan flora and fauna in the north.

Endemic wildlife

Northernmost Myanmar belongs to the eastern edge of the Hindu Kush-Himalayas, which is a narrow strip along the western escarpment of Yunnan Province, once part of continuous land formation. This mountainous region contains flora and fauna communities of Miocene origin isolated since the last glaciation (Ward 1932, 1944, 1949).

Because of the special geological and climatic conditions of the region, its rich biodiversity is characterised by unique flora and fauna (vegetation ranges from humid tropical rainforest to temperate forest, alpine forest, alpine rangeland, and tundra).

Fauna

Animal species endemic to this region include *Budorcas taxicolor*, *Pseudois nayaur*, *Nemorhaedus cranbrooki*, *Selenarctos thibetanus* (Himalayan Black Bear), *Neofelis nebulosa* (clouded leopard), *Cervus unicolor*, *Moschus moschiferus*, *Felis temmincki*, *F. marmorata*, *Nemorhaedus goral*, *Panthera uncia* (snow leopard), *Ailurus fulgens*, *Muntiacus muntjac*, *M. putaoensis* and many others species of Caprinae* and wild ungulates. The Class I National Protected Species found in Kachin State include *Elephas maximus*, *Rhinoceros unicornis*, *Panthera tigris*, and *Panthera pardus*.

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Aquatic species

It is estimated that there are about 200 endemic species of fish. Germplasm occurring in Kachin state includes some peculiar oceanic and

mountain characteristics. The Indostomidae*, Syugnathidae*, Aulostomidae*, and Schizothoracinae families are also endemic. Freshwater turtles (Emydidae* family) and two species of common otter (*Lutra lutra* and *Lutra* sp.) occur in Malihka River, Indawgyi Lake and in many lakes of Tanine.

Butterflies

There are probably about 1,020 butterfly species in Kachin State. Unique and colourful grassland, mountain, and woodland butterflies can be seen throughout the state. Out of the 10 families of butterflies in the world, 9 families are indigenous to Kachin State; these include Satyridae, Parnassiinae, Lycaenidae, Lepidoptera (Insect family), and Nymphalidae.

Birds

Kachin State is home to most of the Sino-Himalayan avifauna. There is a large wintering population of common cranes, and one of the endangered black-necked crane species *Grus nigricolis* is found seasonally in Indawgyi Lake. More than 200 species of migratory birds and permanent waterfowl inhabit the natural wetland of Indawgyi.

Flora

About 50% of Himalayan flora are endemic in the northernmost and the north-eastern part of this region. Vertical elevation and steep valleys produce many favourable regional environments, which retain many of the pre-Tertiary-period flora.

Regarding gymnosperms, the presence of six ancient conifer families, namely Pinaceae, Taxodiaceae, Cupressaceae, Podocarpaceae, Cephalotaxaceae, and Araucariaceae are good evidence of the primitiveness of flora endemic to Kachin State. These six conifer families have fossil records extending back to the Mesozoic era. Another interesting family, which is confined to the north-eastern part of Kachin state, is the ancient Ginkgoaceae. Primitive families such as Gnetales and Cyatheaceae occur throughout the state. Regarding angiosperms, many species belong to the Palaeartic realm and plants include elements of three phyto-geographic regions, the Sino-Himalayan, Assam, and Indo-Malaysian regions. Typical temperate species of Ericaceae, Juglandaceae, Primulaceae, Betulaceae, Aceraceae, Tiliaceae, Schisandraceae, Theaceae, Caprifoliaceae, Aquilariaceae, Colchicaceae, Araliaceae, and Fagaceae are also endemic.

Tropical rain forest species of families such as Dipterocarpaceae, Combretaceae, Verbenaceae, Hypericaceae, Moraceae, Meliaceae, Myrtaceae, Lythraceae, and Caesalpiniaceae, exist in almost all parts of the state.

Three species of progenitor rice species, *Oryza granulata*, *O. rufipogon*, and *O. officinales* (ancient ancestors of today's rice (*Oryza sativa*)) thrive very well in Myitkyina Plain, Putao Plain, Hu Kaung Valley, Nan-Yin Hka Valley, Ba-maw Plain, and Mai-Hka-Tham-Lwin Division. New endemic species are still being discovered.

Some rare and endangered flora species

Euryale ferox Salisb.

Of the family Nymphaeaceae and subfamily Euryalaceae (plant family), this species is commonly known as the thorny lotus or fox nut gorgon. It is aquatic and indigenous to Kachin

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State occurring mainly in Mo-Kaung, Nan Mathi, Hopiin Mo-hnin, and Indawgyi Lake. In Myanmar, this species can only be found in Kachin State. With the population status of *Euryales* decreasing, it has almost disappeared in Mo-Kaung and only a small number of plants can be seen in Indawgyi Lake. Therefore, this species should be classified as an endangered species.

Paphiopedium wardii (var.)

This precious and rare species of Orchidaceae, classified in the CITES appendices, was first discovered by F.K. Ward in 1920 at Nogmung, Parignandin, on the Mali-Hka route and was named (after him) in 1937. Another, new, variety was discovered in April 2000 at Sone Pian Village, Putao Township.

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The two *wardii* varieties have different flowering periods. The newly discovered variety is showier and lacks marble spots on the leaves. It is very rare and can only be found in Putao Township and Sein-Lon. It should therefore be graded as a protected species

Cedrela toona

Of the family Meliaceae, this fragrant species is commonly known as Mawlamyaing mahogany. It is the main source of an essential oil that is extensively used in traditional Chinese medicine and Tibetan medicine. Due to over-harvesting, the population is on the verge of regional extinction. In 2000, the oil extracted from *Cedrela toona* was 1,760 kyats per litre.

Aquilaria agallocha

The only species of Aquilariaceae in Myanmar, it is commonly known as aloewood or eagle-wood and exists in Hukaung Valley, Mo-Hnin, and Putao Township. It is a highly valuable trade commodity and extensive illegal trading has led to over-extraction and a decrease in population.

Coniferales

The Taxodiaceae family is of great historical interest; today it shows only a relict distribution and this small amount of species is called a living fossil. They came into existence before the Tertiary period. This family includes one precious tree *Taiwania cryptomerioides*, also known as Chinese coffin wood or Japanese cedar. It can now only be found in Myanmar in the regions of Kaung-Lan-Phyu, Hphi-Zaw, and Chaung-makaw and the population is gravely threatened because of its extensive use in embalming. The seed of *Taiwania* has become evolutionally infertile and the vitality of this species is in a critical condition.

“the Taxodiaceae family is of great historical interest”

Very rare species of Pinaceae (*Pinus wallichiana* (blue pine), *Thuja occidentalis*, *Tsuaga brunoniana*, and *T. yunnanensis*) exist in Adung Valley and Mai-Hka-Thau-Lwin Division in the primeval forest just below the snowline. Other surviving and rare species, belonging to the

Podocarpaceae family, are *Podocarpus macrophyllum* and *P. wallichianus*; these occur in Saw-Law Township, Adung Valley, and Mai-Hka-Than-Lwin Division. *Cephalotaxus fortunei* and *C. mannii* are very rare species; they belong to the Cephalotaxaceae family which is comprised of ancient conifer and Pre-Tertiary flora. The existence of these plants allows the study of phytogeography.

The nearly extinct conifer, *Taxus baccata*, known as the Himalayan yew is confined to Mai-Hka-Than-Lwin Division.

Species of the Araucariaceae (monkey-puzzle tree family) and Cupressaceae families, and the Himalayan cypress, *Juniperus chinensis*, *Juniperus squamata*, and *Araucaria* spp. can be found in Saw-Law, Adung Valley and on the west flank of Mai-Hka River. These conifers are all declining in population. The relic and rare plant sources of the Tertiary period reduce year by year because of evolutionary pressure; the seeds of the conifers are nearly infertile and out of 500 seeds, only 10 can be grown. There is great concern in the people of Kachin State to protect these surviving conifers.

Ginkgo biloba

Another extremely precious species, the world-famous *Ginkgo biloba*, belongs to the Ginkgoaceae family. *Ginkgo biloba* is the only plant of its kind to exist in the world. It is a surviving plant of the early Tertiary period. The extinction of ginkgo could be avoided by artificial cultivation in China. Wild *Ginkgo biloba* is indigenous to the Chimali Pass, Mai-Hka-Than-Lwin Division. But the population is next to nothing. Possible causes of declining ginkgo numbers are given below.

- In the flowering period, the female ginkgo plants emit an unbearable smell, so they are cut down
- the slash-and-burn process of swidden cultivation causes a considerable loss of Ginkgo plants at Htaw Gaw
- according to traditional Chinese medicine, *Ginkgo biloba* has medicinal value and its kernels are edible and precious. Natural ginkgo plants are uprooted and traded through the Chinese border. Some of the villagers in Chiba Township are involved in ginkgo trading.

Camellia sinensis

Camellia sinensis belongs to Theaceae (the tea family) and is also known as the ten-thousand-flower tree. It can be seen in Chibwe Township and Saw-law Township. Indiscriminate clearing for taungya cultivation has caused the loss of valuable *Camellia* species.

Cyathea spinulosa

Cyathea spinulosa, one of the ancient gymnosperms, belongs to the Cyatheaceae (tree fern family) and is commonly known as the tree fern. Ten years ago, it was abundant and was found in Putao, Machambaw, and Non-Moung Township. Nowadays, the population has decreased and, in some forests, this species has already disappeared. It has economic value because it can be used for handicrafts. The mass production of handicraft articles can lead to loss of the species.

Paris polyphylla

This is a very rare plant and only exists in Myanmar. The popular name is seven-leaves-and-one-flower. It can only be seen in Adung Valley, Tahumdung, and Gawang. *Paris polyphalla* is a

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world-endangered species and its population has decreased hugely. It has medicinal value and is widely used in Chinese medicine. The root and stem are the main ingredients of the famous Yunnan white medicinal powder and it is also believed to be a remedy for cancer. Large amounts of the plants are collected by Lisu people and they engage in trading. This species needs protection.

Rhododendron spp

The existence of rhododendrons in the Myanmar section of the Sino-Himalayas dates back to the Mesozoic era of the Cretaceous period. This area is considered to be the birthplace of mountain rhododendrons and more than 200 species exist here. These mountain flowers are world famous and highly ornamental. But some of the species are rare, others have become endangered through neglect, and the populations of some species have decreased due to the clearing process of shifting cultivation.

“these mountain flowers are world famous and highly ornamental”

Wild rice

The rudimentary types of wild rice and their ancestors such as *Oryza officinales*, *Oryza rufipogon*, and *Oryza granulata* thrive very well. These wild rice can be found in the whole state particularly in Myitkyina Plain, Nam-Yin-Hka Plain, Bamaw Plain, Putao Plain, Hu-kaung Plain, and Mai-Hka-Tha-Lwin Division.

A trace of these progenitor varieties indicated that wild rice is indigenous to Kachin State and that Kachin State is one of the original locations for rice cultivation. More than 100 varieties of wild rice ancestor local races are cultivated by dry and wet farming in the isolated northern region.

But many local varieties of rice have become extinct in the last 10 years; because the productivity of the local crop is lower than other varieties, it is neglected or replaced by high-yielding varieties. This will cause a loss of biological wealth in the next few decades.

“many local varieties of rice have become extinct in the last 10 years”

Plant resources such as wild rice and their ancestor varieties provide precious material for breeding new varieties of rice, including improved high-yielding varieties.

Endangered fish species

The endangered species of the fish *Indostromous aradoxus** has been recorded as endemic and it can be found in stagnant parts of Indawkyi Lake and Nan-kwaye Stream near Myitkyina. This species is used as an aquarium fish and is traded live for ornamental purposes. It is a Pre-Tertiary species. Another oceanic species, *Doryichthys dunckeri**, known as the pipe fish, is indigenous to Nankwaye Stream, Nan-Taing Stream, and Indawgyi Lake. These fish are widely captured and traded live and some private companies are involved in illegal fish trading. As a result the population is gravely threatened. Another strange-looking oceanic species is *Parasphaerichthys ocellatus**, known as the trumpet fish. This species is

ideal for the aquarium and is found in Mo-kaung Township, Nan-kyawe Stream, and Indawgyi Lake. It can be traded for US \$5 per fish. Another new endemic fish, known as the Dennial Leopard fish, can be found in In-Hkaine-Bon Mountain Lake and Indawgyi Lake. These mountain fish are also captured in considerable quantities and need to be protected and conserved.

Very rare mountain fish of the Schizothoracinae family, known as iced-water fish, are endemic to the catchment mountain stream of Mai-Hka and can be found in the upper part of the Mai-Hka River.

Socioeconomic activities such as gold mining can cause barriers to fish migration. A lot of mercury and cyanide are used in gold extraction and are dumped into the headwater of the Irrawaddy. The pollution of the water with these toxins affects fish breeding habits and populations are decreasing. At the current rate, these activities could lead to an irreversible effect.

Recommendations

- Appropriate methods to maintain the aquatic diversity of Kachin State need to be designed and implemented.
- Effective protection against the large-scale, illegal fish trade needs to be implemented.
- Efforts should be made to produce a detailed document of the wild flora and fauna of Kachin State.
- Effective action should be taken for the conservation of Pre-Tertiary flora.
- Education, by participatory methods, about forest conservation and genetic source conservation should take place.

Conclusions

Kachin State is rich in flora and fauna, both new and old, and has natural conditions favourable for the growth of many plants. This natural endowment together with the existence of old and surviving plants of the Jurassic period and Tertiary period has given the region a special significance. Today, most plants of the Jurassic, Quaternary, and Tertiary period are already extinct and new ones have evolved. Only a few plants including *Cyathea spinulosa*, *Ginkgo biloba*, *Taiwania cryptomerioides*, and some conifers have survived through the ages. Such surviving plants are highly precious.

In addition, Kachin State is one of the places of origin of wild rice. Genetic sources of wild rice and their ancestors are available in almost all parts of the region and these are valuable sources for breeding new varieties of rice. These resource plants play a very important role in maintaining the ecological and economical stability and equilibrium of the state.

The preservation of conifer forests and isolation of *Ginkgo biloba* as a solitary specimen hold great potential for ecotourism. This ecosystem needs urgent, effective protection and conservation and these activities could help achieve these aims.