

Anai Mudi Moonscape,  
Eravikulam National Park,  
Kerala. At 2,695m, Anai  
Mudi, is the highest  
mountain in India south  
of the Himalayas.

SWOLLEN CLOUDS TUMBLE OVER RAIN-  
FOREST CLOAKED MOUNTAINS ONLY TO BE  
CONSUMED BY THE SEARING DRAFTS OF  
AIR RISING FROM THE EASTERN PLAINS.  
GEO FINDS OUT WHY THE WESTERN GHATS  
HAVE BEEN DESIGNATED ONE OF THE  
WORLD'S 34 'BIODIVERSITY HOTSPOTS'.

# INDIAN HIGH LAND WESTERN GHATS

By **Ian Lockwood** (text and photos)



**Dramatic scenery on the eastern slopes of Kalakad Mundanthurai Tiger Reserve, Tamil Nadu. Here on a rain-washed June morning a tree with a fresh flush of leaves symbolizes the grandeur of the Western Ghats. The dark horizon gives a hint of the nearby Gulf of Mannar.**

**N**AMED AFTER THEIR STEP-LIKE APPEARANCE IN THE NORTHERN RANGES, the Western Ghats are a collection of heterogeneous geological formations that separate the wet Malabar Coast from the arid interiors of the Indian peninsula. In their western portions overlooking the Arabian Sea, 6–8,000cm of rain falls annually, while a short distance beyond the crestline to the east there are near desert-like conditions with 900cm of rainfall. Geologically and biologically, the Western Ghats share a common ancestry with other Gondwanaland landmasses in Madagascar and southern Africa. Today, the Western Ghats form an uplifted spinal cord whose unique biodiversity shares a fascinating affinity with the island of Sri Lanka as well as the distant Himalaya. Their forested slopes play a critical role in water catchment and feed all of the major rivers of the Indian peninsula. Human population density in the peninsula is high but, until recently, the Western Ghats have been escaped the destructive activities that have ravaged the more accessible surrounding areas.

Biodiversity and its demise is one of the reasons that the Western Ghats have received significant attention in the last decade. This region accounts for 30 per cent of India's biodiversity but only 6 per cent of its land area. Ecologists emphasise the importance of biodiversity for medicine and agriculture. Fruits such as banana and mango, spices such as black pepper cinnamon and cardamom have their genetic roots here, and important wild varieties of rice, barley and finger millet and a host of medicinal plants are abundant.

A good indicator of biodiversity richness is in the number of endemic species found in a given area. Endemic species are restricted to a geographic area and are not naturally found outside of this boundary. Islands tend to be high in endemism and with the Western Ghats being metaphoric 'islands' in the Indian peninsula, it is not surprising to find that they are rich in species diversity. In fact, the various ranges making up the Western Ghats

have the highest rates of endemism in South Asia after the eastern Himalaya. This, and the fact that less than 12% of its original 180,000km<sup>2</sup> is still in its natural state, led Conservation International to designate the Western Ghats (and Sri Lanka) as one of world's 34 'biodiversity hotspots'.

**A** DOZEN KILOMETRES or so or so north of Kanyakumari are the Ashambu Hills, an area regarded as the richest biological zone of the entire Western Ghats. The hills, centred around the 1,866m peak of Agasthyamala, are home to a range of ecosystems delineated by rainfall and altitude, and include several different protected areas, notably the Kalakad Mundanthurai Tiger Reserve (KMTR). Montane and wet, evergreen rainforests cloak the high hills while deciduous, dry scrub forests dominate the lower hills in the eastern rain shadow. Aside from being home to emblematic species such as the king cobra (*Ophiophagus hannah*), tiger (*Panthera tigris*) and Great pied hornbill (*Buceros birornis*), the area is a haven for endemic primates, including the rare Lion-

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Lower falls, Courtallam, Tamil Nadu. Each year in June, bathers and pilgrims flock to the south Indian 'spa'. The streams originate in the thickly forested hills south of the Shencottah gap. Waterfalls like this symbolize the close relationship between natural forests and the life-giving water of these streams.

tailed macaque (*Macaca silenus*) and Slender loris (*Loris lydekkerianus*) as well as many reptile species. At the northern limits of the Ashambu Hills near the temple and industrial town of Tirunelveli, sits Courtallam, known locally as the 'spa of southern India.' The cool waters, fed by rain falling on the crestline of the Western Ghats, attract large numbers of pilgrims during the monsoon from June to September. The water flows east through undisturbed wet evergreen forests and cascades in a series of dramatic waterfalls on its way to the arid plains. The water eventually ends up in irrigation canals around the Tambaraparani River that flows through Tirunelveli into the Gulf of Mannar. Pilgrims bathing in the waters at Courtallam believe it to have healing properties—not a far-fetched idea considering the diverse forests that it flows through.

Just north of the Ashambus is a relatively lower range of the Ghats that contains Kerala's Periyar Tiger Reserve as well as the plantation dominated Cardamom Hills. Periyar is well known for its man-made lake (built during colonial times) and abundant populations of elephants, gaur, sambar and other animals and birds. At the outlet, the lake waters are diverted and tunnelled under the mountains so that the abundant rainfall of the hills feeds the once-dry

Cumbum Valley near the city of Madurai in Tamil Nadu. The water is a lifeline for communities living on these dusty plains though the riparian ecology along the Periyar River was dramatically altered when the dam was built, and it has caused regular water disputes between the two states.

On the western rainforest-clad slopes, Periyar's wildlife share their habitat with the gilded Sabarimala temple, an important religious site for pilgrims from across southern India. Every winter five or more million devotees of the god Ayyappa congregate in a temple sanctuary deep inside the forest sanctuary. It illustrates an important connection between religious tradition and forest protection. The Kerala forest department is successfully working with local communities to provide sustainable fuel wood and to eliminate plastic and other non-biodegradable waste. The challenge of balancing conservation

goals with religious pilgrimage remains a very delicate matter in Periyar, as elsewhere.

## THE HIGHEST MOUNTAINS IN THE WESTERN

Ghats are found where the Palni and Anaimalai Hills meet. The 'High Range', with its rugged

granite peaks, lofty plateaus, and thickly forested valleys, this is one of the least disturbed landscapes in the entire region, and includes Anai Mudi—at 2,694m the highest peak in India south of the Himalaya. Large portions of the wet, evergreen forests that filled the valleys have been converted to plantation agriculture but significant plateau areas remain untouched. Kerala's Eravikulam National Park retains the largest, best-protected *shola*/grasslands systems in the Western Ghats.

The unique *shola*/grasslands ecosystem, found above 1,700m, characterizes the higher plateaus of the High Range as well as other ranges in the southern Western Ghats. *Sholas* are small pockets of dwarfed montane evergreen forests with enormous plant, animal and bird diversity. The shy White-bellied shortwing (*Brachypteryx major major*) and Black and orange flycatcher (*Ficedula nigrorufa*) are both restricted to *sholas* of the southern Western Ghats.

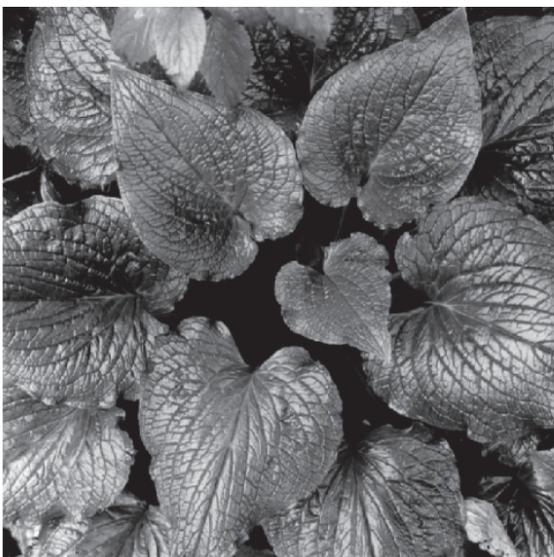
In the *shola*/grasslands system, grasslands occupy about 80 per cent of the area. Few tree species, apart from the endemic rhododendron tree (*Rhododendron arboreum nilgircum*), can withstand the frost, fire and extreme conditions found in the exposed grasslands. Eravikulam National Park was once a hunting reserve for privileged tea planters before being designated a national park in 1978 in order to protect the elusive and endangered Nilgiri tahr (*Hemitragus hylocrius*). These mountain goats are restricted to the highest reaches of the southern Western Ghats. Tahr graze



**Ayyappa devotees on their way to the Sabarimala temple walk through the dense forests of Periyar Tiger Reserve, Kerala.**



**Periyar Tiger Reserve, Kerala. A boatman ferries birdwatchers and other tourists across an arm of Periyar Lake near the tourist boat landing.**



**Above: Elphinstone Point offers breathtaking views of the Sahyadri landscapes. Here, ancient lava flows created steps that drop from the 1,400m-high Mahabaleshwar Plateau to the Konkan Coast.**

**Below: Mahabaleshwar—*Paracaryopsis colesina* is a medium-sized low shrub with cabbage-like leaves found in the high Sahyadris.**

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on the grasslands and use the steep cliffs of the terrain to escape from leopards (*Panthera pardus*) and dhole (*Cuon alpinus*).

In recent times, most of the plateau areas in the southern Ghats have been given over to commercial eucalyptus and *pinus* plantations for fuelwood. This, as well as unrestricted hunting, has resulted in a sharp decline in tahr populations. There are now around 2,000 individuals left, and it has been categorized by the IUCN as an endangered species.

and other large herbivores. The healthy prey base is partly responsible for the relatively large numbers of carnivores, amongst them dhole, leopards and tigers.

The Western Ghats wind their way through Karnataka on their way to border with Goa and Maharashtra. The hills here are relatively low (around 1,200m) but contain some of the most extensive tracts of existent natural forest. The soil is rich with iron, bauxite, manganese and other deposits, and mining has ravaged much of this area. Mining and the damming of rivers for hydroelectricity continue to jeopardize the primeval nature of the Western Ghats. The demand for electricity in urban areas has put enormous pressure on the region's relatively strong conservation laws.

The northern reaches of the Western Ghats have a very different geological origin than the southern ranges. Instead of the pre-Cambrian metamorphic schists and charnockites, the Sahyadris are relatively newer volcanic formations (60-65 million years old) linked to the surge of volcanic activity that created the massive Deccan Plateau. It is here, in the clearly defined divisions of lava, that the Western Ghats get their name. □

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**S**EPARATED BY THE PALGHAT GAP, and just north of the industrial city of Coimbatore is the large tableland of the Nilgiri Hills. The area spread over more than 6,000km<sup>2</sup> includes a broad range of habitats and includes most of the important vegetation types in the Western Ghats.

The Nilgiris are home to several indigenous groups of people, such as the Todas, who lived in the hills before the arrival of the Europeans. Although the Todas today, have been largely assimilated into the other populations of people that make the Nilgiris home, projects such as the Edhkehlynawd Botanical Refuge have initiated a revival of their pastoralist culture, pre-Dravidian language and unique architecture. The Todas have an unsurpassed knowledge of the hills and their natural history.

In the 1990s there was a move to designate the large network of protected areas in the Nilgiris areas as the 'Nilgiri Biosphere Reserve.' On the western side this includes Kerala's Silent Valley and Tamil Nadu's Mukkurthy National Parks. North of the plateau are the spectacular wildlife sanctuaries in Mudumalai, Bandipur, Nagarhole and Bhadra. Mixed deciduous forests dominated by teak (*Terminalia sp.*) and bamboo make the area north of the Nilgiris and east of the crestline a secure home for the world's largest herds of Asian elephants. There are also important populations of gaur (*Bos gaurus*), sambar (*Cervus unicolor*), chital (*Axis axis*)