Plant Formations in the Guayana Highlands BioProvince

Peter Martin Rhind

Guayana Highlands Montane Forest
Ranging at altitudes from about 500 - 3000 m these forests occur on a variety of mountain systems from the conspicuous high tepuis to extensive granitic ranges and low massifs. In the Gran Sahana uplands, which include the spectacular highlands of the eastern tepui chain (Roraima - Ñu), there is a fascinating sequence of altitudinal forest types, but even forests at given altitudes can vary from place to place. On many of the slopes surrounding the tepuis there is often a high frequency of orographic mist creating conditions for cloud forest formation from about 1400 m upwards. Here the typical trees include endemic species like Endlicheria nilssonii (Lauraceae), Moronobea pitaritepuiana (Clusiaceae), Platycarpum rugosum (Rubiaceae) and Sterigmapetalum guianense (Rhizophoraceae). On peat at slightly higher elevations, roughly between 1600-2000 m up to where the slopes reach the vertical cliffs of the tepuis, the near endemic Bonnetia (Theaceae) becomes the main cloud forest genus with endemic species such as Bonnetia steyermarkii and B. tepuiensis predominating, although at the base other species, such as the endemic Stenopadus chimantensis (Asteraceae), become more prolific. Other important trees include the endemic Magnolia pitaritepuiana (Magnoliaceae). At the highest altitudes the trees become stunted producing elfin forest, and typical of cloud forests all of the tree trunks and branches are covered in lichens, bryophytes, ferns and other epiphytes. The under story is less typical, however, being dominated in places by giant endemic rosette herbs such as Brocchinia tatei (Bromeliaceae), Didymiandrum stellatum (Cyperaceae) and Orectanthe pitaritepuiana (Xyridaceae). On the upper slopes of Cerro Duida tepui the main trees are again mainly endemic taxa such as Neotatea longifolia (Clusiaceae), Tyleria floribunda and T. spathulata (Ochnaceae). The ground flora here includes many large endemic herbs like Saxofridericia duidae, Stegolepis grandis (Rapateaceae) and species of the near endemic genus Everardia (Cyperaceae). Along the rivers and creeks the vegetation is typified by the endemic Archytaea multiflora (Theaceae) and Gleasonia duidana (Rubiaceae). A few scattered bits of forest can also be found in depressions on the summit of this tepui. The dominant trees unsurprisingly include various endemics such as Daphnopsis steyermarkii (Thymelaeaceae), Podocarpus roraimae (Podocarpaceae) and Psychotria jauaensis (Rubiaceae).

Guayana Highlands Shrublands
In the BioProvince shrubby growth forms have attained an unparalleled degree of physiognomic and floristic diversity. On the extensive plateaus that surround the Auyan-tepur, for example, there is an impressive mixture of lowland and upland species from about 400 m upwards. Among the dominants are various endemic species such as Blepharandra fimbriata (Malpighiaceae), Bonnetia sessilis (Theaceae), Humiria balsamifera (Humiriaceae), and Platycarpum rhododactylum (Rubiaceae). The phylogeographically interesting endemic Pakaraimaea dipterocarpaceae (Diperocarpaceae) also occurs here as a small solitary shrub, but elsewhere it grows as tall gregarious trees. In the Gran Sabana another type of upland scrub occurs at elevations of between 800 and 1500 m. Its density and height varies according to substrate, but the main species typically include the endemic Bonyunia minor (Loganiaceae), Cyrillopsis micrantha, Ochthocosmus roraimae (Ixonanthaceae), Euphronia guianensis (Euphorbiaceae), Gongylolepis benthamiana (Asteraceae) and Notopora schomburgkii (Ericaceae). Moving on to the summit of Cerro Guaiquinima, a tall very diverse shrubland has developed with interesting endemic elements like Bonnetia lanceifolia (Theaceae), Stenopadus colveei and Stomatochaeta cylindrica (Asteraceae). At higher elevations on
the summit of Auyán-tepui in the Rio Caroni Basin a relatively homogenous stand of tall scrub up to 3 m occurs at elevations up to 2400 m. Here endemic taxa such as *Tepuianthus auyantepuiensis* (Tepuianthaceae) and *Blepharandra hypoleuca* (Malpighiaceae), species of the endemic genera *Maguireothamnus* and *Pagameopsis* (Rubiaceae) and the near endemic genus *Macairea* (Melastomataceae) predominate, but plants with stem rosettes, such as the endemic *Achnopogon steyemarkii* (Asteraceae) become much less frequent. In the same area, the huge, fragmented Chimantá massif probably supports the greatest variety of shrubby species in the Pantepeui Province. One type, a tall, paramoid scrub on peat is dominated by species of the endemic genus *Chimantaea* (Asteraceae), especially *Chimantaea mirabilis*. This spectacular shrubland has many similarities with the páramo shrublands of the Andes. The cauliflorous growth form of *Chamantaea* can also be seen in the Andean genus *Espeletia* and provides a striking example of convergent evolution. Another scrub type is dominated by the endemic *Adenanthe bicarpellata* (Ochnaceae), *Bonnetia multinervia* (Theaceae) and *Mallophyton chimantense* (Melastomataceae). On the summit plateaus of Jaua Sarisariñama massif dense, species-rich shrublands can be found around the mountain’s large sinkholes (simas). Here the characteristic endemic species include *Bonnetia jauaensis* (Theaceae), *Celianella montana* (Euphorbiaceae) and *Tepuianthus sarisarinamensis* (Tepuianthaceae). On the nearby, but higher summit of Cerro Jaua the shrublands share many species, but physiognomically they are quite different mainly due to the predominance of *Bonnetia jauaensis* (Theaceae), and these are considered to be true Pantepeui (high-tepui) shrublands. Other codominants include various endemics like *Gongylolopis jauaensis*, *Stenopadus jauaensis* (Asteraceae), *Maguireothamnus jauaensis* (Rubiaceae) and *Tyleria breweri* (Ochnaceae). On peat, however, dense, almost monospecific stands of the endemic *Archytaea multiflora* (Theaceae) occur in isolated patches.

**Guayana Highlands Upland ‘Meadows’**

Meadow is used here as a collective term for any extensive stands of herbaceous vegetation, and can be broadly divided into gramineous meadows, dominated by grasses and/or sedges, and nongramineous meadows, dominated by other herbs or forbs. The former can be further subdivided into savannas (*sabanas*) and montane grasslands (*praderas*), while the latter comprises four types: broad-leaved meadows, tubiform meadows, rosette meadows and fruticose meadows. Broad-leaved meadows are mainly dominated by various species of Rapataceae; tubiform meadows are dominated by various tube forming herbs of the Bromeliaceae and Sarreceniaceae; rosette herbs of the Eriocaulaceae and Xyridaceae dominate rosette meadows, and fruticose meadows comprise a mixture of herbs and dwarf shrub and represent types of heathland. Montane grasslands are rare in this BioProvince and tend to be confined to periodically waterlogged areas. Some of the best examples are found on Auyán-tepui, the Chimantá massif, Cerro Marahuaka and Sierra de maigulida. These tend to be dominated by the endemic tussock grass *Cortaderia roraimensis* (Poaceae), which has Andean affinity, together with various other gramineous species such as the endemic sedge *Rhynchocladium steyermarkii* (Cyperaceae). In the upland valleys grass of the genus *Axonopus* becomes more conspicuous accompanied by the endemic rosette plant *Orectanthe sceptrum* (Xyridaceae). On the rocky, open, windswept plateaus of Ilú-Tramen, Kukenán, Roraima and Yuruani tepuis rosette meadows predominated populated by plants of the endemic genera *Conellia* (Bromeliaceae), especially *Conellia angustae*, *C. cariciplola* and *C. quelchii*, and *Rondonanthus* (Eriocaulaceae). Down on the lower slopes of Karaurí-tepui and Wadakapiapué-tepui the rosette meadows are dominated by large colonies of the endemic *Brocchinia tatei* (Bromeliaceae), while other species include the endemic South American pitcher plant *Heliamphora heterodoxa* (Sarraceniaceae). At lower altitude
meadows just two species of Rapateaceae (of the endemic genus *Schoenocephalium*) form important floristic elements, while in the uplands rapateaceous taxa have attained a much higher degree of differentiation with several endemic genera recognized including *Amphyphyllum*, *Kunhardtia*, *Marahuacaea*, *Phelpsiella* and *Stegolepis*. On the spectacular summit of Uei-tepui, the upland vegetation differs markedly from all other eastern tepuis in having stands of broad-leaved meadow, mostly composed of the endemic *Stegolepis guianensis* (Rapateaceae) interspersed with rich montane grasslands dominated by the *Axonopus caulescens* and *Panicum chnoodes* (Poaceae). Extensive broad-leaved meadows are also found on the playeau of Gran Sabana. The dominant plants here include the endemic *Stegolepis angustae* and *S. ptaritepuiensis* (Rapateaceae), which form dense colonies up to 1.5 m tall. After the start of the rainy season, their bright yellow flowers provide an eye-catching display. Other associated endemic herbs are *Abolboda macrostachya* (Xyridaceae), *Brocchinia reducta* (Bromeliaceae), *Lagenocarpus guianensis* (Cyperaceae), *Nietneria paniculata* (Liliaceae) and *Trimezia fosteriana* (Iridaceae), while some of the more interesting endemic dwarf shrubs include *Chalepophyllum guianense* (Rubiaceae), *Clusia pusilla* and *Poecilandra pumila* (Ochnaceae). An example of a tubiform meadow can be seen on the summit plateau of Cerro Duida where irregular stands dominated by the endemic *Brocchinia hechtioides* (Bromeliaceae) occur in common association with the giant, endemic pitcher plant *Heliamphora tatei* (Sarraceniaceae) which can grow to a heights of 1.5 m. Other common endemics here include *Amphiphyllum rigidum* (Rapateaceae).

Further information required.

References


