**参考译文：**

山上树带界线的植被

The transition from forest to treeless tundra on a mountain slope is often a dramatic one. Within a vertical distance of just a few tens of meters, trees disappear as a life-form and are replaced by low shrubs, herbs, and grasses. This rapid zone of transition is called the upper timberline or tree line. In many semiarid areas there is also a lower timberline where the forest passes into steppe or desert at its lower edge, usually because of a lack of moisture.

通常从山坡上的森林到没有树的苔原是一种非常戏剧化的转变。在一个垂直距离只有几十米的地方，树木这种生命形式就消失了，取而代之的是低矮的灌木、药草和牧草。这种急速转变的区域被称为上行树带界线或林木线。在许多干旱的地区存在着下行树带界线，在这里由于缺乏水分森林变成干草原，甚至在最下端会出现沙漠。

The upper timberline, like the snow line, is highest in the tropics and lowest in the Polar Regions. It ranges from sea level in the Polar Regions to 4,500 meters in the dry subtropics and 3,500-4,500 meters in the moist tropics. Timberline trees are normally evergreens, suggesting that these have some advantage over deciduous trees (those that lose their leaves) in the extreme environments of the upper timberline. There are some areas, however, where broadleaf deciduous trees form the timberline. Species of birch, for example, may occur at the timberline in parts of the Himalayas.

上行树带界线，比如雪线，在热带最高在极地最低。从极地地区的海平面到干燥亚热带的海拔4500米处以及潮湿热带地区的3500米至4500米处都有上行树带界线。树带界线内通常是常绿树木，他们和处于上行树带界线处极端恶劣环境中生长的落叶树木相比，具有一定的优势。然而，在部分地区也有由落叶阔叶林组成的树带界线。例如，在喜马拉雅的部分地区，桦树就在树带界线上。

At the upper timberline the trees begin to become twisted and deformed. This is particularly true for trees in the middle and upper latitudes, which tend to attain greater heights on ridges, whereas in the tropics the trees reach their greater heights in the valleys. This is because middle- and upper- latitude timberlines are strongly influenced by the duration and depth of the snow cover. As the snow is deeper and lasts longer in the valleys, trees tend to attain greater heights on the ridges, even though they are more exposed to high-velocity winds and poor, thin soils there. In the tropics, the valleys appear to be more favorable because they are less prone to dry out, they have less frost, and they have deeper soils.

上行树带界线的树木开始扭曲和变形，尤其在中高纬度地区的树木，这些地区的树木往往会在山脊上长得更高，而在热带地区的树木则在山谷里长得更高；因为中高纬度地区树带界线受积雪覆盖时间和深度的影响很大。由于山谷中积雪覆盖较厚且持续时间很长，树木往往在山脊上长得更高，即便是生长在大风和贫瘠的土地里。在热带地区山谷更有利于生长，因为山谷不易干涸、很少结霜，并且备有更深的土壤。

There is still no universally agreed-on explanation for why there should be such a dramatic cessation of tree growth at the upper timberline. Various environmental factors may play a role. Too much snow, for example, can smother trees, and avalanches and snow creep can damage or destroy them. Late-lying snow reduces the effective growing season to the point where seedlings cannot establish themselves. Wind velocity also increases with altitude and may cause serious stress for trees, as is made evident by the deformed shapes at high altitudes. Some scientists have proposed that the presence of increasing levels of ultraviolet light with elevation may play a role, while browsing and grazing animals like the ibex may be another contributing factor. Probably the most important environmental factor is temperature, for if the growing season is too short and temperatures are too low, tree shoots and buds cannot mature sufficiently to survive the winter months.

目前还没有一个普遍认同的解释来说明为什么会在树带界线上出现树木停止生长这种戏剧化的现象。多种环境因素都起到作用，例如，积雪过多会让树木透不过气，雪崩和雪移能摧毁树木；长时间积雪缩短了有效生长季节的时间，树苗无法生长；另外，风速会随着海拔的升高而增加，增加树木承受的压力，很明显，正是这种风速带来的压力导致树木在高纬度地区变得畸形。一些科学家提出，随着海拔的上升而不断增强的紫外线、野生山羊等动物的放养，都是导致树带界线形成的因素。或许最重要的环境因素是温度，因为如果生长季节太短并且气温太低，树芽和树苗都无法充分成熟度过冬季。

Above the tree line there is a zone that is generally called alpine tundra. █Immediately adjacent to the timberline, the tundra consists of a fairly complete cover of low-lying shrubs, herbs, and grasses, while higher up the number and diversity of species decrease until there is much bare ground with occasional mosses and lichens and some prostrate cushion plants.█ Some plants can even survive in favorable microhabitats above the snow line. The highest plants in the world occur at around 6,100 meters on Makalu in the Himalayas.█ At this great height, rocks, warmed by the sun, melt small snowdrifts.█

在林木线上有一个称为高山苔原的地区。由于紧挨着树带界线，苔原上都是矮灌木、药材和草地。随着海拔的增加物种的数量和多样性会逐渐减少，直到出现大量空地伴着零星的苔藓和地衣这样的伏地植物。有些植物甚至可以在雪线以上有利的小环境中生存，世界上海拔最高的植物是出现在喜马拉雅山上六千一百米的马卡鲁峰。在这个高度上，被阳光温暖过的岩石可以将小雪堆融化。

The most striking characteristic of the plants of the alpine zone is their low growth form. This enables them to avoid the worst rigors of high winds and permits them to make use of the higher temperatures immediately adjacent to the ground surface. In an area where low temperatures are limiting to life, the importance of the additional heat near the surface is crucial. The low growth form can also permit the plants to take advantage of the insulation provided by a winter snow cover. In the equatorial mountains the low growth form is less prevalent.

 高山植物最突出的特点是其低矮的生长形态。这种特点使他们能够抵御最恶劣的强风环境，并且有助于他们利用来自地表的高温。在这样一个低温限制生命的地区，地表提供的额外温度是至关重要的。低矮的生长形态也可以帮助植物充分利用冬季积雪所提供的保温环境。在赤道区的山脉上低矮的生长形态并不常见。