

The oldest Miocene floras of Iceland

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The oldest Icelandic Miocene floras known today are found on the Western Peninsula, in the 15 Ma sediments in Mount Þórishlíðarfjall, Selárdalur and in the Botn sediments, Súgandafjörður. The sediments are referred to as the Selárdalur – Botn Formation. The second oldest flora is found in the 13,5 Ma sediments in Mount Tafla close to Ketilseyri and in Lambadalur, referred to as the Dufansdalur – Ketilseyri Formation.

The most characteristic feature of the 15 Ma Selárdalur flora is the dominance of *Fagus* (> 90% of macrofossils). In general, components of the Selárdalur flora are typical representatives of hardwood forests with a humid warm temperate appearance as found today in eastern North America (Appalachians), western Eurasia (northern and eastern Black Sea, southern Caspian Sea), and East Asia (Japan, central eastern China). Typical taxa are, among others, *Tilia* and *Aesculus*. The absence of “azonal” elements that are normally confined to lake and river environments, such as *Salix*, *Populus*, and possibly *Glyptostrobus* in the volcanic-pyroclastic sediments of Selárdalur may indicate the allochthonous or zonal character of this flora as opposed to the coeval Botn flora (lowland flora) found in lignitic sediments. The Selárdalur flora may represent broadleaved deciduous and evergreen (beech) forests found mainly on well-drained slopes.

Only few taxa have been recorded so far from the Botn sediments. The most prominent ones are *Glyptostrobus* and *Sequoia*, which are represented by vegetative and fruiting twigs, whereas *Fagus* is mostly represented here by cupules and nuts and only very few fragmentary leaves. The composition of this flora along with the type of sediment points to the autochthonous character of the flora, where *Glyptostrobus* and partly *Sequoia* could have been elements of floodplains adjacent to lakes. While *Glyptostrobus* tolerates high ground water tables, *Sequoia* may have grown in slightly more elevated areas (hummocks), intermixed with some other hardwood taxa, such as *Fagus*. As in the Selárdalur flora, this lowland type of vegetation is likely to have merged into a hardwood forest similar to the one known from Selárdalur.

The pollen and macrofossil data from the Selárdalur – Botn Formation (15 Ma) give the impression of a broadleaved deciduous and evergreen forest with an admixture of conifers that covered mountain slopes and canyons. These forests were dominated by *Fagus friedrichii*, *Tilia selardalense*, *Aesculus* sp., *Ulmus* sp., *Cercidiphyllum* sp., *Platanus leucophylla*, *Magnolia* sp., *Rhododendron* sp., and *Lonicera* sp. Close to the valley floors elements such as *Alnus* sp., *Salix* sp., and *Acer* sp. became more prominent as the groundwater level rose. In areas where groundwater was high, in valleys, around lakes and rivers, on floodplains, and in delta regions, conifers, mostly *Glyptostrobus europaeus*, and *Alnus* sp. dominated the flora. On hummocks, alluvial plains and well-drained lowland sites *Sequoia abietina* may have been more prominent. The pollen and macrofossil data from the Dufansdalur – Ketilseyri Formation (13.5 Ma) do not indicate vast changes in the broadleaved forests except for the sudden decrease of *Tilia* type pollen that was so conspicuous in the older (15 Ma) formation. A more prominent shift is seen in the conifers where the amount of Taxodiaceae type pollen drops considerably and *Picea* becomes prominent.