

with the American, except by means of a former wider distribution in the polar regions, which the species has reached, though only in Finnmark; and judging from the fact that the species is absent from Greenland and the entire arctic coast of our continent, besides from Siberia, it would appear as if the species had a dual origin, from one centre in Europe and from another one in America, inasmuch as the environment is identical and it is associated with the same species of the genus, with *Moneses*, and with *Chimaphila*. The occurrence of some of the species of *Pyrola*, *Moneses*, and *Chimaphila* in eastern Manchuria, and extending from there to Japan, and among these being several endemic species, seems to indicate an important centre of the genus on the eastern coast of Asia.

The widely distributed *P. rotundifolia* reaches the arctic region only in Finnmark and Russia since, according to Ledebour, the species has not been recorded from arctic Siberia; it occurs, however, in Terra Tschukthorum. The distribution agrees remarkably well with that of *P. secunda* but, as may be seen from the table (Table 6), *P. rotundifolia* is quite a variable plant, seven characteristic varieties having been described; thus it appears as if the species is exceptionally well established in various parts of the northern countries, rather than in the southern. It is totally absent from Greenland and the arctic coast of the American continent but is there replaced by a close ally, *P. grandiflora*, which by several authors has been considered as a mere variety of *P. rotundifolia*. It does not seem improbable that *P. grandiflora* has developed from *P. rotundifolia* in the arctic environment, but in any case the former is unquestionably of American origin as stated above, even though it has reached the northeastern corner of Asia and the Altai mountains.

With respect to the typical *P. rotundifolia*, its habitat is somewhat peculiar since it may thrive just as well in Sphagnum bogs as in shady woods, notably coniferous. The species seems to be more typically developed on the European continent, besides in England and Scotland, than really in North America where, however, it is accompanied by four varieties, endemic to this continent, and the variety *arenaria* (Hudson bay), known also from Greenland, Finnmark, and south to Germany. The prevalence of the varieties on this continent may indicate an American centre of distribution of the species and at the same time the gradual disappearance of the type. A similar case is exhibited by the occurrence of the species in arctic Norway, where three varieties: *arenaria*, *pumila*, and *bracteosa* have been observed, and of these the variety *pumila* has also been collected in eastern Siberia. In other words, we have in the *P. rotundifolia*-alliance a series of types, some being characteristic of arctic Europe, others of the American continent south of the arctic circle, and one, *P. grandiflora*, especially characteristic of arctic America and Greenland. And it is quite interesting to notice that of these types the arctic *P. grandiflora* has also become distributed to Terra Tschukthorum and Altai.

The remaining species: *P. elliptica*, *P. media*, *P. picta*, *P. chimaphiloides*, and *P. aphylla*, are mostly of a somewhat restricted occurrence. However, the distribution of *P. elliptica* comprises Newfoundland to British Columbia, and through the northern Atlantic states to the mountains of New Mexico. The species thus represents one of the members from the American centre of the genus; although absent from the northeastern corner of Asia, the species, nevertheless, has extended to Japan. *P. media* is a genuine European type, which has reached the arctic region of Norway, besides Iceland, together with *P. minor* and *P. secunda*; toward the south it has become distributed to the Alps of Switzerland and Caucasus. *Pyrola picta* and *P. aphylla*, on the other hand, are mainly western types, especially the latter; finally, *P. chimaphiloides* is known so far only from British Columbia.

In connection with these geographical notes may be mentioned that *Pyrola aphylla* is only apparently "aphyllous"; it develops, as a matter of fact, two kinds of aerial shoots, viz.: some that are terminal and bear a small rosette of green leaves preceding the inflorescence, and others which are lateral and develop