

Summary

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Summary

1. The zonation of woods on the NW-slope of Weissenstein ($\lambda = 7^{\circ} 30'$, $\varphi = 47^{\circ} 15'$) and on the NW- and SE-slope of Chasseral ($\lambda = 7^{\circ} 04'$, $\varphi = 47^{\circ} 08'$) has been investigated from a phytosociological, phenological and climatological point of view.

2. The arrangement of the vegetation in tabular form (tables 3–6, vegetation table in appendix) on Weissenstein showed fragmentarily developed *Fagetum typicum* which could not be systematically classified, and *Abieti-Fagetum festucetosum* from 900 to 1250 m above sea level of which the *Adenostyles alliariae* part shows relations to the *Aceri-Fagetum* above 1250 m. The northern slope of Chasseral shows *Luzulo-Fagetum* with silver fir (*Abies alba*) on its lower part, *Abieti-Fagetum typicum* grows between 860 and 1250 m and *Aceri-Fagetum* with spruce (*Picea abies*) and lush high shrub about 1250 m above sea level. On southern slope *Cardamino heptaphyllae-Fagetum* grows up to 1100 m, *Abieti-Fagetum elymetosum* on deep groundy soils (in comparison to the northern slope) between 1100 and 1300 m and above 1300 m vegetation consists of a special form of *Aceri-Fagetum* exposed to the south, without hygrophilous high herbs but with crippled beech shrubs.

3. The phenological examination according to SCHREIBER (1968b) resulted in a phenological climatic graduation shown in a map (in appendix) in relation to the vegetation as follows:

- grade 4, 3: *Fagetum*
- grade 2, 1, 0: *Abieti-Fagetum*
- grade 0, –1, –2, –3: *Aceri-Fagetum*

4. The measuring of the climatic factors was accomplished at nine stations during the growing season in the area of the corresponding vegetation units: Three stations on the northern slope of Weissenstein (1: *Fagetum typicum*, 810 m, 2: *Abieti-Fagetum festucetosum*, 925 m, 3: *Aceri-Fagetum*, 1305 m above sea level), three stations on the northern slope of Chasseral (7: *Luzulo-Fagetum*, 800 m, 8: *Abieti-Fagetum typicum*, 1139 m, 9: *Aceri-Fagetum*, 1398 m above sea level), and three stations on the southern slope of Chasseral (4: *Cardamino heptaphyllae-Fagetum*, 990 m, 5: *Abieti-Fagetum elymetosum*, 1245 m, 6: *Aceri-Fagetum*, 1411 m above sea level). On Weissenstein rain and horizontal precipitation were measured (16.6.–31.10.1970), on Chasseral rain and horizontal precipitation and air temperature, rel. humidity (in thermometer screens 1.2 m above ground) and wind velocity (16.6.–31.10.1970 and 1.6.–17.10.1971).

5. Most of the rain falls in the upper and medium areas of the southern slope of Chasseral. Therefore also the largest quantity of snow is to be expected in winter here and this is responsible for the shrubby growth of the beech.

6. The horizontal precipitation consists of fog precipitation and rain which diverted from vertical to more or less horizontal fall by influence of wind. This precipitation is highest in the range of the highest average wind velocity (ridge area on northern slope of Chasseral: lush growth of hygrophilous high herbs in the *Aceri-Fagetum*, numerous springs).

7. The medium daily variation of rel. humidity during the growing season reached its utmost level in the areas above 1300 m (southern slope) respectively above 1250 m above sea level (northern slope). There the daily amplitude comes up to about 10%, on the slopes close to the valley more than 25% (Fig. 8). In figure 10 showing the medium rel. humidity from June

to October 1970, a “dry spot” can be noticed on the middle and upper parts of northern slope in September.

8. The vegetation units *Fagetum* (including *Luzulo-Fagetum*, *Cardamino heptaphyllae-Fagetum*), *Abieti-Fagetum* and *Aceri-Fagetum* can be well characterized by means of average air temperature during the growing season (*Fagetum* 11.2–13.0 °C, *Abieti-Fagetum* 10.2–11.2 °C, *Aceri-Fagetum* 9.5–10.2 °C, see Fig. 19). As expected the greatest average daily amplitude prevales in the comparatively continental Vallon de Saint-Imier near Courtelary (station 7) with more than 8 °C, while only 3.5 °C have been measured in the area of the *Aceri-Fagetum* above 1300 m (Fig. 9 and 18).

9. The hydrothermic examination of the Chasseral slopes (diagramm according to LOSSNITZER 1948) shows a clear discontinuity between station 4 (on the lower slope) on the one hand and station 5 and 6 (on the medium and upper slopes) on the other hand. This quick change from a comparatively warm and dry to a comparatively cool and moist climate coincides with the boundary line between *Cardamino heptaphyllae-Fagetum* and *Abieti-Fagetum*.

10. The upper respectively lower boundary line of the occurrence of *Abies alba* can hardly be fixed by climatic factors. The area of optimal growth is characterized by an average amplitude of air temperature of 4.8 °C during the growing season. The oceanic climate of the plateaus of Suisse Jura excludes the silver fir in favour of beech (breakage of boughs by snow, hoarfrost). The cool and moist climate enables growth of beech and fir simultaneously in mountainous areas on the Jura stones generally inducing growth of deciduous trees.

(Translated by Fam. Brüggmann, München)