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Microdifferentiation patterns in *Ranunculus montanus* Willd. s.l. a preliminary report

by

Regula DICKENMANN

The study deals with ecological genetics of the *Ranunculus montanus* group. For the time being, the alpine zone of Davos (Grisons) was studied in more detail; the *R. montanus* group is represented in the study area by two taxa viz. the diploid *R. Grenierianus* ($2n=16$) and the tetraploid *R. montanus* s. str. ($2n=32$). The alpine region of Davos being geologically heterogenous, a

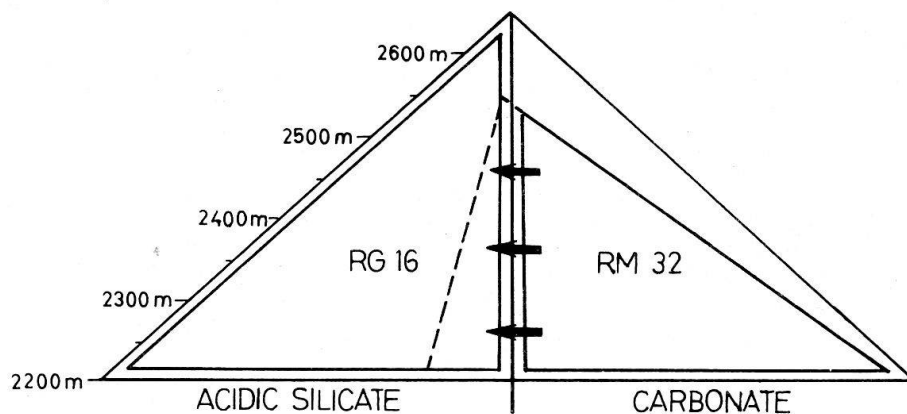


Fig. 1. Distribution pattern of *Ranunculus Grenierianus* ($2n=16$) and *R. montanus* s.str. ($2n=32$) within two types of substrate in the alpine region of Davos. RG16 = *R. Grenierianus*; RM32 = *R. montanus* s.str.

Abb. 1. Verbreitungsmuster von *R. Grenierianus* und *R. montanus* s.str. auf saurem Silikat und Karbonat im Gebiet von Davos.

special attention was paid to the occurrence of *R. montanus* s.l. in acidic silicate as well as carbonate.

The distribution pattern of the group proved to be influenced in a general way by the type of substrate (Fig. 1). *R. Grenierianus* was confined to acidic silicate, whereas *R. montanus* s.str. appeared most frequently on carbonate and occasionally also in siliceous soils. Within the substrate contact zones, tetraploids were able to penetrate 5-10 m into siliceous soil; the resulting heteroploid populations showed a rather irregular distribution of diploid and tetraploid individuals. There was no direct evidence of a gene exchange between *R. Grenierianus* and *R. montanus* s.str., triploid hybrids having never been found in spite of repeated search.

Recently, a most interesting microdifferentiation pattern was found within a restricted but uniformly siliceous area of Jakobshorn (2590 m a.s.l.). In a ENE-exposed slope (surface of about 0.1 km²), diploids alternated with tetra-

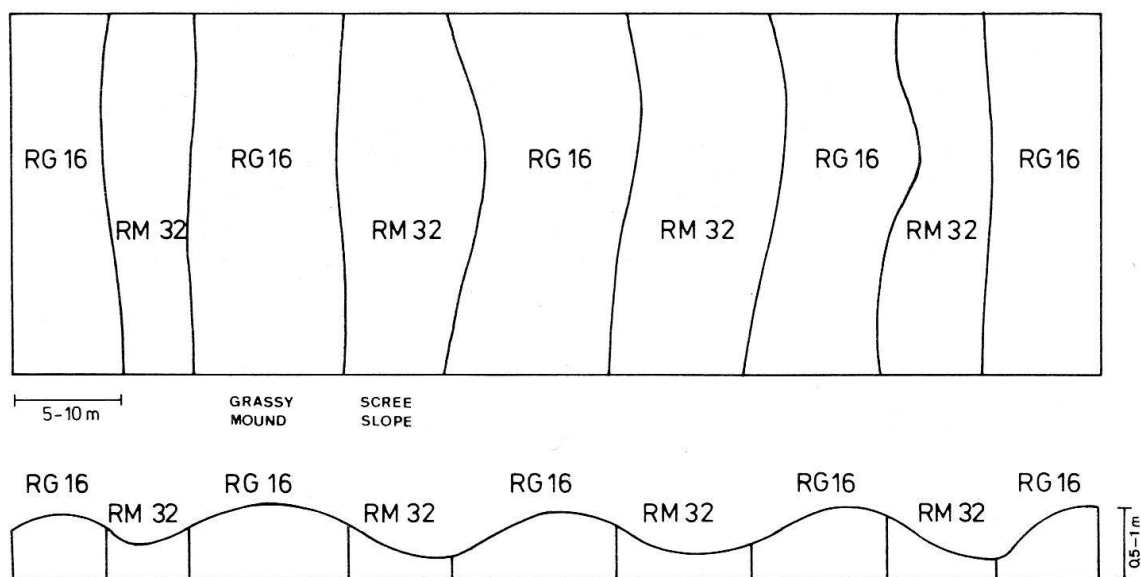


Fig. 2. Microdifferentiation pattern in Jakobshorn
RG16 = *R. Grenierianus*; RM32 = *R. montanus* s.str.

Abb. 2. Mikrodifferenzierungsmuster am Jakobshorn.

a.



b.

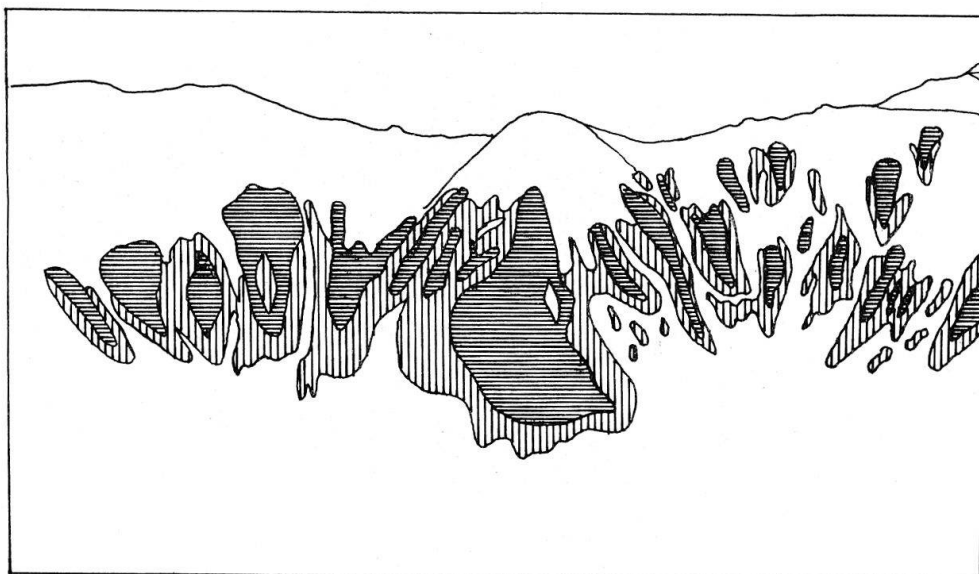


Fig. 3. The area of Jakobshorn: a. Aerial view of the ENE slope; b. Schema of the microdifferentiation pattern.

▨ *R. Grenierianus* ($2n=16$), ▤ *R. montanus* s.str. ($2n=32$).

Abb. 3. Das Jakobshorngebiet.

ploids, precisely following the local relief: *R. Grenierianus* occurred within grassy mounds, whereas *R. montanus* s.str. inhabited moister depressions and open scree slopes (Figs 2-3).

Well-developed soil with a rather thick layer of fine earth occurred in both niches; however, the water supply was better in the depressions than in the mounds. Apparently only a few plant species were able to support the conditions in frequently moving scree slopes, for the vegetation was much better developed in grassy mounds.

Rather sharply defined limits of the minute populations of *R. Grenierianus* and *R. montanus* s.str. at Jakobshorn suggest a disruptive selection that might be influenced by the soil water supply; a possible rôle of competition should also be taken into consideration.

Further studies in the region of Davos are in progress. It is also foreseen to include some other alpine regions of Switzerland into the investigations.

Zusammenfassung

Die Artengruppe des *Ranunculus montanus* Willd. wurde im Gebiet von Davos ökologisch-genetisch untersucht. *R. Grenierianus* ($2n=16$) wurde nur auf Silikat gefunden, *R. montanus* s.str. ($2n=32$) sowohl auf Kalk als auch auf einigen Silikatstandorten.

Im Silikatgebiet vom Jakobshorn besiedelte *R. montanus* s.str. die Mulden mit offenen Schuttstellen, *R. Grenierianus* die dazwischenliegenden Kuppen; das extrem kleinflächige Differenzierungsmuster war offensichtlich von der Wasserversorgung beeinflusst.

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