

Cardamine rivularis auct. non SCHUR in the Eastern Alps

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The populations of the *Cardamine pratensis* group from the higher altitudes of the Eastern Alps were identified as *C. rivularis* SCHUR for the first time probably by KERNER (1884:75). Referring to the specimens collected by DOMINICUS at Mt. Stubalpe he wrote: „Die hier ausgegebenen Exemplare stimmen mit der Beschreibung SCHUR's, mit Originalexemplaren und mit Exemplaren, welche neuerlich SIMKOVICS an den von SCHUR angegebenen Standorten in Siebenbürgen sammelte, vollständig überein. – *C. rivularis* SCHUR ist eine jener merkwürdigen Pflanzen, welche den Karpathen und östlichen Alpen gemeinsam ist. He did not, however, comment on the apparent difference between the purplish anthers of *C. rivularis*, as pinpointed in the SCHUR's description (SCHUR 1853:61, 63), and the yellow anthers of the plants occurring in the Alps. Later, HAYEK (1902:480) reported *C. rivularis* from Styria, but in his Flora Styriaca (1909:484) he named the same plants as *C. crassifolia* POURR. following the broad concept of the latter taxon by SCHULZ (1903:532–533). Much later, LÖVKVIST (1956:97–98) correctly recognized *C. crassifolia* POURR. as an endemic taxon to the Pyrenees distinguished from the other taxa of the *C. pratensis* group by an ascending stem. Regardless of the variability in colour of anthers, LÖVKVIST (1956:114–117) considered populations of the high mountain altitudes of the Alps. Carpathians and the Bulgarian mountains, as one entity, bearing the name *C. rivularis*. He, however, admitted that such treatment of *C. rivularis* is only preliminary and “it is to be hoped that botanists from Central Europe will elucidate the problems of this aggregate species” The same concept of *C. rivularis* was adopted in the first edition of Flora Europaea (JONES 1964), and by URBANSKA-WORYTKIEWICZ & LANDOLT (1974), and LANDOLT (1984).

MARHOLD & RAYNER (1994) lectotypified the name *C. rivularis* SCHUR and pointed out that this taxon is restricted to the South Carpathians and Bulgaria and differs from other mountain populations, previously treated as *C. rivularis*, in having anthers that are purple before dehiscence; the terminal leaflet of the basal leaves being approximately the same size as the lateral ones; and appressed hairs on the rachis of the basal leaves. The same concept of *C. rivularis* was adopted by MARHOLD (1994) and by the same author, at the subspecific level, in the second edition of Flora Europaea (MARHOLD 1993).

The question of how to classify the high mountain populations of the *C. pratensis* group in the Alps still remains open. Karyological investigations of these populations in Austria, referred as to “*C. rivularis*” (LÖVKVIST 1956, URBANSKA-WORYTKIEWICZ & LANDOLT 1974, TEPPNER 1980, MARHOLD, unpubl.) showed that they include diploids ($2n = 16$) as well as tetraploids ($2n = 32$). Tetraploids are much more widespread and populations on this polyploid level were analysed from the altitudes from 1580–1940 m in the Niedere Tauern (Styria) (TEPPNER 1980, MARHOLD, unpubl.) and the Gurktaler Alpen

(Carinthia) (MARHOLD unpubl.). Diploids are known from Mt. Koralpe in Styria, from 1400–1940 m (LÖVKVIST 1956, TEPPNER 1980, MARHOLD, unpubl.). URBANSKA-WORYTKIEWICZ & LANDOLT (1974) reported diploids of "*C. rivularis*" also from several localities in Tirol, but from rather low altitudes (650–1100 m). Morphological differences among the *C. rivularis* auct. from the Alps and the populations classified as *C. pratensis* L. and *C. udicola* JORDAN are rather problematic, especially on the higher polyploid level (cf. LANDOLT 1984). These populations were mostly identified as "*C. rivularis*" in the past according to their distribution and ecology, or according to the intensive reddish-violet petals. However, the latter character is characteristic for many populations of *C. pratensis* group in the high altitudes, including populations with $2n = 30$ and 44, currently classified as *C. pratensis* (MARHOLD 1994). A detailed study of the high mountain populations of *C. rivularis* auct. is being prepared and it is hoped that further detailed morphological investigations might bring more light to this problem.

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