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## SUMMARY

The sociology and ecology of natural and artificial dry grasslands on alkali-rich soil in the area between Lago Maggiore (Southern Switzerland) and lake Garda (Northern Italy) have been studied.

The Chrysopogon gryllus-grasslands studied in the whole area under investigation are referred to as Carici humilis-Chrysopogonetum grylli. This association has been subdivided into the following subassociations and variants:

- (a) Carici humilis-Chrysopogonetum grylli fumanetosum,  
consisting of:
  - (1) Diplachne serotina variant
  - (2) Helianthemum italicum variant
  - (3) typical variant
  - (4) Aster linosyris variant
- (b) Carici humilis-Chrysopogonetum grylli galietosum,  
consisting of:
  - (5) Leontodon tenuiflorus variant
  - (6) typical variant
  - (7) Vinca minor variant

The aridity decreases from variant (1) to variant (7).

Whereas variants (2) and (5) occur predominantly in the lake Como area and regions east thereof, the other variants are to be found around lake Como and in regions to the west (p. 41-54).

At sites where the soil is poorly alkaline, various indicators of acidity are to be found on the Chrysopogon gryllus dry grasslands growing there. This type of grassland was named Holco-Chrysopogonetum grylli prov. (p. 54).

Variant (4), which is found only on the sparsely cultivated Monte Caslano, has been studied in detail and subdivided into different facies (p. 55-59).

A new subspecies of Festuca ovina L. which was found in the region between Lago Maggiore and lake Como is described by Dr. I. Markgraf-Dannenberg: Festuca ovina L. subsp. ticinensis Mgf.-Dbg. (p. 62).

As an association the grassland Carici humilis-Chrysopogonetum grylli is a substitute for Fraxino orni-Ostryetum. Periodic fires or extensive cultivation are a necessary precondition for the existence of this type of association. Another factor determining its occurrence is the annual radiation: it must reach a minimum of 220 kcal/cm<sup>2</sup> year in the region of the lakes Iseo and Garda and  $\geq 260$  kcal/cm<sup>2</sup> year in the region between Lago Maggiore and lake Como (p. 68-73).

The soil supporting subassociation (a) consists mainly of shallow- to- medium rendzinas which are designated "moderrendzinas" or "mullrendzinas", depending on the humus content. The subassociation (b), on the other hand, grows on medium- to- deep soils, which are usually artificially created and the surface of which is sometimes mildly acid (p. 74-87).

On the basis of water potential curves (measured on sieved soils) the readily available water of several sites was calculated and resulted in a gradient of aridity which corresponded to that of the vegetation table 1. Measurements on Monte Caslano showed that the water tension was often  $>15$  atmospheres (p. 88-104).

The association described is characterised by a particular combination of species. The alliance to which it might belong is discussed: its place in the Bromion alliance is shown to be questionable and its position in the Diplachnion is only partially substantiated. Therefore it would appear that this type of grassland is independent (p. 111-113).

A comparison with associations in the more immediate surroundings which also contained Chrysopogon gryllus showed close relationships between the association under study and shrub associations of the alliance Orno-Ostryon. The Chrysopogon gryllus grasslands of Yugoslavia, Hungary and Romania, on the contrary, have little in common with the association described here (p. 113-119).

A scheme is presented which shows how the evolutionary tendencies within the association depend upon depth of soil, geographical location and degree of cultivation (p. 119-121).

Analysis of several ecological factors demonstrated that depth of soil, radiation and type of cultivation (including fires) are the ones which primarily determine the nature of the association. Finally, those ecological factors essential for the emergence and maintenance of the association Carici humilis-Chrysopogonetum grylli are given (p. 121-127).

(Transl.: D. Jarvis)