Die Hummeln Vorarlbergs / The bumblebees of Vorarlberg

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Abstract

As of 2011, research on bumblebees in large areas of Vorarlberg (Austria) was underrepresented. Although, more than 6,000 specimens belonging to 35 different Bombus species (out of a total of 47 species across Austria) had been collected at over 370 localities, mainly below 2,000 m a.s.l. The goal of this study was to complement the distribution data of the bumblebees of Vorarlberg. In addition, a survey of different ecological factors was conducted. From July 1 to August 30, 2012, more than 3,500 specimens belonging to 27 species of the genus Bombus were observed in Vorarlberg. The individuals were collected at 407 localities at altitudes ranging from 400 to 2,780 m a.s.l., using a transect method. Based on the collected data, an analysis of diversity, altitudinal preferences, habitat preferences, flower visiting habits and associations of the different bumblebee species was conducted. The data showed the highest abundance of bumblebees within the altitudinal range from 1,000 to 2,400 m a.s.l. Furthermore, the data allowed for the classification of the different species with reference to their altitudinal distribution. Tall herbaceous vegetation represented the habitats with the highest bumblebee abundance by a substantial margin. Diversity indices were calculated for different altitudinal levels and habitat type groups, using the Shannon-Wiener index. The highest diversity was observed at altitudes between 1000 to 2400 m a.s.l. Humid habitats showed the lowest number of species of all habitat type groups. Collected data revealed that the most frequently visited flowering plant taxa were Aconitum spp., Cirsium spinosissimum and Trifolium pratense. An analysis of flower visits with reference to functional floral types indicated that composite and lipped floral types were most often visited by bumblebees and that the different Bombus-species could be divided into two groups of guilds. The oligophagous species B. gerstaeckeri, which actually only visits the genus Aconitum could also be documented on Cirsium spinosissimum. Distribution maps are provided for all species, also taking into account historical data. The first records of Bombus alpinus and Bombus flavidus in Vorarlberg since 1931 and 1938, respectively, are remarkable.