GROUND LEVEL OZONE CONCENTRATION AND ITS EFFECT ON PLANTS OF POLISH NATIONAL PARKS

Summary

Ozone concentrations were determined during the 1997–1999 growing seasons in 26 forest sites of the Carpathian Mountains using passive samplers (Ogawa & Co, Pompano Beach, FL, USA). In addition, in two western Carpathian sites ozone was continuously monitored (UV O_3 Thermo Environmental Model 49C). Highest hourly ozone concentrations reached 160 and 200 μg m^{-3}; ozone concentrations fluctuated over the whole growing seasons between 40 and 100 μg m^{-3} and showed significant differences between individual monitoring years, monitoring periods and geographic location of the sites. The highest ozone concentrations appeared in Western Carpathians. In the Tatra Mountains (18 forest sites in Polish and Slovak parts) ozone concentrations fluctuated over the whole season between 65 and 122 μg m^{-3}, average monthly concentrations reached 100 μg m^{-3}, and the highest 1-hour concentrations were close to 200 μg m^{-3}. The sites equipped with active monitors showed different patterns of diurnal ozone distribution. The results of studies show that high ozone concentrations appeared in many parts of the Carpathian range, and potential phytotoxic effects of ozone on forest stands (trees, herb layer) can be expected to appear on almost the entire territory of the Carpathian Mountains. The following species showed ozone-like injury symptoms: *Pinus cembra*, *Sorbus aucuparia*, *Corylus avellana*, *Sambucus racemosa*, *Ranunculus repens* and *R. lanuginosus*, *Senecio subalpinus*, *Vaccinium myrtillus*, *Gentiana asclepiadea*, *Centaurea jacea*, *Impatiens parviflora*.