CROATIAN FOREST RESEARCH INSTITUTE
Department for Forest Ecology
Cvjetno naselje 41, 10 450 Jastrebarsko, Croatia
*email: lucijal@sumins.hr

Hrzz Croatian Science Foundation

OZONE IMPACT ON MEDITERRANEAN FOREST ECOSYSTEMS OF CROATIA

Lucija Lovreškov*(1), Tamara Jakovljević (1), Nenad Potočić(1), Ivan Seletković(1), Krunoslav Indir(1), Željko Zgrablić(1), Lukrecija Butorac(2), Goran Jelić(2), Ivan Limić(2), Aldo Marchetto(3), Alessandra De Marco(4)

(1) Croatian Forest Research Institute, Jastrebarsko, Croatia, (2) Institute for Adriatic Crops and Karst Reclamation, Split, Croatia, (3) Water Research Institute, National Research Council (CNR-IRSA), Verbania Pallanza, Italy, (4) Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Roma, Italy

INTRODUCTION

Ozone, one of the air pollutants, poses a great risk to a sensitive ecosystem such as Mediterranean forest ecosystem. According to the European Environment Agency, Mediterranean region of Croatia belongs to the group with very high ozone concentrations and potential threat to the forest ecosystems. Solar radiation and chemical reaction with oxides of nitrogen and/or volatile organic compounds result in ozone which may affect functionality of these ecosystems.

MATERIAL AND METHODS

Four plots in two regions of Croatian Mediterranean were sampled: two in Istria: A – Poreč (*Q. pubescens*), B – Šišan (Q*. ilex*) and two in Dalmatia region: C – Vrana (*P. halepensis*), D – Split (*P. nigra*).

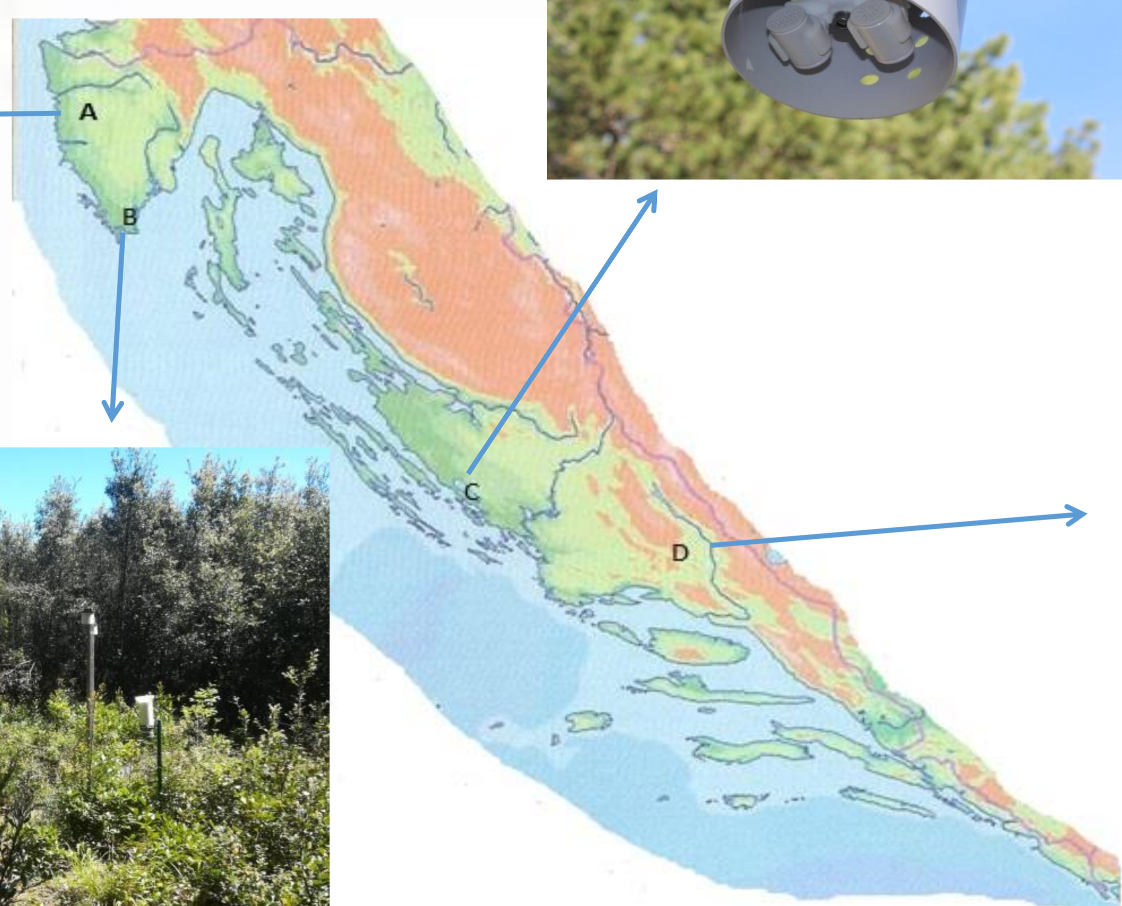

Figure 1 Location of plots: A – pubescent oak, B – holm oak, C – Aleppo pine, D – black pine

Measurements were conducted from April to October in 2018. Ogawa passive samplers were used for measuring ozone concentrations in ecosystems of holm oak and pubescent oak in Istria region likewise in Dalmatia region, Aleppo pine and black pine, representing the most important and the most common species in Croatian Mediterranean. After exposure, filters were brought in laboratory and analysed by ion chromatography. Nitrate concentrations were calculated to the amount of ozone collected on the plots.

Figure 2 Ion chromatograph, Dionex DX600

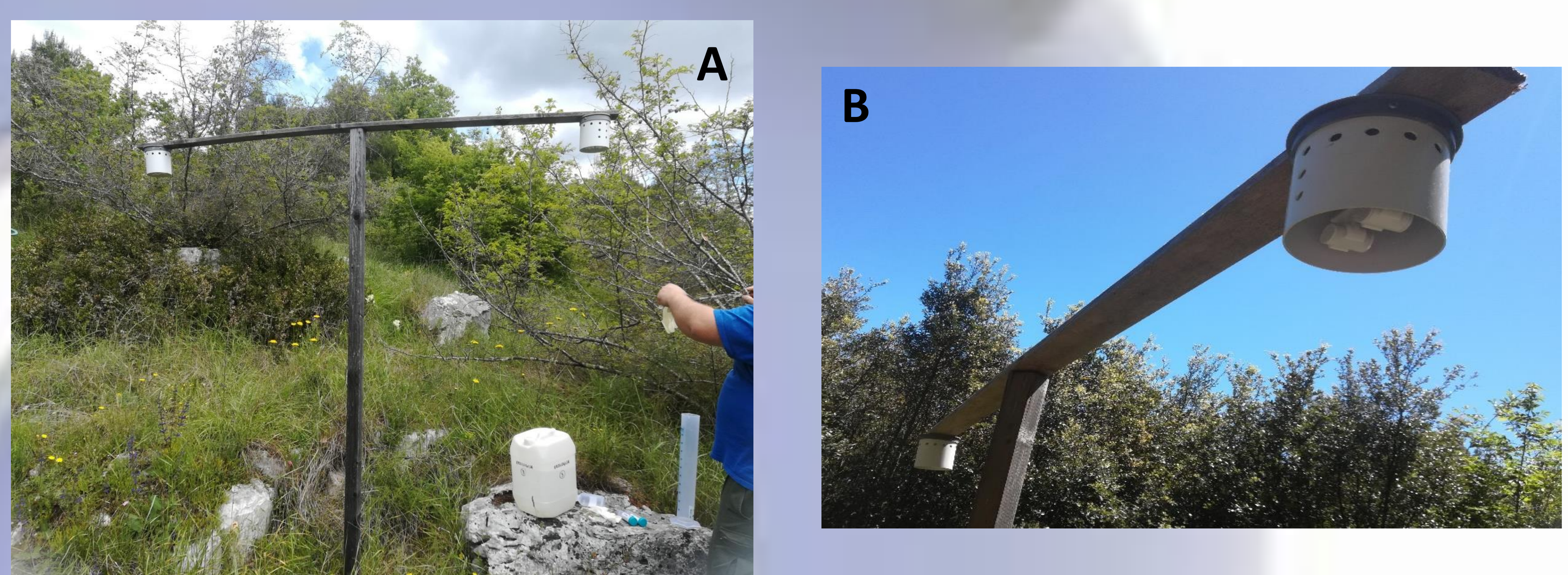

Figure 3 Passive samplers placed on the plots (A – pubescent oak forest, B – holm oak forest)

RESULTS AND CONCLUSION

Higher average concentrations were found in Istria (pubescent and holm oak forests) than in Dalmatia (Aleppo and black pine forests). Minimum and maximum values per plot are shown in Fig. 4. Number on the column represents a month when minimum or maximum value occurred. Minimum values mostly occurred in spring, except on holm oak forest. According to the ICP Manual, three out of four our plots exceeded upper limit (100 µg m^{-3}) for passive monitoring of air quality. This is a preliminary study and the monitoring of these ecosystems will continue.

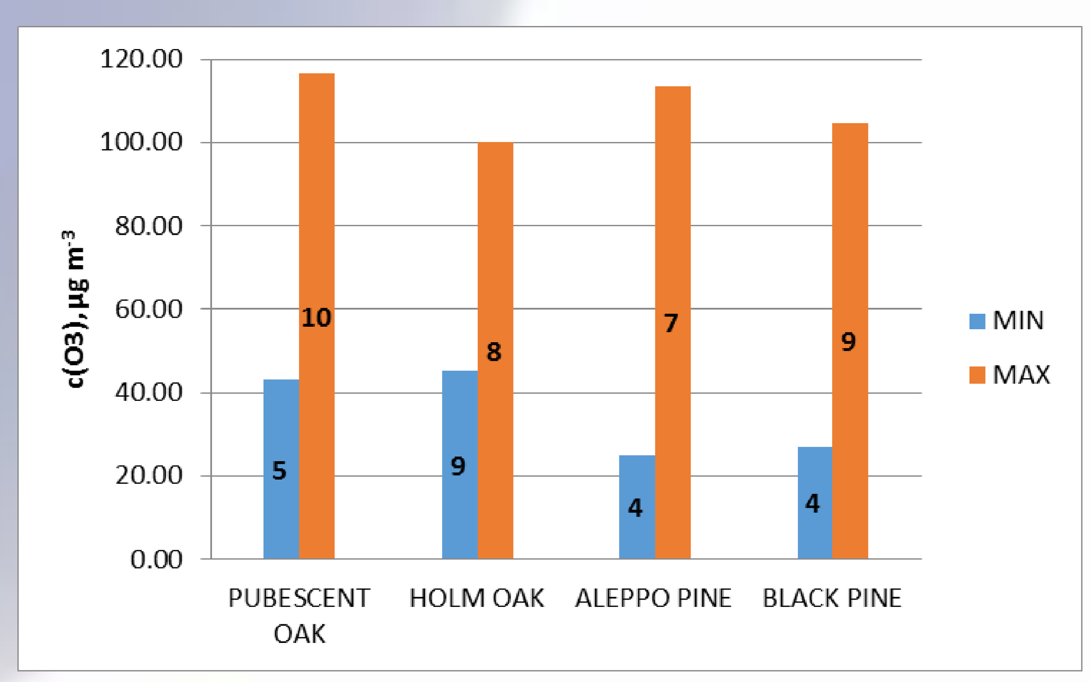

Figure 4 Minimum and maximum values on the plots (month presented on the column)

Acknowledgement: This work has been fully supported by Croatian Science Foundation under the project IP-06-2016-3337.