

SOIL METHANE EMISSION FROM AFFORESTED AREAS WITH PINUS ELДАРICA AND ROBINIA PSEUDOACACIA IN CHEETGAR PARK, IRAN

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INTRODUCTION

The increase in the concentration of the major greenhouse gases (GHG's) in the atmosphere is considered one of the main factors causing the warming (IPCC2006).

Methane contributes about 20% of the direct radiative forcing due to long-lived greenhouse gases affected by human activities. Most work on methane (CH₄) emissions from natural ecosystems has focused on wetlands, however, less attention has been directed toward forests ecosystems, which could be temporarily methane sources. Tree physiology influences both the production and oxidation of CH₄, and can play an important role in determining whether a particular forest is a net source or sink of CH₄. purpose of this study was to gain insight into the influence of plants species, on the CH₄ emission of soil. then selected areas in Cheetgar Park with Pinus Eldarica and Robinia plantation.

MATERIALS AND METHODS

This study was conducted in the Tehran cheetgar park (51°10'E & 35°45'N). Cheetgar Park area covers 814 ha. and the climate is temperate with a mean annual temperature of 17°C and a mean annual precipitation of 272 mm for the period (1997–2013). the afforested areas with Pinus eldarica and Robinia pseudoacacia and with clay - loam textured soil were selected. Then soil samples were prepared from the 3 circular plots with a radius of 50 meters in each area from 0–40 cm in depth (6 samples/circular plot). Soil organic carbon, activate carbon, soil bulk density and soil CH₄ emission were measured. For measurement of soil CH₄ emission, the soil cores were placed in 50 cm long and 8 cm diameter PVC pipes. Additionally, the top 10 cm of each pipe served the purpose of an air filled gas collection chamber (headspace). The soil cores were incubated at temperatures 25°C under controlled laboratory conditions (Regina et al., 1999). The gas samples were collected with a syringe from the headspace, and the concentration of CH₄ were determined with a GC2550TG gas chromatograph. Methane was detected by a flame ionization detector (FID). Statistical analyses were carried out with StatGraphics.

RESULTS AND DISCUSSION

The results of the soil analyses showed that there were statistically significant differences between soil properties of the studied areas ($P < 0.05$) as follow: percentage of soil organic carbon 0.5, 1, activate carbon 500 ton/he, 700 (ton/he), soil bulk density 0.97 (gr/cm³), 0.93 (gr/cm³), respectively for Pinus eldarica and Robinia pseudoacacia. Also soil CH₄ emission was higher for Pinus eldarica than Robinia pseudoacacia. According to obtained results, it could be concluded that, the high bulk density which can limit the aeration need for oxidation of methane and lower organic and

**active carbon were responsible for higher rate of soil methane emission in the area with
Pinuseldarica .**

Keywords: Greenhouse gas, Methane, Pinuseldarica, Robiniapseudoacacia

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