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Get Nutrition and Cool the Earth

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Abstract

The present paper is an attempt to assess the carbon and nitrogen percentages in the Above Ground Biomass (AGB) of wheatgrass (*Triticaum aestivum*) collected from the organic garden of Techno India University, West Bengal after a period of 14 days from the date of sowing seeds on 4th March, 2017. The carbon percentage ranges between 30.99% to 31.92% (mean value = 31.51 ± 0.404). The nitrogen percentage is significantly less compared to carbon value (1.26% - 1.31%; mean value = 1.292± 0.016). The stored carbon and nitrogen levels in the seedlings suggest the species as a potential sink of green house gases.

Keywords: Climate change, carbon and nitrogen percentages, wheatgrass, Above Ground Biomass (AGB)

Introduction

Carbon dioxide is one of the most important drivers for climate change in this blue planet. The temperature is gradually rising in the atmosphere as the heat is trapped by carbon dioxide. This trapped heat is called the Green House Effect and without it the Earth would be about 33ºC colder (Jansen et al., 2002). Anthropogenic factors in the last century have accelerated the level of carbon dioxide in the atmosphere to a great extent. At present human activity is adding about 7 billion tonnes of carbon dioxide into air every year (Jansen et al., 2002). Because of this enormous addition of carbon dioxide, the average temperature of the Earth has increased between 0.3-0.6ºC over the last 100 years. It is now the high time to identify the potential natural sink of carbon dioxide. Areas where more carbon is absorbed compared to the amount given off (through respiration, decomposition, burning etc.) are referred to as carbon sinks and include areas such as native Prairies, forest, fresh water and brackish water wetlands. It has been estimated that grassland store at least 34% of the global terrestrial stock of carbon while forest store approximately 39% and agro-ecosystems approximately 17% (World Resources Institute, 2000). It has also been estimated that 1 ha of wheatgrass is capable of absorbing carbon which is equivalent to emission of carbon from 35 cars in 1 year. This calculation is based on the average car emitting 4.5 tonnes of carbon dioxide/year which is equivalent to 1.227 tons C/yr (Climate Change Central, 2002). On this background the present research aims to evaluate the quantum of carbon and nitrogen stored by wheat grass planted in the organic garden of Techno India University, West Bengal (Figure 1).

Figure 1: Wheatgrass in the terrace garden of Techno India University, West Bengal.

Materials and Methods

Wheatgrass seeds were planted on 04.03.2017 in several pots and placed in the organic garden of Techno India University, West Bengal under natural sunlight. After two weeks they were harvested and the shoot portion (AGB) was considered for carbon and nitrogen analysis. Direct estimation of % carbon and nitrogen in the AGB was done by *VARIO Macro Elementar CHN Analyzer*, after grinding and random mixing the oven dried samples of AGB.

Results

Our analysis revealed relatively high % carbon in the wheatgrass compared to % of nitrogen (Table1)

Table 1: Percentages of carbon and nitrogen in the AGB of wheatgrass

Pot No.	Carbon %	Nitrogen %
GRC/2025/1	31.92	1.30
GRC/2025/2	30.99	1.26
GRC/2025/3	31.05	1.29
GRC/2025/4	31.76	1.31
GRC/2025/5	31.83	1.30
Mean	**31.51**	**1.292**
SD	±0.404	±0.016

Discussion

The recent thrust on global warming phenomenon has generated lot of interest on the carbon storage ability of producer community of the ecosystem. This community removes carbon dioxide from the atmosphere and converts this gas to organic carbon through the process of photosynthesis. Thus, photosynthesis is the sole mechanism to initiate the process of storing carbon in wheatgrass. However, different stages of wheatgrass growth may have different percentages of carbon, which have not been addressed in the present paper. The nutritional value of wheatgrass is known for centuries and since the grasses are consumed during the early stages of growth i.e. within a fortnight from the sowing of seeds, therefore we concentrated only on 14 days old seedlings in this study. It is clear from the present study that these grasses can accumulate considerable levels of carbon and nitrogen in their AGB which are more compared to the BGB (Below Ground Biomass) of wheat grass (Christian and Willson, 1999). The overall results point out that if wheatgrass can be planted as a part of the kitchen garden in the buildings of the urban areas then it will not only serve as a vault of carbon and nitrogen and keep the ambient temperature cool, but will also provide nutrient rich juice to members of the family. This juice rich in vitamins and antioxidants might keep the health of the urban dwellers sound and disease free.

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