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Progressing from Terra Preta de Índios to the Whole World

Evolution of "Biochar" and "Terra Preta" publications

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Introduction

Biochar has been related to chemical, physical and biologic benefits to soils, as well as to improvements in crop production. The addition of biochar to soil is also related to increased sorption of many pollutants and the decrease soil greenhouse gases emissions [1]. This work evaluates the evolution of publications registered in Thompson's ISI Web of Science indexed for "biochar" or "bio-char" and those indexed for "terra preta" (until July 26th 2010).

Results and Discussions

There are 103 articles and 7 reviews indexed for "biochar" or "bio-char" between the years 2000 and 2010. Documents indexed for "terra preta" totalized 29 articles and 4 reviews, which were published between 1984 and 2010. The last five years represent 90 % of the indexed articles for "biochar" or "bio-char" and 66 % of those indexed for "terra preta" (Figure 1).

Articles were divided according to words in the title, objectives and key words in 12 classes (Figure 2). For "biochar" or "bio-char" the subjected areas with major number of articles, according to this classification, were: i) effects on soil and/or in crop production, ii) description characteristics and/or properties, iii) production methods, iv) relations of biochar use and greenhouse gases emissions and v) biochar interactions with pesticides and/or pollutants in soils. The subject is recent in the international literature. For instance, the first two articles related to effects of biochar on soil or crop production were published only in 2006. In 2007 the first articles involving biochar effects in soil microorganisms and immobilization of heavy metals in biochar were available. Just in 2008 and 2009 papers accosting greenhouse gases emissions and pesticides or pollutants behavior in soils began to be published.

For "terra preta" the most important areas were i) effects on soil and/or in crop production, ii) effects on soil microorganisms and iii) description of characteristics and/or properties of "terra preta". The first articles about effects of "terra preta" in soil or crop production were published in 2003. In 2007 was published the first article on the relationship between "terra preta" and soil microorganisms.

Until July 26th 2010 there were 35 articles indexed for "biochar" or "bio-char", which represents an increase of 16.6 % in comparison to the same period in 2009. For "terra preta" the number of indexed articles in Thompson's ISI Web of Science have remained almost constant since 2007. The number of biochar articles published in 2008 enhanced significantly (283 %) compared to 2007 and 176 % in 2009 compared to 2008 (Figure 1). Interestingly, three papers published in 2007 and 2008 , have received, until July 26th 2010, more than 44 citations each [2, 3, 4].

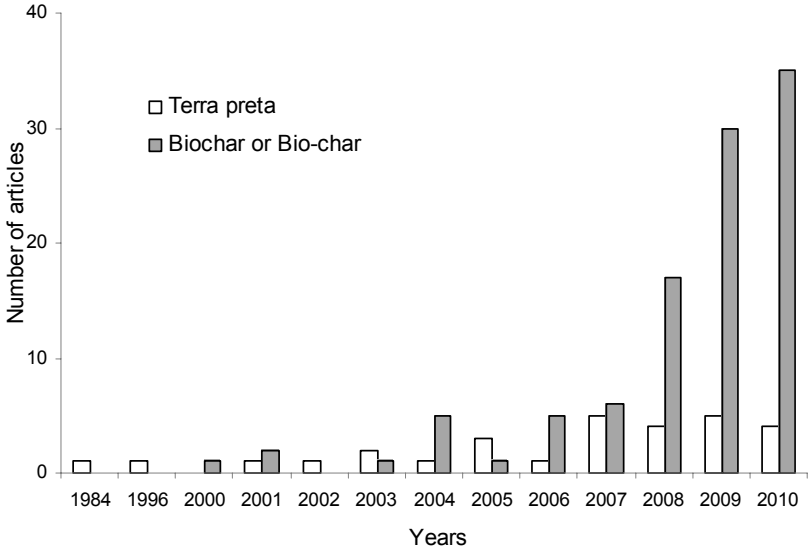

Figure 1. Evolution of publications indexed for "terra preta" and for "biochar" or "bio-char" in Thompson's ISI Web of Science.

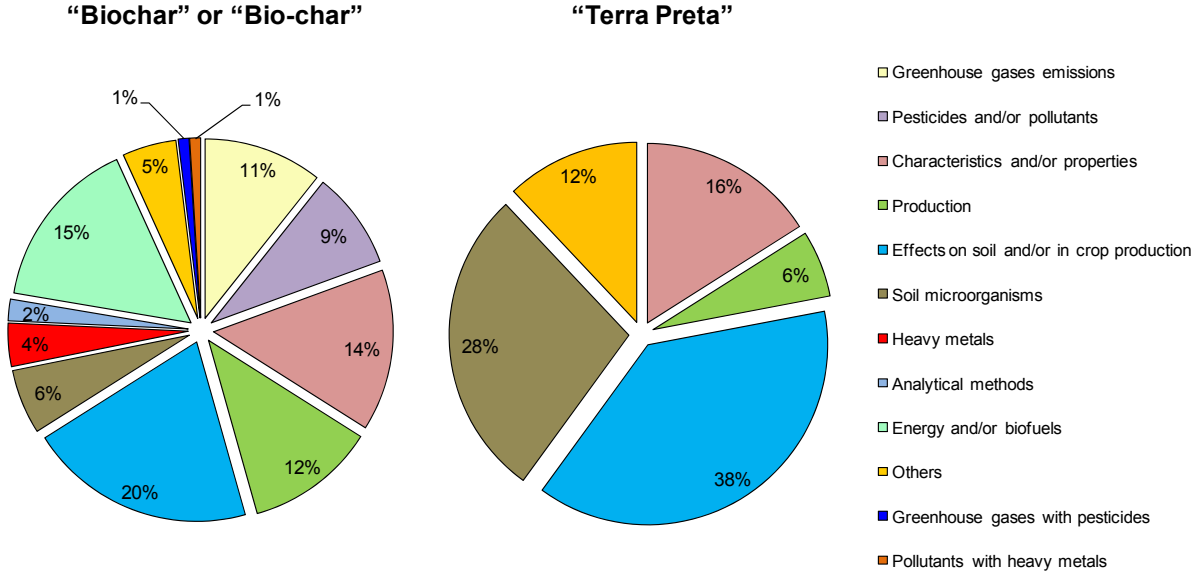

Figure 2. Subjected areas of indexed articles in Thompson's ISI Web of Science for "terra preta" and for "biochar" or "bio-char".

Conclusions

The researches on biochar have been significantly increased in the last five years, while the number of published articles indexed for "terra preta" demonstrates only a small increase. Papers about heavy metals, soil microorganisms, greenhouse gases emissions and pesticides and pollutants behavior in soils with addition of biochar began to be published in the last four years. Two of these subjects are in the group of the most important areas in number of published articles indexed in Thompson's ISI Web of Science.

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