Drosos *Chem. Biol. Technol. Agric.* (2015) 2:20
DOI 10.1186/s40538-015-0044-2

Chemical and Biological Technologies in Agriculture
a SpringerOpen Journal

EDITORIAL NOTES

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Editorial for thematic series HA/NOM structure and bioactivity

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Back in 250 BC Archimedes stated "ΔΩΣ ΜΟΙ ΠΑ ΣΤΩ ΚΑΙ ΤΑΝ ΓΑΝ ΚΙΝΑΣΩ", meaning: Give me a place to stand and I will move the Earth! This applies also to Agriculture. We need research as a stand point to manage the land of Earth, and we need research in chemistry and biochemistry of humic substances to improve fertility. In our effort to apply one more brick of knowledge to meet the above goal, Chemical and Biological Technologies in Agriculture devoted the thematic series "HA/NOM Structure and Bioactivity" based on the contributions of participants to the 17th Meeting of the International Humic Substances Society (IHSS) that took place in Ioannina, Greece, on September 2014.

Within this thematic series, Vaccaro et al. showed that a humic acid from volcanic soil increased the yield of soluble proteins and amino acids, thus influencing the expression of *Zea mays* plants, and Sleighter et al. tested the plant growth of bioassays with *Zea mays* by applying terrestrial dissolved organic matter (DOM) fractionated by pH and polarity. According to their findings, prevalent hydrophilic fractions yielded the largest response for shoot measurements, while fractions dominated by hydrophobic compounds yielded the greatest response on root growth, thus confirming once more that the molecular structure of humic substances is responsible for differences in plant growth. Ramos et al. within the mechanism of plant stimulation by soil organic matter proved that it is the property of humic acid to act like a molecular elicitor of H^+ and Ca^{2+} fluxes. However, the environment can also play an important role in the organic matter characteristics and behavior. Lepane et al. showed that ice-covered DOM contained more microbial-derived peptide-like constituents, and a change in climate conditions, such as temperature, can cause differences in the concentration and chemical composition of DOM. Matiushkina and Kharitonova highlighted the importance of soil matrix in the incorporation of humic substances to form clay aggregates. To obtain more information about the components of humics, Aoyama studied the nature of a soil HA and confirmed that is a mixture of acid-insoluble, FA-like acid-soluble, protein-like and polysaccharide constituents bound by weak linkages. A better understanding of the humic-mediated interactions between plants and soil is needed to develop better screening techniques. In this direction, Li et al. optimized the detection of both inorganic and organic P species in soil by employing liquid state ^{31}P-NMR spectroscopy, while de Almeida and Szpoganicz introduced a novel model to observe the evolution of out-of-equilibrium response patterns for each point of an acid–base titration of humic acids.

This thematic series supports the present quality of natural organic matter research, whereby the comprehension of humic matter molecular nature and its bioactivity in the environment and in the agricultural domains is progressively expanding and conferring practical viability to humic matter applications.

Received: 21 September 2015 Accepted: 21 September 2015
Published online: 17 November 2015

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