Instructions for full paper preparation

Manuscripts will be reviewed by members of the Scientific Committee of the SYMPOSIUM Crete 2012.

Manuscripts will be included in the Symposium Proceedings.

Manuscripts should be submitted in **word format (**in docx or doc format**)** by email at mdoula@otenet.gr

The deadline for abstract submission is the **15th September 2012.**

General information for manuscript preparation

- Manuscripts should be 10 pages long.
- Use A4 page set-up and make all margins (top, bottom, left, right) 20 mm wide.
- Justify the body of the text both left and right.
- Line space should be 1,15.

TITLE (centralized, capital letters, 14-point Times Roman)

- The name(s) of the author(s) (12-point Times Roman-centralized)
- *The affiliation(s) and address(es) of the author(s) (10-point Times Roman, italics)*
- *The e-mail address, of the corresponding author(10-point Times Roman, italics)*

Abstract: Please provide a structured abstract of 150 to 250 words which could indicatively be divided into the following sections:

- Purpose (stating the main purposes and research question)
- Methods
- Results
- Conclusions

Please use 10-points Times Roman and do not include figures or photos

Key words: Please provide 3 to 5 key words which can be used for indexing purposes (10-points Times Roman)

Text

Indicatively, the text could be divided into the followings sections:

1. Introduction
2. Materials and Methods
3. Results and Discussion
4. Conclusions
5. Acknowledgements
6. References

Text Formatting

- Number the sections and please do not use more than three levels of displayed headings.
- Headings should be in bold (e.g. **1. Introduction**)
- Use a normal, plain font (12-point Times Roman) for text.
- Use italics for emphasis.
- Use tab stops or other commands for indents, not the space bar.
- Use the table function, not spreadsheets, to make tables.
- Use the equation editor or MathType for equations.
- Figures and photos should be in **black and white**

Acknowledgments

Acknowledgments of people, grants, funds, etc. should be placed in a separate section before the reference list. The names of funding organizations should be written in full.

References

Citation

Reference citations in the text should be identified by numbers in square brackets.

Some examples:

1. Results have shown that these naturally occurring materials could be used to provide satisfactory solutions for many environmental problems via low-cost procedures [1-6].
2. Jacobs and Waite [17] were studied the retention of divalent iron and manganese cations.
3. This effect has been widely studied [1-3, 7].

Reference list (10-point Times Roman-single spacing)

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text. Do not use footnotes or endnotes as a substitute for a reference list.
The entries in the list should be numbered consecutively.

- Journal article
  V. Kavvadias, M. K. Doula, K. Komnitsas, N. Liakopoulou, Disposal of olive oil mill wastes in evaporation ponds: Effects on soil properties. J. Hazard. Mater. 182 (2010) 144-155.
- Article by DOI
  C.L. Sajti, S. Georgio, V. Khodorkovsky, W. Marine, New nanohybrid materials for biophotonics. Appl. Phys. A (2007). doi:10.1007/s00339-007-4137-z
- Book
  A.L. Page, R.H. Miller, D.R. Keeney, Methods of Soil Analysis, Part 2: Chemical and Microbiological Properties, American Society of Agronomy, Madison, Wisconsin, 1982.
- Book chapter
  D.R. Keeney, D.W. Nelson, Nitrogen-Inorganic Forms. In: Methods of Soil Analysis, Part 2: Chemical and Microbiological Properties, A.L. Page, R.H. Miller, D.R. Keeney (Eds.), American Society of Agronomy, Madison, Wisconsin, (1982), pp. 643-698.
- Online document
  J. Cartwright, Big stars have weather too. IOP Publishing PhysicsWeb. http://physicsweb.org/articles/news/11/6/16/1 (2007). Accessed 26 June 2007

Tables, Figures and Photos

- Tables, Figures and Photos should be numbered using Arabic numerals.
- Should always be cited in text in consecutive numerical order.
- For each table, figure and photo please supply a caption explaining the components.
- Identify any previously published material by giving the original source in the form of a reference at the end of the caption.
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.
- In Tables you may use 10-point Times Roman

DISPOSAL OF OLIVE OIL MILLS WASTES IN EVAPORATION PONDS: A SERIOUS THREAT FOR SOIL QUALITY

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Key words: olive oil mills wastes, OMW, bioremediation, soil, degradation

Abstract: Bioremediation is a process in which microorganisms metabolize contaminants either through oxidative or reductive processes. As such, it uses relatively low-cost and simple techniques, which generally have high public acceptance and can often be carried out on site. Under favorable conditions, microorganisms can completely oxidize organic contaminants and convert them into non-toxic by-products such as carbon dioxide and water or organic acids and methane. The implementation of bioremediation technology for olive oil mills wastes (OMW) disposal areas although could be suitable for Mediterranean countries, where the disposal of OMW in open evaporation ponds or directly on soil is a current and common practice, has not been developed as an alternative soil remediation technology so far.

1. Introduction

Bioremediation is a process in which microorganisms metabolize contaminants either through oxidative or reductive processes. As such, it uses relatively low-cost and simple techniques, which generally have high public acceptance and can often be carried out on site. Under favorable conditions, microorganisms can completely oxidize organic contaminants and convert them into non-toxic by-products such as carbon dioxide and water or organic acids and methane. The implementation of bioremediation technology for olive mill wastewater(OMWW) disposal areasalthough could be suitable for Mediterranean countries, where the disposal of OMWW in open evaporation ponds or directly on soil is a current and common practice, has not been developed as an alternative soil remediation technology so far. In the framework of the LIFE project “Strategies to improve and protect soil quality from the disposal of Olive Oil Mills Wastes in the Mediterranean area-PROSODOL” the application of bioremediation technology and its results at a degraded OMW disposal area was foreseen. In order to develop the most suitable bioremediation methodology for soil quality improvement, a series of lab experiments were conducted and the optimum treatment, as regards oxygen, nutrients and water supply was determined and applied in a pilot area in Crete which is used for surface disposal of OMWW for more than 15 years.

2. Materials and Methods

2.1 Description of the pilot OMW disposal area

The pilot area is located in the Municipality of Rethymnon, Crete; North latitude is 35º17′while the East longitude is 24º21′. The region has subtropical/Mediterranean climate and is characterized by mild winters and dry-hot summers. Soils in the area under study are clayey or silty clayey, slightly or moderately alkaline and rich in carbonates [1]. The selected disposal area (1 ha) with almost 5% slope, includes two evaporation ponds, which were constructed by using native soil and simple engineering, while no impermeable membranes or other protective media were used to protect soil. The two ponds have dimensions 32m×4.20m×1.70m and of 30m×44m×1.75m, respectively.

2.2 Lab tests and analyses-Feasibility studies

Some of the physicochemical properties of soil samples (control and polluted) are shown in Table 1. Four potential treatments for the degraded soil plus one without bioremediation treatment (natural attenuation) were evaluated (Table 2). Plastic containers with 250g of soil were prepared and the four treatments were applied in triplicate to the soil samples. Prior to the microcosm spiking with the OMWW, the microcosms were incubated at 20ºC and with moisture controlled at 50% of water holding capacity (WHC) of soil (Figs. 1a and b). After this period, the microcosms were spiked by adding 500 m^3/ha OMWW (Fig. 1c and 1d). Soil samples from the different microcosms were collected for the different analysis programmed, at 15 days before the OMW contamination (T0) and 3 days after then (T1). Soil samples were collected also at the following time periods: i) T2 after 15 days of T1; ii) T3 after one month of OMWW addition and iii) T4 after two month of OMWW addition. The parameters that were measured in the collected soil samples were polyphenol concentration by mean of Folin-Ciocalteu's method [2]; pH, electrical conductivity (EC), enzyme activities (urease and dehydrogenase activity), phytotoxicity (germination seed experiment) and ecotoxicity measured by luminescent bacteria.

Table 1. Some of the physicochemical soil properties (control and polluted soil samples)

Parameter	Control	Sample	Parameter	Control	Sample
Texture	CL	CL	**Exchnageable Ca, cmol/kg**	46	44
$CaCO_3$, %	27	24	**Exchnageable Mg, cmol/kg**	2.9	4.0
Organic matter, (%)	4.3	6.4	**Available P, mg/kg**	16	113
pH	7.7	7.7	**Available B, mg/kg**	0.2	0.6
EC, mS/cm	0.67	1.89	**Available Fe, mg/kg**	12	106
Polyphenols, mg/kg	57	117	**Available Cu, mg/kg**	2.6	4.6
Total N, mg/g	2.3	4.4	**Available Mn, mg/kg**	5.0	28
Exchnageable K, cmol/kg	0.6	7.8	**Available Zn, mg/kg**	0.79	1.7

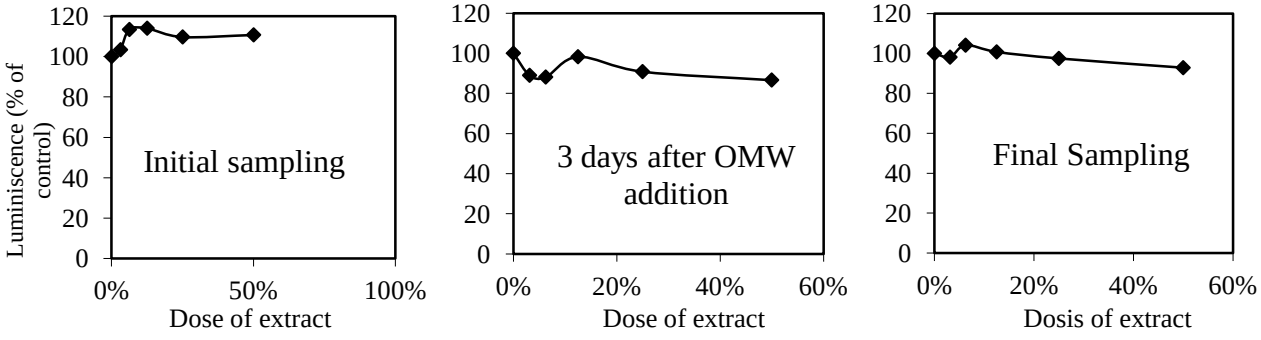

Fig. 2. TA treatment: Relationship between bacteria luminescence (% of light output of the control) and dilution level of the original extract obtained from the polluted soil at T0, T1 and T5 sampling times.

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References

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