

## **ARTICOLI PUBBLICATI DAL GRUPPO DI RICERCA IN FITORIMEDIO IRET-CNR**

### **SEDE DI MONTELIBRETTI (RM)**



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### **RECENTI PUBBLICAZIONI SU RIVISTE INTERNAZIONALI**

1. Ancona et al. (2016) Plant-assisted bioremediation of a historically PCB-contaminated area in Southern Italy. *New Biotechnology* 09/2016;
2. Bianconi (2011) "Applicazione sperimentale di Rizorimedio su suoli inquinati da composti organici: le potenzialità della short rotation coppice (src) per il recupero ambientale e la sostenibilità economica" Ph.D. thesis in Forest Ecology, Università degli studi della Tuscia, Viterbo, Italy, 89 pp.
3. De Cesare et al. (2019). Catechol-Loading Nanofibrous Membranes for Eco-Friendly Iron Nutrition of Plants. *Nanomaterials*, 9(9), 1315.
4. De Paolis et al. (2011) Eco-physiological characterization of the culturable bacterial fraction of a heavy-metal contaminated soil subjected to phytoremediation. *Water Air and Soil Pollution* 216: 505–512;
5. Di Baccio et al. "Response of *Lemna gibba* L. to high and environmentally relevant concentrations of ibuprofen: Removal, metabolism and morpho-physiological traits for biomonitoring of emerging contaminants." *Science of the Total Environment* 584 (2017): 363-373.
6. Di Baccio et al. (2014). Early responses to cadmium of two poplar clones that differ in stress tolerance. *Journal of plant physiology*, 171(18), 1693-1705.
7. Fernández et al. (2014) Gas-exchange, photo- and antioxidant protection, and metal accumulation in I-214 and Eridano *Populus* sp. clones subjected to elevated zinc concentrations. *Environmental Experimental Botany* 107: 144-153;
8. Fernández-Martínez, et al. (2017). Near-infrared reflectance spectroscopy allows rapid and simultaneous evaluation of chloroplast pigments and antioxidants, carbon isotope discrimination and nitrogen content in *Populus* spp. leaves. *Forest Ecology and Management*, 399, 227-234.
9. Grenni et al. (2019). Sulfamethoxazole persistence in a river water ecosystem and its effects on the natural microbial community and *Lemna minor* plant. *Microchemical Journal*, 103999.
10. Iori et al. (2016) Physiology and genetic architecture of traits associated with cadmium tolerance and accumulation in *Populus nigra* L. *Trees* 30 (1), 125-139
11. Iori et al. (2017). Analysis of biometric, physiological, and biochemical traits to evaluate the cadmium phytoremediation ability of eucalypt plants under hydroponics. *iForest - Biogeosciences and Forestry* in press.
12. Maruska et al. (2016) Isolation and identification of fungi tolerant to polycyclic aromatic hydrocarbons and coal tar from different habitats in Lithuania. *Toxicological & Environmental Chemistry* 98: 77-89;
13. Nogues et al. (2019). Microcosm Experiment to Assess the Capacity of a Poplar Clone to Grow in a PCB-Contaminated Soil. *Water*, 11(11), 2220. Passatore et al. (2014). Phytoremediation and bioremediation of

- polychlorinated biphenyls (PCBs): state of knowledge and research perspectives. *Journal of hazardous materials* 278, 189-202
14. Pietrini *et al.* (2015) Evaluation of nickel tolerance in *Amaranthus paniculatus* L. plants by measuring photosynthesis, oxidative status, antioxidative response and metal-binding molecule content. *Environmental Science and Pollution Research* 22:482–494;
  15. Pietrini et al. (2015). Assessment of physiological and biochemical responses, metal tolerance and accumulation in two eucalypt hybrid clones for phytoremediation of cadmium-contaminated waters. *Journal of Environmental Management* 162, 221-231
  16. Pietrini *et al.* (2015). Ibuprofen exposure in *Lemna gibba* L.: Evaluation of growth and phytotoxic indicators, detection of ibuprofen and identification of its metabolites in plant and in the medium. *Journal of Hazardous Materials* 300: 189-193.
  17. Pietrini *et al.* (2016) Combined effects of elevated CO<sub>2</sub> and Cd-contaminated water on growth, photosynthetic response, Cd accumulation and thiolic components status in *Lemna minor* L. *Journal of hazardous materials* 309, 77-86
  18. Pietrini et al. (2017) Effects of a ladle furnace slag added to soil on morpho-physiological and biochemical parameters of *Amaranthus paniculatus* L. plants. *Journal of Hazardous Materials* (in press), DOI: 10.1016/j.jhazmat.2017.01.050;
  19. Pietrini et al. (2017) Investigation on metal tolerance and phytoremoval activity in the poplar hybrid clone "Monviso" under Cu-spiked water: Potential use for wastewater treatment. *Science of the total environment*. Amsterdam: Elsevier, 2017, Vol. 592.
  20. Pietrini, F., Iori, V., Pietrosanti, L., Passatore, L., Zuin, M. C., Aromolo, R., ... & Zacchini, M. (2018). A Survey on the Metal (loid) Accumulation Ability of Spontaneous and Established Plants for the Phytomanagement of an Industrial Landfill in the Venice Lagoon. In *Phytoremediation* (pp. 113-131). Springer, Cham.
  21. Pietrini et al. (2019). Evaluation of morpho-physiological traits and contaminant accumulation ability in *Lemna minor* L. treated with increasing perfluorooctanoic acid (PFOA) concentrations under laboratory conditions. *Science of The Total Environment*, 695, 133828.
  22. Pietrini et al. (2019). Morpho-Physiological and Metal Accumulation Responses of Hemp Plants (*Cannabis Sativa* L.) Grown on Soil from an Agro-Industrial Contaminated Area. *Water*, 11(4), 808.
  23. Pietrini et al. (2019). Effect of Different Copper Levels on Growth and Morpho-Physiological Parameters in Giant Reed (*Arundo donax* L.) in Semi-Hydroponic Mesocosm Experiment. *Water*, 11(9), 1837.

## LIBRI E CAPITOLI

1. Bianconi et al. (2011). Field-scale rhizoremediation of a contaminated soil with hexachlorocyclohexane (HCH) isomers: the potential of poplars for environmental restoration In "Phytoremediation: Processes, Characteristics, and Applications". Handbook of Phytoremediation Eds. I.A. Golubev. Nova Science Publishers, Inc. ISBN: 978-1-61728-753-4. Chapter 31 pp. 783-794.
2. Grandi et al. (2014) Le piante che depurano l'acqua. Ed Il Campo Bologna. Pp 240
3. Grenni et al. (2016). Biorimedio fitoassistito: approccio ecologico per il rimedio di siti multi-contaminati. Monografia su "La ricerca sulle acque e le nuove prospettive di valorizzazione dei risultati in ambito pubblico e privato". Cacci editore, Bari a cura di E Brugnoli e V F Uricchio
4. Iori et al. (2014). Morphophysiological Responses, Heavy Metal Accumulation and Phytoremoval Ability in Four Willow Clones Exposed to Cadmium Under Hydroponics In *Phytoremediation: Management of Environmental Contaminants*, Volume 1, Ansari, A.A., Gill, S.S., Gill, R., Lanza, G.R., Newman, L. (Eds.), DOI 10.1007/978-3-319-10395-2\_7, © Springer International Publishing Switzerland 2015. Chapter 7 pp. 87-98.
5. Massacci et al. Capitolo su Fitorimedio bioassistito, pp.21-34 nel libro: Le innovazioni tecnologiche nel settore della caratterizzazione e bonifica dei siti contaminati, Cacci Editore, a cura di Brugnoli E, Uricchio VF, Massarelli C, Zurlini G,
6. Passatore et al. (2016). Capitolo del libro "Acqua e salute per la popolazione" – stampa GraficaEtica – Roma.
7. Pietrini et al. (2005) "Cadmium interaction with thiols and photosynthesis in higher plants. In "Advances in Plant Physiology" Hemantaranjan editor, Vol. 8, Chapter 18 pp. 313-326, Scientific Publisher Jodhpur.
8. Pietrini et al. (2018). "A Survey on the Metal (loid) Accumulation Ability of Spontaneous and Established Plants for the Phytomanagement of an Industrial Landfill in the Venice Lagoon. In *Phytoremediation: Management of Environmental Contaminants*", Volume 6, Ansari, A.A., Gill, S.S., Gill, R., Lanza, G.R., Newman, L. (Eds.), DOI 10.1007/978-3-319-99651-6\_4, © Springer International Publishing Switzerland 2018. Chapter 6, pp. 113-131.

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## RECENTI PUBBLICAZIONI SU RIVISTE INTERNAZIONALI

1. Macci C, Peruzzi E, Doni S, Masciandaro G. (2019) Monitoring of a long term phytoremediation process of a soil contaminated by heavy metals and hydrocarbons in Tuscany. Environmental Science and Pollution Research Monitoring. DOI: 10.1007/s11356-019-06836-x
2. Tozzi F, Pecchioli S, Renella G, Melgarejo P, Leguac P, Macci C, Doni S, Masciandaro G, Giordani E, Lenzi A (2019) Remediated marine sediment as growing medium for lettuce production: assessment of agronomic performance and food safety in a pilot experiment Running title: reusing dredged sediments as growing media. J Sci Food Agric. 5624–5630 <https://doi.org/10.1002/jsfa.9815>.
3. Tozzi F, Del Bubba, MPetrucci WA, Pecchioli S, Macci C, Hernandez Garcia F, Martinez-Nicolas JJ, Giordani E (2019) Use of a remediated dredged marine sediment as a substrate for food crop cultivation: sediment characterization and assessment of fruit safety and quality using strawberry (*Fragaria x ananassa* Duch.) as model species of contamination transfer. Chemosphere 238 124651 <https://doi.org/10.1016/j.chemosphere.2019.124651>
4. Mattei P, Gnesini A, Gonnelli C, Marraccini C, Masciandaro G, Macci C, Doni S, Iannelli R, Lucchetti S, Nicese FP, Renella G (2018) Phytoremediated marine sediments as suitable peat-free growing media for production of red robin photinia (*Photinia x fraseri*) Chemosphere 201, 595-602. (ISSN) 0045-6535. DOI: 10.1016/j.chemosphere.2018.02.172
5. Ugolini F, Mariotti B, Maltoni A, Tani A, Salbitano F, Izquierdo CG, Macci C, Masciandaro G, Tognetti R (2018). A tree from waste: Decontaminated dredged sediments for growing forest tree seedlings. Journal of environmental management, 211, 269-277. 10.1016/j.jenvman.2018.01.059. ISSN: 0301-4797.
6. Ugolini F, Calzolari C, Lanini GM, Massetti L, Pollaki S, Raschi A, Sabatini F, Tagliaferri G, Ungaro F, Massa D, Antonetti M, Garcia Izquierdo C, Macci C, Masciandaro G (2017) Testing decontaminated sediments as a substrate for ornamentals in field nursery plantations Journal of Environmental Management 197, 681-693. DOI 10.1016/j.jenvman.2017.03.064. ISSN: 0301-4797.
7. Peruzzi E., Macci C., Doni S., Iannelli R., MasciandaroG. (2017). Stabilization process in reed bed systems for sludge treatment. Ecological Engineering, 102; 381-389 DOI: 10.1016/j.ecoleng.2017.02.017. ISSN: 0925-8574 e ISSN: 1872-6992 (I.F. 2.74) (citazioni: 0). ISSN: 0925-8574 eISSN: 1872-6992. DOI 10.1016/j.ecoleng.2017.02.017

8. Ugolini, F., Calzolari, C., Lanini, G.M., Massetti, L., Sabatini, F., Ungaro, F., Damiano, S., Izquierdo, C.G., Macci, C., Masciandaro, G. (2017). Physiological performance and growth of *Viburnum tinus* L. on phytoremediated sediments for plant nursing purpose. *IForest* 10, 55-63. DOI 10.3832/ifor1840-009. ISSN: 1971-7458 (I.F. 1.070)
9. Mattei P, D'Acqui LP, Nicese FP, Lazzerini G, Masciandaro G, Macci C, Doni, S, Sarteschi F, Giagnoni L, Renella G (2017) Use of phytoremediated sediments dredged in maritime port as plant nursery growing media. *Journal of Environmental Management* 186, 225-232. (I.F. 3.13) (citazioni: 1). (ISSN) 0301-4797. DOI: 10.1016/j.jenvman.2016.05.069.
10. Macci C, Peruzzi E, Doni S, Poggio G, Masciandaro G (2016). The phytoremediation of an organic and inorganic polluted soil: a real scale experience. *International Journal of Phytoremediation* 18 (4), pp. 378-386. (ISSN) 1522-6514. DOI: 10.1080/15226514.2015.1109595. (I.F. 2.40) (citazioni: 2).
11. Doni S., Macci C., Peruzzi E., Iannelli R., Masciandaro G. (2015). Heavy metal distribution in a sediment phytoremediation system at pilot scale. *Ecological Engineering* 81: 146–157. (I.F. 3.09) (citazioni: 4). (ISSN) 0925-8574. DOI: 10.1016/j.ecoleng.2015.04.049.
12. Moreno B, Canizares R, Macci C, Doni S, Masciandaro G, Benitez E (2015). Molecular tools to understand the bioremediation effect of plants and earthworms on contaminated marine sediments. *Journal of Hazardous Materials* 300: 398–405. (I.F. 4.84) (citazioni: 2). DOI: 10.1016/j.jhazmat.2015.07.019. ISSN 0304-3894.
13. Peruzzi E., Macci C., Doni S., Volpi M., Masciandaro G. (2015). Organic matter and pollutants monitoring in reed bed systems for sludge stabilization: a case study. *Environ Sci Pollut Res*, 22:2447–2454. (ISSN) 0944-1344. DOI: 10.1007/s11356-014-3054-x (I.F. 2.76)
14. Macci C, Peruzzi E, Doni S, Iannelli R, Masciandaro G (2015) Ornamental plants for micropollutant removal in wetland systems. *Environ Sci Pollut Res*, 22:2406–2415. (ISSN) 0944-1344. DOI: 10.1007/s11356-014-2949-x (I.F. 2.76)
15. Nielsen S, Peruzzi E, Macci C, Doni S, Masciandaro G. (2014). Stabilisation and mineralisation of sludge in reed bed systems after 10-20 years of operation. *Water Science & Technology* 69(3), 539-545. DOI:10.2166/wst.2013.723. (ISSN) 0273-1223. DOI: 10.2166/wst.2013.723 (I.F. 1.06)
16. Masciandaro G., Di Biase A., Macci C., Peruzzi E., Iannelli R., Doni S. (2014). Phytoremediation of dredged marine sediment: Monitoring of chemical and biochemical processes contributing to sediment reclamation. *Journal of Environmental Management* 134, 166-174. (ISSN) 0301-4797. DOI: 10.1016/j.jenvman.2013.12.028. (I.F. 3.13)
17. Masciandaro G, Macci C, Peruzzi E, Ceccanti B, Doni S. (2013) Organic matter–microorganism–plant in soil bioremediation: a synergic approach. *Reviews in Environmental Science and Bio-technoloy* 12:399–419. (ISSN) 1569-1705. DOI: 10.1007/s11157-013-9313-3 (I.F. 4.35) (citazioni: 10).
18. Peruzzi E, Nielsen S, Macci C, Doni S, Iannelli R, Chiarugi M, Masciandaro G (2013) Organic matter stabilization in reed bed systems: Danish and Italian examples. *Water Science and Technology* 68 (8), 1888-1894. DOI 10.1007/s11356-014-3054-x. ISSN: 0273-1223 e ISSN: 1996-9732 (I.F. 1.06)
19. Doni S., Macci C., Peruzzi E., Iannelli R., Ceccanti B., Masciandaro G. (2013) Decontamination and functional reclamation of dredged brackish sediments. *Biodegradation* 24, 499-512. (ISSN) 0923-9820 DOI: 10.1007/s10532-012-9606-1 (I.F. 2.21)
20. Macci C., Doni S., Peruzzi E., Bardella S., Filippis G., Ceccanti B., Masciandaro G. (2013) A real-scale soil phytoremediation. *Biodegradation* 24,521-538. (ISSN) 0923-9820 DOI: 10.1007/s10532-012-9608-z (I.F. 2.21)
21. Macci C., Doni S., Peruzzi E., Ceccanti B., Masciandaro G. (2012). Bioremediation of polluted soil through the combined application of plants, earthworms and organic matter. *Journal of Environmental Monitoring* 14, 2710-2717. DOI 10.1039/c2em30440f. ISSN: 1464-0325 (I.F. 2.45)
22. Doni S., Macci C., Peruzzi E., Arenella M., Ceccanti B., Masciandaro G. (2012). In Situ Phytoremediation of a Historically Contaminated Soil by Metals, Hydrocarbons and Polychlorobiphenyls. *J. Environ. Monit.*, 14 (5), 1383-1390. DOI 10.1039/c2em11016d. ISSN: 1464-0325 (I.F. 2.45)
23. Salvato M., Borin M., Doni S., Macci C., Ceccanti B., Marinari S., Masciandaro G. (2012). Wetland plants, micro-organisms and enzymatic activities interrelations in treating N polluted water. *Ecological Engineering* 47, 36-43. DOI: 10.1016/j.ecoleng.2012.06.033. ISSN 0925-8574 (I.F. 3.09)
24. Moreno B., Nogales R., Macci C., Masciandaro G., Benitez E. (2011). Microbial eco-physiological profiles to estimate the effectiveness of rhizoremediation of trichloroethylene-contaminated soils. *Ecological Indicators* 11, 1563–1571. DOI 10.1016/j.ecolind.2011.03.026. ISSN 1470-160X (I.F. 3.19)
25. Peruzzi E., Masciandaro G., Macci C., Doni S., Ceccanti B. (2011). Pollutant monitoring in sludge treatment wetlands. *Water Science & Technology*, 64 (7), 1558- 1565. DOI 10.2166/wst.2011.589. ISSN: 0273-1223 e ISSN: 1996-9732 (I.F. 1.06)
26. Peruzzi E., Masciandaro G., Macci C., Doni S., Mora Ravelo S.G., Peruzzi P., Ceccanti B. (2011). Heavy metal fractionation and organic matter stabilization in sewage sludge phytotreatment. *Ecological Engineering* 37, 771–778. DOI: 10.1016/j.ecoleng.2010.05.009. ISSN: 0925-8574 e ISSN: 1872-6992 (I.F. 3.09)
27. Peruzzi E., Macci C., Doni S., Masciandaro G., Peruzzi P., Aiello M., Ceccanti B. (2009). *Phragmites australis* for sewage sludges stabilization. *Desalination* 247, 111-120. DOI: 10.1016/j.desal.2008.02.039. ISSN: 0011-9164 (I.F. 4.41)