

REFERENCES

- APHA (American Public Health Association). 1998. Closed reflux, titrimetric method. In *Standard methods for the examination of water and wastewater*. 20th Ed, (pp.5-15 – 5-16), Washington, DC: APHA.
- APHA (American Public Health Association). 1998. Arthropods. In *Standard methods for the examination of water and wastewater*. 20th Ed, (p. 8-85) Washington, DC: APHA.
- Abadulia, E., Tzanov, T., Costa, S., Robra, K., Cavaco-Paulo, A. and Gubitz, G.M. (2000). Decolorization and detoxification of textile dyes with a laccase from *Trametes hirsuta*. *Appl. Environ. Microbiol.* **66(8)**: 3357-3362.
- Archibald, F.S., Bourbonnais, R., Jurasek, L., Paice, M.G. and Reid, I.D. (1997). Kraft pulp bleaching and delignification by *Trametes versicolor*. *J. Biotechnol.* **53**: 215-236.
- Arica, M. Y., Kacar, Y. and Genc, O. (2001). Entrapment of white-rot fungus *Tremetes versicolor* in Ca-alginate beads: preparation and biosorption kinetic analysis for cadmium removal from an aqueous solution. *Biores. Technol.* **80**: 121-129.
- Assadi, M.M., Rostami, K., Shahvali, M. and Azin, M. (2001). Decolorization of textile wastewater by *Phanerochaete chrysosporium*. *Desalination.* **141**: 331-336.

- Bajpai, P., Bajpai, P.K. and Kondo, R. (1999). Pulp bleaching with white rot fungi and their enzymes. In P. Bajpai *et al.* (Eds), *Biotechnology for Environmental Protection in the Pulp and Paper Industry* (pp. 64-89), Germany: Springer-Verlag Berlin Heidelberg.
- Banat, I. M., Nigam, P., Singh, D. and Marchant, R. (1996). Microbial decolorization of textile dye containing effluents: a review. *Biores. Technol.* **58**: 217-227.
- Banat, I. M., McMullan, G., Meehan, C., Kirby, N., Nigam, P., Smyth, W.F. and Marchant, R. (1999). Microbial decolorization of textile dyes present in textile industries effluent. In: *Proceeding of the Industrial Waste Technical Conference*, (pp.1-16), Indianapolis, USA.
- Bayramoglu, G., Bektas, S. And Arica, M.Y. (2003). Biosorption of heavy metal ions on immobilized white-rot fungus *Trametes versicolor*. *J. Hazard. Material B.* **101**: 285-300.
- Behrand, R., Meyer, E. and Rusche, F. (1905). Veber condensation procucte aus glycoloril und formaldehyde. *J. Liebig. Annal. Chem.* **339**: 1-137.
- Benito, G.G., Miranda, M.P. and De los Santos, D.R. (1997). Decolorization of wastewater from an alcoholic fermentation process with *Tremetes versicolor*. *Biores. Technol.* **61**: 33-37.
- Campos, R., Kandelbauer, A., Robra, K.H., Artur, C. and Gubitz, G.M. (2001). Indigo degradation with purified laccases from *Trametes hirsuta* and *Sclerotium rolfsii*. *J. Biotechnol.* **89**: 131-139.

- Cassland, P. and Jonsson, J. (1999). Characterization of a gene encoding *Trametes versicolor* laccase A and improved heterologous expression in *Saccharomyces cerevisiae* by decreased cultivation temperature. *Appl. Microbiol. Biotechnol.* **52**: 393-400.
- Cerniglia, C.E. and Sutherland, J.B. (2001). Bioremediation of polycyclic aromatic hydrocarbons by ligninolytic and non-ligninolytic fungi. In G.M. Gradd (Ed.), *Fungi in Bioremediation* (pp. 136-187), United Kingdom: Cambridge University Press.
- Chen, X., Shen, Z., Zhu, X., Fan, Y. and Wang, W. (2005). Advanced treatment of textile wastewater for reuse using electrochemical oxidation and membrane filtration. *Water SA.* **31(1)**: 127-132.
- Cohen, R. and Hadar, Y. (2001). The roles of fungi in agricultural waste conversion. In G.M. Gradd (Ed.), *Fungi in Bioremediation* (pp. 305-334), United Kingdom: Cambridge University Press.
- Couto, S.R., Sanroman, M.A., Hofer, D. and Gubitz, G.M. (2004). Stainless steel sponge: a novel carrier for the immobilisation of the white-rot fungus *Tremetes hirsuta* for decolorization of textile dyes. *Biores. Technol.* **95**: 67-72.
- Cui, J. and Chisti, Y. (2003). Polysaccharopeptide of *Coriolus versicolor*: physiological activity, uses, and production. *Biotechnol. Adv.* **21**: 109-122.
- Deacon, J.W. (1997). Fungal decomposer communities. In J.W. Deacon (Ed.), *Modern Micology*, 3rd ed. (pp. 186-204), United Kingdom: Blackwell Science Ltd.

- Dobois, M., Gilles, K.A., Hamilton, J.K., Rebers, P.A. and Smith, F. (1956). Colorimetric method for determination of sugars and related substances. *Anal. Chem.* **28(3)**: 350-356.
- Douglas, A. S. and Donald, M. W. (1965) In: *Analytical chemistry method*. Renhart and Winston, Inc. pp. 471-473.
- Duran, N. and Esposito, E. (2000). Potential applications of oxidative enzyme and phenoloxidase-like compounds in wastewater and soil treatment: a review. *Appl. Catalysis B: Environ.* **28**: 83-99.
- Evans, C.S. and Hedger, J. (2001). Degradation of plant cell wall polymers. In G.M. Gradd (Ed.), *Fungi in Bioremediation* (pp. 1-26), United Kingdom: Cambridge University Press.
- Freeman, W.A., Mock, W.L. and Shih, N.Y. (1981). Ozonation-an important technique to comply with new German law for textile wastewater treatment. *Water Sci. Technol.* **30**: 255-263.
- Freshney, R.I. (2004). Culture of Animal Cells. In: *Manual of Basic Technique*. John Wiley and Son, Inc. p. 577.
- Fu, Y. and Viraraghavan, T. (2001). Fungal decolorization of dye wastewaters: a review. *Biores. Technol.* **79**: 251-262.
- Fujita, M., Era, A., Ike, M., Soda, S., Miyata, N. and hirao, T. (2000). Decolorization of heat-treatment liquor of waste sludge by a bioreactor using polyurethane foam-immobilized white rot fungus equipped with an ultramembrane filtration unit. *J. Biosci. Bioeng.* **90(4)**: 387-394.

Garg, V. K., Kumar, R. and Gupta, R. (2004). Removal of malachite green dye from aqueous solution by adsorption using agro-industry waste: a case study of *Prosopis cineraria*. *Dyes and Pigments*. **65**: 1-10.

Ge, Y., Yan, L. and Qing, K. (2004). Effect of environment factors on dye decolorization by *P. sordida* ATCC90872 in a aerated reactor. *Process Biochem.* **39**: 1401-1405.

Gradd, G.M.(2001). *Fungi in Bioremediation*. United Kingdom: Cambridge University Press.

Grothe, D.R., Dickson, K.L., and Reed-Judkind, D.K., eds. (1996). Whole effluent toxicity testing: An evaluation of methods and prediction of recieveing system impacts. *SETAC Pellston Workshop on Whole Effluent Toxicity*, Sep 16-25, 1995, Pellston, Mich. SETAC Press. Pensacola, Fla.

Harvey, P.J. and Thurston, C.F. (2001). The biochemistry of ligninolytic fungi. In G.M. Gadd (Ed.), *Fungi in Bioremediation* (pp. 27-51), United Kingdom: Cambridge University Press.

Hersk, B. (1975). *The ABCs of Batik*. (pp.1-3), Pennsylvania, USA: Chilton Book Company.

<http://www.caudata.org> (29/11/2004)

http://www.reo10.in.th/frame%20detail_tread_pollution.html (7/10/2004)

<http://users.quista.net/sjgall/Brackets.htm> (15/10/2004)

Jarosz-Wilkolazka, A., Kochmanska-Rdest, J., Malarczyk, E., Wardas, W. and Leonowicz, E. (2002). Fungi and their ability to decolourize azo and anthraquinonic dyes. *Enz. Microbial Technol.* **30**: 566-572.

Hu, T.L. (1992). Sorption of reactive dyes by *Aeromonas* biomass. *Water Sci. Technol.* **26**: 357-366.

Kakumyan, P, "Laccase production and characterization by *Coriolus versicolor* RC3 cultivated on rice bran", M. S. Thesis, Chiang Mai University, 2005.

Kapdan, I.K., Kargi, F., McMullan, G. and Marchant, R. (2000). Effect of environmental conditions on biological decolorization of textile dyestuff by *C. versicolor*. *Enz. Microbial Technol.* **25**: 381-387.

Kasinath, A., Nocotny, C., Svobodova, K., Patel, K.C. and Sasek, V. (2003). Decolorization of synthetic dyes by *Irpex lacteus* in liquid cultures and packed-bed bioreactor. *Enz. Microbial Technol.* **32**:167-173.

Keck, A., Klein, J., Kudlich, M., Stolz, A., Knackmuss, H. J. and Mattes, R.(1997). Reduction of azo dyes by redox mediators originating in the naphthalenesulfonic acid degradation pathway of *Sphingomonas* sp. strain. *Appl. Environ. Microbiol.* **63**: 3684-3690.

Khanongnuch, C., Wanphrut, N., Lamyong, S. and Watanebe, T. (2004).

Thermotolerant wood rotting fungi isolated from northern Thailand and their potential uses in lignin degrading application. *Fungal Diversity.* **15**: 187-196.

Kim, S., Park, C., Kim, T., Lee, J. and Kim, S. (2003) COD reduction and decolorization of textile effluent using a combined process. *J. Biosci. Bioeng.* **95(1)**: 102-105.

Kitwechkun, W. (2004). Continuous decolorization of synthetic wastewater contaminated with textile azo dye by immobilized *Coriolus versicolor* RC3 in packed bed bioreactor. M.S. Thesis, Chiang Mai University.

Kitwechkun, W. and Khanongnuch, C. (2004). Decolorization of azo dye (OrangeII) by immobilized white-rot fungus *Coriolus versicolor* RC3. *Proceeding of The 15th Annual Meeting of the Thai Society for Biotechnology*, February 3-6. Pang Suan Kaew Hotel, Chiang Mai, Thailand.

Knapp, J.S. and Newby, P.S. (1995). The microbiological decolorization of an industrial effluent containing a diazo-linked chromophore. *Water Res.* 7: 1804-1809.

Knapp, J.S., Vantoch-wood, E. and Zhang, F. (2001). Use of wood-rotting fungi for the decolorization of dyes and industrial effluents. In G.M. Gadd (Ed.), *Fungi in Bioremediation* (pp. 242-304), United Kingdom: Cambridge University Press.

Knapp, J.S., Zhang, F.M. and Taple, K.N. (1997). Decolorisation of Orange II by wood-rotting fungus. *J. Chem. Tech. Biotechnol.* **69**: 289-296.

Kulla, M.G. (1981). Aerobic bacterial degradation of azo dyes. Microbial degradation of xenobiotics and recalcitrant compounds. In: Leisinger, T., Cook, A.M., Hutter, R., and Nuesch, J. (Eds), *FEMS Symposium.*, (pp. 387-399), Academic Press, London.

Lacina, C., Germain, G. and Spiros, A.N. (2003). Utilization of fungi for biotreatment of raw wastewaters. *African J. Biotechnol.* **2**: 620-630.

- Lopez, A., Ricco, G., Ciannarella, R., Rozzi, A., Di Pinto, A.C. and Possino, R. (1999). Textile wastewater reuse: ozonation of membrane concentrated secondary effluent. *Water Sci. Technol.* **40**: 99-105.
- Maire, R.M., Pepper, I.L. and Gerba, C.P. (1999). *Environmental microbiology*. (pp.214-217), Florida: Academic Press.
- Martins, M.A.M., Lima, N., Silvestre, A.J.D. and Queiroz, M.J. (2003). Comparative studied of fungal degradation of single or mixed bioaccessible reactive azo dye. *Chemosphere*, **52**: 967-973.
- Marungrueng, K. and Pavasant, P. (2006). Removal of basic dye (Astrazon Blue FGRL) using macroalga *Caulerpa lentillifera*. *J. Environ. Management.* **78**: 268-274.
- Mester, T. and Tien, M. (2000). Oxidation mechanism of ligninolytic enzymes involved in the degradation of environmental pollutants. *Inter. Biodeterior. Biodegrad.* **46**: 51-59.
- Mielgo, I., Moreira, M.T., Feijoo, G. and Lema, J.M. (2001). A packed-bed fungal bioreactor for the continuous decolorisation of azo-dyes (Orange II). *J. Biotechnol.* **89**: 99-106.
- Moreira, M.T., Feijoo, G., Mester, T., Mayorga, P., Sierra-Alvarez, R. and Field, J.A. (1998). Role of Organic Acids in the Manganese-Independent Biobleaching System of *Bjerkandera* sp. Strain BOS55. *Appl. Environ. Microbiol.* **64**: 2409-2417.
- Nigam, P. and Marchant, R. (1995). Selection of the substratum for composing biofilm system of textile decolorizing bacteria. *Biotechnol. Lett.* **17**: 993-996.

Nigam, P., Banat, I.M., Singh, D. and Marchant, R. (1996). Microbial process for the decolorization of textile effluent containing azo, diazo and reactive dyes. *Process Biochem.* **31**: 435-442.

Nigam, P., Armour, G., Banat, I.M., Singh D. and Marchant, R. (2000). Physical removal of textile dyes from effluents and solid-state fermentation of dye-adsorbed agricultural residues. *Biores. Technol.* **72**: 219-226.

Notification the Ministry of Science, Technology and Environment, No. 3, B.E.2539 (1996) issued under the Enhancement and Conservation of the National Environmental Quality Act B.E.2535 (1992), published in the Royal Government Gazette, Vol. 113 Part 13 D, dated February 13, B.E.2539 (1996)

Ogawa, T. and Yatome, C. (1990). Biodegradation of azo dyes in multistage rotating biological contractor immobilized by assimilating bacteria. *Bull. Environ. Contam. Toxicol.* **44**: 561-566.

Padmavathy, S., Sandhya, S., Swaminathan, K. and Subrahmanyam, Y.V. (2003). Aerobic decolorization of reactive azo dyes in presence of various cosubstrates. *Chem. Biochem. Eng.* **17**: 147-151.

Pak, D. and Chang, W. (1999). Decolorizing dye wastewater with low temperature catalytic oxidation. *Water Sci. Technol.* **40**: 115-121.

Pala, A. and Tokat, E. (2002). Color removal from cotton textile industry wastewater in an activated sludge system with various additives. *Water Res.* **36**: 2220-2225.

Pearce, C.I., Lloyd, J.R. and Guthrie, J.T. (2003). The removal of colour from textile wastewater using whole bacterial cells: a review. *Dyes and Pigments*. **58**: 179-196.

Peralto-Zamora, P., Kunz, A., Gomez de Morales, S., Pelegrini, R., de Capos Moleiro, P., Reyes, J. and Duran, N. (1999). Degradation of reactive dyes I. A comparative study of ozonation, enzymatic and photochemical processes. *Chemosphere* **38**: 835-852.

Pointing, S.B. (2001). Feasibility of bioremediation by white rot fungi. *Appl. Microbiol. Biotechnol.* **57**: 20-33.

Raghavacharya, C. (1997). Colour removal from industrial effluents-a comparative review of available technologies. *Chem. Eng. World* **32**:53-54.

Reddy, C.A. and Mathew, Z. (2001). Bioremediation potential of white rot fungi. In G.M. Gadd (Ed.), *Fungi in Bioremediation* (pp. 52-78), United Kingdom: Cambridge University Press.

Robinson, T., McMullan, G., Marchant, R. and Nigam, P. (2001). Remediation of dyes in textile effluent: a critical review on current treatment technologies with a proposed alternative. *Biores. Technol.* **77**: 247-255.

Rodriguez, E., Pickard, M.A. and Vazquez-Duhalt, V. (1999). Industrial dye decolorization by laccase from ligninolytic fungi. *Current Microbiol.* **38**: 27-32.

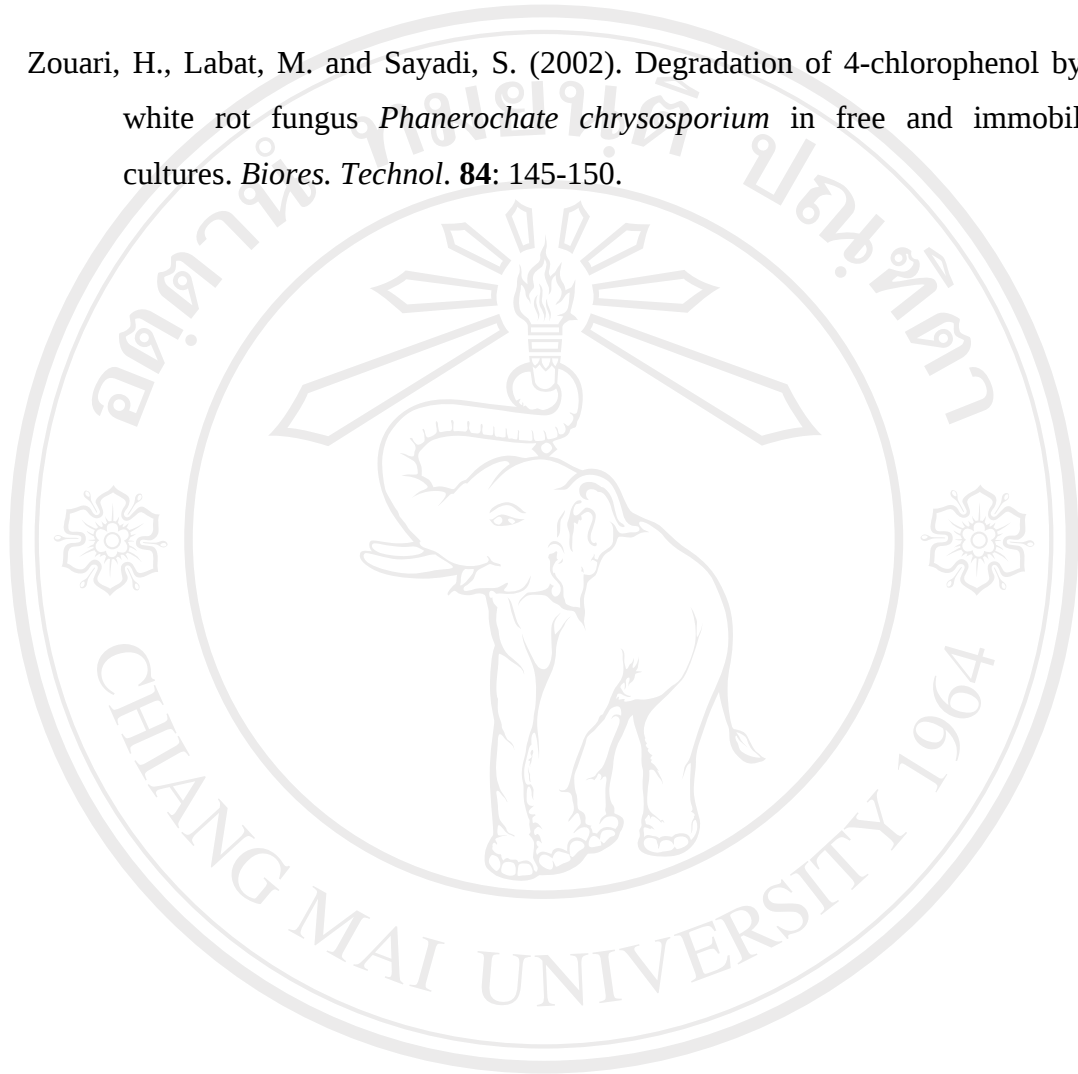
Saparrat, M.C.N., Guillen, F., Arambarri, A.M., Martinez, A.T. and Martinez, M.J. (2002) Induction, isolation and characterization of two laccases from white rot basidiomycete *Coriolopsis rigida*. *Appl. Environ. Microbiol.* **68**: 1634-1540.

- Selcuk, H. (2005). Decolorization and detoxification of textile wastewater by ozonation and coagulation processes. *Dyes Pigment* **64**: 217-222.
- Slokar, Y.M. and Le Marechal, A.M. (1997). Methods of decoloration of textile wastewaters. *Dyes Pigment* **37**: 335-356.
- Shaw, C.B., Carliell, C.M. and Wheatley, A.D. (2002). Anaerobic/aerobic treatment of coloured textile effluents using sequencing batch reactors. *Water Res.* **36**: 1993-2001.
- Skehan, P., Storeng, R., Sgudiero, D., Monks, A., McMahon, J., Vistica, D., Warren, J.T., Bokesch, H., Kenney, S., Boyd, M.R. (1990). New colorimetric cytotoxicity assay for anticancer-drug screening. *J. National Cancer Institute.* **82**: 1107-1112.
- Textile Industry Division. (2005). *Thai Textile Statistics 2004*. Bangkok: Department of Industrial Promotion.
- Vilegas-Navarro, A., Ramirez-M, Y., Salvador-S, M.S., and Gallardo, J.M. (2001). Determination of wastewater LC50 of the different process stages of the textile industry. *Ecotoxicology and Environmental Safety.* **48**: 56-61.
- Villarroel, M.J., Sancho, E., Ferrando, M.D., and Andreu, E. (2003). Acute, chronic and sunlethal effects of the herbicide propanil on *Daphnia magna*. *Chemosphere.* **53**: 857-864.
- Venceslau, M.C., Tom, S. and Simon, J.J. (1994). Characterisation of textile wastewaters- A review. *Envi. Technol.* **15**: 917-929.

- Vyas, B.R. and Molitoris, H.P. (1995). Involvement of an extracellular H_2O_2 -dependent ligninolytic activity of the white rot fungus *Pleurotus ostreatus* in the decolorization of Remazol brilliant blue R. *Appl. Environ. Microbiol.* **11**: 3919-3927.
- Wang, Y. and Yu, J. (1998). Adsorption and degradation of synthetic dyes on the mycelium of *Trametes versicolor*. *Water Sci. Technol.* **38**: 233-238.
- Wesenberg, D., Kyriakides, I. and Agathos, S. N. (2003). White-rot fungi and their enzymes for the treatment of industrial dye effluents. *Biotechnol. Adv.* **22**: 161-187.
- Xu, X., Li, H., Wang, W. and Gu, J. (2005). Decolorization of dyes and textile wastewater by potassium permanganate. *Chemosphere.* **59**: 893-898.
- Xu, Y. and Lebrun, R.E. (1999). Treatment of textile dye plant effluent by nanofiltration membrane. *Separ. Sci. Technol.* **34**: 2501-2519.
- Yesilada, O., Asma, D., and Cing, S. (2003). Decolorization of textile dyes by fungal pellets. *Process Biochem.* **38**: 933-938.
- Young, L. and Yu, J. (1997). Ligninase-catalysed decolorization of synthetic dyes. *Water Res.* **31**(5): 1187-1193.
- Zhang, F.M., Knapp, J.S. and Tapley, K.N. (1999). Development of bioreactor systems for decolorization of Orange II using white-rot fungus. *Enz. Microbial Technol.* **24**: 48-53.
- Zhou, W. and Zimmerman, W. (1993). Decolorization of industrial effluents containing reactive dyes by actinomyces. *Microbiol. Lett. FEMS* **107**: 157-162.

Zissi, U. and Lyberatos, G. (1996). Azo-dye biodegradation under anoxic conditions. *Water Sci. Technol.* **34**: 495-500.

Zouari, H., Labat, M. and Sayadi, S. (2002). Degradation of 4-chlorophenol by the white rot fungus *Phanerochate chrysosporium* in free and immobilized cultures. *Biores. Technol.* **84**: 145-150.



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