Studies on Effect of Cinnamomum ramulus Extract Liquid on Antibacterial Activity

施清文、張基郁、張耀南

E-mail: 9300344@mail.dyu.edu.tw

ABSTRACT

The object of this study was to investigate the effects of the water (H2O) and 50%, 70%, 100% ethanol (EtOH) extract liquids from the retentate and the supernatant of Cinnamomum ramulus (Cr) through the rotary evaporation process on the antibacterial activity (growth inhibition) of Bacillus licheniformis and Legionellaceae bacteria. The concentrations of cinnamaldehyde in the extract liquids was quantified by HPLC analysis. For the antibacterial activity the effect of 50% EtOH extract liquids from the Cr supernatant was markedly good compared with that of other extract liquids. The growth inhibition of 50% EtOH extract liquid was increased by the addition of the liquid. The growth of B. licheniformis and Legionellaceae bacteria was dramatically increased by the addition of H2O and 100% EtOH (10mL of addition) extract liquids from the Cr retentate. The effects of all the extract liguids from the Cr supernatant on the growth inhibition of Legionellaceae bacteria was not significantly effective. The lowest and highest concentrations of cinnamaldehyde were quantified for the H2O and 50% EtOH extract liquids, respectively, compared with other extract liquids. This result indicated that cinnamaldehyde is not only inhibition one component for the bacterial growth.

Keywords : water and ethanol extract liquids；antibacterial activity；Cinnamomum ramulus

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REFERENCES

1. 王衛軍、馬力強、肖覆中、杜銀中 (1996)，不同方法製備的中草藥原液對抑菌試驗的影響。青海畜牧獸醫雜誌，26(2):20-22。 2. 王興華、劉大千、徐軍、劉曉玲、曲運波 (1999)，苦參蛇床子等六種藥用植物的抑菌研究。山西大學學報(自然科學版)，22(4):383-386。 3. 王青牡、孫曉娟 (2001)，幾種防腐抑菌中藥的抗菌作用研究。江西中醫學院學報，13(1):31-32。 4. 李季眉 (1982)，苦瓜抑菌成分的抽取。食品科學，9(3-4):138-147。 5. 李松原 (1997)，芭樂葉之抗菌活性成分之研究，國立台灣大學食品科技研究所，碩士論文，台北、台灣。 6. 何池金、陳少風、葉居新 (1997)，石菖蒲抑菌效應的研究。環境與開發，12(3):1-3。 7. 余有貴、趙良忠、段林東、李新社、舒葉平 (2001)，鳳尾草抗菌藥物的萃取與開發研究。邵陽高等專科學校學報，14(3):199-203。 8. 林宗旦、林宗平、林景彬 (1996)，中藥藥理學，華香園出版社，台北，19-23。 9. 林捷、吳錦鑄、朱新貴、梅潛彪、郭志敏 (1999)，柚皮萃取物的抑菌研究。華南醫學大學學報，20(3):59-62。 10. 林景彬 (1985)，常用中藥藥理學與應用，中國醫藥學院 出版組，台中，13-17。 11. 林家宏 (2001)，紫草之抗癌與抗菌活性成分的研究，私立中國文化大學應用化學研究所，碩士論文，台北、台灣。 12. 周隆武、王淑珍、杜平德 (1997)，牛蒡之抑菌作用

。食品科學，24(2):195-202。 13. 范晉嘉、陳佳慧 (1998)，青蔥乙醇抽出物之抗菌活性。中國農業化學會誌，36(1):12-20。 14. 郭玫君、馮惠萍、吳明娟 (2000)，檳榔、荖花及荖葉抑菌作用之探討。嘉南學報，26:186-191。 15. 高本釗 (1981)，新編中藥大辭典第二冊，新文豐出版公司，台北，2882。 16. 殷梅津、張淑君、蘇國雄 (1997)，若干香辛植物萃取液抑制黑麴菌及白色念珠菌生長之研究。食品科學，24(3):384-388。 17. 曹志安 (2001)，檜木精油之抗菌活性研究，私立大葉大學食品工程研究所，碩士論文，彰化、台灣。 18. 陳光華、鄧德豐 (1977)，蔬菜中抑制微生物之物質。食品科學，4(2):33-44。 19. 陳秋萍 (1998)，天然抑菌劑之開發與特性探討，國立屏東科技大學食品科學研究所，碩士論文，屏東、台灣。 20. 陳燕春、許美芳(1998)，退伍軍人菌檢測方法及其在台灣分布現況。化工資訊，12(8):34-43。 21. 宮錫坤、陳新燦、張蓬 (1998)，5種中藥抑菌效果的測定。中國消毒學雜誌，15(2):106-107。 22. 張圓笙 (1981)，荖藤對於Asperogillus parasticus, Asperogillusniger和Mucor mucedo孢子發芽的影響。中國農業化學會誌，9(1-2):99-107。 23. 張圓笙、游若?、周正俊 (1982)，香辛植物水浸出液抗菌性之初步探討。食品科學，8(2):185-191。 24. 張偉、檀建新、賈英民、馬雯、袁玉榮 (1998)，竹葉對食品致病菌的抑菌作用。食品科學(大陸)，19(4):37-39。 25. 張上鎮、陳品方、張上淳 (2000)，台灣杉精油及抽出成分之抗細菌活性。中華林葉季刊，33(1):119-125。 26. 張靜華 (2000)，中藥萃取液之抑菌性探討，國立屏東科技大學食品科學研究所，碩士論文，屏東、台灣。 27. 黃彩玉、陳幸臣 (1987)，山葵之抗菌性與化學變異性。食品科學，14(3):129-142。 28. 黃俊智 (1999)，洋蔥萃取液之抑菌性探討，國立屏東科技大學食品科學研究所，碩士論文，屏東、台灣。 29. 楊瑩蓉、陳明造、劉登城 (1998)，中氏香腸之不同香辛料其抗氧化性及抗菌性之探討。中國畜牧學會會誌，27(1):117-128。 30. 劉愛如、田櫻、程立方、褚新紅 (1995)，山東地區側柏葉止血和抗菌作用比較。山東中醫學院學報，19(1):47-49。 31. 樊黎生 (2001)，蘆薈汁液菌作用之研究。食品與發酵工業，27(8):38-40。 32. 蔣文明 (1995)，桂枝湯雙向調節作用初探。四川中醫，5:12-13。 33. 謝寶全 (2000)，肉桂萃取液之抑菌作用。台灣農業化學與食品科學，38(3):184-193。 34. 謝寶全、黃淑惠 (2000)，不同植物萃取液對食品微生物之抑制性研究。第十五屆全過技術及職業教育研討會論文集，59-74。 35. 蘇遠志和黃世佑 (1999)，微生物化學工程學，華香園出版社，台北，71。 36. Agarwal, S. K., Singh, S. S., Verma, S., Kumar, S. (2000). Antifungal activity of anthraquinone derivatives from Rheum emodi. Journal of Ethnopharmacology. 72:43-46. 37. Alzoreky, N. S. and Nakahara, K. (2002). Antibacterial activity of extracts from some edible plants commonly consumed in Asia. International Journal of Food Microbiology. 80:223-230. 38. Ankri, S., and David, M. (1999), Antimicrobial properties of allicin from garlifc. Microbes and Infection. 2:125-129. 39. Arora, D. S. and Kaur, J. (1999), Antimicrobial activity of spices. International Journal of Antimicrobial Agents. 12:257-262. 40. Baranowski, J. D., Davidson, P. M., Nagel, C. W. ,Branen, A. L. (1980), Inhibition of Saccharmyces cerevisiae by naturally occurring hydroxycinnamates. Journal of Food Science. 45:592. 41. Beuchat, L. R. (1976), Sensitivity of Vibrio parahaemolyticus to spices and organic acid. Journal of Food Science. (41):899-902. 42. Birrer, G. A., Cromwick, A. M. and Grosst, R. A. (1994), γ -Poly(Glutamic acid) formation by Bacillus licheniformis 9945a:physiological and biochemical studies. International Journal of Biological Macromoecules. 16(5):265-275. 43. Bovarnick, M. (1942), The formation of extracellular D(-)-glutamic acid polypeptide by Bacillus subtilis. Journal of Biological Chemistry . 145:415-424. 44. Buchanan, R. L., Hoover, D. G. and Jones, S. B. (1983), Caffeine inhibition of aflatoxin production；Mode of action. Applied Environmental Microbiology. 46:1193. 45. Bullerman, C. U., and F. Y. Lieu, and S. A. SEIER (1977), Inhibition of growth and aflatoxin production by cinnamon and clove oils, cinnamic aldehyde and eugenol. Journal of Food Science. 42:1107-1109. 46. Chang, S. T., Chen, P. F., and Chang, S. T., Chang, S.T. (2001), Antibacterial activity of leaf essential oils and their constituents from Cinnamomum osmphloeum. Journal of Ethnopharmacology. 77:123-127. 47. Chou, C. C., Lin, L. L. and Chung, K. T. (1999), Antimicrobial activity of tea as affected by the degree of fermentation and manufacturing season. International Journal of Food Microbiology, 48:125-130. 48. Cos, P., Hermans, N., Bruyne, T. D. (2002), Apers, S., Sindambiwe, J. B., Berghe, D. V., Pieters, Vlietinck, A. J., Further evaluation of Rwandan medicinal plant extracts for their antimicrobial and antiviral activities. Journal of Ethnopharmacology, 79:155-163. 49. Davidson, P. J. and Parish, M. E. (1989), Methods for testing the efficacy of food antimicrobials. Food Technology. 1:148-155. 50. Dorman, H. J. and Deans, S. G. (2000), Antimicrobial agents from plant:antibacterial activity of plant volatile oils. Journal of Applied Microbiology. 88:308-316. 51. Fewell, A. M., Roddick, J. G. (1993), Interactive antifungal activity of the glycoalkaloids alpha-solanine and alpha-chaconine. Phytochemistry. 33:323-328. 52. Freese, E., Sheu, C. W. and Galliers, E. (1973), Function of lipophilic acid as antimicrobial additives. Nature. 241:321. 53. Gould, G. W. (1996), Industry Perspectives on the Use of Natural Antimicrobials and Inhibitors for Food Applications. Journal of Food Protection. supplement:82-86. 54. Kabuki, T., Nakajima, H., Ueda, S.,Kuwabara, Y. and Dosako, S. (2000), Characterization of novel antimicrobial compound from mango(Mangifera indica L.) kernel seed. Food chemistry. 71:61-66. 55. Kubo, M., Kimura, Y., Okuda, T. and Namba, K. (1981), Studies on Scutellariae Radix Part II:The Antibacterial Substance. Planta. medica. 43:194-210. 56. Mazzanti, G., Mascellino, M. T., Battinelli, L., Coluccia, D., Manganaro, M. and Saso, L. (2000), Antimicrobial investigation of semipurified fractions of Ginkgo biloba leaves. Journal of Ethnopharmacology. 71:83-88。 57. Moleyar, V. and Narasimham, P. (1992), Antibacterial activity of essential oil components. International Journal of Food Microbial. 16:337-342. 58. Omar, S. B., Lemonnier, N.,Jones, C.,Ficker, M. L.,Smith, C., Neema, G. H. N., Towers, K. Goel, J. T., Arnason (2000), Antimicrobial activity of extracts of eastern North American hardwood trees and relation to traditional medicine. Journal of Ethnopharmacology. 73:161-170. 59. Palmer, A. S., Stewart, J. and Fyfe, L. (1998), Antimicrobial properties of plant oils andessences against five important foodborne pathogens. Letters in Applied Microbiology. 26:118-122. 60. Rauja, J. P., Remes, S.,Heinonen , M., Hopia, A., Kahkonen, M., Kujala, M., Pihaja, K., Vuorela, H., Vuorela, P. (2000), Antimicrobial effects of Finnish plant extracts containing flavonoids and other phenolic compounds. International Journal of Food Microbiology. 56:3-12. 61. Unlu, M., Daferera, D., Donmez, E., Polissiou, M., Tepe, B., Sokmen, A. (2002), Compositions and the in vitro antimicrobial activities of the essential oils of Achillea setacea and Achillea teretifolia (Compositae). Journal of Ethnopharmacology. 83:117-121. 62. Weidenborner, M and Jha, H. C. (1994), Antifungal activity of flavonoids in relation to degree of hydroxylation, methoxylation and glycosidation. Acta Horticulturae. 381:702-709. 63. Wongkham, S.,

Laupattarakasaem, P., Pienthaweechai, K., Areejitranusorn, P., Wongkham, C., Techanitiswad, T. (2001), Antimicrobial Activity of Streblus asper Leaf Extract. Phytother Research. 15:119-121。