

不同柚子果皮香氣萃取與柚子果汁、果肉釀酒之研究

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摘要

本論文研究不同品種柚子對柚子皮的精油萃取、果皮與果汁之香氣成分、及果肉釀酒品質及成分變化。本實驗分為三部分進行：第一部分，將白柚、西施柚、帝王柚清洗後經由去皮、去白囊等步驟，比較不同品種之果肉汁液、釀造酒、蒸餾酒之間的差異；第二部分由破碎後的果肉以HF8商業菌種進行酒液的釀製，為期28天，釀製期間做一般成分分析，比較其間的差異；第三部分，將白柚、西施柚、帝王柚的柚皮經由水蒸氣蒸餾、水破碎減壓蒸餾、酒精破碎減壓蒸餾再以GC和GC-MS進行化合物分析、香氣成分分析，並比較其成分的差異。本實驗同時也探討上述三種不同品種柚子之果汁、釀造酒、蒸餾酒及精油成分、香氣成分有何差異，以及三種不同的萃取方式對於精油的收率和其成分變化的影響。研究結果顯示，不同萃取方式所得到的精油含量都有所不同，且以水蒸氣蒸餾方式可得到較高的產率。三種的萃取方式都為西施柚精油的含量最高。西施柚、帝王柚、白柚在水蒸氣蒸餾的精油收率分別為2.90%、2.77%、2.81%；在水破碎減壓蒸餾的精油收率分別為2.15%、0.71%、1.36%；在酒精破碎減壓蒸餾的精油收率分別為2.08%、0.40%、0.44%。在不同品種的柚子中，比較不同萃取方式的柚子皮精油之揮發性成分都是以 α -烯類碳氫化合物、醇類、醛類、酯類、酮類、酚類等為主，其中含量最高都是limonene。以水蒸氣蒸餾方式，西施柚、帝王柚、白柚的limonene含量分別為86.29%、80.15%、85.19%；以水破碎減壓蒸餾方式，limonene含量分別為86.84%、76.47%、83.86%；以酒精破碎減壓蒸餾方式，limonene含量分別為87.70%、72.98%、85.42%。不同萃取方式所得到的柚子皮精油含量和揮發性成分都有所不同，而又以酒精當溶劑進行減壓濃縮的方式，萃取出來的精油較為單純，沒有酯類、酮類和其他氧化物等。以水蒸氣蒸餾方式可得到較高的產率且三種的萃取方式又以西施柚精油含量為最高。分析結果顯示，不同柚子品種果汁主要揮發性成分有palmitic acid、linoleic acid等，且以酸類物質含量為最多。不同品種釀造酒主要揮發性成分有isoamyl alcohol、phenethyl alcohol等，且以醇類物質含量為最多。不同品種蒸餾酒主要揮發性成分有isoamyl alcohol、phenethyl alcohol等，且以醇類物質含量為最多，其次是酯類。整體上以西施柚香氣含量最為豐富。柚子蒸餾酒品評結果顯示，在風味、嗜味及整體嗜好性上沒有顯著性差異。

關鍵詞：柚子、檸檬烯、 α -烯類化合物、精油、香氣

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