

食品工业科技

Science and Technology of Food Industry

ISSN 1002—0306
CN 11-1759/TS



食品工业科技编辑部
微信公众号

感受得到的 益生菌品质

领先行业的
HOWARU® 益生菌
科学和微生物组能力
• 高性能
• 高稳定性
• 高功效性

Howaru

www.howaru.cn

IFF

科学与创意
的交融之处

ISSN 1002-0306



营养与生物科技



HOWARU益生菌

© 2022 by International Flavors & Fragrances Inc. IFF是注册商标。版权所有。

万方数据

食品工业科技

SHIPIN GONGYE KEJI

2022年3月 第43卷 第5期

目次

未来食品

- 基于口腔咀嚼原理的咀嚼模拟器研究进展 张啸峰, 陈勇, 陈建设*(1)
基于机器视觉的金丝皇菊智能分级系统研究 张银萍, 徐燕, 朱双杰*, 周宇(13)
基于UPLC-Q-Orbitrap HRMS和网络药理学分析五味子治疗非酒精性脂肪肝的物质基础及作用机制
..... 任媛媛, 王超, 谢勇, 郭光鹏, 黄勤挽*, 王瑾*(21)

研究与探讨

- 腰果过敏蛋白Ana o 2与Ana o 3结构分析及致敏性预测 张爱琳, 赵慧娟, 迟越, 梁筱妍, 李晓丹, 郭梅(34)
辣木籽抗氧化肽的分离鉴定及其稳定性分析 郭其洪, 李兴丽, 范江平, 王雪峰*(41)
不同糖类对草鱼鱼糜凝胶的影响
..... 阙凤, 高天麒, 汪超, 熊光权, 石柳, 吴文锦, 乔宇, 丁安子, 李新, 汪兰*(48)
大黄鱼卵分离蛋白的凝胶特性分析 杜椅楠, 阎佳楠, 王昱乔, 姜昕昱, 许诗琦, 吴海涛*(56)
西林火姜片微波间歇干燥特性及品质变化 黄纪民, 吴钊龙, 李浩, 陈桂英, 林芳, 李秉正, 黄志民*(61)
三个不同种源的铁皮石斛多糖比较及其初步的药理活性评价
..... 黄俊彬, 丁婕, 朱海媚, 李运容, 黄丹丹, 魏刚*(71)
蓝靛果微波泡沫干燥过程中维生素C降解过程模拟 孙宇, 张雨涵, 徐皖君, 郑先哲*(79)
高强度超声处理对大豆7S和11S球蛋白结构和理化性质的影响 田然, 冯俊然, 隋晓楠, 江连洲*(87)
KCl部分替代NaCl对猪肉脂肪氧化的动力学影响 孔庆新, 张径舟, 黄业传*, 徐伟平, 罗丽梅(98)
裸藻非水溶性和水溶性多糖的化学组成及抗氧化活性分析 文愉熙, 黄晓舟*, 林晓思(105)
发酵和后熟对牦牛奶营养及风味物质的影响 李升升, 张燕, 赵立柱(114)
不同处理方式对米荞营养成分及抗氧化活性的影响 严静, 蔡易熹, 薛秋艳, 李俊健, 黎攀, 杜冰*(121)

生物工程

- 六堡茶渥堆过程中产多酚氧化酶菌株的筛选及多酚氧化酶的分离纯化
..... 王洁, 何瑜琳, 滕建文, 夏宁, 韦保耀, 黄丽*(130)
酒曲中乳酸菌的筛选及其在板栗糯米饮料发酵中的应用 刘莹红, 陈晓慧, 常学东, 王月颖, 邹静*(138)
窖泥中挥发性物质和微生物群落的空间分布规律及其关系 张朝正, 张天爽, 董思文, 孙伟, 赵华*(147)
酿酒酵母与植物乳杆菌复合发酵对面条储藏特性的影响 葛珍珍, 高珊珊, 王维静, 许明月, 张培旗, 纵伟*(158)

食品工业科技

SHIPIN GONGYE KEJI

2022年3月 第43卷 第5期

目 次

植物乳杆菌HCS03-001安全性评价及其益生特性分析

..... 矫艳平, 余萍, 赵迪, 张春宇, 宋佳, 汤纯, 曹蓝(165)

响应面法优化秋刀鱼酶解制备抗氧化活性肽的工艺

..... 栾俊家, 张尚悦⁺, 李昂达, 李学鹏*, 励建荣, 林洪, 王明丽, 郭晓华, 于建洋, 周小敏(172)

工 艺 技 术

全谷物发芽糙米韧性饼干制作工艺优化

..... 孙莹, 李欣, 刘艳香*, 关丽娜, 张瑛, 张筠芹(182)

微波协同L-苯丙氨酸处理对苦荞萌发中黄酮的影响

..... 许先猛, 卞紫秀, 王顺民*, 陆宁, 张慧敏, 王俊珍(191)

药桑葡萄酒发酵工艺优化及体外抗氧化与结合胆酸盐能力研究

..... 古丽米热·祖努纳, 王伟雄, 吕泽, 黎进雪, 雷静, 买哈巴·库尔班, 米克热衣·衣沙克江, 武运*(199)

雨生红球藻喷雾干燥工艺的建立与放大

..... 费忠南, 万民熙, 樊飞, 白文敏, 李元广*(209)

塔尔米速冻熟制拉面研制及其辅助降糖、降血脂活性

..... 罗昕艳, 谭敏怡, 敬思群*, 张俊艳, 王玉涛, 王晓芸(217)

表面活性剂辅助超声提取柿叶总黄酮工艺优化

..... 张富坤, 孙媛, 高艺菲, 王娇, 高世杰, 赵盼, 柯仲成*, 赵东升*(224)

宾川葡萄籽原花青素纯化及对HepG2细胞增殖的影响

..... 张丽明, 马雅鸽, 牛若楠, 张希, 赵声兰*, 陈朝银(230)

载原花青素的魔芋葡甘聚糖微粒的制备、表征及体外释放性能评价

..... 王朦朦, 谢勇, 蔡梦思, 卫子颜, 刘雄*(237)

双螺杆挤压复合方便粥配方优化及品质分析

..... 王晨, 王燕*, 吴卫国, 廖卢艳(245)

分 析 检 测

超高效液相色谱-串联质谱法测定牛乳中6种兽药残留

..... 张敏, 王鸽, 马晓冲, 张耀广*, 柴艳兵, 李兴佳, 李飞(255)

酸性电生功能水联合超声波去除马铃薯净菜中4种农药残留效果分析

..... 刘媛, 程铭, 王健*, 朱旭冉, 刘洋, 万宇平, 吴小胜, 李娜, 王继英(262)

液相色谱串联质谱法同时测定调味酱中85种酸性合成色素

..... 林子豪, 毛新武, 周庆琼, 崔世博, 陈羽中, 戚平*, 钱振杰, 曾玮(270)

气相色谱-三重四极杆串联质谱法同时测定乳粉中22种邻苯二甲酸酯

..... 王金翠, 王晰锐(280)

免疫富集联合MALDI-TOF MS检测奶粉中阪崎克罗诺杆菌的方法建立

..... 赵宏, 杨柳⁺, 赵良娟, 庞璐, 张俊哲, 朱韶英, 赵玉玲, 谭有兰, 赵化冰, 刘培, 刘国红, 吴岚, 董志珍*(286)

蘑菇中鹅膏毒肽间接竞争ELISA检测方法的建立

..... 刘河冰, 秦誉, 邢维维, 马立才*(294)

食品工业科技

SHIPIN GONGYE KEJI

2022年3月 第43卷 第5期

目 次

玫瑰、百合煎饼风味成分比较研究 黄一承, 史 玉, 马艳丽, 丁云峰, 马 琳, 李 丹*, 李晓磊*(302)

成品白酒中酸酯总量的近红外检测 黄清霞, 付国勇, 陈黎萍(310)

不同类型白茶儿茶素、香气成分与感官品质比较 王若娴, 黄翔翔, 李 勤, 李 娟, 谭 君*, 朱洺志*, 王坤波*(315)

贮运保鲜

不同解冻方式对鳀鱼鲜度及挥发性风味物质的影响 凌胜男, 刘特元*, 陈雪叶, 王红丽, 王锡昌, 施文正(322)

冷吃兔常温贮藏的风味物质变化规律 袁先铃*, 彭先杰, 陈崇艳, 万晓玉, 林洪斌(331)

外源褪黑素对甜樱桃果实褐变和品质的影响 王 锋, 杨青珍*, 赵旗峰, 张晓萍(340)

贮藏温度对采后龙眼果实糖代谢及其相关酶活性的影响 关博洋, 殷菲胧, 刘云芬, 廖玲燕, 陈振林, 帅 良*(348)

营养与保健

巴戟天对人源结肠癌细胞HCT-116移植瘤的抑制作用及机制初步探讨

..... 李灿涛, 卢颖裕, 陈勇儿, 梁 健, 侯少贞, 陈鑑强*(356)

发酵麸皮水提物体内外抗氧化及心脏保护活性研究 尹 娜, 陈秋燕, 郝希然, 王瑞芳, 王 园, 齐景伟*(366)

益生菌联合白藜芦醇对小鼠慢性酒精性肝损伤的改善作用及机制研究 王 引, 张兰威*(374)

葛根多糖抗氧化性及其降血糖作用研究 王秋丹, 赵凯迪, 林长青*(381)

专题综述

谷子的生产概况及其保健功能与机理研究进展 刘建垒, 常 柳, 段晓亮, 王文娟, 孙 辉*(389)

感官词典建立方法及食品中应用研究进展 朱雨萱, 闻亚琴, 许晓青, 陈亦新, 苏庆宇, 刘雅冉, 王 冬*, 朱保庆*(396)

壳聚糖脱乙酰度的测定及其应用研究进展 王一迪, 古 渊, 谢 媚, 游清徽*(408)

磁性纳米酶显色技术在食品安全检测中的应用 李佳银, 罗 磊, 熊蓥姿, 李 跑, 李脉泉, 刘 霞*(416)

发酵鱼中菌群组成及发酵特性研究进展 孙海鑫, 陈智慧, 王盛美, 韩 军, 孙纪录*(424)

基于纤维素的食品包装材料的研究进展 赵冬梅, 初小宇, 张 勇, 魏丽娜, 贾连莹, 刘 宇(432)

透明质酸的制备及其应用的研究进展 卢方云, 吴瑀婕, 黄 琪, 张新笑*, 王道营, 邹 烨*, 徐为民(440)

壳聚糖与生物保鲜剂复合使用在水产品保鲜中的研究进展 裴 诺, 施文正, 汪之和*(448)

等温水分活度及其对低水分食品中微生物抗热性的影响研究进展 张亚兰, 吕思琪, 张诗淇, 秦 文, 刘书香*(455)

液体饮料无菌灌装技术发展趋势 佟 璞, 高彦祥*(464)

SCIENCE AND TECHNOLOGY OF FOOD INDUSTRY
SHIPIN GONGYE KEJI
Mar. 2022 Vol.43 NO.5

CONTENTS

Future Food

- Research Progress of Masticatory Simulator Based on the Principle of Oral Mastication *ZHANG Xiaofeng, CHEN Yong, CHEN Jianshe*(1)*
Research on Intelligent Grading System of *Imperial Chrysanthemum* Based on Machine Vision *ZHANG Yiping, XU Yan, ZHU Shuangjie*, ZHOU Yu(13)*
UPLC-Q-Orbitrap HRMS Combined with Network Pharmacology to Analyze the Material Basis and Mechanism of *Schisandrae chinensis* in the Treatment of Non-alcoholic Fatty Liver *REN Yuanyuan, WANG Chao, XIE Yong, GUO Guangpeng, HUANG Qinwan*, WANG Jin*(21)*

Research and Investigation

- Structural Analysis and Sensitization Prediction of the Allergic Proteins Ana o 2 and Ana o 3 in Cashew Nuts *ZHANG Ailin, ZHAO Huijuan, CHI Yue, LIANG Xiaoyan, LI Xiaodan, GUO Mei(34)*
Isolation, Identification and Stability Analysis of Antioxidant Peptides from *Moringa oleifera* Seeds *GUO Qihong, LI Xingli, FAN Jiangping, WANG Xuefeng*(41)*
Effect of Different Carbohydrates on Gel Properties of Grass Carp Surimi *QUE Feng, GAO Tianqi, WANG Chao, XIONG Guangquan, SHI Liu, WU Wenjin, QIAO Yu, DING Anzi, LI Xin, WANG Lan*(48)*
Gel Properties of Large Yellow Croaker (*Pseudosciaena crocea*) Roe Protein Isolate *DU Yinan, YAN Jianan, WANG Yuqiao, JIANG Xinyu, XU Shiqi, WU Haitao*(56)*
Intermittent Microwave Drying Characteristics and Quality Changes of Xilin Fire Ginger Slices *HUANG Jimin, WU Zhaolong, LI Hao, CHEN Guiying, LIN Fang, LI Bingzheng, HUANG Zhimin*(61)*
Comparison between Three Different Origins of *Dendrobium officinale* Polysaccharides and Their Initial Pharmacological Activity Evaluations *HUANG Junbin, DING Jie, ZHU Haimei, LI Yunrong, HUANG Dandan, WEI Gang*(71)*
Simulation of Vitamin C Degradation during Microwave Assisted Foam-mat Drying Process *SUN Yu, ZHANG Yuhan, XU Wanjun, ZHENG Xianzhe*(79)*
Effect of High Intensity Ultrasound on the Conformational and Physicochemical Properties of Soy 7S and 11S Globulin *TIAN Ran, FENG Junran, SUI Xiaonan, JIANG Lianzhou*(87)*
Kinetic Effects of KCl Substitution for NaCl in Different Proportions on Lipid Oxidation in Pork *KONG Qingxin, ZHANG Jingzhou, HUANG Yechuan*, XU Weiping, LUO Limei(98)*
Analysis of Chemical Composition and Antioxidant Activities of Water-insoluble and Water-soluble Polysaccharides from *Euglena gracilis* *WEN Yuxi, HUANG Xiaozhou*, LIN Xiaosi(105)*
Effect of Fermentation and Post-fermentation on Nutritional Composition and Volatile Substances of Yak Milk *LI Shengsheng, ZHANG Yan, ZHAO Lizhu(114)*
Effects of Different Treatments on Nutritional Composition and Antioxidant Activity of Rice Buckwheat *YAN Jing, CAI Yixi, XUE Qiuyan, LI Junjian, LI Pan, DU Bing*(121)*

Bioengineering

- Screening of Producing Polyphenol Oxidase Strains from the Fermentation Process of Liupao Tea and Purification of Polyphenol Oxidase *WANG Jie, HE Yulin, TENG Jianwen, XIA Ning, WEI Baoyao, HUANG Li*(130)*
Screening of Lactic Acid Bacteria from Jiuqu and Its Application in the Fermentation of Chestnut Glutinous Rice Beverage *HU Yinghong, CHEN Xiaohui, CHANG Xuedong, WANG Yueying, ZOU Jing*(138)*
Spatial Distribution and Relationship of Volatile Compounds and Microbial Community in Pit Mud *ZHANG Chaozheng, ZHANG Tianshuang, DONG Siwen, SUN Wei, ZHAO Hua*(147)*

SCIENCE AND TECHNOLOGY OF FOOD INDUSTRY
SHIPIN GONGYE KEJI
Mar. 2022 Vol.43 NO.5

CONTENTS

Effects of <i>Saccharomyces cerevisiae</i> and <i>Lactobacillus plantarum</i> Co-fermentation on the Storage Characteristics of Noodles	..... GE Zhenzhen, GAO Shanshan, WANG Weijing, XU Mingyue, ZHANG Peiqi, ZONG Wei*(158)
Safety Evaluation and Probiotic Characteristics Analysis of <i>Lactobacillus plantarum</i> HCS03-001	..... JIAO Yanping, YU Ping, ZHAO Di, ZHANG Chunyu, SONG Jia, TANG Chun, CAO Lan(165)
The Optimization of the Preparation Process of Antioxidative Active Peptide from the Enzymatic Hydrolysate of Pacific Saury (<i>Cololabis saira</i>) by Response Surface Methodology	..... LUAN Junjia, ZHANG Shangyue*, LI Angda, LI Xuepeng*, LI Jianrong, LIN Hong, WANG Mingli, GUO Xiaohua, YU Jianyang, ZHOU Xiaomin(172)

Processing Technology

Optimization of Processing Technology of Whole Grain Germinated Brown Rice Tough Biscuit	..... SUN Ying, LI Xin, LIU Yanxiang*, GUAN Lina, ZHANG Ying, ZHANG Duqin(182)
Effects of Microwave-assisted L-phenylalanine Treatment on the Flavonoids of Tartary Buckwheat during Germination	..... XU Xianmeng, BIAN Zixiu, WANG Shunmin*, LU Ning, ZHANG Huimin, WANG Junzhen(191)
Optimization of Fermentation Process of Grape Medicine Mulberry Wine and Its Antioxidant and Bile Acid Binding Capacity <i>in Vitro</i>	..... GULIMIRE Zununa, WANG Weixiong, LV Ze, LI Jinxue, LEI Jing, MAIHABA Kuerban, MIKEREYI Yishakejiang, WU Yun*(199)
Establishment and Scale-up of Spray Drying Technology for <i>Haematococcus pluvialis</i>	..... FEI Zhongnan, WAN Minxi, FAN Fei, BAI Wenmin, LI Yuanguang*(209)
Preparation of Quick-frozen Cooked Ramen Based on Talmi and Its Hypoglycemic and Hypolipidemic Activities	..... LUO Xinyan, TAN Miryi, JING Siquan*, ZHANG Junyan, WANG Yutao, WANG Xiaoyun(217)
Optimization of Surfactant-assisted Ultrasonic Extraction of Total Flavonoids from Persimmon Leaves	..... ZHANG Fukun, SUN Yuan, GAO Yifei, WANG Jiao, GAO Shijie, ZHAO Pan, KE Zhongcheng*, ZHAO Dongsheng*(224)
Purification of Proanthocyanidins from Binchuan Grape Seed and Its Effects on Proliferation of HepG2 Cells	..... ZHANG Liming, MA Yage, NIU Ruonan, ZHANG Xi, ZHAO Shenglan*, CHEN Chaoyin(230)
Preparation, Characterization and <i>in Vitro</i> Release Performance Evaluation of Konjac Glucomannan Microparticles Loaded with Proanthocyanidins	..... WANG Mengmeng, XIE Yong, CAI Mengsi, WEI Ziyan, LIU Xiong*(237)
Formula Optimization and Quality Analysis of Double Screw Extrusion Compound Instant Porridge	..... WANG Chen, WANG Yan*, WU Weiguo, LIAO Luyan(245)

Analysis and Determination

Determination of 6 Kinds of Veterinary Drug Residues in Milk by Ultra Performance Liquid Chromatography-tandem Mass Spectrometry	..... ZHANG Min, WANG Ge, MA Xiaochong, ZHANG Yaoguang*, CHAI Yanbing, LI Xingjia, LI Fei(255)
Effect of Acid Electrolyzed Functional Water-Ultrasonic Cleaning on the Removal of 4 Pesticide Residues in Fresh-cut Potatoes	..... LIU Yuan, CHENG Ming, WANG Jian*, ZHU Xuran, LIU Yang, WAN Yuping, WU Xiaosheng, LI Na, WANG Jiying(262)
Simultaneous Determination of 85 Acid Synthetic Pigments in Sauce by Liquid Chromatography Tandem Mass Spectrometry	..... LIN Zihao, MAO Xinwu, ZHOU Qingqiong, CUI Shibo, CHEN Yuzhong, QI Ping*, QIAN Zhenjie, ZENG Wei(270)
Simultaneous Determination of 22 Phthalate Esters in Milk Powder by GC-MS/MS	..... WANG Jincui, WANG Xirui(280)
Establishment of the Method of Immunoenrichment Combined with MALDI-TOF MS to Detect <i>Cronobacter sakazakii</i> in Milk Powder	..... ZHAO Hong, YANG Liu*, ZHAO Liangjuan, PANG Lu, ZHANG Junzhe, ZHU Shaoying, ZHAO Yuling, TAN Youlan, ZHAO Huabing, LIU Pei, LIU Guohong, WU Lan, DONG Zhizhen*(286)
Establishment of Indirect Competitive ELISA Method for Detecting Amanitin in Mushroom	..... LIU Hebing, QIN Yu, XING Weiwei, MA Licai*(294)

SCIENCE AND TECHNOLOGY OF FOOD INDUSTRY
SHIPIN GONGYE KEJI
Mar. 2022 Vol.43 NO.5

CONTENTS

- Comparative Study on the Aroma Compounds of Rose and Lily Pancakes *HUANG Yicheng, SHI Yu, MA Yanli, DING Yunfeng, MA Lin, LI Dan*, LI Xiaolei**(302)
Detection of Acid Ester Content in Baijiu (Chinese Liquor) Based on Near Infrared Spectroscopy *HUANG Qingxia, FU Guoyong, CHEN Liping*(310)
Comparison of Catechins, Aroma Components and Sensory Quality of Different Types of White Tea *WANG Ruoxian, HUANG Xiangxiang, LI Qin, LI Juan, TAN Jun*, ZHU Mingzhi*, WANG Kunbo**(315)

Storage and Preservation

- Effect of Different Thawing Methods on the Freshness and Volatile Flavor Compounds of Anchovy (*Engraulis encrasicholus*) *LING Shengnan, LIU Teyuan*, CHEN Xueye, WANG Hongli, WANG Xichang, SHI Wenzheng*(322)
Variation of Flavor Substances in Cold-eating Rabbits Stored at Room Temperature *YUAN Xianling*, PENG Xianjie, CHEN Chongyan, WAN Xiaoyu, LIN Hongbin*(331)
Effect of Exogenous Melatonin Treatment on Browning and Quality of Sweet Cherry *WANG Feng, YANG Qingzhen*, ZHAO Qifeng, ZHANG Xiaoping*(340)
Effects of Storage Temperature on Sugar Metabolism and Related Enzyme Activities of Postharvest Longan Fruits *GUAN Boyang, YIN Feilong, LIU Yunfen, LIAO Lingyan, CHEN Zhenlin, SHUAI Liang**(348)

Nutrition and Healthcare

- Study on the Therapeutic Effect of *Morinda officinalis* on HCT-116 Xenograft Tumor Model and the Underlying Mechanism *LI Cantao, LU Yingyu, CHEN Yonger, LIANG Jian, HOU Shaozhen, CHEN Jianqiang**(356)
Study on the Internal and External Antioxidant and Cardio Protective Activities of Fermented Wheat Bran Aqueous Extracts *YIN Na, CHEN Qiuyan, HAO Xiran, WANG Ruifang, WANG Yuan, QI Jingwei*(366)
Ameliorative Effect and Mechanism of Probiotics Combined with Resveratrol on Chronic Alcoholic Liver Injury in Mice *WANG Yin, ZHANG Lanwei**(374)
Study on Antioxidant Properties of *Pueraria lobata* Polysaccharides and Its Hypoglycemic Effect *WANG Qiudan, ZHAO Kaidi, LIN Changqing**(381)

Reviews

- Foxtail Millet: Production Status, Advances in Health Benefits and Its Mechanism *LIU Jianlei, CHANG Liu, DUAN Xiaoliang, WANG Wenjuan, SUN Hui**(389)
Research Progress of Sensory Lexicon Building Method and Applications in Food *ZHU Yuxuan, WEN Yaqin, XU Xiaoqing, CHEN Yixin, SU Qingyu, LIU Yaran, WANG Dong*, ZHU Baoqing*(396)
Research Progress on the Determination of the Degree of Deacetylation of Chitosan and Its Application *WANG Yidi, GU Yuan, XIE Man, YOU Qinghui**(408)
Application of Magnetic Nanoenzyme Colorimetric Technology in Food Safety Detection *LI Jiayin, LUO Lei, XIONG Yingzi, LI Pao, LI Maiquan, LIU Xia**(416)
Research Progress on Microflora Composition and Fermentation Characteristics of Fermented Fish *SUN Haixin, CHEN Zhihui, WANG Shengmei, HAN Jun, SUN Jili**(424)
Research Progress of Food Packaging Materials Based on Cellulose *ZHAO Dongmei, CHU Xiaoyu, ZHANG Yong, WEI Lina, JIA Lianying, LIU Yu*(432)
Research Progress on Preparation and Application of Hyaluronic Acid *LU Fangyun, WU Yujie, HUANG Jin, ZHANG Xiniao*, WANG Daoying, ZOU Ye*, XU Weimin*(440)
Research Progress in the Application of Chitosan and Biological Preservative in Aquatic Products Preservation *PEI Nuo, SHI Wenzheng, WANG Zhihe**(448)
Water Activity at Isothermal Temperature and Its Effect on Microbial Heat Resistance in Low-moisture Foods *ZHANG Yalan, LV Siqi, ZHANG Shiqi, QIN Wen, LIU Shuxiang**(455)
Advanced Progress of Aseptic Filling Technology for Liquid Drinks *TONG Zhen, GAO Yanxiang**(464)