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螺旋藻产品活性物质检测与免疫功能研究

Bioactive compounds in spirulina products and their immunological functions

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中文摘要:

目的 检测国内市场19种有代表性螺旋藻产品的理化指标及活性物质含量，比较研究活性物质含量不同的2种螺旋藻产品的免疫功能，研究活性物质含量之间的相关性，确定评价活性物质含量的主要技术指标，为提高螺旋藻产品检测技术和制定相关产品质量标准提供科学依据。方法 总蛋白质含量测定采用凯氏定氮法，γ-亚麻酸、二十碳五烯酸（EPA）、二十二碳六烯酸（DHA）采用气相色谱法，类胡萝卜素、藻蓝蛋白、别藻蓝蛋白、藻红蛋白、叶绿素a、叶绿素b、β-胡萝卜素、螺旋藻多糖、超氧化物歧化酶（SOD）采用比色分析法，免疫性能检验采用小鼠

Abstract:

Objective To test the physical and chemical characteristics and the content of bioactive compounds of representative spirulina products in domestic markets. To compare the immune properties of two spirulina products with different amount of bioactive compounds. To test the correlations among bioactive compounds of spirulina products. To develope technical indicators for evaluating bioactive compounds. To provide scientific basis for improving detection technology and establishing quality standards. Method Total protein content was determined by Kjeldahl method; γ-linolenic acid, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) was determined with gas chromatography; carotenoids, phycocyanin, allophycocyanin, phycoerythrin, chlorophyll a, chlorophyll b, β-carotene, spirulina polysaccharides, and superoxide dismutase (SOD) was determined by colorimetric analysis; immune performance was tested in mice. Correlation analysis was conducted with SPSS13.0 statistical analysis software. Result The content of ntrients and bioactive compounds were as follows: total protein 47.0%-67.3%, carotenoid 4.98g/kg-24.81 g/kg, phycocyanin 3.89%-9.23%, allophycocyanin 2.03%-5.47%, phycoerythrin 0.63%-1.51%,γ-linolenic acid 694.3 mg/100g-1860.0 mg/100g, EPA 9.49 mg/100g-55.73 mg/100g, DHA 0-19.81 mg/100g, chlorophyll a 705.37 mg/100g-1235.67 mg/100g, chlorophyll b 26.31 mg/100g-190.46 mg/100g, β-carotene 152.1 mg/100g-562.3 mg/100g, spirulina polysaccharide 9.1%-20.2%, SOD 629 U/g-3086 U/g. There is a significantly positive correlation of carotenoids with phycocyanin, γ-linolenic acid, DHA, chlorophyll a, β-carotene and SOD; a significantly positive correlation of phycocyanin with allophycocyanin, phycoerythrin, γ-linolenic acid, chlorophyll a, β-carotene and SOD; and a significantly negative correlation of spirulina polysaccharide with total protein, phycocyanin and chlorophyll a. The immune properties including antibacterial effect, peritoneal macrophages, serum lysozyme activity and serum globulin levels in the sample No. 8 with more bioactive compounds was significantly stronger than that in the sample No. 13 . Conclusion Bioactive compounds in spirulina products, which were the basis for immune function, were found in all representative Spirulina products inspected in domestic markets, and the difference of their contents was up to 2-5 times. Carotenoids, phycocyanin, spirulina polysaccharides and γ-linolenic acid are good technical indicators reflecting the bioactive properties of Spirulina products. The national standard GB / T 16919 - 1997 for Food gade spirulina powder is difficult to evaluate the function of health food containing spirulina, because the current standard is lack of technical specifications for bioactive compounds. It is suggested to add technical specifications for bioactive compounds while amending the standard.

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