The 2nd International Conference on Biological Engineering and Medical Science
DOI: 10.54254/2753-8818/4/20220533

Application of Probiotics and Metazoans in Cosmetics

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Abstract. Probiotics are living microorganisms that when administered in appropriate quantities bring health benefits to the host. Probiotics products have been developed in the form of dairy products, dietary supplements, fermentation and enzyme preparations or other biological agents, and the global probiotics industry is growing at a rate of 15% to 20% per year. The clinical application of probiotics is becoming more and more extensive, especially in bacteriostasis, treatment of intestinal diseases, neonatal diseases and immune diseases, as well as in lowering blood pressure, lowering blood lipids, anti-aging, anti-tumor and central nervous system diseases. Metagenin refers to the bioactive compounds beneficial to health produced in the fermentation process of probiotics. Metagenin has anti-inflammatory, antibacterial, immune regulation, antioxidant, anti-obesity, anti-hypertension, hypidemia, liver protection, promoting wound healing and other biological activities, which has broad prospects in the development of new health functional food. This topic will be used for the method of investigation and demonstration to study the research status and future development of probiotics and metagenics cosmetics, as well as the safety evaluation of cosmetics components and human body. The main research direction is on lactic acid bacteria and bacillus.

Keywords: Probiotics, Lactic acid bacteria, bacillus

1. Introduction

1.1. Probiotics and metazoa

An internationally recognised definition of probiotics is living micro-organisms that, when managed in the right amount, bring health benefits to the host [1]. Other definitions that have been proposed over the years are limited by institutional norms, location of action, form of delivery, method or subject. Probiotics have been shown to have a wide range of effects. Mechanisms of action for probiotics (such as affecting gut bacteria or boosting immune function) are removed from the definition to include health effects due to the new mechanism, and allow the term to be applied before mechanisms are confirmed. The physiological benefits have been attributed to dead food organisms. In addition, some mechanisms may not require living cells. However, in terms of functionality, dead microbes are not probiotics [2].

Metabiotics are also called probiotics [3],It is the main metabolite of probiotics and specific chemicals released by probiotics that have a direct or indirect effect on host health [4].Probiotics include the cell wall debris products of probiotics, such as Petidoglycan of Exoploysaccharide ; it also contains probiotic cells endocrine metabolites, such as lactic acid, acetic acid, short-chain fatty acids, bacteriocins, etc. (bifidobacterium, acidophilin, etc.), in addition to a variety of polypeptide products [5].Metabolites also have functions such as skin flora regulation and immunity regulation similar to probiotics, and reduce the long shelf life of raw materials and finished products by adding live bacteria.

DOI: 10.54254/2753-8818/4/20220533

Therefore, it has attracted more and more attention from the public in the development and application of skin care raw materials.

1.2. Research status of probiotics and probiotics

Probiotics are bacteria that have been proven to be beneficial to human or animal health. They are also known as microecological regulators for humans or animals. They have a wide range of physiological functions and have potential use value and great theoretical significance. At present, probiotics have been applied to various fields and have played an increasingly important role in maintaining human and animal health and preventing some chronic diseases. After continuous development and exploration, more and more probiotic products have emerged in the form of dairy products, dietary supplements, fermentation and enzyme preparations or other biological agents. The global probiotic industry is growing at an annual rate of 15 % to 20 %. The clinical application of probiotics is becoming more and more extensive, especially in bacteriostasis, treatment of intestinal diseases, neonatal diseases and immune diseases. At the same time, it has good effects in lowering blood pressure, lowering blood lipid, anti-aging, anti-tumor and central nervous system diseases [6].

Probiotics can improve the skin microenvironment, thereby reducing the incidence of some skin diseases. Staphylococcus epidermidis has become the main resident microorganism of human epidermis, which plays a key role in the whole epidermal ecosystem. It reduces the loss of microecology by maintaining a low pH value and secreting a large number of antimicrobial peptides. At the same time, it also produces some beneficial microbial metabolic elements, such as fat concentration, organic acid concentration, etc., to regulate the homeostasis of the epidermis [7].Nodake et al.collected a large number of epidermal cells from the patient, and amplified them from the Staphylococcus on the surface of the skin, and added colloidal substances after lyophilization, and then applied them to the face twice a day. The results showed that it greatly increased the lipid content of the skin and controlled the evaporation of water, thus greatly improving the skin 's moisturizing properties [8].Due to the influence of various factors such as the content of living cells and the difficulty of cosmetics in maintaining the vitality of probiotics, probiotics generally do not exist intuitively in color cosmetics, but only exist in the form of probiotic fermented products to promote skin microecology, thereby enhancing resistance to the body.

Probiotics can change the composition of gastrointestinal flora in livestock and poultry, promote the absorption rate of nutrient digestive system, enhance the resistance of human body, promote healthy reproduction and improve product characteristics [9]. In the intestine of livestock and poultry, it exerts its probiotic effects by protecting the intestinal epithelial barrier, regulating intestinal mucosal immunity, resisting intestinal pathogen infection and oxidative stress, and promoting nutrient absorption. Studies have found that probiotics play a significant role in the prevention and treatment of livestock and poultry diarrhea, avian necrotizing enteritis, and intestinal allergic diseases [10]. Probiotics are also a feed additive, which can significantly improve animal digestibility, protect the ecological balance of intestinal flora, improve the palatability of pigs to feed, increase reproductive efficiency, and improve pork quality [11]. In the food industry, probiotics play an indispensable role. Probiotics have an indispensable position in foods such as dairy products [12]. Probiotics can also be a biologically active bacteria that can form favorable factors for the physiological function of the host, and have the effects of improving the internal environment of the digestive tract, tissue immune regulation and resistance to the growth of malignant tumors [13].

Metazoan refers to the health-beneficial bioactive compounds (including probiotics metabolites, protein composition or their mixture) formed by probiotics during the fermentation stage, such as short-chain fatty acids, tryptamine, peptides, teichoic acid, peptidoglycan, polysaccharides, organic acid content, and lipids. Compared with probiotics, it has the advantages of clear chemical molecular structure, high safety dose and long shelf life. Metabolites have biological activities such as anti-inflammatory, insect suppression, autoimmune, anti-oxidation, anti-obesity, anti-hypertension, cholesterol reduction, liver protection treatment, and promotion of wound healing. They have great development prospects in the development of new health functional foods, but the exact mechanism of their physiological functions has not been fully elaborated [14].

Metabolites refer to the soluble substances discharged from probiotic secretions and bacterial cells after lysis, mainly bacterial components and bacterial metabolites. In addition to many characteristics such as immune regulation and antioxidant capacity of organisms, it also has certain benefits for skin health care. Such as probiotics cell disintegration, can produce hyaluronic acid, lipoteichoic acid, extracellular polysaccharides, peptidoglycan, lactic acid and other biologically active substances, can alleviate atopic eczema, dermatitis, scarring, light damage and other skin phenomena [15].At present, the international market in the development of cosmetics skin micro-ecological raw materials generally meta, including probiotic fermentation products, probiotic - agricultural by-product fermentation products, medicinal fungi - Chinese herbal medicine fermentation products. He et al. [16]also believed that the emulsion of single metazoan formula had a good effect on skin health care and the prevention of atopic dermatitis. Although the mechanism of harm to health is not entirely clear, it is widely favored in the field of makeup because of its strong durability and good stability.

In the animal experiments studied by Kang Yuhong [17], a milk beverage containing both metazoan and yeast β-glucan has important effects on immune function in mice. BALB / c mice were randomly divided into low, medium and high dose groups of milk beverage intervention group (1408,3520,8448 mg / kg bw), and a blank control group was set up. Thirty days after oral gavage, organ / body weight ratio, spleen lymphatic metastasis test, delayed hypersensitivity, antibody-producing cell test, serum hemolysin test, carbon clearance test, egg endocytosis test and natural killer bacterial activity test were performed. Compared with the control group, the thickening degree of the footpad in the high dose and low concentration group of the milk beverage intervention group was significantly increased within 24 hours ($P < 0.05$). The plaque formation coefficients of the low and medium dose groups were significantly increased ($P < 0.05$). The activity of NK cells (**TABLE 1**) in the middle and high dose groups increased significantly ($P < 0.05$). It was concluded that the humoral immunity and NK cell activity of mice were significantly improved after feeding the milk beverage containing metabiotics and yeast β-glucan, suggesting that the milk beverage has the potential effect of enhancing immunity.

Table 1. Effects of different concentrations of milk drinks on NK cell activity.

description of sample	peer group	NK cell activity rate /%	Transfer
distilled water	control group	16.52±10.50	0.41±0.13
milk beverage	Low dose group Medium dose group High dose group	14.49±7.37 26.87±9.28a 26.47±11.28a	0.38±0.11 0.54±0.10a 0.53±0.14a

In the study of Wu Fei [18], experiments were conducted to study the negative effects of the addition of synbiotics (Lactobacillus cell components and their metabolic products) to the diet without resistance on weaning reproductive characteristics, and to study the appropriate amount of synbiotics in the diet of weaned piglets. In the first experiment, 144 Duroc × Landrace × Yorkshire weaned sows at 28 days of age were selected and randomly divided into control group, Lactobacillus group (live bacteria number was 6 × 106 CFU/g diet) and zero point four metazoan group, with six replicates in each group and eight sows in each replicate. In experiment 2, 144 28-day-old Duroc × Landrace × Yorkshire weaned sows were randomly divided into four treatment groups, with six replicates in each group and six sows in each replicate (Table 2). The four groups were fed with experimental diets containing zero percent (control group), zero point three percent, zero point six percent and zero point nine percent. Pre-trial period 7d, trial period 28d. Diets in Experiment 1 and Experiment 2 did not include other antibiotic preparations. Conclusion : In Experiment 1, compared with the control group, the addition of Lactococcus lactis group and metazoan could increase the average daily gain of weaned sows ($P < 0.05$), and the average daily gain of metazoan group was better than that of Lactobacillus group ($P < 0.05$).Conclusion 2: Compared with the same study group, the average daily feed intake and average daily feed intake of weaned

DOI: 10.54254/2753-8818/4/20220533

chickens increased (P < 0.05), and the feed consumption increased ratio decreased (P < 0.05), but there was no significant difference between the different levels of metabiotic groups. Compared with the study group, the increase of six percent metabiotics could increase the yield of Lactobacillus and decrease the yield of Clostridium in ileal digesta (P < 0.05). It can be seen that metabiotics can improve the reproductive characteristics of weaned sows and change the composition of intestinal flora. The optimum dose range in weaned sows diet is 0.3 % to 0.6 %. Solid after growth element can be added to food to increase immunity, etc.

Table 2. Effects of different supplemental levels of metazoan on growth performance of weaned piglets.

item	Control group	0.3% postbiotics group	0.6% postbiotics group	0.9% postbiotics group	SEM	P
Initial weight, kg	8.10	8.12	8.08	8.10	0.25	0.68
End weight, kg	19.55	21.22	22.00	22.46	1.04	0.18
Average daily feed intake, g	663B	719A	741A	778A	24.06	0.01
Average daily gain,g	409B	468A	497A	513A	16.95	0.01
Consumable weight gain ratio	1.62A	1.54B	1.49B	1.52B	0.04	0.03
Diarrhea rate, %	4.3	4.32	3.65	2.32	0.73	0.17

2. Lactobacillus

2.1. Lactobacillus plantarum

2.1.1. Application of lactobacillus plantarum. Lactobacillus plantarum (LP) is a kind of multi-purpose lactic acid bacteria, which is a homofermentative bacteria of common lactic acid bacteria. Its metabolites can produce high organic acid content, small molecular peptides, hydrogen peroxide and other bioactive products, which are used to produce fermented dairy products, meat, fruits and vegetables. LP and its metabolite reaction products have good ecological antibacterial activity, and have considerable control over Gram-negative bacteria and Gram-positive bacteria. Lactobacillus plantarum bacteriocin and phenyllactic acid formed by LP metabolites can effectively control various pathogens, and are relatively safe, and can be used as a new type of edible probiotic additive in the future. The bacteria not only prolongs the shelf life of the diet, improves the flavor and quality of the diet, but also has a positive impact on human health. At the same time, the fermented diet of Lactobacillus plantarum also has a benign effect on intestinal function, which can reduce high serum cholesterol, chronic coronary heart disease risk, and reduce depression. Therefore, the lactic acid bacteria also has a wide application prospect [20].

2.1.2. Prospects for cosmetics. Through the study of Brij Pal Singh [21], the antibacterial activity of the bioactive peptides produced by soymilk fermentation and the bioactive peptides produced by Lactobacillus plantarum C2 were known. Bioactive peptides are specific fragments of proteins, which can be released by fermentation. After release, they have antibacterial, antioxidant, antihypertensive,

DOI: 10.54254/2753-8818/4/20220533

immunomodulatory and cholesterol-lowering activities. LP C2 showed very good growth in soymilk, which significantly increased the number and acidity of soymilk, so the pH value decreased. Ultrafiltration was used for the separation of peptides, and the peptide content was analyzed by OPA. The content of 10 kDa fraction was higher in peptides (655.128 ± 2.95 μg / ml). The antibacterial activity of bioactive peptides was determined by agar diffusion method. The results showed that the bioactive peptide composition of 5 kDa showed the highest activity against various pathogenic bacteria, among which Escherichia coli (12 ± 0.57 mm) had the strongest inhibitory effect, followed by Shigella dysenteriae (11 ± 0.57 mm), Listeria monocytogenes (10 ± 0.57 mm) and Bacillus cereus. So through the study of Brij Pal Singh we can know that Lactobacillus plantarum can have antibacterial effect. Can be used as preservatives in cosmetics.

Through the research results of Li [22], we have found that plant-type Lactobacillus microcapsules can be prepared by endogenous emulsification gel method. By calculating the embedding degree of microcapsule probiotics and the pore size of microcapsule particles, it can also evaluate the heat resistance of microcapsule probiotics in vitro, and simulate the biological tolerance in gastric juice and intestinal juice, so as to calculate the survival rate. Conclusion : The embedding rate of microcapsules prepared by endogenous emulsification gel method was 9142 %, and the pore size of microcapsules was 1.43 ~ 3.00 mm. Similarly, microencapsulation technology also greatly improved the survival rate of probiotics under high temperature, simulated gastric fluid and intestinal fluid ($P < 0.05$). It is indicated that the microcapsule probiotics produced by the endogenous emulsification gel technology can significantly improve the sensitivity of Lactobacillus plantarum to adverse environmental conditions, and is also conducive to future large-scale growth. Through Li Long ' s research we can find that Lactobacillus plantarum can have good heat resistance and other resistance to various adverse environmental tolerance. Is a good regulator in cosmetics.

In experiments by Yi-Fan Hong [23], UV radiation from sunlight is the most important environmental factor in skin aging. Ultraviolet light irradiation induces the expression of matrix metalloproteinases (MMPs) and extracellular matrix metalloproteinases. Among members of the MMP family, MMP-1 is an interstitial collagenase that degrades the collagen triple helix. In Yi-Fan Hong 's experiment, Lactobacillus plantarum, a useful microbe, was also explored for its effect on UV-induced MMP-1 expression in human skin fibroblasts. Yi-Fan Hong uses the method of pre-stimulating human skin fibroblasts with Lactobacillus plantarum lipoteichoic acid under UV irradiation. Western blotting was used to detect the level of MMP-1 secreted protein, and the phosphorylation of mitogen-activated protein kinase and NF-κB in cell lysate was detected by Western blotting. Activated transcription factors were also determined. Finally, we found that lipoteichoic acid could inhibit the expression of MMP-1 in plant Gram-positive bacteria under fluorescence microscope. Collagen synthesis was also promoted and the generation of ROS induced by ultraviolet irradiation was reduced. Lipoteichoic acid inhibits collagen degradation and promotes collagen synthesis. Lipoteichoic acid helps reduce ROS production. Therefore, lipoteichoic acid in Lactobacillus plantarum has potential ability to prevent and treat skin photoaging. So Lactobacillus plantarum can try to add to cosmetics as a regulator can also slow down the skin photoaging can also be used as a regulator.

2.2. Lactobacillus paracasei

2.2.1. Application of lactobacillus paracasei. Lactobacillus paracasei belongs to the genus Lactobacillus and is a Gram-positive bacterium. It not only has the advantages of improving tolerance and life function, but also has a strong probiotic effect on human health, and can be metabolized to produce new life chemicals, so it has attracted attention at home and abroad in recent years [24].

2.2.2. Prospects for cosmetics. In the scientific research of Jia Mutai [25], the Lactobacillus with strong antibacterial activity isolated from the hand-made koumiss in the pastoral area of Inner Mongolia, China was detected by double-layer agar plate diffusion method, and the lactic acid bacteria with strong antibacterial ability were identified by molecular biology. At the same time, the structural characteristics of the immunosuppressive substances produced by them were studied in depth. The eight strains of Lactobacillus detected were resistant to Bacillus subtilis. One strain of Lactobacillus paracasei Q-1-4 was identified as Lactobacillus paracasei. After eliminating the interference of organic acid content and hydrogen peroxide, L.paracasei Q-1-4 was fermented, and the cell-free fermentation supernatant (CFS) after centrifugation had an inhibitory effect on B.subtilis.After treatment with trypsin, pepsin and papain, the inhibitory activity was significantly reduced, indicating that proteins should be included in the immunosuppressant produced. The produced inhibitor had inhibitory effect on Bacillus subtilis under acidic conditions and was stable to high temperature and insensitive to ultraviolet light. The effect of combined application with SDS and EDTA was better than that of single application, but other surfactants, organic synthetic solutions and various metal molecules had no significant effect on it.Good storage stability and high inhibition spectrum. Therefore, by studying Lactobacillus paracasei, it has a significant effect on bacteriostasis and is very stable and insensitive to ultraviolet rays. It can be tried with preservatives in cosmetics and can be used in sunscreen and other products.

According to the experiment of Qiao Xiangjin [26], the protective effect of Lactobacillus casei on the barrier function of porcine intestinal epithelial cells and the possible mechanism were preliminarily studied by establishing a porcine intestinal epithelial cell IPEC-J2 infection model caused by ETEC K88, an enterotoxin-producing intestinal pathogen. The results showed that ETEC K88 culture medium had a significant toxic effect on IPEC-J2 cells. The cell morphology showed obvious deformation and atrophy, and there was a large amount of apoptosis. The pretreatment of IPEC-J2 cells with L.casei 393 culture medium for 2 h could significantly antagonize the toxic effect of ETEC K88 culture medium on IPEC-J2. The results of ELISA showed that the pretreatment of L.casei 393 significantly reduced the activity of alkaline phosphatase ALP in cell culture medium compared with the ETEC K88 treatment group ($P < 0.05$). The results of trans-membrane impedance (TER) showed that IPEC-J2 cells pretreated with L. casei 393 for 2 h could effectively inhibit the decrease of TER induced by ETEC K88 infection ($P < 0.05$). The results of Rea time PCR showed that the pretreatment of L.casei 393 significantly reduced the mRNA expression level of TLRs / NLRs signaling protein compared with the ETEC K88 treatment group ($P < 0.01$).western Blot results showed that compared with the ETEC K88 treatment group alone, the pretreatment of L.casei 393 significantly increased the protein expression levels of tight junction proteins Occludin and ZO-1 ($P < 0.05$). So through Qiao Xiangjin ' s experiment we can find that L. casei 393 can effectively protect the barrier function of porcine intestinal epithelial cells. Therefore, it can be concluded that Lactobacillus paracasei has a protective effect on the barrier function of porcine intestinal epithelial cells. Therefore, its high stability for skin tolerance can also be elegant, you can try to add cosmetics ingredients.

2.3. Lactobacillus rhamnosus

2.3.1. Application of Lactobacillus rhamnosus. Lactococcus rhamnosus is one of the most common probiotics. It has the functions of adjusting the flora in the digestive tract, adjusting the immunity of the digestive tract, antioxidants, controlling animal and plant viruses, inhibiting the reproduction of pathogenic bacteria and regulating the decomposition of fat and protein, which are beneficial to human health, and improving the quality structure of milk. The results of the study on the mechanism of the relationship between Lactobacillus rhamnosus and human body showed that the important functional factors generally included pili or flagellin, lipoteichoic acid, cell secretory genes, extracellular polysaccharides and specific DNA motifs, and the main functional factors of each type also had different functional mechanisms. At present, the most commonly used Lactobacillus rhamnosus strain is LGG, and its important factor is extracellular polysaccharide [27].

2.3.2. Prospects in cosmetics. The effect of milk protein on gastrointestinal function and immune function of sensitive children treated with Lactobacillus rhamnosus preparation was studied by Wang Zijian [28]. From Wang Zijian 's research program, they selected a total of 88 cases of milk protein-sensitive children who had been treated in their hospital for one year. They were divided into

DOI: 10.54254/2753-8818/4/20220533

observation group and study group according to random allocation. In the observation group, they used amino acid formula powder for feeding, while other people in the study group added Lactobacillus rhamnosus drugs. The curative effect and recurrence rate of the two groups of children after 6 months of treatment were compared. In the study compared the various data during its study can be found that the data in the study of children with Lactobacillus rhamnosus drugs anti milk protein treatment has a significant effect. It can be concluded that Lactobacillus rhamnosus has an anti-allergic effect and can be used as an anti-allergic agent in cosmetics.

In the experiment of Buyushan [29], the typical decadent fungi (Aspergillus flavus, Kluyveromyces marxianus, Pichia guilliermondii) in yogurt were used as the guiding bacteria to select lactic acid bacteria with antifungal activity, and their antibacterial characteristics and mechanism of action were studied in depth, which laid a theoretical foundation for the wide application of antifungal lactic acid bacteria in yogurt. In the research results of Buyushan, they successfully found a new strain with excellent antibacterial effect from 140 kinds of lactic acid bacteria. It was identified as Lactobacillus rhamnosus. The fermentation supernatant of Lactobacillus rhamnosus still had certain antibacterial activity after acid exclusion test, and was sensitive to protein enzyme. Therefore, it was considered that its main antifungal substance was protein, and had good acid-base stability and thermal stability. However, the results of scanning electron microscopy and transmission electron microscopy confirmed that the supernatant of Lactobacillus rhamnosus fermented bacteria may destroy the cell wall and cell membrane of Kluyveromyces marxianus, resulting in the leakage of macromolecular compounds in the cytoplasm. In the SDS-PAGE study of the genes in Kluyveromyces marxianus cells, the loss of protein bands with molecular weight of 63 ~ 180k, the color fading, and the color change of protein bands with molecular weight of 35 ~ 48k were observed. The results of gel electrophoresis showed that the crude extract of strain F32-2 degraded the nucleic acid of the indicator bacteria during the amplification process. It can be seen that Lactobacillus rhamnosus has high production capacity of starter cultures and preservation technology bacteria. It can be seen that Lactobacillus rhamnosus has the development and utilization potential of starter cultures and preservation technology bacteria.

Finally, according to the study of Xu [30], Lactobacillus rhamnosus ZB1107-01 (LR ZB1107-01) and Lactobacillus rhamnosus GG (LGG) commercial strains were carried out to study the antioxidant function of the body surface cells. The DPPH (1,1-diphenyl-trinitrophenylhydrazine) free radical, hydroxyl free radical and superoxide anion radical removal rate were used as the main indicators, and the antioxidant damage model of Caco-2 bacteria was constructed. The effect of LR ZB1107-01 on bacterial oxidative stress was studied by detecting the activity of SOD and GSH-Px. The results showed that the higher the bacterial content, the stronger the elimination function of the three self-groups. The elimination rate of DPPH self-group in the fermentation broth of LR ZB1107-01 was significantly better than that of LGG. The elimination rate of hydroxyl radical in the bacterial supernatant was significantly higher than that of LGG, while the elimination rate of superoxide anion self-group in the bacterial lysate was significantly better than that of LGG. In the antioxidant damage model of Caco-2 cells, the activities of SOD and GSH-Px were detected. The results showed that LR ZB1107-01 could reduce the oxidative stress damage to Caco-2 cells, thereby increasing the antioxidant capacity of cells in the antioxidant response state.

So according to the above research can be found that Lactobacillus rhamnosus can be added in cosmetics as an anti-allergic agent and preservative development potential and its strong antioxidant capacity, can remove free radicals also have whitening agent development potential.

3. Bacillis

3.1. Bacillus coagulans

3.1.1. Brief description of Bacillus coagulans. Bacillus coagulans has similar health care characteristics as Lactobacillus and Bifidobacterium, such as adjusting the balance of flora in the digestive tract, improving nutrient metabolism and utilization, and enhancing resistance. The spores produced have high disease resistance advantages such as high heat resistance, acid resistance and bile salt resistance. Bacillus coagulans is a new microecological drug and has been used in animal husbandry [31].

3.1.2. Function of Bacillus coagulans. In the study of Muhammed Majeed [32]Scavenging DPPH free radicals and suppressing intracellular reactive oxygen species allowed researchers to assess the extracellular metabolite's antioxidant efficacy. Antioxidants and water-soluble free radicals called DPPH interact to disperse color in the reaction mixture. It gauges the extract's capacity to neutralize free radicals in a solution[33]. A dose-dependent reduction in free radical activity was seen with 50% inhibition at 0.43% v/v (IC50). TBHQ has an IC50 value of 2.5 g/mL.

It exhibits defense against UV-induced cell deterioration and collagenase activity suppression, suggesting its potential application in delaying the onset of accelerated aging. Early research has shown that this formulation has an antibacterial impact on cutaneous microbial infections. Lactobacilli-based formulations revealed less severe acne in a recent clinical investigation [34]. In addition, the product was found to have good clinical safety and tolerance in human patch test and clinical studies.

In another study by Linglin Fu [35], the role of Bacillus coagulans in the preservation of large yellow croaker at 4 °C was studied. The results showed that Bacillus coagulans had good function in promoting the preservation of large yellow croaker. Further studies showed that Bacillus coagulans inhibited the growth of spoilage bacteria by producing antimicrobial components. After purification and identification, the component was a new bacteriocin-Bacillus coagulans L1208. Finally, the inhibitory effect of L1208 on spoilage bacteria was evaluated, and the preventive effect of L1208 on large yellow croaker at 4 °C was determined. Our results show that Bacillus coagulans bacteriocin clotting protein L1208 is a potential preservative. So the prospect of Bacillus coagulans function in cosmetics may have preservative and whitening skin care effect.

3.2. Bacillus amyloliquefaciens

3.2.1. Brief description of Bacillus amyloliquefaciens. Bacillus amyloliquefaciens is a kind of main probiotics, which belongs to Bacillus. The bacteria have a significant inhibitory effect on the growth of plant pathogenic bacteria, and can promote the normal growth and development of crops. Studies have shown that the bacteria can form biological polymers with great use value while forming antibacterial active substances. In many applications, such as light industry, rural areas, farming, aquaculture, meat processing industry, fruit postharvest preservation technology, feed industry and other industries have great practical value [36].

3.2.2. Function of Bacillus amyloliquefaciens. In the study of Uttara Vairagkar [37], the antibacterial activity of Malassezia spp.was identified by using seaweed-related bacteria Bacillus amyloliquefaciens MTCC 10456 as the research object. The findings demonstrated that Bacillus amyloliquefaciens MTCC 10456 generated bacillomycin D, macrolactin, and bacitracin, which were all implicated in antagonistic action. The B.amyloliquefaciens MTCC 10456 strain appears to benefit from the joint synthesis of lipopeptides, polyketides, and dipeptide antibiotics like bacitracin, and these molecules alone have antifungal action. Therefore, the antibiotic-producing metabolite Bacillus amyloliquefaciens MTCC 10456 can be considered as cell death caused by antifungal drugs for skin-related diseases. In the study, protease K treatment slightly reduced the antifungal activity of the three indicator strains of Malassezia, but it was not significant.This suggests that compounds with antifungal activity may belong to the polyketide or lipopeptide family and that their antifungal activity is not responsive to protease treatment. At neutral and acidic pH levels, the antifungal activity was unaffected, but at alkaline pH, it drastically fell to 20%. At pH 6 and 7, the antifungal activity was at its peak. The activity is fully maintained in the 20–60 °C temperature range.However, after 30 minutes of exposure to 80 ° C, the inhibitory activity dropped to 65%. After an incubation period of 30 minutes at 100 ° C, the antifungal activity is lost. 100%

of the antifungal activity of AE is kept after 365 days of storage at 4 to 20 °C. So Bacillus amyloliquefaciens has antifungal activity. Can be used as preservatives.

In the study of another Dong Liu [38], with the improper use of fungicides, P.sojae began to develop resistance to fungicides. Biological control is one of the effective ways to control P.sojae. We screened two buds that can also control mycelial growth, cyst germination, and swimming spore swimming. Through comparative transcriptome analysis, the responses of Beauveria bassiana to Bacillus amyloliquefaciens and Bacillus subtilis stresses and the molecular mechanism of biocontrol were studied. The results of transcriptome analysis showed that the expression genes of soybean changed significantly, and a total of 1616 differentially expressed genes (DEGs) were monitored. They are involved in two main types of regulation, ' specific ' regulation and ' common ' regulation. It may also control soybean growth and development mainly by controlling ribosome activity. The results of pot experiments showed that Bacillus amyloliquefaciens and Bacillus subtilis could enhance the resistance of soybean to soybean disease, and the control effect reached 70.7 % and 65.5 % respectively. In addition, the fermentation broth of B.amyloliquefaciens can also cause reactive oxygen species outbreak, NO formation, callose precipitation and lignification. Bacillus subtilis can also use lignin and plant antitoxin stimulation to form resistance to soybean system. So you can think of Bacillus amyloliquefaciens prospect in cosmetics is preservative, its antibacterial ability is very good. Therefore, preservatives will be the prospect of Bacillus amyloliquefaciens in cosmetics ingredients.

4. Conclusion

In the research of this topic, we focus on lactic acid bacteria and Bacillus. Analyze the functions of some different strains in the two strains. Analysis of micro ecological skin care opened the door to a new era of cosmetics. The following strains of lactic acid bacteria contain several features such as whitening, anti-corrosion, and high stability, and lactic acid bacteria are considered safe to use as one of the probiotics. Therefore, its safety, functionality, etc., are very consistent with the efficacy of cosmetics. Is one of the cosmetics forward prospects. Among the following strains of Bacillus, anti-corrosion and whitening are the main effects. Bacillus is also considered to be one of the safe probiotics. Therefore, its good whitening effect, strong anti-corrosion ability and high safety can be regarded as one of the prospects for the advancement of cosmetics.

The prospect of this research is a new and emerging field of modern cosmetics - micro-ecological skin care. And in the micro-ecological skin care research in the country is still very scarce. This topic to summarize the functionality of strains, safety. To analyze the prospects of micro-ecological skin care cosmetics in the future development.

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