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STUDYING OF SOME BIOLOGICAL PROPERTIES OF REMEDIES WITH PROBIOTICS*Soloviova A.V., Kucheruk K.A., Brushnevskaya V.E.**Scientific supervisor: PhD, doc. Kalyuzhnaya O.S.***National University of Pharmacy, Kharkiv, Ukraine**

The benefits of probiotics in health regulation have been studied and recognized for over a century. In 1974, probiotics were defined as organisms or substances that contribute to the gut microbial balance. Since then, increasing interest in probiotics has focused mainly on improving overall gut health. The definition of probiotics has been rethought for many years and has been defined as living microorganisms that affect health when consumed in sufficient quantities.

Microorganisms associated with probiotic properties:

- Lactobacillus: *L. acidophilus*, *L. brevis*, *L. casei*, *L. curvatus*, *L. fermentum*, *L. gasseri*, *L. johnsonii*, *L. reuteri*, *L. rhamnosus*, *L. raliarius*;

- Bifidobacterium: *B. adolescentis*, *B. animalis*, *B. breve*, *B. infantis*, *B. longum*, *B. thermophilum*;

- Enterococcus: *E. faecalis*, *E. faecium*;

- Streptococcus: *S. thermophilus*;

- Lactococcus: *L. lactis* subsp. *cremoris*, *L. lactis* subsp. *lactis*

- Propionibacterium: *P. freudenreichii*, *P. freudenreichii* subsp. *shermanii*, *P. jensenii*;

- Yeast: *Kluyveromyces lactis*, *Saccharomyces boulardii*, *Saccharomyces cerevisiae*;

- Others: *Leuconostoc mesenteroides*, *Pediococcus acidilactici*.

It has been widely reported that probiotics alleviate lactose intolerance, suppress diarrhea, reduce irritable bowel symptoms, prevent inflammatory bowel disease and have anticancer activity. Recently, clinical studies have reported that probiotics may have other health-related effects on the gut. Probiotics have been documented to lower blood cholesterol levels, exhibit hypotensive effects, treat urinary infections, reduce allergic reactions, prevent dental caries, reduce cancer risk, reduce postmenopausal symptoms and exhibit immunostaining. In addition, probiotics have also been documented for the use of skin potentials, such as the improvement of atopic eczema, atopic dermatitis, burn and scarring, skin rejuvenating properties, and the improvement of innate skin immunity.

There is increasing evidence that bacterial compounds such as cell wall fragments, their metabolites, and dead bacteria can cause some immune responses to the skin and improve skin barrier function. It has been demonstrated that cells containing no cells, lactic acid bacteria with probiotic potentials, carry out antimicrobial and immunomodulatory activities, suggesting the use of the probiotic in non-viable forms. Natural cellular components and metabolites may be the best choice when live cell delivery is not possible. Moreover, cellular components and metabolites are more stable than viable cells at room temperature and are therefore more suitable for topical use. Clinical studies in humans suggest that probiotics provide dermal benefits not only

through the gastrointestinal tract but also in topical applications. It has been demonstrated that cell-free cultures of lactic acid bacteria with probiotic potentials, including *Lactobacillus plantarum*, *Lactobacillus casei* and *Enterococcus faecium*, inhibited the expression of soluble virulence factors such as pathogens, and substrate represented by HeLa cells.

Usage of living cells of probiotics and their metabolites is becoming a common practice in the development of therapeutic and care products for facial skin. New cosmetic brands of probiotic products and lines of probiotic products of brands with global significance appears.

As part of the work of developing of composition and technology of therapeutic and prophylactic remedy with a probiotic for treating dermatological problems, were selected 6 samples with a probiotic from different manufacturers and a diverse price segment to determine the probiotic content in them.

These samples were used:

- sample 1 - Biofresh yoghurt of Bulgaria probiotic face cream (Bulgaria);
- sample 2 - Cream fluid for face and décolleté with probiotics Elysee Cosmétiques (Ukraine);
- sample 3 – HydraFlora Probiotic toner essence, Hydropeptide (USA);
- sample 4 – Sensitive serum, Esse (Australia);
- sample 5 – Bubble falls, Valmont (Switzerland);
- sample 6 – Cleansing gel Probiotic formula, Healthy skin (Ukraine).

To determine the probiotic content in the samples, 2 solutions of the sample were prepared in glycerol and saline. Next, a series of dilutions were prepared from each sample and sown in Petri dishes with nutrient medium. Cultivation was carried out under optimal conditions (37 °C) for 48 hours.

Summarized results of the study showed a large number of colonies of probiotic microorganisms for the samples 1, 2 and 4. The number of microorganisms for samples 5 and 6 were much lower and complete lack of growth for sample 3.

Thus, the potential of living probiotic cells and cellular components or metabolites from probiotics that can help improve skin condition and improve dermatological diseases is difficult to overestimate. Although many of these studies have suggested positive potential for skin health, more comprehensive and well-designed human trials are required for the final thematic applications to justify the exact doses needed. At this time, the world market is filling with a large number of probiotic remedies for the prevention and treatment of dermatological diseases. Most of them contain metabolites of probiotic microorganisms, as a rule, they are products from probiotic lines of well-known brands; however, appears brands of drugs that produce only probiotic cosmetics and contain living cells of microorganisms.