

# Alleviation of erythematous changes in systemic lupus erythematosus (*Cutaneous lupus erythematosus*) with the use of flavonoids – case study

Aleksandra Krasuska<sup>1</sup>, Małgorzata Gorzel<sup>2,3</sup>

<sup>1</sup> Scientific Circle of VPU Cosmetology Students 'SanuS', Lublin, Poland

<sup>2</sup> Faculty of Health Sciences, Vincent Pol University in Lublin, Poland

<sup>3</sup> Research and Science Innovation Centre, Lublin, Poland

---

## Abstract

**Introduction:** Systemic lupus erythematosus is a chronic, inflammatory, autoimmune disease of the connective tissue of unknown origin which affects both the internal organs and the skin. Skin symptoms are most often manifested as red spots of various nature and location. Cosmetic procedures based on flavonoids can be an effective complement to a specialist treatment, improving the physical and mental health of the patient. The aim of this study was to assess the effectiveness of cosmetic procedures with the use of flavonoids on the condition of skin affected by lupus erythematosus. In this study, particular attention was paid to the role of a cosmetologist in the initial diagnosis of lupus and in improving the emotional state of a patient with skin defects.

**Material and methods:** This article describes the case of a 58-year-old woman with visible erythematous skin lesions who has been suffering from lupus erythematosus for over 20 years.

**Cosmetological procedure:** A series of eight cosmetic procedures based on flavonoids was applied as well as proper care at home.

**Results:** A series of cosmetic procedures with the use of flavonoids proved effective in the reduction of the skin changes. The erythema became paler and therefore less visible. The skin turned out to be smoother and firmer.

**Conclusions:** The applied therapy did not bring any spectacular effects, nonetheless it visibly alleviated the skin changes. Treatments with the use of flavonoids had a positive impact on the patient's emotional condition as she got her confidence back and is willing to continue fighting the disease.

**Key words:** systemic lupus erythematosus, flavonoids, SLE, autoimmune disease.

---

## Introduction

Systemic lupus erythematosus is a chronic, inflammatory, autoimmune disease of unknown aetiology which affects both the internal organs and the skin. Skin symptoms are most often manifested as red spots of various nature and location. The disease is physically debilitating, causing the dysfunction of the patients' numerous organs and systems, and has a negative impact on the mental

condition, contributing to lowering the patients' self-confidence and, subsequently, deteriorating social relations.

Systemic lupus erythematosus is a disease which requires specialised pharmacotherapeutic treatment. Cosmetic procedures using natural plant substances which alleviate erythematous changes seem to be a suitable complement. Proper cosmetology procedures can improve the patients'

quality of life, both in terms of functioning and well-being, which translates into self-perception and relationships with others.

This article describes the case of a woman suffering from systemic lupus erythematosus for 20 years. The influence of a series of cosmetic procedures with the use of flavonoids on the alleviation of lesions was characterised. A particular attention was paid to the role of the cosmetologists in supporting the treatment of lupus erythematosus. Initial diagnostics of the patients, referring them to the appropriate specialist, and, at a later stage, appropriate cosmetic procedures may positively affect the patients' condition. The cooperation of several specialists: dermatologists, rheumatologists and cosmetologists guarantees a multidimensional treatment which will improve the quality of the patients' life.

#### ***Characteristics of systemic lupus erythematosus (SLE)***

Systemic lupus erythematosus (Latin: Cutaneous lupus erythematosus) is a chronic, inflammatory, autoimmune disease of connective tissue which affects the entire body. It is associated with the formation of autoantibodies directed against various cellular elements, which means that the disease process can affect almost any organ or system of organs. The forming autoimmune complexes are deposited in the circulatory system, internal organs and the skin, particularly on the face, neck and cleavage, which are exposed to stronger solar radiation [1-5].

In the course of the disease, the skin, joints and kidneys are most often affected. The disease can also attack other organs, including the heart, lungs, nervous system and bone marrow. Depending on its course, the disease can be mild, with periods of remission and exacerbation, or severe, leading to renal and cardiovascular failure or irreversible changes in the nervous system [1,3].

The aetiopathogenesis of lupus is not fully understood. The causes of this disease include autoimmune factors, factors provoking the initiation of autoimmune processes (such as antihypertensive medications, antiarrhythmics, anticonvulsants), genetic factors and factors provoking the appearance or exacerbation of disease symptoms: UV sun radiation, viral and bacterial infections [1,2,4]. The factors which may increase the risk of the disease occurrence include: stress, environmental factors, pharmacotherapy, hormonal factors, genetic predisposition, infections [2,6].

Forms of lupus can be divided according to the type of severity of the lesions. The most common is systemic lupus erythematosus, a cutaneous type of lupus erythematosus, including its focal (chronic) form, and disseminated forms of lupus erythematosus. The focal cutaneous form is characterised by the formation of immune complexes in the circulation and their deposition on the skin (Figure 1). The disseminated form is manifested by diffused skin lesions of the chronic type (Figure 2). Focal (chronic) form [1,2,7].

Symptoms which occur with systemic lupus erythematosus include primarily weakness, easy fatigue, sub-febrile state, lymphadenopathy, gastrointestinal symptoms such as: diarrhoea, constipation, abdominal pain, pyrosis, permanent fatigue and sudden loss of weight. Skin symptoms are the characteristic butterfly-shaped facial erythema which occurs in approximately 65-85% of people, hypersensitivity to sunlight, photosensitivity, erythematous and cicatrising skin lesions with permanent hair loss on the scalp, discoid changes, Raynaud's phenomenon, erosion of the oral mucosa, symptoms of the musculoskeletal system, joint pain and inflammation, muscle pain and weakness, lupus nephritis [1-3,6,9].



Fig. 1. Focal form of SLE, butterfly-shaped erythema, source: <https://www.termedia.pl/dermatologia/Skorna-postac-tocznia-rumieniowatego-rekomendacje-lecznicze-PTD,30156.html>



Fig. 2. Disseminated form of SLE, source: <http://www.toczenforum.pl/toczen-dyskoidalny/>

### **Diagnosics and treatment**

SLE diagnosis is very difficult and lupus is often compared to other disease entities, such as photosensitisation reactions, forms of granulosa diseases, rosacea, psoriasis [1,8]. Frequently, the initial diagnosis is “undifferentiated connective tissue disease”, and then as more symptoms develop, lupus is diagnosed. The following tests are used to diagnose the disease and assess its activity: antinuclear antibodies (ANA) – basic test for systemic connective tissue diseases, antiphospholipid antibodies – including anticardiolipin antibodies, anti- $\beta_2$  glycoprotein-1 and lupus anticoagulant, inflammation markers, e.g. ESR, CRP, protein electrophoresis, the level of complement components (C3c, C4), blood count, blood clotting INR, assessment of kidney function – creatinine, GFR, urinalysis. In the event of the irregularities, further tests are performed, e.g.

evaluation of urinary protein excretion and kidney biopsy, evaluation of liver function, e.g. AST, ALT, capillaroscopy – performed in the presence of Raynaud’s phenomenon. The doctor may also order other tests to rule out lupus-like diseases, including rheumatological and virologic examinations, imaging examinations of the affected joints (X-ray, MRI, ultrasound) [3, 10].

Currently, the common diagnosis of systemic lupus erythematosus is based on the criteria developed by the American College of Rheumatology, ACR. When at least four of the eleven criteria are met, a diagnosis of lupus can be assumed. These are: erythema on the face, cheeks, dorsum of nose, discoid erythema, sensitivity to sunlight, ulcers in the mouth or throat, arthritis characterised by soreness and swelling, pleurisy or pericarditis, changes in the kidneys, changes in the nervous system (convulsions, mental disorders, once other causes are ruled out), haematological disorders (anaemia, disturbances in the number of leukocytes – white blood cells – or platelets which help stop bleeding), immunological disorders (the presence of, among others, the above-mentioned antibodies, except for antinuclear which is a separate criterion), the presence of antinuclear antibodies [3,11].

### **Treatment**

Treatment of people with lupus depends on its severity and the organs involved. The most commonly used medications to treat lupus are glucocorticoids. In life-threatening situations or advanced changes in kidneys, cytotoxic medications such as cyclophosphamide, azathioprine or mycophenolate are used. Non-steroidal anti-inflammatory drugs are used in the symptomatic treatment of joint and muscle pain. Topically, in the treatment of skin lesions, medications in the form of ointments or creams are applied: medium-strength steroids (fluticasone, mometasone) or

0.1% tacrolimus. In systemic treatment, in the case of severe skin lesions, oral steroids and antimalarial medications are prescribed. Second- and third-line medications include methotrexate, retinoids, mycophenolate mofetil, azathioprine, cyclosporine and thalidomide. In bullous and urticarial forms, sulfones proved effective. People suffering from lupus are recommended to rest, regenerate, avoid stress, avoid strong sunlight, perform physical activities, observe hygiene rules, perform preventive vaccinations, keep healthy lifestyle. In the case of skin lesions, exposure to sunlight ought to be avoided, and protective clothing and application of creams with a UV filter is advised [3, 10, 12].

#### ***The role of the cosmetologists in supporting the treatment of SLE***

The most important task of a cosmetologist in supporting the treatment of lupus erythematosus is recognising the symptoms and directing the patients to a specialist in order to implement appropriate therapy. It should be noted that the symptoms of lupus are often confused with other diseases, especially in the initial stage, which is why the correct diagnosis and subsequent referral to a dermatologist or rheumatologist is of such importance.

In the course of the disease, the skin lesions become more visible and more difficult to mask, which significantly reduces the patients' mental comfort and often makes them seek help from a cosmetologist. The cosmetologist can provide appropriate skin care in cooperation with a dermatologist, which will help the patient to function with the disease. It can help both from the physical, and an equally important emotional point of view [1,2,9]. It must be noted that not all cosmetic treatments offered by beauty salons are advisable in the case of SLE. appropriate. There are many contraindications which should be considered

when supporting the treatment. With such a disease and skin symptoms, appropriate treatment needs to be applied which does not deteriorate the condition of the skin and the cosmetics used should not irritate and cause inflammation of the lesions. Cosmetics with plant extracts work well with this type of skin. Their active ingredients have unique properties, including antioxidant, anti-inflammatory, antiallergic [7,13].

#### ***Flavonoids – characteristics***

Flavonoids are secondary metabolites commonly found in plants. These are plant compounds with multidirectional activity and are often active ingredients in medicinal plants, used in folk medicine to treat, among others, inflammation, cardiovascular diseases and diabetes. They perform a variety of functions, including protecting the plant against ultraviolet radiation or pathogens [13-15]. From the chemical point of view, flavonoids belong to polyphenols and constitute a group of compounds that are significantly different in terms of structure and biochemical properties. The primary frame of flavonoids consists of 15 carbon atoms connected in the C6 – C3 – C6 system (two benzene rings connected by three carbon atoms). In most flavonoids, an additional heterocyclic ring is formed between the aromatic rings, containing an atom other than carbon in its structure – often it is an oxygen atom. The basic difference between the flavonoid subgroups is the difference in the degree of oxidation [2,7,16,17].

Flavonoids are compounds which demonstrate unique properties, and the differences in the structure of these compounds trigger diverse biological effects. In cosmetology, flavonoids are used primarily in the case of couperose skin or skin with rosacea as they reduce redness and skin irritation. They have a sealing and strengthening effect on blood vessels, improve blood flow through the coronary arteries and reduce blood pressure. They protect against the

negative effects of UV radiation, inhibit the activity of hyaluronidase and collagenase (enzymes that break down hyaluronic acid and collagen). The result is an anti-aging effect and strengthening the structure of blood vessels desirable in the case of couperose skin. They demonstrate significant anti-inflammatory, anti-swelling, antiallergic, antibacterial and antiviral properties. They are also strong antioxidants. Therefore, plant extracts containing the flavonoids are increasingly used in cosmetic preparations [7, 12-14].

Scientific research confirms the comprehensive influence of flavonoid compounds on different layers of the skin. In the outer layer of the epidermis, which is a structure very rich in lipids and easily oxidizable compounds, flavonoids can play an effective role as antioxidants and eliminate free radicals. In the deeper layers of the epidermis, their antioxidant properties make it possible to prevent damage caused by UV radiation and inhibit the activity of certain enzymes. In the dermis, flavonoids affect the permeability and fragility of the capillary system of blood vessels. Flavonoid extracts are most often made from roots, leaves, flowers or seeds, the most popular being grapes, ginkgo biloba, arnica and chamomile. It should be noted that flavonoids are an indispensable part of the extract, and their activity and the ability to penetrate into various layers of the skin also depend on the presence of other components [7, 13, 15-17].

### ***The aim of this article***

The aim of this article was to evaluate the effectiveness of cosmetic procedures with the use of flavonoids on the condition of skin lupus erythematosus affected skin. In the study, attention was paid to the role of a cosmetologist in the initial diagnosis of lupus erythematosus, selecting appropriate care and, consequently, improving the emotional condition of a patient with skin defects.

## **Material and methods**

### ***Patient's medical history***

A 58-year-old woman who has had systemic lupus erythematosus for over 20 years. The lesions are: erythematous changes on the face, erythematous-cicatrisation changes. The changes are on the face, neck, cleavage and chest. In the period of increased exposure to the sun, erythematous changes also appear on the shoulders and back of the neck, but they are not permanent. The patient takes antimalarial medications, corticosteroids, steroid ointments and immunosuppressants. The woman is under constant medical care. She is frequently hospitalised for testing and steroid therapy. The patient complains about mood swings and has lowered self-esteem. The general every day symptoms include: weakness, fatigue, decreased immunity, joint pain, muscle pain, weight loss, dry mouth mucosa, dry eye mucosa, dry skin, brittle nails, hair loss – alopecia.



Fig. 3 Focal, diffused, cicatrisation lesions,  
(Fot. A. Krasuska)

### ***Cosmetological diagnostics***

The cosmetic interview and skin diagnostics showed that the patient has sensitive and dry skin. She has focal changes on the face, neck, and cleavage, changes with visible scarring and hair loss on the eyebrows. Additionally, hair thinning on the scalp and alopecia areata were diagnosed.

The patient complains of hypersensitivity to sunlight and sensitivity to cosmetics which contain photosensitising ingredients, are alcohol-based or perfumed.

### ***Cosmetological procedure***

A series of procedures was applied with the use of flavonoid-based cosmetics. Initially, procedures were performed once a week for a month, then their frequency was increased to twice a week for the following two weeks. In total, a series of eight procedures was performed.

For home care, using a gentle cleansing foam, a tonic based on flavonoid extracts and a cream rich in active ingredients such as Arnica Montana Flower Extract, chestnut (*Aesculus Hippocastanum* Seed Extract), witch-hazel (*Hamamelis Virginiana* Leaf Extract), aloe (*Aloe Barbadensis* Leaf Juice) was recommended.

A short questionnaire was used to check the emotional condition of the patient before and after cosmetological procedures. The questions pertained to self-confidence, self-acceptance and a sense of beauty. The patient marked the answers on a scale from 1 (very bad) to 5 (very good) to describe how she felt before and after the series of treatments.

### ***Characteristics of active substances used during the procedures***

The following active substances were used during the procedures:

1. **Sakura – the Japanese cherry leaf extract (*Prunus Yedoensis* Leaf Extract)**, which strengthens the vessels and increases the resistance of sensitive and allergic skin. Sakura has anti-inflammatory and antiallergic properties, reducing irritation, erythema, swelling and itchiness [18].
2. **Arnica Montana Flower Extract** has anti-inflammatory and anti-swelling properties.

It affects the tightness of blood vessels which improves venous circulation. It is also used to soothe contusions, bruises and swelling [14].

3. **Horse chestnut seed extract (*Aesculus Hippocastanum* Seed Extract)** shows anti-swelling and anti-inflammatory properties, reduces the permeability and increases the elasticity of capillaries, and improves lympho-venous circulation. Like arnica, it is used in swelling and bruising [14].
4. **Witch-hazel (*Hamamelis Virginiana* Leaf Extract)** – extract from the leaves of this plant reduces the symptoms of inflammation, among others, in atopic dermatitis, ichthyosis or various types of eczema. It soothes skin irritation and redness [14].
5. **Ivy (*Hedera Helix* Leaf Extract), St. John's wort (*Hypericum Perforatum* Flower Extract) and grapevines (*Vitis Vinifera* Leaf Extract)**, as well as the other ingredients, have a soothing effect, reducing redness.
6. **Aloe (*Aloe Barbadensis* Leaf Juice)**, in particular fresh gel obtained from aloe, reduces acute inflammation, soothes irritation, erythema, sunburn, insect bites, and accelerates the healing process of wounds and burns. The aloe vera gel prevents skin ischemia caused by e.g. burns or frostbites. It also moisturises and soothes irritations [14].
7. **A mixture of oils: avocado (*Persea Gratissima* (Avocado) Oil), Macadamia Ternifolia Oil, rice (*Oryza Sativa* (Rice Bran) Oil), and shea butter** which rebuild the hydro-lipid layer, nourish and protect against weather conditions.

### ***Methodology of the procedure***

A serum (1) with an extract of Japanese cherry leaves (Table 1) was applied to the cleansed skin of the face, and after the serum was absorbed, a soothing cooling gel mask (2) with a with 15% extract of sakura. Subsequently, a massage was performed on

Tab. 1. Ingredients of cosmetics used during the procedure

No.	preparation	Ingredients according to INCI
(1)	serum	Aqua, Glycerin, Butylene Glycol, <b>Prunus Yedoensis Leaf Extract, Hedera Helix Leaf Extract, Hamamelis Virginiana Leaf Extract, Arnica Montana Flower Extract</b> , Benzyl Alcohol, Dehydroacetic Acid, Ascorbyl Tetraisopalmitate, Parfum, Tetrasodium Glutamate Diacetate, Sodium Benzoate, Potassium Sorbate
(2)	sensitive mask	Aqua, <b>Aloe Barbadensis Leaf Juice</b> , Glycerin, <b>Amorphallus Konjac Root Extract, Hedera Helix Leaf Extract, Hamamelis Virginiana Leaf Extract, Arnica Montana Flower Extract, Hypericum Perforatum Flower Extract, Aesculus Hippocastanum Seed Extract, Vitis Vinifera Leaf Extract</b> , Butylene Glycol, <b>Prunus Yedoensis Leaf Extract</b> , Sodium Polyacrylate Starch, Phenoxyethanol, Ethylhexylglycerin, Parfum, Tetrasodium Glutamate Diacetate, Sodium Benzoate, Potassium Sorbate
(3)	algae mask	<b>Diatomaceous Earth Algin, Potassium Alginate</b> , Tetrasodium Pyrophosphate, <b>Prunus Yedoensis Leaf Extract, Aloe Ferox Leaf Extract</b> , Titanium Dioxide, Parfum
(4)	cream	Aqua, Caprylic/Capric Triglyceride, <b>Persea Gratissima (Avocado) Oil</b> , Glycerin, <b>Makadamia Ternifolia Oil</b> , Polyglyceryl-3 Dicitrate/Stearate, Decyl Cocoate, <b>Oryza Sativa (Rice Bran) Oil</b> , Isoamyl Cocoate, Glyceryl Stearate, Maltooligosyl Glucoside/Hydrogenated Starch Hydrolysate, <b>Hedera Helix Leaf Extract, Hamamelis Virginiana Leaf Extract, Arnica Montana Flower Extract, Hypericum Perforatum Flower Extract, Aesculus Hippocastanum Seed Extract, Vitis Vinifera Leaf Extract</b> , Stearyl Alcohol, Cellulose, Butylene Glycol, <b>Prunus Yedoensis Leaf Extract</b> , Benzyl Alcohol, Dehydroacetic Acid, Tocopherol (mixed), Beta-Sitosterol, Squalene, Xanthan Gum, Parfum, Tetrasodium Glutamate Diacetate, Sodium Benzoate, Potassium Sorbate CI 19140, CI 42090

the mask with a jade roller, which additionally cools the skin and relaxes it. The treatment was finished with an algae mask (3) with aloe vera, which has a calming and soothing effect on the skin. Finally, a cream (4) with active ingredients such as sakura extract, arnica, chestnut, macadamia and rice oil as well as panthenol was applied.

## Results

After the first treatment, a subtle improvement in the condition of the patient's skin was noticed. The erythematous lesion slightly dimmed and diminished, and the skin became lighter and soft to the touch (Figures 4 and 5). Similar results were observed after the second and third treatments. After the fourth treatment and an adjustment of facial skin care at home, a slightly greater improvement in skin condition was noticed. The focal erythematous changes decreased and clearly dimmed (Fig. 4 and 5). The skin became moisturized, brightened and firmer. Similar results were observed after the fifth, sixth and seventh

treatments. The final effects of the application of a series of treatments are presented in Figures 8 and 9, comparing the condition of the skin before and after the series.

The final results obtained after the series of treatments did not bring a spectacular result. The erythematous lesion has not disappeared and is still visible, however, a significant reduction has been noticed. The contours of the lesion are less clear, it is paler and definitely less visible. The skin of the face becomes moisturized, brightened, firm and elastic to the touch.

Cosmetic procedures improved the appearance of the affected skin but also had a positive effect on the emotional state of the patient. Before the treatments, she complained about feeling unwell, she lacked self-confidence and self-acceptance, which she assessed as 1 point, which means very bad on a 5-point scale. Not much better, she rated the sense of her own beauty as 2 points (Tab. 2). After the treatments, the emotional state of the patient improved significantly. The patient

assessed her well-being and self-acceptance as 4 points, which means good, and self-confidence

and a sense of beauty as 5 points, which is very good.



Fig. 4. Patient's face before the procedures  
(Fot. A. Krasuska)



Fig. 5. Patient's face after the first procedure  
(Fot. A. Krasuska)



Fig. 6. Patient's face before the procedures  
(Fot. A. Krasuska)



Fig. 7. Patient's face after the fourth procedure  
(Fot. A. Krasuska)



Fig. 8. Patient's face before the procedures  
(Fot. A. Krasuska)



Fig. 9. Patient's face after the eighth procedure  
(Fot. A. Krasuska)

Tab. 2. Selected aspects of the patient's emotional state before and after cosmetic procedures

	Before procedures	After a series of procedures
Self-confidence	1	5
Sense of own beauty	2	5
Self-acceptance	1	4
General mood	1	4

\*1 – very poor, 2 – poor, 3 – average, 4 – good, 5 – very good

## Discussion

Autoimmune diseases manifesting skin lesions are a very heavy burden for patients, both physically, leading to dysfunction of the body, and psychologically, negatively affecting their emotional condition. One of such diseases is systemic lupus erythematosus, which affects most of patients' organs and systems, impairing their activity, and also manifests skin changes which negatively affect the psychological condition of the patient, lowering self-esteem and self-evaluation.

The flavonoid therapy turned out to be effective in alleviating facial erythematous changes. Although the erythematous changes did not disappear completely, they clearly faded and their contours became less clear, which resulted in an overall good effect.

Flavonoids have a beneficial effect on erythematous changes. As Kołodziejczyk [14] emphasizes, flavonoids bring various biological effects. The sealing and strengthening of blood vessels, anti-inflammatory, anti-swelling, diuretic, anti-allergic, antibacterial and antiviral effects need to be stressed in particular.

Undoubtedly, cosmetological procedures are an important supportive method for a long-term medical treatment of lupus, as well as a therapeutic alternative for patients. It is especially important because the patients' mental satisfaction is an important factor which increases the effectiveness

of the medical treatment and allows the patients to recover faster.

Skin lesions accompanying lupus erythematosus can be a substantial emotional problem for patients. The skin being an organ visible to other people takes a special place in the perception of one's own self, of self-esteem and self-evaluation, and thus plays an important role in the process of socialisation. The skin is an organ of sensation, sensitivity and sexuality [20]. When this organ is injured or deformed, it affects our well-being and negatively affects the quality of life [21]. The importance of skin diseases and their impact on the psyche is described by Korabel et al. [22] in the article "Suicidal tendencies among dermatological patients". The authors emphasize that dermatological diseases such as psoriasis, acne, and atopic dermatitis often lead to emotional problems. Defects in external appearance intensify emotional discomfort and social withdrawal, which in turn leads to serious depression or even suicide [22]. The presence of depressive symptoms in the group of patients with skin diseases is indicated, among others, by Gupta and Gupta [23]. They found a significant intensification of depression in a group of 480 patients with skin diseases such as: acne, alopecia areata, atopic dermatitis (AD) or psoriasis.

In autoimmune diseases manifested by skin lesions, the best results seem to be brought by a holistic approach to the problem. Only cooperation between doctors, dermatologists, rheumatologists, as well as cosmetologists and psychologists can bring satisfactory results, both in terms of physical and mental health, and improve the patient's quality of life.

## Conclusions

1. Cosmetic procedures with the use of flavonoids seem to be effective in alleviating erythematous changes in patients with systemic lupus erythematosus on the basis of the analysed case.

2. The effectiveness of cosmetic procedures is largely determined by an appropriate diagnosis of the disease, proper selection of cosmetic procedures and active substances, as well as by cooperation between the cosmetologists and the patients' attending doctor, most often a dermatologist and rheumatologist.
3. The role of the cosmetologist in supporting the treatment of lupus erythematosus is very important in terms of alleviating lesions, improving the patient's appearance and increasing the patient's self-esteem and self-evaluation which consequently leads to improving the quality of life.

## References

1. Adamski Z., Kaszuba A., *Dermatologia dla kosmetologów*, Wrocław 2010, 1-466
2. Majdan M., *Toczeń rumieniowaty układowy*. Termedia, Poznań 2015, 1-237
3. Skoczyńska M., *Skórne postacie toczenia rumieniowatego*. *Kosmetologia Estetyczna* 2016. Vol 5. 6 637-640
4. Szczelik A., *Choroby wewnętrzne*. *Medycyna Praktyczna*, Kraków, 2006, s. 1659-1665
5. Kalińska- Bienias A., Foroniewicz B., Bienias P., Kowalewski C., „Wybrane nowe aspekty patogenezy toczenia rumieniowatego- spojrzenie interdyscyplinarne” *Przegląd dermatologiczny* 2016. 5, 345-353
6. Teresińska E., Szewczyk L., „Ocena jakości życia pacjentów z toczeniem układowym” *Aspekty zdrowia i choroby*, 2016, 1, 3, 27-37
7. Martini M.C., „*Kosmetologia i farmakologia skóry*.” PZWL, Warszawa 2009, 1-469
8. Jabłońska S., Majewski S., *Choroby skóry i choroby przenoszone drogą płciową*. PZWL, Warszawa 2010, 1-528
9. Samotji D, „Leczenie toczenia rumieniowatego układowego – wyzwania i perspektywy na przyszłość”. *Medican* 2018, 2, 5, 432-433
10. J. Musiał: *Toczen układowy*, [in:] A. Szczeklik (Eds.): *Choroby wewnętrzne*, *Medycyna Praktyczna*, Kraków 2006, 1659-1665.
11. M. Petri, A.M. Orbai, G.S. Alarcón, et al.: *Derivation and Validation of Systemic Lupus International Collaborating Clinics Classification Criteria for Systemic Lupus Erythematosus, Arthritis and Rheumatism*, 64(8), 2012,2677-2686.
12. Yao L.H., Jiang Y.M., Shi J. i wsp.: Flavonoids in food and their health benefits. *Plant Foods Hum. Nutr.* 2004, 59, 3, 113-122.
13. Oborowska A, „Flavonoids in today's cosmetology. *Personal Care*, 2009, September , 19-23
14. Kołodziejczak A., *Kosmetologia 2*, PZWL, Warszawa 2020, 1-620
15. Malińska D., Kiersztan A., *Polskie towarzystwo biochemiczne „Postępy biochemii”* 2004, tom 50, nr 2, 183 accessed [https://rcin.org.pl/Content/33446/WA488\\_24050\\_P939\\_T50-z2-PB.pdf#page=96](https://rcin.org.pl/Content/33446/WA488_24050_P939_T50-z2-PB.pdf#page=96), 15.08.2020.
16. Majewska M., Czeczot H., „flawonoidy w profilaktyce i terapii” vol. 65, 5, 2009
17. Wojciechowska A, „Flawonoidy w preparatach kosmetycznych” 2013, accessed: <https://biotechnologia.pl/kosmetologia/flawonoidy-w-preparatach-kosmetycznych,12841>, 15.08.2020.
18. *Vademecum Arkana*, 2018/19,84
19. Lipex Avo Butter – kombinacja wyjątkowych olejów, accessed: <https://biotechnologia.pl/kosmetologia/lipex-avobutter-kombinacja-wyjatkowych-olejow,9510>, 15.08.2020.
20. Stein DJ, Hollander E. *Dermatology and conditions related to obsessive-compulsive disorder*. *J Am Acad Dermatology* 1992; 26: 237-42.
21. Chuh A, Wong W, Zawar V. *The skin and the mind*. *Aust Fam Physician* 2006; 35: 723-5.
22. Korabel H. , Dudek D., Jaworek A., Wojas Pelc A. *Tendencje samobójcze wśród pacjentów dermatologicznych.*, *Post. Dermatol. Arelgol.* 2008., XXV, 2:69-75.
23. Gupta MA, Gupta AK. *Psychiatric and psychological co-morbidity in patients with dermatologic disorders: epidemiology and management*. *Am J Clin Dermatol* 2003; 4: 833-42. 11

## Corresponding author address:

Małgorzata Gorzel, PhD  
 Vincent Pol University in Lublin,  
 Choiny 2; 20-816 Lublin, Poland