OCULAR SEVATHERAPY WITH THE HELP OF CRYING SAP FROM GRAPE VINE

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Abstract: *The antioxidant effect of polyphenols from wines and grape seed extracts recommends the vine as one of the most important plants used in prevention and medical treatment. The mice that were overfed and were added flavonoids and anthocyanins in their food did not have diabetes, cardiovascular diseases or cancer, thus prolonging their life. To the acknowledged concept of "Vinotherapy", we allow us to suggest the term of "Sevatherapy", referring primarily to the curative qualities of the spring sap, from the vine, for the prevention and improvement of the cornea and the eye lens condition.*

Cuvinte cheie: *polifenoli, antioxidanţi, seva de primavară, metabolism ocular, tulburări de vedere, reechilibrare*

Rezumat: *Efectul antioxidant al polifenolilor din vin şi din extractele de sâmburi de struguri, recomandă viţa de vie ca una dintre cele mai importante plante folosite în prevenţia şi tratamentul medical. Cobaii care au fost supraalimentaţi şi li s-a adugat în hrană flavonoizi şi antociani nu au făcut diabet, boli cardiovasculare sau cancer, prelunginduli-se în acest fel viaţa. La conceptul consacrat de vinoterapie, ne permitem să-l propunem şi pe cel de sevoterapie,cu referire în primul rând la calităţile curative ale sevei de primăvară, provenite de la viţa de vie, în prevenirea şi ameliorarea unor afecţiuni ale corneei şi ale cristalinului.*

INTRODUCTION

"Fruits, vegetables, only by themselves and in all circumstances, are not sufficient to cause an increase in red blood cells or in the percentage of hemoglobin. But in all cases, there will be, undeniably, some useful, if not incomparable, support treatment." (J. Valnet, 1986).

This statement belongs to a known promoter of natural treatments, the American doctor Jean Valnet, and it is valid for the vines, too. The therapeutic virtues of this plant have been known for a long time and have been proven nowadays by their application in the medical practice; they show multiple possibilities of using the elements from the vine to treat various diseases of the human body. The therapeutic role is due to their extremely complex biochemical composition: tannins substances (d-catechins. gallocatechins and quercitin), anthocyanin pigments (delphinidin, petunidin, peonidin, and malvidin), organic acids (tartaric, citric, salicylic), soluble vitamins (B, C, PP, folic acid). These substances are present in all the plant organs and also in wine.

MATERIAL AND METHOD

The leaves, grapes and wine owe their therapeutic virtues firstly to the tanning substances: their structure is based on the flavan-3 molecule ol (catechins), which is the main pharmacologically active substance. Routine, Troxerutin and Tarosin are sold on the market, containing flavonoids extracted from Fagopyrum esculentum (buckwheat), and also Difebiom, Difabiol and Difrarel containing antocianozide of Vaccinium myrtillus (bilberry). These drugs have trophic action, increasing the resistance of blood capillaries (Vit. P or routine-is a biflavonoid). However, the raw material, blueberries and buckwheat, are not plants cultivated in technological systems as the vine is, therefore they can be replaced with grapes and seeds of grapes or even with the red wine.

The specialized literature contains few references to the composition and the therapeutic effects of the spring sap. But its anti-inflammatory action is known, due to flavanols, in the treatment of conjunctivitis and blepharitis. In the optical system of the eye, it is known that carrying out a cure of drops with this sap favors a "clarifying vision". The lenses of this system are the cornea and the lens

To explain the role of the compounds involved in prevention and therapy of some ocular dysfunctions, we dosed:

- Vitamin B1: important nutrient factor which takes part in the redox processes, with the role of coenzyme,
- Vitamin B6: coenzyme of aminotransferases, it occurs in transamination reactions, necessary for protein synthesis; it facilitates the absorption of amino acids,
- Glutamic acid and glutamine amide: major antioxidant and detoxifier,
- Proline: an osmotic active substance contributes to cell hydration and serves the biosynthesis of about 30% of free amino acids,
- Alanine: in combined condition, it is found in various proteins such as casein, gelatine and especially fibroin, the alanine enters into the constitution of dipeptides (carnosine and anserine), pantothenic acid and coenzyme A.

The spring sap

The spring sap is an aqueous extract of substances mobilized in spring, at the beginning of the growing phase: water from 97.6 to 98.5 g%, dry matter 1.5-2.4 g%, pH from 6 to 6.8, total sugars from 0.16 to 0.28 g / l (glucose and fructose from 0.29 to 0.81, respectively from 0.059 to 0.21 g / l). The nitrogen protein is between 0.065 -0.55 g / l

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The mineral composition comprises the following chemical elements: Ca 124-163 mg / l, K 54-157mg / l, Fe from 0.30 to 0.45 mg / L, Mg 10.4 to 23.3 mg / l, P 23-28 mg / l, and other elements in much smaller amounts.

The organic acids, expressed in milliequivalents per liter, are represented by: succinic acid 3.63, 2.14 tartaric acid, citric acid 3.63; 0018 fumaric acid, malic acid 3.49

Knowing the role of sap resulted form "crying" on vision "clarification", we have tried to identify the compounds responsible for these effects. We have analyzed the sap of spring biochemically, leaked due to cutting, from the table vine varieties: Cardinal and Queen of Vines belonging to Calugareasca Valley vineyard. The sap was collected in sterile brown sampling bottles, every other two days, three times a week.

Determinations:

- Total proteins – Semiautomatic analyzer (reagent Folin - Ciocalteu)
- Vitamin B1 – The Fluorometric method with potassium fericianura;
- Vitamin B6 – The dosage of pyridoxine hydrochloride in the presence of pyridoxal at 420nm;
- Amino acids: Glutamic acid, glutamine, Proline and alanine - AAA 881 (column chromatography).

RESULTS AND DISCUSSIONS

- Cardinal: Total proteins 51mg / lVit. B1 1.92 mg / l Vit. B6 7.08 mg / l Glutamine 6.21 mg / l Glutamic acid 3.54 mg / l Proline 1.7 mg / l Alanine 1.2 mg / l
- Queen of Vines: Total proteins 72, 8mg/l Vit. B1 4mg/l Vit. B6 28.5 mg/l Glutamine 7.28 mg/l Glutamic acid 2.12 mgl Proline 0.7 mg / l Alanine 0.7 mg / l (The results presented represent the average of three determinations. The concentrations found depend largely on the soil structure and the nature of work performed: for example, the high nitrogen content was caused by the excessive presence of nitrates in the irrigation water or because of a very extensive root system of some varieties, the zinc and copper deficiency is due to the alkaline soil, and the chlorine level is placed also on account of the irrigation water from the drinking network).

The eyepiece dioptre (the transparent and refracting mediums of the eyeball) is composed of cornea, aqueous humour, lens and vitreous.

Cornea

The cornea is the first and the most powerful diopter (the optical surface which occurs in refraction), a transparent membrane that acts as a strong lens and participates in sending images on the retina; it has a thickness of 0.48 mm.

The histological analysis reveals five layers of the cornea: epithelium, Bowman membrane, stroma, Descemet's membrane and endothelium.

The corneal epithelium is 70% water under normal hydration. The solid components are nucleic acids (DNA and RNA), lipids, proteins, ATP, Krebs cycle enzymes and glycosides. The acetylcholine and cholinesterase are also found in high concentration.

90% of the thickness of the cornea is the stroma. The stroma consists of layers or parallel strips on the surface, each layer being composed of bands of parallel fibbers of collagen. The stroma contains 75-80% water, the rest being made up of collagen and other proteins and mucopolysaccharides. The corneal collagen contains nitrogen, glycines and hydroxyprolines.

The tear layer is in osmotic balance with the cornea. The eye tolerates variations in osmotic pressure between 0.6% and 1.3%. The transition from cornea to sclera is made at a level of a conjunctive condensation area called scleral-corneal limbus, a very important area anatomically and functionally speaking, because at this level, it drains the aqueous humour from the eye to the conjunctiva (the connection area between the two parts represents the place for surgical approach in interventions on the open eyeball). The inner layer or endothelium consists of one row of cells. Their density decreases with age. The disappearance of some cells following an injury or surgery is compensated by increasing the size of the healthy cells. Thus, the intercellular pores are closed, making the penetration of water from the aqueous humour into the cornea become slower and more controlled.

The aqueous humour

The ciliary body, highly vascularised, secretes the aqueous humour necessary for maintaining normal intraocular pressure, and for the nutrition of the parts of the eye which do not have blood vessels, such as cornea and lens, the aqueous humour is formed by filtering the blood plasma,. The aqueous humour has thus a dual role: on the one hand, it contributes to the metabolism of the cornea and lens, by the intake of nutrients, and on the other hand, it is the regulator agent of the endocular pressure.

The crystalline lens

The crystallinelens is an avascular, transparent and elastic biconvex structure. It is composed of the anterior chamber, a centrally located nucleus, and the posterior chamber. The structural differentiation of the lens enables the accommodation function. Any disorder that appears in the aqueous composition will affect the lens metabolism. The lens is composed by water in a percentage of over 60%, the water from the lens plays a very important role; it provides a high refractive index for the lens. The lens should always keep a good state of hydration, since more than half of its composition is water. Besides water, the lens also contains soluble and insoluble proteins. The disease is manifested by disturbances of lens transparency; many of soluble protein components will transform the insoluble components, they settle and begin to float in the visual field as scotoma. The crystalline lens is surrounded by its own chamber; with aging, it loses its elastic properties, change accompanied by the index of refraction alteration. If the lens chamber were destroyed, the body contact with the host immune system elements would generate specific antibodies directed against the lens proteins and the occurrence of pathological manifestations. Also, to maintain the vitality of the lens, carbohydrates are vitally important, taking into account the energy consumption of this structure, due to the permanent accommodation process and the high pace of the protein synthesis

Vitreous humour

Tears	Sap crying	Aqueous humour
PH 7,3 - 7,7	6,0 - 6,8	7,20 - 7,21
Water 98.2g%	97,6 98.[illegible]g%	98.75g%
Solid substances 1.8g%	1,5 2.4g%	1.25g%
Total protein 670mg/l	N protein 65-550mg/l	100mg/l
Glucose 25mg/l	290 640mg/l	
Ca 22.9mg/l	124-163mg/l	10mg/100ml
K 39.9 -62.9 mg/l	54-157mg/l	205 mg/100ml
Hac. citric 6mEq/l	3,63mEq/l	-
Na 142mg/l	20 mg/l	330mg/100ml
Cl 102mg/l		365mg/100ml

The vitreous humour occupies the posterior vitreous chamber of the eye. It is considered a secretion of the neuroretinitis. It weighs about 3.9 g, its water content is between 98% and 99.7% and its pH = 7.5. Through its hypotonic content, the vitreous structure allows the existence of an osmotic current which results in the diffusion of nutrients from the ciliary body to the retina.

In a careful analysis of these constituents and the quantities in the sap of vines, one can notice the fact that these substances are in an optimal proportion for an easy assimilation, and simultaneously devoid of any shortcoming.

Comparing the chemical composition of the three fluids - tears, aqueous humour, vitreous humour and sap crying - in correlation with the histology and biochemistry of the cornea and lens, we found:

1. The osmosis and the diffusion are two vital processes through which the aqueous humour feeds the cornea and the eye lens with minerals, carbohydrates, and protein, water etc. The variation of osmotic balance by exosmosis or endosmosis, at the level of the contact surface of the aqueous humour with the cornea or lens, is made by a permanent mechanism for regulating the distribution of water molecules between these compartments. In this mechanism, mainly sodium and potassium ions are involved, as well as water. The amount of water in the sap is identical to that of the aqueous humour and tears; however the sodium and potassium concentrations are lower and confer the sap a hypotonic character. Sodium acts complementarily towards potassium, regulating cell function and helping to maintain the acid-base balance. Along with potassium, sodium regulates the osmotic pressure at the cellular level, when the cell membrane depolarizes externally, with about 55 mV, the Na channel opens as a voltaic gate, and the Na+ ions leave the cell, and the K + ones enter, replacing them and balancing the internal and external polarities until a new cell depolarization.
2. If this mechanism is disrupted, a structural alteration of the ocular dioptre takes place, which can have as a result a loss of transparency and refractive light and bringing about other metabolism disorders. For example, at lens level, plasmolysis takes place, followed by hypertonia or, on the contrary, by the liquefaction of the lens, followed by hypotonia, while the collagen fibbers can agglutinate due to the soluble protein precipitation. The lens chamber has the properties of an intact cell, i.e. it "expands" in hypotonic medium and "squeezes" in hypertonic medium. The water that enters the lens in too much quantity dislocates the collagen fibers by forming microvesicles which determine optical discontinuity; the balance between crystalline and its environment can be cancelled also if the concentration of the osmotic active compounds (Na +, K +, etc.) increases inside the chamber, taking place a deterioration of optical homogeneity and a loss of transparency, condition which is known under the name of cataract.
3. Corneal epithelium is hydrophobic due to its superficial lipid layer. In contrast, the adjacent mucin layer is hydrophilic and provides the corneal wetting by tears. Some of the tears are lost by evaporation from 10% to 25%. The normal osmotic pressure of tears is equivalent to 0.9% NaCl. If the aqueous part decreases, the tears become hypertonic (more than 0.97% NaCl) and therefore resulting in corneal dehydration (the moment when the eyelids are closed, the tears do not evaporate and the film of tears is in osmotic balance with the cornea). This way, the variation of tears concentration influences the feeding process of the cornea. Initially, these variations are put on account of fatigue or excessive TV watching, air currents etc. In this situation, rehydrating the cornea with drops of sap is a fast and efficient method to ease the pain.
4. The functional status of the cornea and the lens is maintained by the aqueous humor. Lifestyle also reflects on the composition of the aqueous humor, which is formed by the filtering blood. With age, both hypertonia and the organism acidosis increase mainly because of a poor diet; to absorb water, the dioptre cells have to be in a more diluted environment than the cytosol, i.e. the external solution should to be hypotonic compared to the cellular content. This way, an endosmotic current is created, penetrating the water molecules into the dioptre cells (cornea + lens), which determine its functional balance.

Following the crying sap analysis, it has been found a significant similarity in terms of presence and concentrations of inorganic and organic elements, from the sap and the aqueous humour or tears. The sap coming from vines can substitute the aqueous humour, at times when its chemical composition or its osmotic pressure becomes unbalanced; by the use of local applications of sap, the external intake of water and of the osmotically active chemical elements, Na, K, Cl, is achieved that facilitates the transmembrane exchange and restores the electrolyte balance (through osmosis and simple or facilitated diffusion), both at the interface level of the cornea and the lens

5. The collagen in the eye contains much nitrogen, glycines, hydroxyproline, proteins, DNA and RNA, which highlights the existence of protein synthesis processes. With their properties, the organic substances contained in the spring sap, locally administrated, contribute to maintaining the homeostasis of these cells, and to the regeneration of specific proteins. Thus, the addition of vitamins B1 and B6, of Glutamic acid, Proline and alanine promotes hydration and stimulates the biosynthesis protein reactions: the new synthesized molecules arrange themselves quickly replacing the microvesicles of the collagen network of the cornea and lens, improving their transparency and elasticity

How to harvest

The sap is collected in small plastic or glass containers, which are well tied at the ends of the vine strings, freshly cut in the spring. The amount to be collected in a single vessel is not very big so, it is best to use more containers. The sap solution must be protected from contamination with pathogens. The jars or the bottles used must be sterilized before harvesting and immediately after filling them with sap, they are tightly sealed and refrigerated until use.

How to apply

With a sterile pipette, apply 5-10 drops of sap at the outer corner of eye. The eye is kept open as long as possible during the application, after which the eyelids are closed several times and then, with the eyes closed, it is recommended to make some slight rotation movements of the eyeballs. On average, there will be given 3 times a day. The first effects are slightly astringent and healing and will be felt in 5-10 minutes after the application of this natural remedy.

CONCLUSIONS

1. The red wine, the black grape husks and seeds, consumed as such or served as natural products, protect the arterial walls due to proanthocyanidins and other phenolic compounds.
2. The high valorization of husks, seeds and the remains of fermentation (marc) is required for the extraction of polyphenols, with significantly lower costs than other raw materials (blueberry, buckwheat).
3. The sap produced by the vine is a natural remedy, an ideal formula which can be used successfully in Sevatherapy. Due to its osmotic active characteristics and of bio-protein manufacturing stimulation, the sap from the "crying" vines

can be considered a substitute for aqueous humour because it treats the eating disorders that occur at the level of the eye and prevents their chronic character. The important effects at clinical level are not so spectacular, because the "crying" does not last more than seven to eight days (the patients being forced to treat only in this range) but they may become evident by repeated courses, optimizing the dosage levels and establishing the necessary time to complete absorption at the level of contact with the eyes.

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