LIVING SYSTEMS: AN ENDOBIOGENY PERIODICAL

OUR RELATIONSHIP TO THE UNIVERSE: COSMOBIOLOGY & CIRCADIAN RHYTHM

VOL 1, ISSUE 3, OCTOBER 2023

Mokwon, Subsoo Lim (b.1940)

MEDICINAL PLANTS: ADAPTOGENS FOR SEASONAL CHANGE

Source: "Illustration in Taqwīm as-Siḥḥa (Maintenance of Health)"

ADAPTOGEN HERBS THAT HELP WITH SEASON CHANGING

Dr. Manel Zghidi, PharmD

SUMMARY: The purpose of any living being is adaptation: it must "digest" any new event, take advantage of it to rebuild itself and evolve. According to the theory of endobiogeny (1)(2), a concept proposed by Dr. Duraffourd and relayed by his disciple Dr. Kamyar M. Hedayat, there are several types of adaptations: immediate adaptation, short-term adaptation, the general adaptation syndrome and chronobiological adaptation. The expression and effectiveness of these different adaptation phenomena depend on several extrinsic (ambient temperature, light intensity, duration of photoperiod, geomagnetic intensity) and intrinsic factors (chronobiology - age, sex, genetics - the microbiota - mainly enteric flora - pineal axis - melatonin, vitamin D - the state of the neuro-endocrine terrain and emunctories, epigenetics).

According to a growing body of scientific research, several medicinal plants have been shown to be effective in ensuring a smooth seasonal transition. The understanding of this adaptation phenomenon in relation to all the factors that can modify or influence it will justify the contribution of the different medicinal plants proposed during these crucial moments of life.

Introduction

The primary objective of endobiogeny is to bring the organism back to its original state of balance while maintaining internal integrity and harmony with the external environment. Medicinal plants play an essential role in achieving this goal by providing comprehensive and integrative care.

This article highlights the benefits of using Saffron and Rhodiola during seasonal changes.

ENDOBIOGENIC APPROACH TO SEASONAL CHANGE[1]

In addition to developmental and circadian rhythm adaptation, seasonal adaptation is part of the chronobiological adaptation syndromes. It is subject to the influence of several factors and involves several neuroendocrine and emunctory actors for a successful transition between seasons.

According to Dr. Duraffourd, the duration and intensity of the photoperiod are key factors in maintaining the seasonal rhythm. This mainly involves MSH and melatonin, which have an impact on the hypothalamus-pituitary-adrenal axis and thus on the regulation of the body's ability to adapt to stress, including during seasonal transitions. We therefore observe changes in the functioning of the different neuroendocrine axes. These changes follow a pattern similar to the circadian rhythm:

- During the pre-seasonal winter-spring transition, which occurs approximately from February 18 to 28, there is a predominance of the thyroid axis through the decrease in melatonin secretion which leads to an increase in TRH secretion.

There is therefore an energy expenditure which results in an increase in metabolism. Thyrotropic activity is actually increased in response to corticotropic stimulation: The level of ACTH reactivity is increased so that the body responds optimally to the energy demand. However, through negative feedback, MSH tends to reduce CRH secretion, which allows for better adaptation to the seasonal change by improving the body's stress management.

- In contrast, during the pre-seasonal summer-fall transition, which occurs approximately from August 18 to 28, the shift in photoperiod and daylight hours results in increased melatonin secretion, which then leads to a decrease in TRH release. The thyroid axis is thus inhibited. There is a shift towards the anabolic axes with a boost to the para-sympathetic. This is mainly serotonin and oxytocin via ADH which stimulates ACTH. The alpha-sympathetic system undergoes an adaptive phenomenon allowing an increase in the general level of the hormonal system. By negative feedback, MSH tends to decrease the corticotropic activity allowing an important energy saving.

The appearance of certain symptoms related to chronic diseases or the triggering of these medical conditions during seasonal transitions is due to the existing state of imbalance or to a pre-critical terrain.

For example, a pre-existing state of insulin resistance could interfere with the completion of the second loop, leading to exacerbation of symptoms of autoimmune diseases, such as multiple sclerosis, during the transition to spring. In autumn, the same exacerbation can be observed in cases of hypovitaminosis D.

Emunctorial congestion and mitochondrial insufficiency have a significant impact on seasonal transitions.

Liver congestion during the great "spring cleaning" leads to dysbiosis which explains the peak of migraines and ENT infections in the pre-spring period.

CLINICAL APPROACH ACCORDING TO THE THEORY OF ENDOBIOGENY:

THE PINEAL GLAND AS AN EXAMPLE[1]

Literally called the "third eye", the pineal gland has been referred to as the "seat of the soul" by René Descartes.

The pineal gland, also called the epiphysis, is responsible for synchronizing the central clock with the various peripheral clocks of the body, ensuring the overall rhythmicity of the organism by integrating with cosmobiological phenomena, including the seasonal rhythm. It manages vital processes such as the sleep-wake cycle, mitochondrial energy, immune-inflammation balance and cell regeneration by involving several actors, mainly melatonin, which is mainly secreted during the night and is closely related to vitamin D, known as the daytime hormone.

Insufficient exposure to sunlight, high exposure to blue light and possible calcification of the epiphysis with age can lead to the appearance of various disorders caused by a dysfunction of the epiphysis.

The goal is to resynchronize the sleep-wake cycle with sleep-enhancing herbs, to restore melatonin levels to improve sleep quality, to restore vitamin D and serotonin levels, to restore energy balance and to "drain" calcification.

Oxytocin also plays a role in the regulation of this axis by calibrating the functioning of the corticotropic axis, by increasing consciousness and by having an anxiolytic effect.

HOW DO ADAPTOGEN HERBS HELP WITH SEASONAL TRANSITIONS?

Saffron and Rhodiola are known to be adaptogens. The word "adaptogen" comes from the Latin "adapt (to adapt)" and the ancient Greek "genesis (action of generating)". Adaptogenic plants are known to increase attention and resistance to fatigue and reduce deficiencies and stress-induced disorders related to the neuro-endocrine and immune systems, especially during seasonal changes. They act in synergy to help the body better manage the stress it is subjected to during seasonal transitions.

SAFFRON VS. RHODIOLA

What is the difference between Saffron and Rhodiola?

- **Saffron:** helps to adapt MSH activity at the central level by balancing peripheral corticotropic activity, improving cortisol activity during the day and avoiding excessive activity at night.

  Saffron is used in case of lack of restful sleep with daytime fatigue or in case of recurrent nightmares and/or insomnia.

  It is also used for all gastrointestinal disorders such as dysbiosis, constipation, nausea, indigestion, infections and even inflammatory and ulcerative diseases.

- **Rhodiola:** Generally speaking, the golden root has a stimulating effect on the activity of the main neurotransmitters. It has a positive effect on mood with a better resistance to stress.

  It is therefore used in patients with a strong intolerance to stress or a declining memory.

  Thanks to its effect of support of the peripheral corticotropic activity, Rhodiola is used to improve physical performances but also to support immunity during the changes of season.

  It is indicated in case of various thyroid hyperfunctioning disorders such as Hashimoto's disease. It also has an anti-diabetic effect.

When would you combine them?

- As an antioxidant and adaptogen during periods of high stress such as infections and seasonal changes.
- To relieve anxiety and depression and to improve mental and cognitive abilities.
- In case of premenstrual syndrome, dysmenorrhea and sexual disorders in men, especially in case of decreased libido and erectile dysfunction.
- For their protective effect on the cardiovascular system

When would you use them separately?

- Saffron for sleep disorders, gastrointestinal disorders, aphrodisiac, stomachic, fibromyalgia and spasmophilia.
- Rhodiola for fatigue and severe asthenia, fatigue associated with Lyme disease, over-excitation states, myocardial remodeling post-infraction.

What are the complementary plants that help them work better?

Ribes nigrum, Passiflora incarnata, Eschscholtzia californica, Rosmarinus officinalis, Vinca minor, Crataegus monogyna, Matricaria recutita, Melissa officinalis, Ginkgo biloba, Panax ginseng, Eleutrococcus senticossus.

SAFFRON

Latin name: *Crocus sativus* L.

Family: *Iridaceae*
Common names: zafran (Arabic & Hebrew), za'afaran (Farsi), fan hong hua (Chinese Mandarin), safran (French, German), zaffarano (Italian), azafrán (Spanish), krokos (Greek), and kesar (Hindi).

The etymological origin of the word's "crocus" and "saffron are from the Near East. The term " crocus " comes from the Greek krokus which means "thread" and refers to the stigma of the saffron.

The word "saffron" is of Arabic origin: za'farân which means "to color with saffron". It is itself derived from asfar = yellow and safrâ = yellow flower.

Its cultivation was illustrated on the frescoes of the Palace of Knossos in Crete (1700 BC) and it was used by the Assyrians.

It appears in Book 2 of Avicenna's "Canon of Medicine" (al-Qanun fi al-tib). (3)

It was Introduced in Spain by the Arabs in the 10th century, the Crusaders brought it to France in the 12th century.

It was spread on the beds where the guests of the Roman feasts lay down because of its aphrodisiac virtues.

Known to trigger a good mood, it is said that the emperor Nero had sprinkled it on the roads before his crossing.

Active Principles

The stigma of saffron consists of more than 150 components which contain lipophilic and hydrophilic carbohydrates, proteins, amino acids, minerals, mucilage, gums, vitamins (especially riboflavin and thiamine). The main components of the stigma are carotenoid pigments (crocin, crocetin, alfa and beta-carotenes and picrocrocin responsible for the bitter taste), safranal (major terpene of the essential oil) and flavonoids including quercetin and kaempferol.

MODERN HERBALISM

- Saffron has been the focus of several studies that have confirmed its pharmacological properties:
- Immunomodulating and anticancer (anticancer activity against a wide spectrum of tumors, anticarcinogenic by induction of apoptosis in lung cancer cells),
- Anti-inflammatory (especially in chronic inflammation) (bronchial inflammation), anti-asthmatic (safranal), antitussive,
- Antidepressant (crocin inhibits the reuptake of dopamine and noradrenaline; safranal inhibits the reuptake of serotonin), (7) (9)
- Neuroprotective and antioxidant: memory disorders induced by chronic stress, increases learning capacity, protects dopaminergic neurons, potentialities in Parkinson's disease, safranal improves oxidative damage induced by the ischemia-reperfusion process in the rat hippocampus, decreases neurotoxicity due to aluminum, improves symptoms of early Alzheimer's disease, anticonvulsant (safranal, crocine),(5) (6) (8) (10)
- Positive effect in the anxiety-depression syndrome in type 2 diabetics,
- Hepatoprotective (4), lipid-lowering, protective against the deleterious effects of hyperlipidemia, analgesic (safranal), reduces nibbling and increases satiety,
- Hypotensive, cardioprotective, anti-inflammatory,
- Hypotensive, cardioprotective, renoprotective, (4)
- Antibacterial, antispasmodic, emmenagogue, (4)
- Improves sexual disorders induced by some antidepressants (SSRI) in men and women.

Based on Dr. Kamyar Hedayat's work, the following can be said about *Crocus sativus:*

ENDOBIOGENIC ACTIONS

NEUROLOGIC: Improves sleep by augmenting the rate of production of melatonin by improving serotonin utilization during the day and thus availability at night; Mild euphoric through beta-endorphin and GABA activity; Improves cerebral circulation by fluidifying blood and improving oxygen release within the brain.

GONADOTROPIC: Regulates estrogen activity in the periphery, favors menstrual flow and metabolic activity of the ovarian-uterus unit.

SOMATOTROPIC: Regulates central prolactin activity on hypothalamus.

ANS: Reduces central and peripheral Alpha-sympathic effect.

GASTRO-INTESTINAL TRACT: Antalgic; Astringent to mucosa, digestive neurotonic, anti-spasmodic.

ADRENAL: General adrenal support with a slight emphasis on cortisol.

CARDIAC: Cardioprotective, vasodilatory (through nitric oxide-mediated activity);

METABOLIC: Augments oxidative metabolism by increasing oxygen entry, mild mitochondrial support.

PULM: Augments oxygen diffusion by improving surfactant activity and alveolar integrity; mild-bronchodilatory through nitric oxide-mediated activity.

ENDOBIOGENIC USAGE

Tincture: ***General***: 10 drops twice or three times per day, not to exceed 20 drops three times per day in chronic use.

Oligomenorrhea, Dysmenorrhea, Amenorrhea: 15 drops three times per day (+ Vitex + Alchemilla

Recurring nightmares: + *Viburnum* GM, *Rosmarinus* GM + Clove EO.

Depression: 30 drops twice a day x 10 days, then 20 drops twice a day x 20days, then 10-15 drops twice a day

Asthma: 5-7 drops twice a day as an adjunct to other treatments (i.e. Ribes GM, Ilex GM, Crataegus GM, etc.).

TISANE:

Mild gastric disorders, prevention of gastric cancer: Pinch saffron, steep in 4 oz water for 4-6 minutes; Drink before each meal.

Constipation and nausea: Add saffron *nabaat* (rock candy);

GI infections: 1 tsp coarse stamens in 8 oz water, steep 10 minutes, add 1 cap peppermint hydrolat; drink 2 oz every hour for 4 hours; repeat as needed.

Depression with fear: 1 tsp saffron prepared above, added to warm bath. Soak for 10-15 minutes with 1 cup Epsom salt, 1 cup sea salt; (mild staining of skin possible but worth it).

CONTRA-INDICATIONS: Avoid in tumors of the blood, especially lymphomas (Dr. Hedayat's work)

GOLDEN ROOT

Latin name: *Rhodiola rosea* L.

Family : *Crassulaceae*

Common names: Golden Root, Rose Root Rosavin, Rosenroot, Rhodiola Rhizome, Arctic Root, and Rhidola.

Mentioned by Dioscorides in "De materia Medica" under the name of golden root, Rhodiola was consumed to prevent fatigue and "lack of desire to work", increase physical endurance and prevent altitude sickness.

It was used in infusion by the Yakuts (Eastern Siberia) for its stimulating virtues.

The Inuits of Alaska and Canada consumed, often in great quantities, its stems and its fleshy leaves as green vegetable.

Rhodiola rosea L. was known as an adaptogen and used to treat asthenic conditions, anxiety disturbances, depression, schizophrenia, insomnia and hypotension and to cope with cold weather and fatigue. Recent studies showed that R. rosea efficiency in treating age related disorders (such as Alzheimer's disease) (11), and smoke and opioid addiction. (14) (15) (16) (17)

Active principles

Rhodiola root contains about 140 chemical compounds: Phenols, rosavin, rosin, rosarin, organic acids, terpenoids, phenolic acids and their derivatives, flavonoids, anthraquinones, alkaloids, tyrosol, and salidroside.

MODERN HERBALISM

- In modern herbalism, Rhodiola rosea is used for the following pharmacological properties:

- Adaptogen and anti-fatigue (13)
- Improves memory, attention, concentration, and learning, decreases salivary cortisol response in patients suffering from stress-related fatigue syndrome (11)
- Improves physical capacities and muscular resistance: Decrease of oxidative stress induced by physical effort in rats, increase of muscle glycogen content
- Major and multi-targeted anxiolytic and antidepressant activity on different receptors and neurotransmitters: Increases serotonin and dopamine levels, potential activity on senile dementia by effect on MAOI B
- Neuroprotective (11) (18)
- Reduces the adverse effects of antidepressants
- Antidiabetic by hypoglycemic and antihypoglycemic effect
- Anti-inflammatory
- Immunostimulant, stimulates the proliferation of T lymphocytes, increases phagocytosis, increases cellular immunity (12)
- Anticancer, antiangiogenic properties (12)
- Anti-aging

According to Kamyar M. Hedayat MD, Jean-Claude Lapraz MD[2], the following can be said about *Rhodiola rosea:*

ENDOBIOGENIC ACTIONS

NEUROLOGIC: Serotonergic, dopaminergic, cholinergic, noradrenergic.

ENDOCRINOLOGIC: General adaptogenic effect: harmonizes the central and peripheral communication of the various endocrine axes (vertical endocrine feedforward). Synchronizes the response between the corticotropic axis and the gonadotropic axis (cortico-gonadotropic coupling).

CORTICOTROPIC : Augments adrenal cortex's capacity to produce all metabolic lines of hormones.

GONADOTROPIC: Modulates and decreases estrogen receptor expression in case of an excessive corticotropic axis response.

THYROTROPIC: Supports the activity of the thyroid glands by maintaining an efficient synthesis of calcitonin and thyroxine and by decreasing the penetration and adhesion of thyroid antibodies.

IMMUNITY INHANCER: Supports the thymus by improving maturation of T-cells and by its antioxidant effect (supporting mitochondria, free radical scavenger).

GONAD AND UTERUS : Emmenagogue, it improves sexual function by increasing orgasm and improving recovery.

ONCOLOGY: Anticarcinogenic, anti-metastatic, antimutagenic.

HEMATOLOGY: Leukocytogen.

ENDOBIOGENIC USAGE

ADRENAL FATIGUE: States of fatigue from asthenia (+ Inula helenium + Ribes nigrum GM + Quercus pedunculata GM) 3 ml twice a day with meals or over-excitation (+ Passiflora incarnata MT + Sequoia gigantea GM+ Quercus pedunculata GM+ Lavandula angustafolia EO).

PSYCHOLOGIC: Depression (+Crocus sativa MT, Ribes nigrum GM); mental retardation (+ Melissa officianalis MT + Sambucus nigra leaf MT), ADHD (+ Gingko biloba MT, Salvia officinalis MT or EO +/- Menyanthes trifoliata).

CARDIOVASCULAR SYSTEM: Myocardial remodeling post-infarction (+ Panax ginseng MT + Coenzyme Q10, D-ribose)

CONTRA-INDICATIONS: Can worsen bipolar disorder or high-strung people. ❊

About the Authors

Dr. Manel Zghidi holds a doctorate of Pharmacy, from Faculty of Pharmacy, Monastir, Tunisia. She also holds a master's degree in phytotherapy and cosmetic marketing. She currently lives and works in Montreal, Canada. Her love of medicinal plants was instilled at an early age by her father, also a pharmacist. She has served as medical director of her family supplement company where she has brought endobiogenic thinking to product development. Her three great teachers in endobiogeny and medicinal plants are Dr. Duraffourd, Professor Chemli and Dr. Hedayat. Her goal is to continue their work in making endobiogeny accessible and applicable worldwide, for the benefit of mankind.

References

1. Kamyar M. Hedayat MD, Jean-Claude Lapraz MD - The Theory of Endobiogeny_ Volume 1_ Global Systems Thinking and Biological Modeling for Clinical Medicine-(2019, Academic Press)
2. "Kamyar M. Hedayat MD, Jean-Claude Lapraz MD - The Theory of Endobiogeny_ Volume 3_ Advanced Concepts for the Treatment of Complex Clinical Conditions (2019, Academic Press)
3. Hosseinzadeh H, Nassiri-Asl M. Avicenna's (Ibn Sina) the Canon of Medicine and Saffron (Crocus sativus):A Review. Phytother Res. 2013 Apr;27(4):475-83.
4. bHosseini A, Marjan Razavi B, Hosseinzadeh H. Saffron (Crocus sativus) petal as a new pharmacological target: A review. Iranian Journal of Basic Medical Sciences 2018, 21.
5. Hosseinzadeh Hossein, Khosravan Vahid. Anticonvulsant Effects of Aqueous and Ethanolic Extracts of Crocus sativus L. stigmas in Mice. Arch Irn Med 2002; 5 (1): 44-47.
6. Hosseinzadeh H, Talebzadeh F. Anticonvulsant evaluation of safranal and crocin from Crocus sativus in mice. Fitoterapia. 2005 Dec;76(7-8):722-4.
7. Moshiri, E., Basti, A. A., Noorbala, A. A., Jamshidi, A. H., Abbasi, S. H., & Akhondzadeh, S. (2006). Crocus sativus L. (petal) in the treatment of mild-to-moderate depression: a double-blind, randomized and placebo-controlled trial. Phytomedicine, 13(9-10), 607-611.
8. Heitmar R, Brown J, Kyrou I. Saffron (Crocus sativus L.) in Ocular Diseases: A Narrative Review of the Existing Evidence from Clinical Studies. Nutrients. 2019 Mar 18;11(3):649.

9. Akhondzadeh S, Tahmacebi-Pour N, Noorbala AA, Amini H, Fallah-Pour H, Jamshidi AH, Khani M. Crocus sativus L. in the treatment of mild to moderate depression: a double-blind, randomized and placebo-controlled trial. Phytother Res. 2005 Feb;19(2):148-51.
10. Rajabian A, Hosseini A, Hosseini M, Sadeghnia HR. A Review of Potential Efficacy of Saffron (Crocus sativus L.) in Cognitive Dysfunction and Seizures. Prev Nutr Food Sci. 2019 Dec;24(4):363-372. doi: 10.3746/pnf.2019.24.4.363.
11. Nabavi SF, Braidy N, Orhan IE, Badiee A, Daglia M, Nabavi SM. Rhodiola rosea L. and Alzheimer's Disease: From Farm to Pharmacy. Phytother Res. 2016 Apr;30(4):532-9.
12. Li Y, Pham V, Bui M, Song L, Wu C, Walia A, Uchio E, Smith-Liu F, Zi X. Rhodiola rosea L.: an herb with anti-stress, anti-aging, and immunostimulating properties for cancer chemoprevention. Curr Pharmacol Rep. 2017 Dec;3(6):384-395.
13. Jówko E, Sadowski J, Długołęcka B, et al. Effects of "Rhodiola rosea" supplementation on mental performance, physical capacity, and oxidative stress biomarkers in healthy men. Journal of Sport and Health Science. 2018 Oct;7(4):473-480.
14. Titomanlio F, Perfumi M, Mattioli L. Rhodiola rosea L. extract and its active compound salidroside antagonized both induction and reinstatement of nicotine place preference in mice. Psychopharmacology (Berl). 2014 May;231(10):2077-86.
15. Mattioli L, Perfumi M (2011a) Evaluation of Rhodiola rosea L. extract on affective and physi-cal signs of nicotine withdrawal in mice. J Psychopharmacol 25:402–410
16. Mattioli L, Perfumi M (2011b) Effects of a Rhodiola rosea L. extract on acquisition and expression of morphine tolerance and depencence in mice. J Psychopharmacol 25:411-420
17. Titomanlio F, Manzanedo C, Rodriguez-Arias M, Mattioli L, Perfumi M, Miñarro J, Aguilar MA (2013) Rhodiola rosea impairs acquisition and expression of conditioned place preference induced by cocain. Evid Based Complement Alternat Med 2013:697632.
18. Zhang B, Wang Y, Li H, Xiong R, Zhao Z, Chu X, Li Q, Sun S, Chen S. Neuroprotective effects of salidroside through PI3K/Akt pathway activation in Alzheimer's disease models. Drug Des Devel Ther. 2016 Apr 6;10:1335-43.