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PHYTOMEDICAL INTERVENTION AS A DOUBLE BIOSEMIOTIC ROAD TO HEALTH: TOWARDS A THEORETICAL MODEL

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Resumo: As sociedades pós-Covid passaram a trabalhar com a complexidade do tema da boa saúde e qualidade de vida. Os modelos padrão da ciência biomédica concentram-se na maquinaria biológica do corpo e aplicam as lentes teóricas da biologia (celular), química, neurologia e estatística clássica, para mencionar apenas estas metodologias científicas. Este texto conciso investiga a possibilidade teórica de ampliar o escopo da pesquisa médica para (i) abranger pela atenção médica um contexto mais amplo, essencial para propor uma intervenção médica ideal; (ii) e convidar para a investigação médica outras disciplinas (como linguística interdisciplinar moderna, biossemiótica), que podem facilitar a construção de novos modelos médicos e, posteriormente, programas de intervenção nos cuidados de saúde. O ponto focal deste texto são as terapias fitoterápicas e seu suposto envolvimento de duas vias no processo de cura.
Palavras-chave: Ervas; Fitomedicina; Neoholismo; Qualidade de vida; Processo de cura; Comunicação.

Abstract
Post-Covid societies start to work with the complexity of the theme of good health and quality living. Standard models of biomedical science focus on the biological machinery of the body, and apply the theoretical lens of the classical (cell) biology, chemistry, neurology and statistics, to mention but these scientific methodologies. This concise text delves into the theoretical possibility to expand the scope of medical research in order to (i) embrace by the medical attention a larger context essential to propose optimal medical intervention; (ii) and to invite into the medical research other disciplines (i.e. modern interdisciplinary linguistics, biosemiotics), which can facilitate building new medical models and, later, intervention programs in health care. The focal point of this text are herbal therapies and their hypothesised two-road involvement in the healing process.
Key-words: Herbs; Phytomedicine; Newholistic; Quality living; Healing process; communication.

1. Introduction

This theoretical study marries up several current scientific methodologies. It focuses on how to build a complex theoretical model which offers an explanatory proposal for the effectiveness of herbal therapies in quality health care and health regulation. The working hypothesis which is presented here for further discussions is that herbal remedies work to allow the patient's health improvement: (i) through substance-bound-healing effects and (ii) through non-substance-bound-healing effects. In both cases we observe the biosemiotics process involving the organismic response to signs. The starting-point theoretical stance we take is that what herbal remedies do to the patient is more complex and multispectral than the traditional biomedical model in the medical research assumes (BOGUSŁAWSKA-TAFELSKA, 2021; BOGUSŁAWSKA-TAFELSKA; LECKO, 2022).

To pinpoint this complexity we embark here on the short tour across several sciences, towards the multidisciplinary field of (bio)semiotics and ecolinguistics. We will for a while adopt the position of the philosophers of science as our proposal requires a change of the paradigmatic base from which we depart and start to construct our theoretical model. Our study proposes leaving the classical paradigmatic framework of the main stream of the Western sciences and employing the assumptions and interpretations of life systems of the postclassical (newholistic) paradigm. We will benefit in this brief analysis from the complementarity model of life and human proposed by Walach (2005 a; 2005 b), which allows to identify this double healing road of herbal treatments in the healing process.

2. Herbal therapies. Methodology in the current research of the classical biomedical paradigm

Herbal therapies involve using plant's seeds, leaves, berries, roots, bark or flowers in medical interventions or health-promoting therapies. This category of therapies belongs to the historically oldest types of healing practices developed locally in the world cultures, usually exerted within the context of a given geocultural region. In other words, phytomedicine is one of the proto-sciences. Apart from tradition, there is the essential factor of relative safety of using herbs in treatments; and their effectiveness in healthcare which make herbs an important medical tool.

> (…) in developed Western countries, researchers have found that antibiotics have only a limited effective lifespan, so consumption of herbal medicines has also increased in these countries (…) (AHMAD ZARE JAVID ET AL., 2017).

Today, in the globalisation era, we can not only benefit from local herbal traditions, but also can reach for i.e. Ayurvedic or Chinese phytoremedies, easily accessible on the Western market of remedies and food supplements.

The scientific research in the mainstream biomedical paradigm has been analysing the ways herbal therapies work within the human organism. In this paradigm, the human system is conceptualised as a physical complex algorithmically steered, where structures and processes are based on complex linear and nonlinear chemical, neurological and biological phenomena (WALLECZEK, 2000). Hence, from this perspective the healing effect of plants in the therapeutic process comes down to providing the organism with supporting, biochemically active ingredients which act as biochemical signs and

(i) nourish the system, level up the biochemical resources and strengthen its self-repairing potential – the literature calls such remedies 'functional foods' for healthcare (AHMAD ZARE JAVID ET AL., 2017);

(ii) (ii) fight the pathogens which de-regulate the organism and cause a given health problem (BOGUSŁAWSKA-TAFELSKA, 2021).

In order to proceed with our thought pathway proposed in this study, in the subsequent section we present several examples of the mainstream biomedical research into the healing process of phytomedicines. From this sample report one can learn about the current general direction of the mainstream research which uses standard medical models.

2.1 Herbs as biochemically active medicines

The first exemplary study is on the effects of the Ayurvedic specifically composed herbal supplements on the vasomotor, psychosocial, physical and sexual well-being of 117 menopausal, overall healthy women demonstrated a significant positive result of the herbal intervention on the menopausal symptoms (STEELS ET AL., 2018). This research illustrates how the phytotherapy can level up and regulate the organismic biological and chemical supplies. The researchers chose a formulated Ayurvedic herbal medicine which contains 75 mg *Tinospora Cardifolia*, 100 mg *Asparagus racemosus*, 100 mg *Withania somnifera* and 225 mg *Commiphora* mukul per capsule. The subjects in the study were taking one capsule twice a day, for the period of 12 weeks. The researchers describe the active influence of the tested herbal medicine in terms of the following active biochemical ingredients of the composing herbs:

1. *Tinospora cordifolia* is rich in bioactive components, such as aliphatic compounds, alkaloids, steroids, lactones, glycosides, sesquiterpenoids, polysaccharides, various fatty acids, essential oils, arabinogalactan, a polysaccharide with prebiotic and immunological activity.
2. *Asparagus racemosus* has phytochemical ingredients such as steroidal saponins, alkaloids, quercetin and glycosides of quercetin. These components are used in the Ayurvedic medicine to regulate the female reproductive system, the nervous system and the immune system.
3. *Withania somnifera* contains alkaloids, steroidal lactones, steroids (β-sitosterol, diosgenin, sitoinosides), flavonoids (quercetin) and nitrogen-containing compounds (withanol), which have anti-stress and neuroprotective functions.
4. *Commiphora mukul* includes volatile oils, steroids, flavonoids, guggultetrols, lignans, sugars and amino acids. This herb is used in Ayurveda for obesity, diabetes and inflammatory conditions such as arthritis.

In this study, the scholars concentrated on measuring the biological positive influences of the herbal remedy (as containing specific ingredients active biochemically) on the organisms of the female subjects.

Another illustration of the research into the biochemical activeness of herbs is the study on the therapeutic effects of Valerian root and lemon balm extracts on child symptoms of restlessness, insomnia, hyperactivity and impulsiveness (GROMBALL ET AL., 2014). While analysing the healing/regulating processes of the remedies, the scientists were focused on the active biochemical ingredients included in the plants which were used to treat the children involved in the study. As the researchers reported,

Lemon balm extract (600 mg) improved mood, cognitive performance and attentiveness in young adults under mental stress (…) presumably via increasing activity of acetylcholine. Essential oils (…) as well as constituents of the aqueous extract like cis- and trans-rosmarinic acid (…) inhibit acetylcholinesterase. Moreover, lemon balm extract binds to the nicotinic and muscarinic acetylcholine receptor (…) as was also demonstrated for human tissue (…).

There are indications that the effects of valerian arise from interplay of several constituents. Valerenic acid binds to β_2- and β_3-subunits of $GABA_A$-receptors (…) which can explain anxiolytic, calming and mild anti-depressive

properties of the extract. In addition, effects of valerian on the 5-HT5A-receptor are reported (…) which has been suggested to be involved in regulation of circadian rhythms (…).

In the paper the researchers point out that 'efficacy of herbal medicines strongly depends on the quality of the specific extracts, i.e., on the concentration of effective ingredients and a constant batch-to-batch composition' (GROMBALL ET AL., 2014).

Active biochemical substances in herbal remedies are the biochemical signs. They straightforwardly supply the organism's biological resources, as a result strengthening the immune and nervous systems and overall biological condition.

Another clinically essential function of herbs is their potential to fight antigens which have caused disturbance to the patient's health. To give an example, the recent research reports on the efficacy of *Melissa officinalis* in treating patients with chronic stable angina (JAVID ET AL., 2018). The researchers report that supplementation of *Melissa Officinalis* may improve the results of echocardiography, exercise stress test, cardiovascular serum biomarkers such as lactate dehydrogenase, and nitric oxide, and blood pressure in patients with chronic angina. The therapeutic influence of this plant is due to polyphenolic compounds and some flavonoids in their leaves. Rosmarinic acid, as its major polyphenol, is pointed out to prevent cardiac complications and hypertension in the research on rats. The results showed that this supplementation can prevent cardiac hypertrophy and decreases blood pressure. Herbal tea made from the leaves of the *Melissa Officinalis* strengthens antioxidant defence of the organism.

To summarise this section, the clinical research into the healing mechanisms and facilitating potential of herbal remedies concentrates on the biochemically operating ingredients which naturally appear in plants. Biochemical ingredients in herbal remedies act as biochemical signs in the biosemiotic process to health. This is a straightforward way to naturally support and supply the biological apparatus of the human body – using natural substances taken from the planet's ecosystem. What we aim to point out is that in herbal intervention this *biological road* to health is complemented by *the communicational road*, operating on another paradigmatic plane, though the nonlocal mechanism of generalised entanglement (WALACH; ROEMER, 2011; WALACH; VON STILLFRIED, 2011). In other words, when we consider the postclassical, expanded paradigmatic framework of life processes, we can attempt to model theoretically the parallel healing process that takes place when herbs are the medicine in the healing process. So, the sections below elaborate on what seems possible in the healing process in the reality of nonlocal phenomena.

3. Nonlocal phenomena in the healing process

To repeat, the working hypothesis in our analysis has it that the healing process is based on the response to signs (WALACH, 2015; GOLI, 2016). It is the basic meta-principle to enter the expanded paradigmatic line of reasoning. In the previous sections we briefly presented how biochemical substances included in herbs act as biochemical signs; as a result, the biological intervention on a biological system takes place. Now, we aim to discuss the parallel road to health, where there are signs primarily communicational/relational, bringing about the biochemical effects to the organism (GOLI, 2016,p. 17). In fact, in this parallel road, signification occurs only in the psycho-semiotic sense being a type of a ploy or a tool to open the patient to the nonlocal relation with the therapist, and, ultimately, incite self-healing processes of the organism (WALACH, 2015). Let us now attempt to disambiguate this complex theoretical proposal.

3.1 General characteristics of the postclassical paradigm

Complementarity lies at the heart of the postclassical paradigm and, much as unstudied it still remains, this presently very peculiar to us phenomenon probably is one of the major organising principles in the living reality of the universe. The postclassical physics (quantum physics mostly) is a thoroughly scientifically scrutinised physical theory, as physicists acknowledge (GREENE, 2011, p. 76). However, its emergence in the transdisciplinary debate and research still has the sense of a novelty. And, what is essential, the scientific phase when the quantum theory is applied in the disciplinary research and applicational programs not only in the area of modern physics but of other disciplines as well, is still before us.

The research into the expanded paradigmatic plane in modern science, the medical science included, is challenging for two reasons. First, we still are moving within the unstudied territory; much is to be done and relatively little is already achieved. Second, most, if not all, of the considerations we undertake in the post-Newtonian physics – is based not on logic but on the idea of a paradox. It violates all our intuitions, cognitively-based knowledge systems, and the folk knowledge we nonconsciously refer to as well. In Table 1 the two paradigms, the classical paradigm and the postclassical paradigm, are briefly characterised by means of several key terms/concepts. These specification lists are by no means complete; we have chosen here the most telling, general characteristics to give the interdisciplinary reader some idea about the profound character of the paradigmatic change we talk about here.

The classical, 'Newtonian' paradigm: basic explanatory concepts and terms	**The post-classical, newholistic paradigm: basic explanatory concepts and terms**
materialistic atomistic/structuralist deterministic dualistic reductionist local binary causal logic	complementarity entanglement probabilistic holistic unity/continuum local and nonlocal causal and acausal paradoxical/inclusive

Table 1. General characterisation of the two paradigms: the classical one and the newholistic one.

As regards the phenomenon of complementarity, entanglement being its special case, through the lens of this model we can look at and try to analyse nonlocal processes of life, one of them being the process of healing.

3.2 Signs initiating self-healing: one of the postclassical paradoxes

Complementarity and entanglement are the theoretical tools which help us to make sense of the nonlocal effect of herbal therapies on the patient's health.

Harald Walach, interdisciplinary scholar and internationally renowned authority on the current CAM research, points out that all healing is self-healing. "All so-called specific effects, causal

interventions etc. are only manoeuvres that help marshal this most powerful therapeutic ally: the self-healing response" (WALACH, 2015, p.112). The manoeuvres the scholar refers to involve the active initiation of signs in the organism's creating the response in the form of self re-organisation and optimization. Here a postclassical paradox reveals itself, where self-healing mechanism needs some triggering sign to start it.

Signs which can awake the subjective organismic response towards self-regulation have various nature, from linguistic signs (spoken, written, etc.), through human artefacts like homeopathic pills, human symbolic/ritualistic behaviour (i.e. a visit to a medical doctor), to a biochemical substance(s) which can function as signs to the biochemical body. All of the signs can be divided into two general categories:

a. 'local' signs, working within the plane of the classical, form/substance based processes; these can be involved in linear or nonlinear processes; we characterised their functions in sections 2 and 2.1 of this paper;
b. 'nonlocal' signs, working within the plane of the postclassical reality.

Looking at case *a*, in our example of rosmarinic acid in *Melissa Officinalis*, the acid can act as a sign to the body circulatory system to activate complex biological process of the blood pressure decrease. It is both the linear chemical influence of the plans onto the biology of the organism. And, simultaneously, the nonlinear organismic interpretation of the chemical agents as signs (GOLI, 2016, p. vii). I. Walleczek says that 'nonlinear dynamics is critical to understanding biological function and order (…)' (2000, p. 13). The scholar adds that '(…) modern medicine might greatly benefit from a better understanding of the self-organized biodynamical processes that appear to be involved at all levels of physiological organization (WALLECZEK, 2000, p. 327). Hence, to encapsulate this thought pathway, when healing occurs as a result of the biochemical intervention of a given herbal remedy on the linear and nonlinear biochemical activity of the organism, we talk about the local effects of the treatment; or the local processes enabling healing.

Looking now at case *b*, in a given phytomedical intervention the parallel healing/regulating process takes place, this time of the nonlocal nature. So, again, just like in case of the biochemical chain of reactions, the nonlocal phenomena use signs to activate the healing response in the patient. The healing trajectory is different, though. We do not have a biological or chemical connective chain reactions to evoke the healing response (this feature is known in the literature as the binding problem). We do not talk about the 'causes' of the healing effect; nonlocal processes are a-causal. The framework of space-time is not applicable in these types of processes. And, nonlocal processes operate beyond the to-date recognised as the ultimate limit of life phenomena, the speed of light (GREENE, 2011; JIBU; YASUE, 1995).

4. Through the lens of the complementarity model: how herbs can work both locally and nonlocally

To construct our working hypothesis, we need to move this analysis onto the postclassical, holistic paradigm, where fundamental differences are occurring in the ways the reality around is structured (ontology), in the ways this reality is made sense of (epistemology), and in the ways it can be studied (methodology). For a more detailed presentation of the postclassical paradigm the reader is asked to reach for other sources which focus on exactly these topics (JIBU; YASUE, 1995; VITIELLO, 2001; PLOTNITSKY, 2004; WALACH; VON STILLFRIED, 2011; KITTO ET AL., 2011). We, at this point of our analysis, are looking at the complementarity model of the mind-body interaction (WALACH, 2005; 2015 a; 2015 b). This model is based on the paradigmatic precepts of the Generalised Quantum Theory (GQT) which is a bridge, theoretical proposal

between quantum theory as studied by physics and the modern interdisciplinary, holistic research (ATMANSPACHER, RÖMER, WALACH, 2002; WALACH; RÖMER, 2011; WALACH; VON STILLFRIED, 2011). The complementarity model is based on the idea of the material/bodily/brain aspects of the human organism and the nonmaterial/mental aspects being co-primary and equal in status within the organism's structure. What is essential for our analysis is that the two co-primary dimensions of the human organism remain in the state of generalised entanglement, where there are mutual influences, without actual biochemical/material causes. The mutual communication and influence between the mind and the body are a-causal. No material or energetic signal is transmitted; nor any other detectable physical impulse triggers the reaction. So, in simpler words, we have here a cross-disciplinary, scientific, theoretical model, derived from the generalised quantum theory, which addresses the mind-body, or the material-nonmaterial interface healing mechanisms. This model can refer to such alternative healing modalities as distant healing, homeopathy, psychotherapeutic or psychological interventions, and herbal medicine. As a matter of fact this model can be related to all healing modalities, mainstream medical modalities as well, but for the purpose of our present chapter, we focus on herbal healing.

So, what is needed for the nonlocal healing to take place? There needs to be a system of global and local variables, constructing an entangled structure. In the therapeutic process it may be a communication dyad doctor-patient, or (herbal) therapist – healee. The global variable is the community or unity, the therapist and the patient temporarily form in the intervention procedure, while the local variable is the individuality or uniqueness. H. Walach describes this process as follows:

> The healer creates a bond of community between him- or herself and the healee, either by a ritual or in the healer's mind, and lets his or her own individuality merge to a certain extent with the one of the healee, thus creating a kind of unity or community. By still upholding a certain sense of individuality at the same time, entanglement between the healer and healee could become instantiated, since community or unity and individuality are complementary, the one being a global and the other a local description. By virtue of this connectedness with the healee the healer might be in a position to enact, on behalf of the healee, in the healer's mind or in a symbolic reality, what would be a desired state for the healee, which then through this entanglement might be installed within the patient through a nonlocal correlated action (WALACH, 2005, p. 555).

The healing on this plane of the healing process happens without an exchange of any signal; thus is a-causal. The whole mechanism is based on the entanglement which, however magically it presents itself today to the Western mind, belongs to the solid scientific proposal in the micro scale; the research now has been focused to sort it out in the macro scale of large-scale material objects. L. R. Milgrom assures that:

> As Fisher pointed out, non-locality has been verified experimentally many times, most famously by Aspect et al. (…) Therefore non-locality or EPR entanglement at least at a nanoscopic level of subatomic particles, atoms and molecules (…) is a fact (…) (2005: 101).

This nonlocal, a-causal mechanism of the living system's regulatory processes has not been scientifically and systematically inspected by the main stream of the medical or biological sciences. The very idea that immunological processes of the human organism are to be studied beyond the materialistic approach of the cause and effect model, has been now entering the wider scientific debate as a serious hypothesis to pursue.

5. Herbal treatment seems to have it all

In this study we delineate a theoretical model in which herbal therapies operate within the semiosphere where the biosemiotic process brings a meaning response in the organism, through (i) the biochemical supplementation and intervention of the herbal active ingredients – being referred to as the specific effects; and (ii) through the nonlocal meaning effect created by the entangled healing dyad between the patient and the therapist, activating a patient's self-healing processes. We can actually risk a step further in these conclusions and say after F. Goli that (…) paying attention to these factors and analysing them make these seemingly non-specific effects specific' (2016, p. 3). The 'nonspecific' feature of the nonlocal pathway in the intervention actually refers to a specific process.

To encapsulate the main tenets of this theoretical study, what makes phytoremedies a promising healing modality of the integrative medicine of the future is their lack of biochemical side-effects and the non-toxicity for the biological organism, as plant remedies come from nature and are not processed or synthetized pharmacologically in any way. In addition, we propose to consider phytoremedies as an even more elevated healing modality than homeopathy is, because phytomedicines, unlike homeopathy, operate on the double healing axis, i.e. signification the biochemical/local plane; and signification in the nonlocal realm in the quantum/entanglement-induced plane. Herbal medicines, thus, seem to be seated on both the material paradigm and the newholistic/postclassical paradigm, and addressing a health issue within both paradigmatic dimensions.

6. Concluding: communicational processes in phytotherapy

The complementarity model allows to theoretically grasp one coherent local-nonlocal healing mechanism in all types of phytotherapies. In this model, communication processes of meaning generating transpose the whole mechanism onto the domains of the ecolinguistic and biosemiotics research. Linguistic aspects involved here require an expanded research program to theoretically model what awareness and behaviours are required from medical practitioners to actually work with the nonlocality of healing in a conscious way. It seems that the linguistic and communicational awareness are key in this healing model under discussion in this paper. Nonlocal processes happen anyway in any healing intervention (these are life processes); however, when the participants of a healing procedure understand what is actually going on in the healing intervention, when the process is more consciously moderated (through language and communication), we can optimise the whole procedure and maximize its awaited effectiveness. Actually, a new narration in practicing medicine is what we need, which will reflect this expanded awareness of the healing process and which will be – as a matter of fact – a major therapeutic tool in it (cf. project description on new narration in medical practice: BOGUSŁAWSKA-TAFELSKA, 2021). When considering contemporarily active research theories of language in modern linguistics one notices the advantage of ecolinguistics. Ecolinguistics is so wide and multilayer as a theory of communication that it has the features of a metamodel, a models' model (BOGUSŁAWSKA, 2022). Ecolinguistic perspectives are very elastic. This capacity and multidimensionality of the ecolinguistic paradigm will allow to smoothly incorporate the linguistic aspects into the interdisciplinary medical research on linear/nonlinear healing.

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