

Editorial

NEGLECTED AREAS OF PHYTO-MEDICINAL RESEARCH

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ABSTRACT: The contemporary phytomedicine research is engaged principally towards the target of identification of active principles of the diluents-extracted section of the dry parts of the medicinal plants. Thus, medicinal plants are used in the modern healthcare system almost solely as a source of knowledge for getting efficient molecule/s for synthesizing marketable new drugs. But plants can influence the overall health status in positive directions in various different ways. On the other hand, health status and susceptibility to diseases of an individual is dependent on many factors, like the biological age of the individual, expression or suppression of the genetic predisposition to diseases, etc. All such factors can be controlled or modified in positive directions through following a designed lifestyle and food-drink style, by closing the entry of different synthetic chemicals inside the body, etc. Positive effects of some specific foods, like succulent vegetable salad, fruit salad, nut mixture, spice mixture, etc., in the daily diet can influence the innate immunity of the body to a large extent and thus can control initiation, progression, and severity of diseases. Along with these, the use of synthetic chemical-free succulent biomedicines can act as a better alternative to the presently synthetic chemical-based treatment practices of modern medicine.

Keywords: Phytomedicine, Drug development, Active principle, Biological age, Succulent biomedicine, Neglected research.

INTRODUCTION

Source of a very good portion of the drugs used in modern medicine is directly or indirectly linked with different plants [1, 2, 3]. Following the principle of identification and mass production of identified active agent/s from the plant source, most of such drugs were developed. Plants have immense possibilities in healthcare, but many of the potential areas are not considered for intense study. The presently practiced uni-directed techniques of research towards drug development in modern medicine, as well as the use of the knowledge of the codified ancient healthcare systems practiced in the present time, have many conceptual limitations that demand attention from the research communities.

USE OF MEDICINAL PLANTS IN THE ANCIENT SOCIETIES

Plants have been treated as a preventive and therapeutic means to control different diseases from a very ancient time. In ancient societies, the locally available plants were used for such purposes, mainly just after collection [1, 4]. Such practices are still observed among animals genetically near or even far

away from human [5]. Such uses of plants as some medicines at their raw, succulent stage are still practiced by many ethnic and rural people [1, 6].

But not all medicinal plants grow during all the seasons of the year. Many of them grow only in some specific conditions of soil and climate, and so were not available in many other places. So, these were having the constraints of regional and seasonal availability. To overcome that problem, storage of the parts of the medicinal plants was considered. As there was no other option for the storage of such medicines in most parts of the world during ancient time, storage of the dry parts of the medicinal plant was the only way left to overcome these problems. Afterwards, the use of only the dry parts of the medicinal plants becomes a practice in human society [1, 6, 7].

DEVELOPMENT OF THE CODIFIED SYSTEMS OF ANCIENT HEALTHCARE AND THEIR LIMITATIONS

Along with the development of the language and writing capabilities, the knowledge gathered and passed through generations by the way of verbal teaching was noted in many parts of the world [1, 7]. But probably

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portions of such knowledge among the ethnic people who live in remote areas were left outside of such documentation. On the other hand, along with the passing of time, the ancient names of the plants documented in the codified systems are forgotten in many cases, and many plant species become extinct [1, 6, 7].

USE OF MEDICINAL PLANTS IN THE MODERN SOCIETIES

Identification of plants and use of the procedures described in the codified systems

In the present time, the identified plants and techniques described in the ancient codified systems are adopted and used as a means of healthcare in the name of alternative medicines. But only the techniques of use of dry parts of the medicinal plants are accepted in that journey, though there were descriptions of other techniques also in the ancient texts [1, 6, 8]. The dry parts of the plants, singly or at different combinations in the name of poly-herbal medicines are used in such healthcare systems. These plants are used either directly or after mixing with some vehicle or in the form of alcoholic extracts.

Modification and adaptation of new available procedures of modern medicine are in practice during the use of such codified knowledge in healthcare, though some criticisms are there in the steps of validation, standardization, technique adaptation, and impact studies of such medicines [9, 10, 11].

Concept of use of ethno-medicinal knowledge to prepare usable drugs of modern medicine

The medicinal plants are treated with almost the same concept of drug development as the other sources, following different chemical means. The dried parts of the medicinal plants are used to validate their reported efficacies, and after getting positive results in such studies, efforts are made to identify the active portions (principles) of such dry parts of the medicinal plants. The solvent extracted sections of the dry parts of the medicinal plants are considered equal or representative of the original medicinal plants in such procedures. If a negative result comes during validation of such solvent-extracted parts, the ethno-medicinal reports of efficacy of such plants are almost considered wrong [12, 13, 14].

The solvent extracted sections of the dry part of the medicinal plants are used to identify the bioactive compounds, termed as active principles. Individually, such active principles are tested for their efficacy and toleration level in the human or animal body following different techniques of safety and efficacy studies. After

passing all such tests, the compound/s are synthesized at bulk quantities to market them as some drugs [1, 15]. Alternatives to such a unidirectional procedure of validation and use of medicinal plants in healthcare are already proposed, though not studied thoroughly [5, 32, 35].

Framework developed for drug development using plants as a knowledge source

For the development of marketable drugs after getting the knowledge from the reported medicinal plants, a huge infrastructure has been established throughout the globe. Over 60 such phytochemical databases are identified by the researchers [16]. A huge amount of fund are used continuously to develop effective drugs to combat important diseases like diabetes [17, 18, 19] or cancers [20, 21, 22] with very limited success [23, 24, 25]. The target of making a profit by business may be a more potent inspiring force acting behind such efforts than the benefit of humankind [26].

THE CONCEPTUAL GAPS

In the codified systems practiced presently

In many ancient healthcare systems, the use of different forms of the medicinal plant parts is described for their efficient uses [27, 28, 29]. Among them, only the dry parts of the medicinal plants are considered as the only form to prepare usable medicines in the present time. On the other hand, many other techniques of modern medicine are adopted for the production and marketing of such coded medicines, though many of them are not described in the related ancient texts [14, 30, 31].

In modern medicine

For validation of the traditional claims of the ethnomedicinal systems, the therapeutic efficacies are not tested on any animal or human. Even for the plant parts used in healthcare purposes by different ethnic groups for centuries without any report of any untoward effects, the same procedures of solvent extracted from the dry parts of the reported plants are analyzed for certification of their non-toxicity and efficacies. Many plant parts are used as some succulent foods by some people or groups of people, but they are also treated in the same way [1, 13].

The main target of the contemporary research on medicinal plants is the identification of effective (active) principles to synthesize chemically in bulk quantities to get business [19, 32]. Perhaps due to consideration of only that target, possible combinational effects of known or unknown phytochemicals present in the succulent state of even a single medicinal plant are overlooked and not considered important [1, 32].

THE NEGLECTED AREAS OF RESEARCH

A. Prevention of diseases by means other than vaccination or drug-based treatment

Body immunity can be roughly divided into two parts: the innate or non-specific immunity and the acquired immunity. The innate immunity covers all the soldiers and weapons the living body has, develops from the zygote stage, and is modified lifelong. The acquired immunity is acquired during encounters with disease agents or vaccination antigens. The innate immunity actually acts as the first line of defense of the body.

Many trials are performed, and huge research has been done for the modification of the acquired immunity status of the body by vaccination, the use of drugs, and other techniques. But research for modulation of innate or non-specific immunity of the body to prevent catching of the diseases or expression of the genetic predisposition to various diseases is scarce [32, 33].

1. Following a designed lifestyle

Correction of the habits of use of different synthetic chemical-based products in all aspects of the daily routine can reduce the entry of different synthetic chemicals of different nature into the body. Staying away from the processed foods containing a huge number of synthetic chemicals of different categories (preservatives, stabilizers, added flavors, colors, etc.), mixture of different chemicals in the name of cold drinks or chemical-made or added fruit juices [34, 35], the trans fats of the oils used [36], different cheap, adulterated foods; micro and nano-plastics, etc., most of which are having serious toxic effects on the body, can reduce increase of load of these chemicals inside our body [34, 35, 37].

Use of different skin-care, hair-care, health-care, cosmetic, etc. products with different mixtures of synthetic chemicals and their absorption through skin is another serious subject in this regard [35, 38, 32]. Staying away from these practices is also important [32, 39].

Alternatives to these so-called healthcare products in the category of cosmetics, skin care products, etc., can be prepared totally from herbs without the addition of any synthetic chemicals for their regular use following the ethno-medicinal knowledge [35].

2. Immuno-modulation through food

Modification of food habits by inclusion of nut mixture, succulent vegetable salad, fruit salad, and spice mixture in the diet can modify the innate immunity to a large extent to strengthen our overall disease preventing power of the body. There are at least 124 edible

succulent vegetables and also 124 edible succulent fruits, having different possible mechanisms of actions to modify the immunity status of the body [32].

3. Succulent biomedicines

The related parts of the reported medicinal plants (fruit, leaf, root, stem, flower, etc.) can be used directly as edible medicine in the encapsulated form without the addition of any synthetic chemical following some specific production design [19, 40, 41].

For the preparation of succulent biomedicines to prevent or cure different diseases, plant sources are already available. There are reports of 800 medicinal plants with anti-diabetic activities, 934 plants with anti-cancer activities, 130 plants with immunomodulation activities, 78 plants with antiviral activities, and 1200 plants with anti-microbial activities. Among all these lists, many plants are found commonly. So, possibly they can act against different diseases with different mechanisms of action [32].

4. Following of near-nature lifestyle

The nature attached lifestyle can add some positive force in life, so it can influence the immunity status of the body. It is already established that the mental status (psychology) of individuals can control overall neuronal systems, the endocrine system, and immunity of the body. Nature-attached lifestyle can also strongly influence these factors [32, 42]. Following a pre-designed lifestyle with regular exposure to sunlight, physical and mental exercises (as follows the techniques of removal of stress), maintenance of body clock, spending time in nature without electronic gadgets, etc., can reduce the biological age by modulating the body's immunity status [32, 43].

B. Study of the possible mechanism of action of the alternatives proposed

Along with fewer entries and the formation of different toxins in the body, the immunity status will improve. The catching of different diseases and initiation of so-called lifestyle diseases will be reduced for such habits.

As per a few studies found, immunomodulation by antioxidation is considered as the way to show the activities of the succulent biomedicines. But these are some broad terms, containing different ways and means. There may be other possible mechanisms related with masking of genetic pre-disposition towards initiation of various diseases, potentiation of some procedures of innate immunity, suppression of some detrimental procedures of the body like development

of autoimmunity, etc., particularly by the metabolic products of the succulent fruits, nuts, vegetables and the biomedicines inside the body system, both in case of limited time medicinal use, and more importantly, as a result of their continuous use as a part of the lifestyle followed [1, 19, 32].

CONCLUSION

Plant is mainly considered as the source of information related to the development of some drugs of synthetic origin to use them in modern medicine. But that concept covers only a part of the capability of the plants to influence our health and overall well-being. Different other ways like modification of different detrimental parameters of lifestyle, modification food style, inclusion of nature as a part of life, use of healthcare products of raw herbal origin and widespread use of succulent biomedicine capsules for healthcare practices can change the entire scenario of presently practiced chemical based healthcare procedures along with the side effects of the drugs and the huge expenditure related with it.

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