Materia Medica of Tibetan Medicine: Identification, Quality Check and Protection Measures

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Abstract
This paper discusses the relationship between Tibetan medical theory and practice with respect to the classification of materia medica and the discernment of quality and potency. Based on more than thirty years of experience as a Tibetan medical practitioner, the author describes a number of specific materia medica in detail, with an emphasis on how to determine fake from authentic ingredients. The author also offers recommendations and guidance on proper cultivation techniques and conservation methods, in line with Tibetan textual sources on the subject, in combination with empirical knowledge.

Keywords
Tibetan medicine, materia medica, quality, cultivation, threats to species diversity

Editors’ Introduction
As one of the world’s leading experts on Tibetan materia medica, the author of the seminal Tibetan and English publication A Clear Mirror of Medicinal Plants (Rome: Tibet Domani, 2002) and a former director of the Men-Tsee-Khang in Dharamsala, India, Dr Dawa is in a unique position to comment not only on issues of species identification, potency, and quality, but also on much broader social and ethical concerns with respect to the current and future status of Tibetan medicinal plants, and the practice of gso ba rig pa.

At a basic level, Dr Dawa is addressing here the protection of plants as well as issues of classification and discernment with respect to quality, potency, and efficacy of materia medica. More significantly, though, he is addressing the protection of gso ba rig pa as a whole. Indeed, Dr Dawa’s comments on the ethical as well as practical implications of contemporary depletion of medicinal resources symbolizes the extent to which he sees these two issues as inextricably linked. While scholars of gso ba rig pa might be tempted to
create distinctions between plants and non-plant materia medica, between plants as non-medicines and plants as medicine, and finally between materia medica and other aspects of the Tibetan medical system (such as practices of diagnosis or disease aetiology), in this paper and in our other encounters with Tibetan medical practitioners, these distinctions are often irrelevant conceptual discontinuities. Likewise, for Dr Dawa, one cannot easily separate these two issues: conservation or preservation of medicinal plants cannot be considered in itself, but must be addressed within a broader context that is concerned with the ethical and accurate transfer of medical knowledge and the continued ability to practice and produce medicines of high quality.

Dr Dawa’s essay provides a wealth of empirical knowledge combined with a careful reading of classic Tibetan medical texts, from the perspective of a practitioner with more than three decades of experience. Dr Dawa’s essay presents some of the first comprehensive discussions of specific high-value materia medica with respect to discerning ‘fake’ or sub-standard quality ingredients. While this type of knowledge is commonly discussed amongst medical practitioners and pharmacists or even between practitioners and foreign researchers, such information is often the stuff of oral transmission; rarely do we find this kind of detailed, didactic illustration of such issues, in consort with references to medical texts as well as experience gained through plant collection trips and time spent in search of medicinal ingredients with which to help fuel the production unit of a major institution.

Dr Dawa’s list of rare and endangered medicinal plants is provided as an appendix. It is also worth noting that this paper was actually given at the Twelfth Seminar of the International Association of Tibetan Studies (Vancouver, August 2010). However, the themes discussed herein are very similar, and even more elaborated, than the presentation Dr Dawa gave at the 2009 IASTAM conference in Bhutan.

Introduction

Tibetan medicine has a long history (nearly 4,000 years) with verifiable sources of authority relating to its theory and practice. It is an outstanding and unique medical tradition with a record of efficacious treatment of human ailments, preventative measures in maintaining good health and as a means of ensuring mental health and peace. It is a unique system in that, in addition to possessing the hallmarks of the identity and characteristics of the theory and practice of the traditional medical system of Tibetan people, it is also characterised by being imbued with a high degree of modern, scientific nature.
and characteristics. This system is appropriate and suitable for use at all times (past, present and future), has pragmatic value in its application, and is as inexhaustible as the vast ocean.

In Tibetan medical texts, principally the *Four Medical Tantras* (*Rgyud bzhi*), of the many curative measures explained with reference to illnesses, the principal antidotes may be summarized as relating to diet, behavior, medicine and external therapies. From amongst these, the key is medicine. In order for the medicine to be as efficacious as the saying, ‘piercing right on the spot where the pus is’, it is of critical importance that besides accurate and faithful adherence to the texts in the compounding and preparation of medicines, it is even more important to unerringly identify medicinal ingredients and to ensure that they are of standard quality.

As compared with the past, due to changes of time, the development of society, changing human needs, the forces of economic globalization and so on, there is an increase in the number of people who are engaged in moral as well as immoral practices in the preparation and compounding of medicines. And in this era when rapid advances are being made in the scientific field, along with a growing realization of the value and need of traditional medicine felt ever more widely, we have reached the happy situation where more and more people are beginning to trust, love, show an interest in, study, carry out research on and practice within the Tibetan medical system.

On the negative side, however, taking advantage of such times and opportunities, one can notice a marked trend in the simultaneous growth of both moral and immoral practices in the preparation, compounding and usage of medicine. As such, one sees it as vitally important to be cognizant of these developments and to take appropriate measures to encourage good practices and discourage bad practices.

Hence, I would like to share with you my analysis of the knowledge and understandings that I have gained during the course of the last thirty years through direct involvement and experience (seeing, hearing, experiencing) [with Tibetan medicine]. It is hoped that the impartial and fair-minded scholars will be generous with their comments and advice.

Broadly speaking, according to the four Tantras, *materia medica* of Tibetan traditional medicine are classified into thirteen categories on the basis of their inherent potency according to their essential character.¹ These can be further

¹ Editors’ note: A Tibetan medical doctor who reviewed this text and its translation notes that these thirteen categories are not based on inherited potency (’ngo bo’i nus pa) but according to the quality of the substance itself. Qualitative potency and inherited potency are distinct.
amalgamated into three broad categories: mineral *materia medica*, plant *materia medica* and animal *materia medica*.2

However, because of a variety of causal factors, we have now reached a stage whereby the use of medicinal ingredients based on precious stones and minerals and living organisms has been dwindling progressively with a corresponding increase in the use of ingredients that are based on plants. This is not only because of increasing practice of this traditional medical system but also because, commensurate with the growing needs of individuals and society, there are new and scientific means of preparing medicines such as health tonics, cosmetics, mild therapy, herbal tea products and so on [which require plants to produce].

In particular, during the course of the last two decades, there has been a marked increase in the exploitation of medicinal plants in the Himalaya [and Tibetan] Plateau. Nevertheless, due to the rampant exploitation of such resources by not too few a person purely motivated by temporary profits, with utter disregard for the damage to the environment and unconcern for the risk of extinction of medicinal plant resources, a sizable number of precious plants of medicinal value are on the verge of extinction. This risk of total extinction is real and we are faced with an emergency situation.

Under such circumstances, it is become hard to procure quite a range of precious medicinal ingredients at the scale required; and, even where available, they have to be bought at much higher prices. Therefore, like the proverb 'colouring goat-tails to sell in a market where demand for (yak) tails is high', we can see, not too infrequently, the dangerous practice of people mixing and adulterating medicinal ingredients or producing fakes with utter disregard for human health. Such immoral practices not only harm the interest of the promotion and development of the traditional medical system and practice but are also bound to adversely affect the health of the members of the family, negatively impact the environment that sustains all beings, hinder the economic development and so on.

Medicine, the antidote, is the key to eliminating all ailments like the means to vanquish all inimical forces in battle, and therefore, without it, it would be as useless as sending a well-equipped army to battle without bullets. No matter how profound and extensive the cultural background of the medical system, and howsoever famous the doctor may be, without medicine, he would be [at] as much a handicap as a businessman without merchandise, and therefore, devoid of substance or significance. Hence, it would be hard to

2 Living organisms are rarely used in Tibetan medicine these days.
fulfil the needs, aims and objectives of this medical system; failing to make any significant contribution to the health and wellbeing of humans, a lack of medicine could become the cause for the decline of this medical tradition. Therefore, if this medical tradition is to be effectively safeguarded and developed, it [is essential that we] find ways and means to prevent such malpractices and dangers.

From a sense of personal responsibility, I have been trying to encourage discussion about certain issues and themes based on my first-hand experience of field trips to pick medicinal plants as well as to conduct research over the past thirty years. I have travelled to various resource areas where medicinal ingredients are found in Tibet, India, Nepal and Bhutan, eliciting the knowledge of experienced local physicians through interviews, and [coming to understand] the general market situation by way of interested observation and analysis, all with the hope of stimulating peoples’ interest, research and possible remedial action.

General introduction to *materia medica* according to the Tibetan medical system

In accordance with the spirit of the Tibetan medical treatises, *materia medica* is classified into separate groups based on their nature, potency and properties. They are classified into three broad groups:

1. naturally occurring precious metal where they be smelted or not, mineral medicine, soil medicine, and rocks that constitute the *materia medica* known to be mineral-based
2. woody and herbaceous plants that constitute plant-based *materia medica*
3. wild animals, birds (big and small), aquatic animals, and domesticated animals that constitute animal-based *materia medica*

Sub-categories of *materia medica*

The sub-categories of *materia medica* are as follows:

1. Gem medicines, such as gold, copper and iron (minerals in a state that can be smelted) and turquoise, coral and agate stone (*dzö*) (precious stones that are in a state that cannot be smelted)
2. rock medicines, such as gold ore and silver ore in a state that can be smelted
3. Soil medicines, such as golden sand and oxidized lead
4. Tree medicines, such as a ru ra, ba ru ra and skyu ru ra (two kinds of myrobalan—Terminalia chebula, T. bellerica—and Phyllanthus emblica, respectively), white and red sandalwood, and a ga ru (aloes wood, Aquilaria spp.)
5. Aromatic medicine from plants and animal products, such as saffron, liver and gall bladder bezoars (gi wang) etc.
6. Ecoloction medicines, derived from semi-herbaceous plants such as ma nu (Inula racemosa), ru rta (Saussurea costus, S. lappa, or Dolomiaea souliei) etc.
7. herbal medicines, such as re skon (Corydalis spp.), gya’ kyi ma (Chrysosplenium spp.), and tig ta (Swertia spp., sometimes other genera of Gentianaceae)
8. salt medicines, such as sal-ammoniac rock salt, sea-salt (rgya tshwa), and black salt derived from brackish salt (kha ru tshwa)
9. animal medicines, such as wild animals, aquatic and land-based as well as domesticated creatures
10. crop medicines, such as barley, wheat and other grains with awn or bristle; round peas, small lentils, and other crops with pods
11. aquatic medicines, such as drinking water, medicinal water, curing water, and spring water
12. fire medicines, such as ingredients with heat generating properties (bsten bya sman gyi me) and those used for moxibustion (reg bya dpyad me)
13. extracted medicines, such as essence of mineral or metals extracted in ash form (tsha ba mes gdus pa) and decoction (bsil ba chus gdus pa)

However, depending on the stage of societal development and changes wrought by the vagaries of time, mineral-based medicinal ingredients have become progressively less common [and less frequently used]. The possible causes are:

1. restrictions imposed under environmental protection regulations inspired by religious considerations of eschewing [life-taking] and the grave risk of extinction faced by certain kinds of living species/beings/organisms.
2. restrictions imposed on the mining and extraction of precious stone, given the high demand and turnover of the precious stones/gems in daily life, rendering them scarce and hard to obtain or only at exorbitant prices; and following the substitutes recommended for these precious stones, an increasing use of such herbal substitutes.
[Related to this], the Final Tantra (phyi ma rgyud) states:

When the final days of the 500 year cycle are reached, if anything and everything that grows and within sight are not used as medicinal ingredients, it would be hard to find anything with high medicinal potency and impossible to find [medicinal ingredients] despite searching. For example, they are like the jewels of the deus and nagas [serpent spirits] in that even if they were to be found by the poor, their lack of karma would render them too potent for their ailment and akin to wandering in a marketplace without wares to trade. Instead, in order to alleviate the ailments of the poor in the remote regions, herbal concoctions have been taught out of compassionate motivation, and nonetheless, the herbal remedies are more potent than the [extraction of substances like camphor etc.).

Thus the benevolent Master Physicians of the past, in accordance with the contents of the Four Tantras, finalized a considerable number of herbal remedies as substitutes for precious stones, minerals etc.

Identification of Materia Medica and their Classifications with Respect to Healing Potency

In the treatise Stainless Crystal Garland authored by Deu-mar Geshe Tenzin Phuntsog [the following is written]:

The potency of medicine being generated by the five natural elements, produces six tastes, three post-digestive tastes, eight powers, seventeen qualities as well as rkyang pa (single tastes), 'dan (combination of two tastes), dus (multi-combination tastes) and tshogs pa (synthesizing tastes). Since anything that grows

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3 The six tastes (ro drug) are: sweet (e.g., bamboo, grapes, saffron) which pacifies rlung and bad kan and increases mkhris pa; sour (e.g., pomegranate, Hippophae spp., Crataegus spp.) which pacifies rlung and mkhris pa and increases bad kan; salty (e.g., salt and several minerals) which pacifies rlung and mkhris pa and increases bad kan; bitter (e.g., Gentiana spp., Aconitum spp., Berberis spp.) which pacifies bad kan and increases rlung and mkhris pa; hot (e.g., pepper/ capsicum, ginger, garlic) which pacifies rlung and mkhris pa and increases bad kan; and astringent (e.g., sandalwood, Terminalia spp., Aquilegia spp.) which pacifies mkhris pa and increases rlung and mkhris pa.

4 The eight powers (nus pa brgyad) are: heavy, smooth (these two treat wind-related ailments), cool, blunt (these two treat bile-related ailments), light, rough, hot and sharp (these four treat phlegm-related ailments). To increase wind, rough and cool medicines are used; to increase bile warm, sharp, and smooth medicines are used; to increase phlegm, heavy, smooth, cool, and soft medicines are used.

5 The seventeen qualities (yon tan bcu bdun) are smooth, heavy, warm, oily, stable, cold, blunt, cool, flexible, fluid, dry, parched, hot, light, sharp, rough and mobile.

6 Editors’ and translator’s note: we believe this refers to the Sanskrit equivalents lalana and rasana, taste-unifying chakra and aggregate tastes, respectively.
and within sight has potential medicinal use, nothing on earth is without medicinal potency. However, past generations (of physicians) have identified and classified the potency of medicines on the basis of those generated by five natural elements and the inherent nature of the medicinal ingredients. Therefore medicinal ingredients generated by the natural elements have similar potency in a natural state but get transformed during the process of digestion. And even though the ingredients influenced by the natural elements are similar in potency they differ in function. Such are the objects of knowledge only for the Prescient, not ordinary mortals!

In the same text, describing the potency of medicines, Geshe Tenzin Puntsog states: ‘One must be thoroughly well versed in counting with pebbles the range of tastes that differ such as taste-unifying chakra or aggregate tastes (\textit{\textit{dan dus tshogs pa}}) and others totalling some 46,556 varieties’.

And again, he adds:

If one can get acquainted with that [range], then even without reference to the identification and names given by the past generations [of physicians], one can surely recognize and identify new herbs on the basis of their potency, and thus be able to pronounce, ‘This is the taste of such and such; this particular element of nature generates this; this is what you obtain after ingestion and during the process of digestion; this is its power; it has these qualities; it can cure or combat such imbalances; it will generate this etc.’ Then one can even give new names based on the form and function [of the herb in question]. Such are the pronouncements.

Deu-mar Geshe Tenzin Phuntsog had travelled to India, Nepal and many regions of Tibet and examined the medicinal ingredients; he then went on to write \textit{\textit{Stainless Crystal Garland}}, the encyclopaedic and descriptive treatise on Tibetan \textit{materi medica}. In this, whilst discussing classifying medicinal ingredients on the basis of their potency, he suggests two groups: those whose potency is generated from the natural elements, and those whose potency is inherent or natural.

As for the former, there are the six tastes, three post-digestive tastes, eight powers and seventeen qualities/properties. As for the ingredients with natural potency, they may be differentiated into eight types: a. potency of strength; b. taste-related potency; c. potency of smell; d. antidotal potency; e. potency of the similar genus/kind; f. potency of those with similar shape; g. potency due to \textit{pratitya samutpada} or auspicious coincidence; h. the potency arising from holy substances, e.g. relics etc.

When one refers to past accounts, the past generations of physicians had managed to identify certain kinds of medicinal ingredients by way of research. For example, there is mention of twenty-one main types of treatment of wounds; \textit{bead sbyor} is a name given on the basis of method of treatment. Such
methods of treating wounds were discovered by clever and resourceful Sages (rishi). Noticing that wounded animals of the wild or birds appeared to recover from wounds and survive, they wished to find out the secret of the healing medical ingredient. So, with ink, they drew crack lines on birds’ eggs and smeared the blood of other creatures on the young of wild animals to find out how their parents nursed the ‘wounds’. Their parents, believing the wound to be real, brought the healing herbs to patch up the ‘cracks’ or ‘wounds’ and thus the Sages were able to identify the potent plants. When they took away the herb/plant the next time and left the eggs really cracked and the young creature actually cut, the parents, like before, patched them up with the same plants, which bonded the crack and healed the wound. With great amazement, they regarded this secret medicinal [plant] as the supreme of medicines.

In this way the earlier generations of physicians established and defined clearly the taste, potency, three post-digestive tastes, attributes/qualities etc. and bequeathed, just like ready-made food and drinks, for later generations.

However, either because they were unable to fully learn, integrate and pass on the legacy of the prescribed medical practice or because of a progressive decline in one particular aspect or because of lack of consensus and unity in the art/science of identification of medicinal ingredients or perhaps due to lackadaisical attitude to research and innovation, later generations preferred instead the routine purveying of high-in-demand medicinal ingredients. In later times, it is extremely rare to find any instances of new materia medica or books on medicinal ingredients that have been discovered and used.

Furthermore, with respect to the identification of materia medica, despite the fact that the teaching of the [art/science] of identification of materia medica forms part of the syllabus of medical schools both in and outside Tibet, not many people are keenly interested and engaged in serious research in this area of medicine.

The traditional system of identification of materia medica and the method of testing and appreciating quality is based principally on the Illustrated Sources and Identification of Tibetan materia medica (khrungs dpe) and relying on one’s own field experience in most cases. However, one of the recurring problems encountered due to this situation is that although the corpus of khrungs dpe is strong and clear on the identification of medicinal plants while in growth, practitioners who lack experience find it hard to identify the very same plants after they are plucked and dried because of the considerable change that takes place [with respect to] the shape and colour.

7 These Eight Sages (tsa ra ka sde brgyad) are those mentioned or cited in the last stanza of the First Tantra (rtsa rgyud) of the Four Tantras (rgyud bzhi).
A large variety of raw *materia medica* are imported into Tibet in ever increasing quantity from India and Nepal, and the explanations of their classification as well as illustrations in the *'khrungs dpe* pertain to their state on the basis of shape, colour, smell, taste and nature after they are collected and dried. Therefore, practitioners face not infrequent problems in their correct identification and quality assessment.

**Methods of checking quality**

As far as the quality of processed medicine is concerned, it is of vital importance that the compounding is done strictly as prescribed in the medical texts; [adherence to] the standard practice of *gdul*, or transforming the nature of the substance for easier digestion, purification of raw materials, good hygiene, and standard and uniform dosage of medicine whether in powder or pill form are all important; [likewise] it is important that ingredients do not stink of fungi and are not damaged by insects or worms. In particular, in addition to avoiding any mistake in the identification of the medicinal ingredients, it is even more important that they should be of high quality since that would significantly affect the healing potency of medicines.

Moreover, in this modern scientific era the quality of the products of traditional medical systems are subjected to a set of stringent scientific measures, irrespective of their relevance and appropriateness. And therefore, in cases where the products are subjected to quality control measures under the international Good Manufacturing Practices (GMP) criteria, a host of obstacles and problems are encountered.

It is not enough just to be able to unerringly identify the medicinal ingredients but also to ensure their quality standard. Heretofore, the experienced physicians have, based on the methods of quality assessment as prescribed in the relevant medical treatises, used key factors such as colour, shape, essential nature, smell and taste and have subjected the ingredients to further examination through processes such as burning, soaking, grinding, cutting, weighing, pounding into pulp and so on to ascertain the relative quality of each ingredient.

However, since it would be hard to find absolute uniformity with respect to their experience, educational level, analytical power and sensitivity, it is hard to arrive at any final standard criteria with a high degree of confidence. And therefore, more often than not, one has to go ahead on estimates since there are no reliable measures to refer to, it seems.

Thus, unlike in the past, if we are able to combine traditional and modern methods of quality control, then we might possibly establish a standard
criterion of carrying out quality control tests. The justification for integrating traditional and scientific approaches is that science can be more precise with respect to ascertaining the chemical composition, quantifying measures [such as] percentage of fat and toxic content, presence of traces or mixtures of other chemicals and so on. However, scientific instruments cannot help ascertain and make any conclusive decisions with regard to the inherent qualities of healing potency, the post-digestion potency, the power of smell or the power of shape and colour etc. that can be ascertained on the basis of the essential nature of the medicinal ingredient as described in the Tibetan medical treatises.

Thus, the two approaches have to be used in an interdependent relationship. It will be problematic for science alone to ascertain and determine the qualitative aspects of medicinal ingredients. That is because the theory and related textual sources and practice of the traditional medical system which provide explanations of the basis of the healing potency of the medicinal ingredients, their compounding and preparation, production, dosage for patients and so on are diametrically opposed to that of the modern scientific system and its approaches [and yet must still be addressed].

With regard to the identification of the *materia medica* and the method of ascertaining their quality as mentioned above, allow me to offer here, with altruistic motivation, a few examples of how a harmonious integration of traditional and modern approaches may be used to identify authentic from fake [*materia medica*] and ways to ascertain the positive and negative qualities of a few, relatively high usage medicinal ingredients, namely: precious medical ingredients, medicines from extracts or essences, and raw medicinal plants and dried fruits (*khrog*) etc.

**Turquoise**

Turquoise is a precious gem used as a medicinal ingredient. Turquoise occurs generally in regions with high deposits of copper ore. There is copper content in turquoise in terms of the chemical CuAl₂₆(PO₄)₄(OH)₈.4H₂O. Its density/hardness is 5.6 approximately. Turquoise has been regarded as a precious gem in the everyday lives of people since the ancient times, and used in ornaments, display goods, religious artefacts, and medicinal ingredient and so on. The *Precious Old Turquoise pill 25* is one of the principal therapies used in Tibetan medicine.

The *Stainless Crystal Garland* and other textual sources mention that the above pill is a compound of 8 elements: 3 old turquoises, 2 turquoise of mediocre quality and 3 new turquoises. Its colour can vary in hues such as pure sky blue, bluish-red, bluish-green, light green, yellowish-green, ashen green and so on. Generally, modern scientists state that dark-blue turquoise...
has higher copper content whereas greenish-blue turquoise has higher ferrous content. Any turquoise that is essentially hard, solid, and of a higher density becomes smooth and shiny on grinding, and if it is deep blue or blue-green, the quality is considered to be good. Generally speaking a genuine turquoise piece that is a composite of different hues, changeable, variegated with hairline fissures that go deep, vividly reflect the natural occurring qualities. Any turquoise that is essentially of less density, is a composite of a greater variety of other stone elements, is porous, lacking lustre and smoothness even after grinding, is susceptible to fracture and has relatively more dark spots and fissures suggests it is of inferior quality.

**Processing inferior quality turquoise with other substances**

In order to use inferior quality turquoise for ornaments, other substances are used to fill in its holes and pores; to give it a shine and smoothness, chemicals are used as a consequence of which the surface would appear conspicuously variegated; the holes betray signs of fillings, and easily disintegrate if scraped with a knife; the shiny veneer wears off easily with sour juice/vinegar etc.

With regard to inferior turquoise, its colour is less than desirable or chemically treated but the colour does not penetrate deeper than 1 mm upon grating or scraping with a sharp object like a knife or rinsed with sour juice or vinegar; the colour wears off easily.

**Fake turquoise**

The stone known as *gibbsite* is commonly found in sedimentary rocks where turquoise is found. Its colour can be translucent, light green, light red or pink but does not occur in the colour of turquoise. Its inherent composition is somewhat similar to calcite mineral and it is shiny like crystal or glass, slightly brittle in nature, has an earthy smell, and a crude rocky formation. Although it can be dyed to make it appear like turquoise, closer examination will reveal that the colour has not percolated into the fissures as the false colour and line drawings are apparent only on the surface, not in depth. The colour will be uniform and the shape and thickness of fissures will be balanced in general. A genuine turquoise tends to be rich in colour and of variegated hue with varying shapes and thickness of fissures.

The *be dkar* stone which is dyed to produce a fake turquoise lacks the natural lustre of a genuine turquoise and the colour tends to be uniformly spread. Though shiny at the time of colouring, it rapidly loses its sheen, and is particularly prone to losing colour on exposure to sunlight and water. Its fissure lines do not look like genuine turquoise. Occasionally, other stone elements are mixed as fillings; its nature is brittle and of low density, soaks
water and can get damp easily and crumbles when ground on hard surfaces like a stone, and the ground dust turns white on drying.

Plastics which are used to produce fake turquoise tend to come with uniform colour, are pure, hard but lightweight, have lead cores in some cases to lend them weight, and lack stony character, meaning that they do not sound like stone when knocked with other hard substances. They may melt if exposed to fire or change into a dark-yellow colour.

Bone-like materials used to produce false turquoise are also found. Though it can get the sheen of turquoise through colouration, the colours inside and outside do not match, as the surface colour tends to be very uniform. Its essential nature is bony rather than appearing like a stone. Although it cannot be burned, fire discolours it. It can be scrapped with sharp objects like knives. It is not heavy like real turquoise.

China-clay material used to produce fake turquoise tends to resemble an old turquoise in terms of shape and dyed both on the surface and inside. They can vary in shape and fissures, and occasionally mixtures of other stones are used, leaving an uneven coat of colouring; the external colour comes off on buffing; even though slightly hard, the texture is coarse; although the surface is reflective like Chinese porcelain, its demarcation is like China-clay.

With regard to the compounding of various stones to make fake turquoise, their nature and hardness is very similar to a genuine turquoise. In fact, the large majority of the gemstones used for ornaments as well as carved display sculptures for sale in the market are made of this composite stone. These are made from molten turquoise-like stones that are cast and refined as a result of which the sheen is even both inside and outside, and the fissures, too, like a genuine turquoise, go deep. The fissures and the thickness of the line are not that apparent and therefore present a high risk of mistaking it for a genuine turquoise. A wide range of display artefacts made of this composite material is a common sight.

Fake turquoise made from crystal glass is smooth and shiny. It is hard and brittle by nature and tapping gives off the sound of its hard property. If broken, like glass it will splinter into pieces with sharp jagged edges; it lacks the dark fissure lines of real turquoise and occurs in bubbles like fish-eyes.

In short, anything that is not genuine turquoise, is a composite of other materials, or is an inferior type of turquoise that has been processed and refined, etc., should never be used as a medicinal ingredient.

Coral

Coral is a precious [medicine] that is neither bone nor stone. In the Stainless Crystal Garland the origin of coral is described as, ‘It grows like a tree in an
area of sand and rocky crags at the edge of the ocean, and although it is stone-like in nature, it is also called a tree due to its method of growth’. In the *Bouquet of White Lotus* (*pad dkar chun pu*) authored by Slob dpon Hum chen, there is the line, ‘Precious coral, tree in sands by the ocean’s edge’. And again, there is a clear quote from the *Stainless Crystal Garland*: ‘...though the popular belief is that light red (coral) is old and deep red is new; since light red coral grows in wet, sandy parts, they develop thick trunks but remain light, free from sunburn. And since red coral grows in rocky crags, it develops slender trunks but since it is exposed to heat it tends to be deep red’.

Whilst I lack any confidence, not even the size of a sesame seed, to challenge and refute the above quotes forwarded by scholars of the past, I wish to submit for analysis the following considerations based on personal observations and understanding.

To begin with, the process of the formation of corals is that first there appeared over five hundred different kinds of tiny, marine organisms in the ocean, including those shaped like stars or aster flowers. These marine organisms habitually try to survive in warmer parts of the ocean where waves break. Countless dead bodies (skeletons) of these marine organisms accumulate into piles (reefs) from where new organisms take birth and concurrently develop into coral. A countless number of these coral organisms die simultaneously and also grow simultaneously in huge numbers. The locations where coral trees grow are on reefs in the ocean where the skeletons of other marine organisms are piled and accumulated on organisms such as snails. The organisms that have formed the tree, and die in due course, render the coral tree progressively porous as if nibbled by worms and then decay. Thus, the chief factor for the formation of coral is the presence of these organisms in the ocean. Since these organisms cannot survive on dry land apart from the ocean (floor), it appears that there is no corroborative evidence to support the assertion that corals develop in sandy and rocky reefs near the ocean.

In general there are many varieties and types of coral. However, there are six broad types that are commonly used in everyday life. They occur in white, red and dark colours but for medicinal use, the red colour is said to be good as referenced in the assertion from the *Stainless Crystal Garland* that light red coral is said to grow in marshy and sandy land and red coral is said to grow in dry rocky reefs and heat causes them to turn into deep red.

In real life, coral tends to come in almost 80 different hues of red and they are formed between depths of three to 90 metres below sea level. The deeper and darker it gets the deeper red the coral tends to be, and the shallower and more lighted it gets, the coral tends to be light red. These days, deep red corals in the market are more expensive and the light red ones are cheaper.
Though it is easy to discern that the coral tree is shaped like the antlers of a deer, it is slightly more difficult to ascertain the quality and differentiate fake from genuine coral when they are processed and fashioned into ornamental jewellery or display artefacts. The general properties of coral are hard and solid; its composition is neither earth nor stone; its grains are fine and heavy; like a wood it has fine rings of formation.

Occasionally, white or dark spots appear here and there. The bigger the coral is, the bigger the white spots tend to be, and smaller the coral, the smaller the white spots. These white spots mark the points where the branches, sub-branches and final shoots had taken off. Corals have natural lustre. Knocking two pieces of coral together gives the sound of knocking stones; the colours and the rings marking the stage of development tend to be different and reflect natural growth; if exposed to fire it neither melts nor burns but leaves white burnt marks, emitting the smell of burnt bone; and the redder and heavier they come, the better they are.

**Examining fake coral**

*Antipathes japonica* Brook is a species of coral [which lacks medicinal qualities] whose natural environment is the ocean floor and is a kind of living organism. It resembles a common willow tree with lots of branches and sub-branches. It grows on reefs at depths of about 30 metres below sea level. In the ocean it tends to be slightly tender and delicate but once brought to dry, it becomes hard and solid. While underwater, it can appear in white or red colours but after drying, it turns dark and is therefore called, ‘black coral’.

Normally, people find relatively greater use in this coral and value it. In China and some countries, this is used to fashion cigarette smoking pipes, ornaments, display artefacts, beads and so on with artistic carvings.

It is also used as a medicinal ingredient. When this coral is dyed red, people risk mistaking it for the real medicinal coral. A closer examination would reveal that one cannot find the tiny porous holes as if nibbled by worms; the main lines are very pronounced, the colour is bright red and evenly spread but not deep without a natural feel of the (texture) and lacking in natural lustre.

*Yushania qiaojiaensis* Hsueh et Yi⁸ is a living matter that inhabits the depths of the ocean. Though it grows in the shape of a coral, its branches bear the

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⁸ Editors’ note: There seems to be some confusion with the use of *Yushania qiaojiaensis* in this context. *Yushania* is actually a species of bamboo, although the Chinese for this term is haidi 海笛 (literally, ocean bamboo) which may explain a source of the confusion. Dr Dawa is probably referring to bamboo coral, a term for a variety of genera under the family *Isididae.*
joint of reeds like bamboo. The shape of the branches is cylindrical and tends to be either hollow or filled. These limbs/branches bear conspicuous furrows. This material is dyed deep or light to give it sheen like a coral. Traders with moral integrity admit that these are fake coral. But there are no small numbers of traders in Asia who trade in this as genuine coral. The criteria to examine it are: it tends to be relatively softer and more delicate than coral; the colour is evenly spread and lacks natural lustre; it has neither the white spot blemishes marking growth of branches nor the pores as if made by worms; the main lines are pronounced and it discolours easily; sour juice like vinegar can discolour it easily; the material is rough and lacks the natural smoothness and lustre; and if in an unprocessed raw state it is easy to notice the bamboo-like reed rings on its branches.

With respect to white coral that is dyed and processed to make it look like red coral, though the material is genuine coral, it is dyed and chemically treated for use as ornaments and other artefacts. Since red coral is good for medicinal use, this dyed coral should not be used. The colour is not fast and loses its shine rapidly and lacks natural lustre.

Other materials obtained from the ocean that resemble coral are ground into powder and then processed through casting and colouring to produce fake coral. These lack the natural rings that mark its growth and also are without either the white blemishes or the tiny pores. The colour is also uniformly even. It discolours easily and is also very brittle.

Mother of pearl/oyster shell and snails are ground and then compounded, dyed and processed to make fake coral for making ornaments and artefacts. It is coarser than coral and lacks all the properties of real coral. The colour is uniformly even and it discolours and cracks easily the original lustre does not last; and ornaments and artefacts made with this material almost always look alike in design and colour.

Calcified minerals, water crystal, and other sandstones that can be compounded to make glass, are compounded, processed and dyed to make fake coral. These fake corals tend to be slightly heavier than genuine coral and their stony substance is self-evident. Sometimes, people even call them ‘stone coral’. In essence they lack any of the natural properties of a coral and the lustre is also poor. Such fake corals discolours easily and get coarser the older they get.

Plastic processed to produce fake coral are also found. These are of two types: one that melts on exposure to fire and the other that does not. Either of these two types discolours easily, is lightweight, lacks the natural lines and fissures, and tends to be of the same colour and shape when used in ornaments or artefacts. One type melts easily if burnt but the other type is fire-resistant and only from the smell can one can tell [that it is plastic].
Gall bladder bezoars / Gall bladder stones (Calculus bavis, ghi wang)

This is a type of medicinal extract from living organisms. In the Stainless Crystal Garland and others, it is said that the best quality comes from elephants; the mediocre varieties come from the young of cattle with slender tails and wild animals; that made from the hide of cattle and sheep and goats is said to be of inferior quality. However, in later days since elephants and wild animals are facing the risk of extinction, it is as hard to obtain ghi wang (go locana in Sanskrit) as it is to obtain the fabled jewels of the Serpent (King). What is of common use is that obtained from cattle.

In most of the traditional medical systems, this is used. In particular, the Chinese medical system uses it and is called nye’u hong [niu huang 牛黄] where nye’u is cattle and hong is yellow or gall bladder or gall bladder stone. The term ghi wang is a corruption of the (above) Chinese word and therefore, on the basis of its etymology as well as signification, there is no harm in interpreting it as a medicinal ingredient obtained from cattle. These days, most people interpret it likewise. Nevertheless, it is extremely important to be cautious and analyze whether it is genuine or fake.

Broadly speaking, ghi wang refers to the [gall]stones that occur in the rtsa sbug (nadi walls)9 between the gall bladder and liver diaphragm. They come in various shapes and sizes such as oval, triangular, elongated, cubical, and others. Outwardly, it tends to be yellowish-maroon or copper coloured, and again some come with the exterior covered with a veneer of oily dark cream. Some resemble the back of a frog; others crack easily. Whatever the type, inside, if cut, there appears a gradual accretion of a cancerous growth that has left concentric rings like an onion. Sometimes, something of a white pill is obtained from the centre. It emits a pleasant smell and the taste is bitter to start with but then gradually turns sweet. It is not abrasive to the teeth and is easily digestible. If soaked and applied on the nails, it is difficult to wash off; soaking a piece in water will not dissolve it easily. If it cracks or is folded, it may appear with a purple tint, but if it is ground, it will change into a yellowish colour. Such are its properties.

Classifying and identifying fake ghi wang

In the markets in India and China myang rtsi spras (Coptis spp.), dpa’ ser (Phyto- laccac acinosa), yung ba (turmeric, Curcuma longa), lcum rtsa (Rheum spp.) and potato are processed into powder form and mixed with eggs and bilious

9 Editors’ note: rtsa sbug may be comparable to the biliary tract, the route of dissemination of bile from the liver to the intestines.
fluid to prepare fake ghi wang. These fake ones externally resemble the genuine article but the colour is light yellow with a coarse texture, the cut surface is yellowish-purple; they are heavy, lacking rings inside; are bitter in taste but have no smell; when orally ingested 'tshi (locana of herbs) and remains of substances are felt; they dissolve easily when soaked; and one can also find the gall-bladder of other animals used in the mixture.

Man-made ghi wang is a product that is made mainly from the mixture of bilious fluid of cattle and pigs. According to scientifically analyzed evidence, some 98% of the market in China is flooded with this type of man-made ghi wang. In case its healing potency is comparable to that of the genuine ghi wang then it has the advantage of being easy to compound and market at an affordable price.

Kashmir saffron (kha che gur gum, Crocus sativus)

This is a rtsi sman (aromatic medicine) that is obtained from herbal plants of high usage which are valuable and expensive to procure. There are various accounts of its origins but these days it is commonly believed that it originated from Greece and has a history of some 5,000 years. It spread gradually via Asia Minor through Iran, India and then to Spain and then southern and central Europe where it is cultivated. Its largest producers are Iran, Spain and India, accounting for over 80% of the market in saffron. However, specific features of geographical terrain, climate and atmospheric conditions or the natural elements affect its quality and healing potency. Today’s market is flooded with saffron from the above-mentioned countries but there is also a considerable volume of products and fake and adulterated versions produced in other countries.

Kha che gur gum (Kashmiri saffron, Crocus sativus), alias kha che sha skam, is a type of root medicinal plant. It has one bulbous root shaped like an onion, the leaves grow like an onion, and are shaped like a flat string and are green in colour; the flowers tend to be purplish-red or pinkish-purple; six-petals are arrayed in two layers; three yellowish female stamens, and in the centre purplish-red, male stigma with three-headed filaments in blossom. The male stigma is used in medicine and we get only three filaments from each flower. About 150,000 flowers produce only about 1kg of dried saffron stigmas. It is shaped like the Tibetan long horn and narrows towards the root; it can grow to a height of about 4 cm and at the base its circumference can range from 0.5 to 2 cm. The colour is light yellow. The top part opens out like a long horn instrument and with striped patterns. The colour is red with a hint of purple.
In the market, saffron is sold in three kinds: the whole stigma, the two yellow and red filaments separated, or as a mix of the stigma filaments. Most of the fake and adulterated are like the latter (mixed kind). The properties of the genuine saffron are as mentioned above: red with strong purple and oily in appearance; excellent aroma; sweet in taste with a hint of tanginess; and even though the stigma may be red, it turns yellowish on soaking; the shape is a like a Tibetan long-horn; it is easy to be ground into powder whilst retaining its colour. As for the quality, even though [all are] genuine saffron, due to differences of the geography of its cultivation and growth, the best comes from Kashmir and Iran; those from Spain and Europe are of mediocre quality; and those cultivated in Tibet and China and others are of poor quality. Any saffron that is fresh, reddish-purple and oily with sweet aroma is good. Dark-purple and small ones lack aroma and are of inferior quality.

Identifying and classifying fake and adulterated saffron

Plants similar to saffron which are dyed do not have the sweet aroma even if resembling it a little bit in shape and colour. If soaked, they give red colour; the stigma is not like the shape of a Tibetan long-horn; they discolour easily.

The beard-like tassel of the corn (staminate flower with anther), the inner skin of the nutmeg plant and the slender lower stigma of genuine saffron, are also dyed to produce fake saffron in countries like India. These are mixed with real saffron and sold in smaller markets. They can be identified by the fact that if soaked, the stigma loses shape; the colour of water looks different; either there is no aroma whatsoever or it is too sweet smelling; and it discolours entirely.

Safflower or saffron thistle (Gur gum, alias bal gur, Carthamus tinctorius)

This is a medicinal plant that grows for a year. The petals of the flower have medicinal use. It is cultivated mainly in India, China and Nepal. Although fakes of this kind are rare in the market, there is considerable variation in quality. Generally, when they are new, the aroma is strong, with reddish-yellow or orange colour; it produces a yellowish colour when soaked. These days, there are those who soak to take out the juice once and then dry it again for sale in the market. However, in some cases, due to improper drying, sorting and care, the colour tends to be darkish yellow or light yellow, and they stink of mould and bunch together. Therefore, due to their inferior quality they are not suitable for medicinal use.
White sandalwood (Tsan dan dkar po, Santalum album)

This is a medicinal tree of which the trunk has medicinal use. The Stainless Crystal Garland and others list three types of white sandalwood, two of which are as rare and unobtainable as the precious jewels of the devas and nagas. For details about its source and background information, refer to the Stainless Crystal Garland. In present day markets, we find white, yellow and maroon coloured sandalwood. The white sandalwood is a very slow growing tree, and takes about ten years before it can be put to medicinal use. However, given the growing demand for religious use such as artefacts, incense, carvings, display goods, aromatic water and oils and balms, medicines and so on there is a shortage of white sandalwood which has led to high prices.

At present, botanists have identified 15 types of trees similar to this tree [white sandalwood] and 13 others, which undergo transformations [over time]. This has led to a situation whereby it is difficult for people to differentiate between the fake and genuine sandalwood. Nevertheless, an understanding of the real sandalwood will be of help to recognise and identify fake sandalwood.

On the quality [of sandalwood]
The best quality trees are those that have matured over ten years; sandalwood is oily and maroon in colour, solid and hard. It has a sweet, aromatic, and long-lasting smell, and when aged gives a sweet smell on being carved with a knife. Carving leaves behind a smooth and shiny surface, burning chipped wood gives sweet smell that is thick and heavy. Regular traders of sandalwood separate a sandalwood tree into three categories and fix their price accordingly. The heart of the tree trunk and its adjacent parts are considered the best quality; the intermediate parts are considered mediocre and the ends of the tree are considered inferior. The branches are progressively less valued and, therefore, cheaper.

Determining fake sandalwood
The fake products are made from other trees that are of the same sandalwood genus. The wood fashioned from such trees, although similar to real sandalwood in nature, shape and colour, lack the aroma, oily sheen and weight of the real sandalwood. It lacks density. However, to mask the fake products they often apply sweet scents. There are many products made with such wood in the market. But in good shops, they keep mainly genuine sandalwood artefacts and if they have fake goods, they will tell the customer so.

Sandalwood powder comes in two kinds. The first is the powder made from the wood chippings while cutting the tree and the sawdust etc. collected
whilst making artefacts and religious articles and indiscriminate mixing them up to produce sandalwood powder. The second kind is mixing these with other kinds of wood. Apart from use in making medicinal incense and incense sticks, they should never be used for medicinal purposes since they are adulterated and the dust and oil from the machinery and equipment etc. pollute the powder, which could potentially cause more harm than benefit.

**Tig ta, alias rgya tig (Swertia spp.; sometimes other genera of Gentianaceae)**

This is an herb with an annual cycle of growth. Popularly, these grow in some parts of the trans-Himalayan region of India and Nepal. Most of the dried *tig ta* will have lost its leaves, the branches and flowers and buds remain; the stem is of tea-colour or yellowish-purple and smooth, hollow and delicate; it has yellowish tinge inside if broken. It is lightly bitter in taste and an accidental inhaling of its dust would give a bitter taste in the mouth. These days people either use the herbs *lcags tig* (Gentianella paludosa, Gentianopsis grandis, or *Halenia elliptica*) and *dngul tig* (Parnassia cabulica or *Swertia franchetiana*) as fakes or as poor substitutes for the good quality *rgya tig* (from India) or else mix these herbs. Closer inspection will show that the shape of the stem and leaves are different and the taste, too, is very slightly bitter.

**Dug mo nyung (Holarrhena antidysenteriaca)**

This plant is generally of three types. Normally it is obtained from the fruit of medicinal trees that grow in India and Nepal and are commonly used in medicine. However, these days, people also use as a substitute the fruit of creeper plant called *sngo ldum ’khri shing*¹⁰ whose pod, though similar to the genuine one, is green and the taste is sweet. This fake one is sold in the market.

**Gser me sngo ldum (Momordica spp. or Herpetospermum spp.?)**

This plant creeps up other trees and its pods contain seeds the size of half a finger-length. The outer husk is dark and slightly thin. The outer edges are jagged like saw and inside is oily and extremely bitter in taste. Again, people use a fake substitute, the seeds from the pods of a similar type of bitter-tasting vegetable plant that grows in India and so on.

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¹⁰ Editors’ note: this could be *Vincetoxicum canescens*, which Dr Dawa identifies in his book *A Clear Mirror of Tibetan Medicinal Plants* as being *sngo dug mo nyung*. Or, this could be a species of *Clematis*, as *’khri shing* is a synonym for several species of this genus (Dawa 1999: 118, 120, 122).
Lord Indra’s Hand (dbang lag, Gymnadenia spp.)

There are six types of dbang lag and most often that which grow wild in the mountains are used. It is a leafy plant. The roots, both old and new, grow joined in the shape of a palm with fingers. Each successive year, from the base of the old dried root a new shoot grows and develops into a stem. The root is used for medicine and considered ‘the fatter the better’. These days one can find a fake dbang lag in the market, and also the juice-extract of dbang lag. The fake one is made from edible materials into a shape similar to the dbang lag and resembles the original in both size and shape. It is white and its taste is sweet; without the outer husk, the surface of the cut lines of growth are not present. The second category—though the juice of the real dbang lag—is dried powder of juice extract. It can be identified by its grey color and the surface of the cut lines of growth is not evident. In particular if soaked in water and cut in flat chunks, one can see with a magnifying glass that the natural lines of rtsa ris dang bu ga’i rgyud lam (tiny vein-like pores through which water is absorbed) will appear smashed and distorted.

Other medicinal materials or ingredients that can easily be faked and deceptive are: byi tang ka (Embelia laeta), shing kun (Ferula assafoetida), brag zhun (bitumen), ze tsha (saltpeter), smyug cu gang (bamboo residue), hong len (Lagotis spp.), skyu ru ra (Phyllanthus emblica), li shi (clove, Eugenia spp.), gu gul (Commiphora spp.), sbrang rtsi (honey) and so on which can be easily faked, substituted, mixed, or juice-extracted.

Conservation and Preservation of Materia Medica

This [section of the paper] relates to strategies to protect these medicinal materials; problems of communication during the course of project implementation; or the risk of defaulting the good work due to lack of interest and attention. For instance, the medicinal materials used by [this] traditional medical system are solely natural products. Apart from its popularity and continual practice in the countries where the traditional medical system had flourished for over many centuries, there has been relatively little interest, awareness and practice in the western countries. The ancients could neither envisage the future prospect for the continued popularity and practice of a traditional medical system nor predict where, how and what degree of interest and awareness it would generate. With the vagaries of time and a host of other variables and causes, a wide range of difficulties and obstacles had to be surmounted during the course of [Tibetan medicine’s] growth and development. There has been considerable decline due to lethargy and neglect, too.
Now as we enter the twenty-first century, when the negative aspects of modern and scientifically prepared medicines become clearer and the side effects become pronounced, people are becoming more and more cautious and wary of taking such medicines. And, like a sudden explosion, the qualities of traditional medicine such as being free from side effects, [encouraging a] balanced state of patient’s health, affordability, convenience and so on, attracted the attention of the otherwise busy people who, longing for some unhurried and relaxed personal life, began to take interest in this traditional medical system by engaging in its study, research, practice and use, in ever increasing numbers.

Concurrently, the idea of trading in medicinal products made from natural ingredients that are efficacious in healing without side effects began to catch on. Today, this craze for natural products is not just limited to natural medicine but also in the areas of cosmetics, tea products, tonics, [overall] balanced health and perfumes. Additionally, there is an increase in the use of herbal ingredients in foods, so much so that in the last twenty years many varieties of precious herbal medicines are faced with the risk of extinction due to high demand for herbal products, especially from the Himalayan region where the earth and water are clean and the air is pure. Therefore, restrictions have been imposed on the use of such herbal products in quite a few countries with the consequence of growing difficulty in procuring herbs for compounding healing medicinal products. This is a newly arisen risk and challenge.

It is certainly necessary to protect the environment and to impose such restrictions, as their intention and aim is to serve the larger interests of human beings. It is not just imposing restrictions but even more important to actually help by encouraging the cultivation and propagation of such endangered species of plants. The successful implementation of projects to cultivate such plants in certain regions and countries is to be highly commended. However, it is also evident that in many other countries, due to considerations of politics and policy constraints, apart from a cursory implementation of such projects, there have been hardly any worthwhile results or sustaining projects through to the end.

In this case, either because of restrictive policies or because of not cultivating these endangered herbs, the opportunity to give a lease on life to humans would be lost or at the same time, this precious tradition and medical system will certainly decline gradually. In former times, herbal medical systems used to be prevalent in Europe. However, because of the people’s attitude and understanding of its value at the time and other variables of social change etc. their herbal medical tradition suffered catastrophic declines and became almost non-existent in our times.

We have reached a stage of critical review of the situation by taking into consideration this example. If we were to adopt a mutually beneficial strategic
policy, we will be able to gain three advantages: first, we could protect the environment; second, we could respond to the needs of alleviating the illness of human beings; and third, this work would result in the preservation and promotion of the precious traditional medical system.

The way forward to carry out such a strategy of protection will involve cultivation and propagation of plants appropriate to the chosen natural habitat, and the planned and systematic picking of plants.

*Cultivation strategy*

Ideally, in keeping with the content of the medical texts, under the heading ‘Cultivating Where it Grows’ in the context of describing the healing power and properties of medicinal herbs, the relevant herbs should be planted appropriate to the cultivation land with respect to their individual cooling and heating properties in order to maximise their healing power. That would be entirely in keeping with modern scientific approach as well as being in accord with the system of quality control of the medicines.

At the stage of actual implementation of the plan, due attention should be paid to the unique qualities of each herb or plant including the local features such as earth quality, weather/climatic conditions, water sources and so on.

- Plants and herbs that have a luxuriant growth of shoots growing from the root should be plucked and separated and then sown in the manner in which farmers plant potatoes. This will help quicker growth. Again, another category of these plants and herbs can be planted with their seeds. However, this method results in a slower growth rate and could take two years for the root to be fully formed, e.g. *ma nu* (*Inula racemosa*) and *bong nga* (*Aconitum spp.*) and so on.
- Plants and herbs that have fine seeds that grow in cool locales should be stored in intense cold and, at the time of sowing, the seeds should be mixed with fine sand and spread on the ground. Alternatively, the seeds may be scattered in a pot previously filled with earth and after levelling and smacking the surface flat, water should be sprinkled and placed where light and shade is in good balance. When the shoots grow to about one [man’s arm] span, they should be transplanted on the ground and protected in shade for a few days.
- Plants that have large seeds inside bone-hard shell should be planted carefully ensuring that the seeds are not damaged whilst trying to crack open the hard shell.
• Seeds resembling peas should be made damp and moist to encourage the tusks of the sprout to appear. After that they must be transplanted to the ground.

These are some general suggestions and ideas for consideration. Otherwise, specifics of planting considerations should be done commensurate with the local conditions and circumstances.

Collection of medicinal plants

When picking medicinal plants, follow the guidelines and instructions given in the medical texts; the particular parts of plants and herbs should be picked when their potency and power is at its peak of maturity. It is important to pick and collect only the relevant part(s) that are needed for medicinal use and not recklessly pluck the whole stem when only the leaves are needed. Similarly, when digging up roots of medicinal plants, one should responsibly level the dug up hole with the soil afterwards and not leave it untended as if a herd of pigs had rummaged through the place.

The picking should be regulated and timed according to the concerned organization’s annual cycle of medicine compounding rather than picking indiscriminately, surplus to requirement. Otherwise, as the medical text says, ‘so ma rnying pa lo dus spo’ which means that the herbs should be picked fresh every year so that the cutting edge of the potency does not degenerate. If this advice is ignored, the consequences would be a decline in the healing power of the medicinal plants, negative impact on profitability, problems with storage, risk of damage by worms and insects, mould and rotting and so on. However, if the advice is followed and picking is done in a systematic, planned and responsible manner, the above faults will be avoided and has the benefit of propagating and multiplying the medicinal plants at risk.

Conclusion

It has become extremely important for states and their governments, communities and individual members, to pay attention to the issues discussed here. In particular, it behoves the practitioners of this medical system to especially pay attention [to these issues of plant quality, identification, cultivation and proper harvesting techniques] and do their best for the cause [of sustaining Tibetan medicine and materia medica].
References

Note: The author refers in the article, without specifics, to a range of 'khrungs dpe-type texts, which are source books, often illustrated, for the identification of Tibetan materia medica. In addition to De’u dmar’s Dri med shel gong shel phreng, this would include works such as those listed below by Mkhyen rab Nor bu, Rje bsun Sgrol ma, Sde srid Sangs rgyas Rgya mchho and Slob dpon Hūm chen.


De’u dmar Bstan ’dzin Phun tshogs (late C17–early C18). Dri med shel gong shel phreng (Stainless Crystal Garland).

G.yu thog Yon tan Mgon po (C12). Bdud rtsi snying po yan lag brgyad pa sgang ba sman ngag gi rgyud (The Four Medical Tantras).

Mkhyen rab Nor bu (C20). ’Khrungs dpe ngo mtshar gser snyen (Unique Golden Illustration of Materia Medica).

Rje bsun Sgrol ma (Tārā) (attrib.—date unknown) Gser dpyad rin chen ’khrungs dpe (Golden Analytic Materia Medica).

Sde srid Sangs rgyas Rgya mchho (C17). Vaidūrya sngon po (Blue Lapis Lazuli).

Slob dpon Hūm chen (C17–C18?). Padma dkar po’i chun po (Bouquet of White Lotus).