

Methods of Processing Medicinal Plants: A Semantic Study of the Use of Verbs in Sesotho Sa Leboa

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Abstract

From time immemorial, medicinal plants have been common traditional medicines for treating diseases and ailments in most households. Even today, plants are used for treating ailments and diseases such as the flu and coronavirus disease 2019 (COVID-19). This article investigates the semantic use of verbs for collection, preparation and administration as methods of processing medicinal plants in Sesotho sa Leboa. Most of the medicinal plants, like folktales, are extinct, so by writing this study the ethnobotanical knowledge of the communities will be promoted and preserved. Medicine from medicinal plants is mostly used in a traditional medical healthcare system. Recent studies have indicated how the medicinal plants form the foundation of traditional medicine and how these are sometimes incorporated into allopathic or biomedical medicine. For the medicinal plant to attain its medicinal value, several processes take place and verbs are used to describe them (processes). Specific meaning is attached to the verbs of methods used during the collection, preparation and administration of medicinal plants. Ethnobotanical theory forms the framework of this article, supported by the theory of linguistics. A qualitative approach is used to explain concepts in the collection, interpretation and analysis of data. Data is collected from existing documents and auto-ethnography. The study found that verbs used in the methods of processing medicinal plants are semantically used in relation to specific parts of the plant.

Keywords: collection; administration; preparation; process; method; medicinal plant

Introduction

Human beings have used medicine from plants since prehistoric times. Even today, plants are the most common traditional medicine used in most households to treat ailments and some diseases, including the current COVID-19 (coronavirus disease 2019) pandemic. The indigenous knowledge on plants used for traditional medicine is important as it helps to define cultural identities of communities and link these communities to their past practices (Tahir et al. 2021, 2). Recent studies indicate how medicinal plants form the foundation of traditional medicine and how these are sometimes incorporated into allopathic or biomedical medicine. World Health Organization (WHO 2000) statistics indicated that 25% of modern medicine is made from medicinal plants. Medicinal plants in their raw form are mostly used in traditional medical and healthcare systems, for example they are used in soups, tonics, as appetizers, energy boosters, in teas, flavourings, in aromatherapy and as chewing sticks (Maundu et al. 2001). In Sesotho sa Leboa, traditional knowledge of medicinal plants, like folktales, is fading, as it mostly resides with the elders and these elders are gradually disappearing with this knowledge. Although the knowledge is not new, there are few or no records of the methods of processing medicinal plants, as this knowledge was passed orally from one generation to the next and the medicine was prepared in-house and not in a laboratory. The main aim of this study is to document methods of processing medicinal plants in order to preserve the knowledge about medicinal plants.

Broster and Bourn (1981) highlight two views of medicinal plants, that is, the spiritual view and the world view. In terms of the spiritual view, traditional healers ask the ancestral spirits to guide them in their search for medicinal plants and in the treatment of their patients. In terms of the world view, people use medicinal plants according to their knowledge from being exposed to medicinal plants while they were young or from books.

For the medicinal plant to attain its medicinal value, several processes take place. In both traditional and modern systems, there are different ways of processing medicinal plants. This study focuses on the traditional processing of medicinal plants with the emphasis on the semantic use of verbs to describe the methods of processing. Despite the great role played by plants for medicine in South Africa, little has been investigated and documented about verbs used in the processing of medicinal plants in Sesotho sa Leboa. From a cultural point of view, it is deemed necessary to document the knowledge of processing medicinal plants for future generations, especially the ones in the urban areas who may need the information in Sesotho sa Leboa. The study will classify and discuss verbs used in the indigenous methods of processing medicinal plants (or medicine from plants).

Theoretical Framework

As the article focuses on the verbs used in the methods of processing medicinal plants by humans, ethnobotanical theory will be used as the framework. Ethnobotanical theory

deals with the classification, use and management of plants by people (Martin 2004). I concur with Van Wyk, Van Oudtshoorn and Gericke (2009, 250) that the study of ethnobotany in the country is of importance not only as a way of preserving indigenous knowledge but also as a means to serve the natural products of the economic sector. Documenting ethnobotanical information of medicinal plants of the country is one of the ways of preserving indigenous knowledge of the people on medicinal plants before it is lost and inaccessible. According to Ayalew et al. (2017, 172), knowledge on the processing of medicinal plants is regarded as a fragile traditional skill that is likely to be lost when communities migrate to towns or regions with a different flora, or if the local ecology is drastically altered.

The ethnobotanical theory will support the study as the researcher will be identifying and classifying verbs used in the processing of medicinal plants according to different methods. The other theory that will be incorporated is the linguistic theory by Chomsky (2011), who argues that language acquisition is governed by universal, underlying grammatical rules including lexical semantics. Linguistic theory will be used in this article as meanings of verbs used in the processing of medicinal plants in Sesotho sa Leboa will be explained and discussed in sentences. The two frameworks support the study as ethnobotanical theory was used to identify verbs used in the processing methods and then the verbs were used in sentences and analysed through linguistic theory.

Methodology

Ethnobotanical data is a broad range of information that the researcher collects on the way the people interact with the natural environment, such as plants (Martin 2004). Ethnobotanical methods of data collection will be purely qualitative in nature. In this article, a qualitative method will be employed because subjective and inductive reasoning will be used to explain and describe meanings attached to the verbs. The paper will be more explanatory and descriptive.

For each method of processing medicinal plants, ethnobotanical data was collected from existing documents. Therefore, the study used desk research. Zhou and Nunes (2016) describe desk research as research that relies on published data.

The medicinal plant parts are processed in various forms such as decoctions, concoctions, and through crushing, chewing, smoking, inhalation and steam bath. Medicinal plant parts are also administered through oral, dermal, nasal and other body parts (Agisho, Osie, and Lambore 2014). Linguistically, different kinds of verbs with different meanings are used to describe the processing of medicinal plant parts. In Sesotho sa Leboa, there is no method of processing medicinal plant parts that does not include verbs. For example, in the collection/harvesting process verbs such as *rema* (chop) and *sega* (cut) are used, while in the preparation process verbs such as *šila* (crush) and *bediša* (boil) are used. In the administration process verbs such as *sohla* (chew) and

aramela (steam) are used. Therefore, ethnobotanical data is linguistically analysed. Data was collected using purposive sampling.

Processing Medicinal Plants and the Semantic Use of Verbs

Traditional indigenous knowledge and practice involve processing medicinal plants that traditional healers and communities have been using over the years to survive diseases (Masoga and Shokoane 2020). Despite the great role played by plants as medicine in African communities, little has been researched and documented concerning medicinal plants and their related methods of processing, specifically in Sesotho sa Leboa. In their study, Abubakar and Hague (2020) state that medicinal plants are processed for direct consumption as herbal or traditional medicine. Processing medicinal plants involves collection, preparation and administration.

Collection of Medicinal Plants

Collection is the first method of processing after the medicinal plant is cultivated. The other word for collection is harvesting. In African communities, collecting or harvesting medicinal plants was confined to traditional healers as the knowledge of these species was limited to them (Mathibela 2013). These days, knowledge of medicinal plants is known by most people, and they are used for self-medication, especially during the coronavirus pandemic. Usually, collection is done in the surrounding bushes, mountains, riversides, roadsides, and home gardens. Ethnobotanically, Basotho ba Leboa collect various plant parts such as leaves, stems, roots, bulbs, seeds, fruit, barks and the whole plant for medicinal purposes. Traditional beliefs, rituals and taboos practised by rural communities help to preserve and protect medicinal plants from over-collection. Seile et al. (2022, 9) argue that traditional management practices such as taboos, seasonal and social constraints served to limit over-harvesting of medicinal plants, thereby allowing for their sustainable use. Taboos that are called *go ikelela* in Sesotho sa Leboa are practised to ensure that the medicinal plant does not die. Moeng (2010, 70) states that:

Underground parts (roots) are dug up using [a] metal rod, hoe or sharp instruments. Bark is stripped by using an axe or knife. Leaves are collected by picking the upper leaves by hand and in some instances by breaking branches to obtain the leaf.

This view is supported by Semenya, Potgieter and Erasmus (2013, 68), who argue that instruments such as axes, pitchforks, knives, pickaxes, spades and many other sharp instruments are used by Basotho ba Leboa to harvest plant parts.

Ethnobotanically, Basotho ba Leboa use a number of verbs to denote the methods of collection of medicinal plants. Verb stems such as *-kgā*, *-gopa*, *-tumola*, *-sega*, and *-rema* are linguistically used to describe methods of collection.

-kgā (pick/pluck)

In English, “pick” means to break flowers, fruit or leaves off the plant while “pluck” is a process whereby a fruit, flower or leaf is forcibly or abruptly pulled from the medicinal plant. In Sesotho sa Leboa, the same verb, *kga*, is used for both pick and pluck (Ziervogel and Mokgokong 1975).

Analysis

The verb stem *-kga* is used in the method of collection *go kga*. This method is preferred as it allows the part to grow again so that the plant can produce more of that plant part. Examples of the semantic use of the verb stem *-kga* follow:

Monna o kga letlakala la lengana.
(A man picks a leaf of wild wormwood.)

Monna o kga letšoba la moringa.
(A man picks a flower of moringa.)

Monna o kga lekala la motšhidi.
(A man picks a branch of sourplum tree.)

Monna o kga letšhidi.
(A man plucks a sourplum tree fruit.)

Linguistically, the above sentences indicate that the verb stem *-kga* is used in relation to the method of collecting leaf, flower, branch and fruit. Therefore, the verb stem *-kga* collocates with the above-mentioned plant parts.

-gopa (scrape off or strip)

This verb stem *-gopa* is used in the collection of the bark. Bark is collected with equipment such as knives, axes and any other sharp instruments. Harvesting the bark in large quantities can destroy the plant because the protective role of the bark will be curtailed (Tugume et al. 2016). The process of bark collection among Basotho ba Leboa is usually done by stripping the bark from the eastern side of the tree as it is believed that this side has more healing ingredients than other sides and there is rapid recovery as the tree receives enough sunlight on both eastern and western sides (Semenya, Potgieter, and Erasmus 2013, 70).

Analysis

-Gopa is the verb stem of the method of collection whereby the bark is scraped off the main plant. This method of collection has a disadvantage for the plant as it causes a wound, which sometimes takes time to recover. Delvaux (2009, 40) argues that sustainable bark harvesting techniques vary among species, depending on the ability of individual trees to survive harvesting and recover from the inflicted wound. *-Gopa* can semantically be used in the following sentence:

Mosadi o gopa letswamati la morula.
(Mother strips a bark of marula tree.)

Linguistically, *-gopa* is a verb stem that collocates with the removal of the bark from the medicinal plant.

-tumola (uproot or pull out)

The verb stem *-tumola* is used in the method of pulling out the plant's roots. Usually this method of *go tumola* (to uproot) takes out the whole tree or shrub. I concur with Semenya, Potgieter and Erasmus (2013) that the method of uprooting is not only destructive for the plant itself, but also has a negative effect on the surrounding plants by affecting their root systems.

Analysis

The verb stem *-tumola* is semantically used in the following sentences:

Mosetsana o tumola modu wa serokolo.
(The girl is pulling out the root of African ginger.)

Malome o tumola mošunkwane.
(Uncle is uprooting the shrub.)

Linguistically, the verb stem *-tumola* collocates with the plant part *modu* (root) or the whole plant of *mošunkwane* (shrub).

-sega (cut)

Go sega (cutting) is usually divided into primary cutting and secondary cutting. Primary cutting is usually performed on the plant itself, when cutting the medicinal part of the plant from the main plant. Primary cutting can also be done at or near the collection site to reduce the size of the raw medicinal part of the plant for transportation purposes (WHO 2018). Secondary cutting is performed during preparation process. In the best method of *go sega* (cutting), the leaves of a medicinal plant are cut closer to the main stem and on the bottom of the plant to allow the leaf to grow again and to ensure multiplication.

Analysis

-Sega is a verb stem of *go sega*. Semantically it can be used as follows:

Mosadi o sega matlakala a kgokgopha.
(A woman cuts the leaves of an aloe.)

Mošemane o sega medu ya motšhidi.

(The boy cuts the roots of the sourplum.)

Linguistically, the verb stem *-sega* collocates with the process of collecting the leaves and small roots from big roots, especially adventitious roots.

-rema (chop)

This method of processing is used in the collection of bigger plant parts such as *makala* (branches) and *dikutu* (stems). Medicinal plants like trees and shrubs can also be a good source of chop-and-drop material. During this process, branches and stems should be *rengwa* (chopped) just like a person would normally do during pruning, but instead of hauling them away, simply drop the branches on the ground. Usually chopping is done by axe or garden scissors. After chopping branches, cut them up small so that they can be prepared easily. Examples of the semantic use of *-rema* in a sentence are as follows:

Papa o rema lekala la mokgalo.
(Father chops the branch of wait-a-bit tree.)

Mma o rema kutu ya morula.
(Mother chops the stem of marula tree.)

Linguistically, the verb stem *-rema* collocates with the process of collecting branches and stems.

The desired raw medicinal part of the plant should be sorted after collection and be subjected to various methods of preparation.

Preparation of Medicinal Plants

Preparation is the post-collection or post-harvest process that covers different activities performed on the medicinal plant parts when being processed into medicinal material. In African culture, the preparation of medicinal plants is performed at home using instruments such as *maswika* (stones), *dikota* (wood) and *magapa* (calabashes) and other traditional instruments, while in Western culture, the preparation process takes place in laboratories (Tembane 2019).

Preparation methods of herbal medicines may vary according to place and culture. The plant materials may be used fresh or dried. Methods of extracting the useful medicinal plant properties are disappearing annually due to lack of written documents, the death of seniors, migration of people due to drought and social problems, urbanisation, the influence of modern medicines and the influx of different cultures (Van Wyk and Prinsloo 2018). With experience, a particular method is chosen to increase efficiency and decrease toxicity. Generally, in Sesotho sa Leboa, verb stems used in the preparation of the medicinal plants include: *-ena*, *-šila*, *-bediša*, *-beša* and *-gamola*.

-ena (soak)

In Sesotho sa Leboa, the verb stem *-ena* is used for methods of preparation that both soak and macerate the plant parts. In *go ena* (soaking), boiled or cold water is poured on the medicinal plant part, or the plant part is steeped in the boiling or cold water for some minutes. Maceration is done by putting the plant part in water at room temperature for a certain period of time (WHO 2018). *Motswakoenwa* (infusion) is formed by this method of *go ena* (soak or macerate). The preparation of infusion aims at removing the medicinal substances contained in the plant with the help of water. An infusion is prepared mainly from thin medicinal plant parts, mainly leaves and flowers (Noila 2020).

Analysis

The method of *go ena* (to soak and to macerate) serves to soften plant tissues so that the medicinal chemical constituents of the tissues are extracted into the liquid for medicinal purposes (WHO 2018). For example, leaves of *lebake* or *patše* (cannabis) are steeped in water for the treatment of asthma; the infusion is strained for drinking purposes (Rankoana, Shilubane, and Potgieter 2015). Examples of the semantic use of *-ena* follow:

O ena matlakala a kgokgopha.
(He soaks aloe leaves.)

O ena matsoba a moringa.
(He soaks moringa flowers.)

Linguistically, *-ena* collocates with the method of preparing leaves and flowers. The plant parts may be cut into small sizes or soaked as a whole.

-šila (grind)

The verb stem *-šila* is used in the method of turning the medicinal plant part into powder. Before *go šila* (grinding) takes place, the medicinal plant part should be cut into suitable size. According to the WHO (2018, 117), “size reduction of the herbal materials facilitates the process of extraction and the preparation of dosage forms.” Medicinal plant parts *o a omišwa* (are dried) before they can be ground. It is important *go omiša* (to dry) the raw medicinal plant part as this will enable the plant part to retain as much as possible of its active ingredients (Mahanom, Azizah, and Dzulkifly 1999). Traditionally, *go šila* (powdering or grinding) is done by using *maswika* (stones) and *dikota* (wood). The ground powder is usually sieved in order to eliminate bigger or unwanted particles. The advantage of the powder (pounding) method is that the medicinal plant part can be preserved for a very long period and is readily available. Powdered medicine can be sucked orally or used with water to be drunk for healing purposes (Rankoana, Shilubane, and Potgieter 2015).

Analysis

Fresh or dried medicinal plant parts can be ground, but usually the parts *e a omišwa* (are dried). Examples of the semantic use of the verb stem *-šila* are as follows:

Mma o šila matswamati a mokgalo.

(Mother is grinding barks of wait-a-bit tree.)

Mma o šila medu ya serokolo.

(Mother is grinding roots of African ginger.)

Mma o šila matlakala a lengana.

(Mother is grinding leaves of wild wormwood.)

Mma o šila matšoba a moringa.

(Mother is grinding flowers of moringa.)

The verb stem *-šila* is semantically used in relation to the preparation of plant parts such as *matswamati* (barks), *medu* (roots) *matlakala* (leaves) and *matšoba* (flowers).

-bediša (bring to boil)

The verb stem *-bediša* (boiling) is used in the method whereby the medicinal part of the plant is put into water to be heated and to form *motswakobedišwa* (decoction). Decoction preparation aims at separating the main ingredients contained in plants with the help of water. From the raw material, the medicine is prepared from the hard plant parts, such as the stem, bark, branches and roots (Noila 2020). After boiling, the medicinal material is strained and the patient will take the medicine directly for healing purposes. The amount of water to be used and the length of boiling are usually determined by the traditional healer on a case-by-case basis (WHO 2018). *Bediša* is the preparation method used by most traditional healers or communities, possibly because of the simplicity of the preparation (Semenya and Maroyi 2018, 30).

Analysis

Roots are boiled and the decoction is used for the treatment of venereal diseases and also serve as an emetic (Rankoana, Shilubane, and Potgieter 2015, 780). Examples of semantic uses of *-bediša* are the following:

Mma o bediša makala a lengana.

(Mother is boiling wild wormwood branches.)

Mma o bediša medu ya serokolo.

(Mother is boiling African ginger roots.)

Mma o bediša matswamati a mokgalo.

(Mother is boiling wait-a-bit tree barks.)

Linguistically, the sentences above indicate that the verb stem *-bediša* collocates with the method of preparing branches, roots and barks. These plant parts are cut before being boiled.

-beša (roast)

The verb stem *-beša* means to put medicinal plant parts directly on a source of heat without using any form of liquid. The roasting process involves dry-heating using direct heat, where the medicinal part of the plant is put in a heating device such as a pot lid, tin or other suitable devices (WHO 2018). The exact temperature used and the duration of roasting differ from one medicinal plant part to another. Some medicinal parts of plants are roasted until they change colour. Some of the medicinal plant parts have to be roasted so that the main ingredients are not separated from the plant part as the plant part is to be used as is. For example, the leaves of *kgokgopha* (aloe) need to be roasted so that they can be soft and cooled as they are used as a bandage for wounds, burns or sores.

Analysis

In a sentence, *-beša* is semantically used as follows:

Ke beša matlakala a kgokgopha.
(I am roasting leaves of an aloe.)

Linguistically, *-beša* collocates with the method of preparing leaves for healing purposes.

-gamola (squeeze)

The verb stem *-gamola* (squeeze) is used in the process of extracting the liquid/juice from the plant part. Juice from medicinal plant parts is high in vitamins, thus offering protection against scurvy as well as potassium, calcium and magnesium. Because of its healthy juice, marula fruit are eaten by humans as well as by elephants, giraffe, kudu and warhogs. Virgin marula oil extracted from the kernels is rich in antioxidants and oleic acid (McElmurry 2013).

Analysis

The verb stem *-gamola* is semantically used in a sentence as follows:

Sesi o gamola torofaeye.
(Sister is squeezing a prickly pear fruit.)

The sentence above indicates that *-gamola* collocates with the method of preparing fruit as a medicine.

Levin (1993) indicates that verbs of preparation describe the creation of a product usually through transformation of raw material.

After the medicinal plant parts have been prepared, they are ready to be administered for healing purposes.

Administration of Medicinal Plants

Traditional medicine is administered through various routes, including skin, nasal, rectal, oral, fumigation and inhaling (Tahir et al. 2021, 6). Maroyi (2013) indicates that the method of administration and dosage depend on the type of disease. Methods of administration process are divided into internal administration and external administration.

Internal Administration

Internal administration describes the physical form in which traditional medicine is delivered into the body for healing purposes (Pan et al. 2014). Traditional medicine can be administered orally, nasally and anally or rectally into the body. Verb stems involved in oral and nasal administration processes include the following: *-kgoga/-fola*, *-aramela*, *-nwa*, *-mona*, *-sohla*, *-latswa*, *-kgakgametša*, *-ja* and *-goga*. The anal administration process is done through *sepeite* (enema) and the verb stem is *-peita* (enema).

Oral and Nasal Administration

Internal administration is done orally, but in some instances it is done both orally and nasally, implying that there are medicines that are simultaneously taken through the mouth and the nose. Verb stems for this kind of administration are the following:

-kgoga or *-fola* (smoke)

The verb stems *-kgoga* or *-fola* refer to the smoking or inhalation of the smoke from the burned medicinal plant part. Dried medicinal plant parts are ground and burnt, then the smoke is inhaled through the mouth and nose for healing purposes. The inhalation of smoke from burning incense by a patient is another common method of using indigenous herbs and it is believed to be an effective method (Rankoana, Shilubane, and Potgieter 2015, 789).

Analysis

In a sentence, the verb stem *-kgoga* or *-fola* can be used as follows:

Mosadi o kgoga letlakala la mosehla.
(A woman is smoking a rain bush leaf).

Letlakala can be replaced by *modu* or *letswamati* as in the following examples:

Mosadi o kgoga modu wa mosehla.
(A woman is smoking rain bush root.)

Mosadi o kgoga letswamati la mosehla.
(A woman is smoking rain bush bark.)

Linguistically, the verb stem *-kgoga* or *-fola* (smoke) collocates with the leaves, roots and barks of medicinal plants. In the use of the verb stem *-kgoga*, sometimes in Sesotho sa Leboa only the name of the plant is mentioned rather than the plant part that is smoked. For example,

Rakgolo o kgoga patše or lebake.
(Grandfather smokes marijuana or cannabis.)

Patše or *lebake* refers to the whole plant, but actually we know that a person is smoking dried leaves of *patše*.

The plant parts mentioned above may be raw or ground.

-aramela (steam)

-Aramela is a verb stem of the administration process whereby *motswakobedišwa* (decoction) or hot water is put into a container. Then, while still hot, a blanket or towel is used to cover the head or the whole body. The vapour is inhaled through the mouth and nose while the skin also benefits. This method of administration is used mainly for the traditional treatment of flu as well as COVID-19. *Go aramela* (steam inhalation) has medical properties such as:

- giving relief to common cold symptoms;
- providing relief to influenza (flu);
- loosening nasal mucus congestion; and
- relieving breathing problems causing airways congestion.

Analysis

In a sentence, the verb stem *-aramela* can semantically be used as follows:

Monna o aramela ka matlakala a lengana.
(A man steams with leaves of wild wormwood.)

Matlakala can be replaced by *medu* (roots) or *matswamati* (barks) as follows:

Monna o aramela ka medu ya lengana.

(A man steams with roots of wild wormwood.)

Monna o aramela ka matsamati a lengana.

(A man steams with barks of wild wormwood.)

Linguistically, the verb stem *-aramela* collocates with the plant parts such as leaves, roots and barks. For steaming purposes, the plant part used may be fresh or dried.

Verb stems for oral and nasal administration semantically relate with the body parts *molomo* (mouth) and *dinko* (nose), while *letlalo* (skin) also benefits.

Oral Administration

The oral method of using traditional medicine is important in the internal administration process. The medicine is taken in the mouth for healing purpose. Verb stems in this process of administration are the following:

-nwa (drink)

-Nwa is a verb stem that describes taking in the decoction or infusion through the mouth. The decoction or infusion is most quickly absorbed in the body for healing purposes. For example, dried leaves of *kgokgopha* are crushed, boiled, and the decoction is drunk as a remedy for ingested poisons (Mogale, Raimando, and Van Wyk 2019, 94). Herbal drinks can be made with fresh or dried flowers, immature fruits, leaves, seeds, and/or roots by steeping (infusion) or boiling (decoction) the source materials including herbs. Herbal teas are the most common decoctions that are drunk for healing purpose. It is indicated that:

Herbal teas consist of one or more herbal substances intended for oral consumption and prepared by means of decoction, infusion or maceration. The herbal substance(s) used in tea formulations may be processed in advance by means of drying and comminuting. Therefore, commercially available products may be in different forms such as whole dried plant parts, dried powder, dried particles within tea bags, as well as granulates, and solutions which can be consumed directly. In the modern societies they are used for reducing the risk conditions of non-communicable diseases such as type 2 diabetes, hypertension, dyslipidemia and cancer. (Chandrasekara and Shahidi 2018, 451)

Emetics are also a means of healing through drinking whereby powdered plant parts are mixed with a lot of water and drunk, and after some time vomiting is self-induced.

Analysis

-Nwa can be semantically used in a sentence as follows:

O nwa motswakobedišwa wa sekanama.

(He/she drinks drimia elata decoction.)

Sometimes *-nwa* is used with the name of the medicinal plant, but actually it refers to the decoction or infusion, as in the following examples:

Monna o nwa lengana.

(He drinks wild wormwood/artemisia afra.)

Monna o nwa mosehla.

(He drinks rain bush/African wattle.)

The verb stem *-nwa* collocates with all medicinal plant parts that are boiled or soaked.

-ja (eat)

The verb stem *-ja* refers to the method of placing food in the mouth, chewing and swallowing. *-Ja* (to eat) is the common method of internal administration. In the case of traditional medicine, the powdered form of a medicinal plant part is mixed with food and then taken orally (Monakisi 2007, 41).

Analysis

The verb stem *-ja* is used in a sentence as follows:

Mma o ja motepa wa go hlakantšhwa le lerole la moringa.

(Mother is eating porridge mixed with moringa powder.)

Linguistically, *-ja* collocates with powder or crushed plant part.

-mona (suck)

The verb stem *-mona* is used to describe the method of drawing the medicinal plant part such as fruit into the mouth by contracting the muscles of the lips and mouth to make a partial vacuum. In other Sesotho sa Leboa dialects *-mona* is called *-nyanya*.

Analysis

-Mona can be used in a sentence as follows:

Mosadi o mona lebilo.

(A woman is sucking medlar tree fruit.)

Linguistically, the verb stem *-mona* collocates with fruit.

-sohla (chew or masticate)

-Sohla is a verb stem used to describe the method of cutting the plant part into smaller pieces with the teeth with the aim of swallowing it. Usually, plant parts that are chewed are leaves and roots. The succulent leaves are chewed and solid plant material is spat out; only the leaf juices are swallowed for the treatment of the disease (Mogale, Raimando, and Van Wyk 2019, 95).

-Sohla is also explained as the process whereby ingested food (food you've put into your mouth) is cut or crushed into small pieces mixed with saliva and formed into a bolus in preparation for swallowing (Keep Talking n.d.).

Analysis

In a sentence, *-sohla* can be used as follows:

Koko o sohla serokolo.

(Grandmother chews African ginger.)

Koko o sohla letlakala la mosehla.

(Grandmother chews a leaf of rain bush.)

Linguistically, *-sohla* collocates with roots and leaves.

-latswa (lick)

The verb stem *-latswa* is used to describe the method of using the tip of the tongue to take in the medicinal plant part. Usually, the powdered form of the plant part is licked for healing purpose.

Analysis

In a sentence, *-latswa* is used as follows:

Mošemane o latswa lerole la medu ya motšhidi.

(A boy is licking a powder of sourplum roots.)

The verb stem *-latswa* collocates with roots, leaves and barks.

-kgakgametša (gurgle)

The verb stem *-kgakgametša* is used to describe the method of drinking a decoction or infusion and making a bubbling sound. Gurgling reduces infections in the upper respiratory tract (Walsh 2022).

Analysis

The verb stem *-kgakgametša* can be semantically used in a sentence as follows:

Mosetsana o kgakgametša ka motswakoenwa wa moringa.

(A girl gurgles with a moringa infusion.)

Linguistically, *-kgakgametša* collocates with the infusion or cool decoction of plant parts.

-goga (draw)

The verb stem *-goga* is used to describe the method of oral administration where a straw is used to draw the medicine through the mouth.

Analysis

-Goga is used in a sentence as follows:

Monna o goga sehlare ka lehlaka.

(A man draws medicine with a reed straw.)

The verb stem *-goga* collocates with powdered or liquid medicine.

Verb stems used for oral administration semantically relate with the body part *molomo* (mouth).

Anal or Rectal Administration

Anal or rectal administration is the only process done through *go peita* (enema).

-peita (enema)

The verb stem *-peita* is used to describe the process of providing medicine internally through an enema with the aim of fighting a disease or relieving constipation. An enema is important for those at higher risk of constipation, including young children and the elderly. Constipation may occur due to poor fluid and food intake, among other factors. Herbal enemas may be administered because different herbs possess active compounds that, if absorbed by the body, enter the intestinal walls all the way into the bloodstream. An enema is better than oral administration as oral consumption of herbs provides fewer benefits because some of the active compounds are destroyed or altered by the gastric juices before they are even absorbed into the body (Medisential 2022).

Analysis

The meaning of *-peita* is expressed in a sentence as follows:

Ngaka e peita molwetši.

(The healer uses an enema on the patient.)

Linguistically, the verb stem *-peita* collocates with anal or rectal administration only.

Levin (1993, 214) explains the verbs of internal administration as “verbs of ingesting” because the meaning of these verbs involves the complete and usually speedy consumption of something.

External Administration Methods

External administration methods are associated with dermal processing (processing through the skin). The skin is the organ that covers the body and is likely to be infected by ailments and diseases. Afolayan, Grieson and Mbeng (2014, 221) indicate that the skin serves many important functions, which include temperature regulation, protection, fluid maintenance, sensory functions, absorption and disease control. The following verb stems are used to describe the process of controlling diseases through external administration:

-hlapa (bath)

The verb stem *-hlapa* is used to describe the method of administration whereby the raw or powdered part of the medicinal plant is put into water. This kind of bath is called a herbal bath. The patient pours or sprinkles herbal water on the affected body part or the whole body. Ethnobotanical studies have reported on bathing as a form of medical treatment in many cultures worldwide, such as Basotho ba Leboa. Bathing can have many different meanings across cultures, varying from an individual act concerned with cleanliness and hygiene to social acts related to rituals of purification and separation, or as a form of therapeutic practice (Van’t Klooster et al. 2018).

Analysis

The verb stem *-hlapa* can be used in a sentence as follows:

Mosadi o hlapa ka motswakoenwa wa mosehla.
(A woman is bathing with rain bush infusion.)

In Basotho ba Leboa culture, an infusion of rain bush is associated with cleansing, especially in cases involving death.

-tlola (smear on)

-Tlola is used as a verb stem to describe the application of lotion to the skin. The lotion of a medicinal plant or any other lotion mixed with the powdered part of a medicinal plant can be put on the skin in order to be healed. The lotion can be directly applied to the affected body part or to the whole body.

Analysis

-Tlola can be semantically used in a sentence as follows:

Mosadi o tlola ka makhura a kgokgopha.
(A woman smears on lotion of aloe vera.)

Linguistically, the verb stem *-tlola* collocates with the powdered or crushed medicinal plant parts.

-tšhatšha (rub)

The verb stem is used to describe the method whereby the medicine is rubbed into incisions made in the body. Through this method, the raw or powdered medicine is applied directly to the body part.

Analysis

-Tšhatšha can be semantically used in a sentence as follows:

Ngaka ya setšo e gaya molwetši gore a mo tšhatšhe ka sehlare.
(The traditional healer makes incisions on the patient to rub the medicine.)

Linguistically, the verb stem *-tšhatšha* collocates with raw or powdered plant parts.

-bofa (bandage)

-Bofa is a verb stem used to describe the method of binding the wound or sore with a medicinal plant part covered with protective material for healing purposes. Usually, the medicinal plant part is slightly burned to make it soft to ease binding. For example, burned *letlakala la kgokgopha* (aloe leaf) can be used as a bandage to help wounds, burns and sores heal and to fight inflammation (Mogale, Raimando, and Van Wyk 2019, 93).

Analysis

The verb stem *-bofa* is used in a sentence as follows:

Mosadi o bofa ntho ka letlakala la kgokgopha.
(A woman bandages the wound with a leaf of aloe.)

Linguistically, *-bofa* collocates with the leaf of the medicinal plant.

-gaša or *-foka* (sprinkle)

A synonym for *-gaša* is *-foka*, depending on the Sesotho sa Leboa dialect. In *go gaša* or *go foka*, the infusion or cool decoction is sprinkled on a part of the body or over the whole body for healing or hygiene purposes. The herbal medicine may also be sprinkled in a house or any designated place. Culturally, sprinkling is intended for cleansing

purposes and it is done by using a bunch of leaves or a small branch of a tree. In the modern method, *go gaša* is done through sanitising spray.

Analysis

The verb stem *-gaša* is used in a sentence as follows:

Papa o gaša diatla ka motswakoenwa wa kgokgopha.
(Father sprinkles an infusion of aloe on his hands.)

Linguistically, *-gaša* or *-foka* collocates with the liquid form of medicine.

The verb stems for external administration semantically relate with the body part *letlalo* (skin).

Specific nouns are selected by the semantic content of other verbs as internal argument while other nouns may be restricted from being used in the syntactic environment (Mojapelo 2013, 147). For example, the semantic content of *nwa* selects the body part *molomo* (mouth) while *letlalo* (skin) cannot be used with *nwa*, but it can be used in the syntactic environment with *tlola* (smear on).

Conclusion

Plants provide medicine in various forms such as leaves, bulbs, seeds, roots, flowers and barks. For the medicinal plant to attain its medicinal value, several processes such as collection, preparation and administration take place. Different parts of the plant are processed differently. Methods of processing are expressed with verbs and those verbs collocate with different parts of the plant. There is a semantic relationship between the three stages of processing. For example, after the method of collection *kgā* (picking), the plant part is prepared by *go šila* (grinding), then the powdered medicine is mixed with water and administered orally through *go nwa* (drinking). Each method of administration is semantically related to a specific body part. Documenting the processing of medicinal plants is important to promote and preserve the ethnobotanical knowledge of the communities. I therefore recommend that documentation of the associated ethnobotanical knowledge should be carried out before such rich heritages are lost due to various anthropogenic and other natural causes.

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