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## **Health Informatics — Categorial structures for representation of herbal medicaments in terminological systems**

*Élément introductif — Élément principal — Partie n: Titre de la partie*

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## Foreword

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ISO nnn-n was prepared by Technical Committee ISO/TC 215, *Health Informatics*, Subcommittee WG 3, *Semantic content*.

This second/third/... edition cancels and replaces the first/second/... edition (ISO nnn-n:19xx), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

ISO nnn consists of the following parts, under the general title *Health informatics — Categorical structures for representation of herbal medicaments in terminological systems*.

The **foreword** shall appear in each document. It shall not contain requirements, recommendations, figures or tables.

## Introduction

For centuries, natural materials have been used by mankind for medicinal purposes. Today herbal medicaments are used extensively both in medicines and in supplements.

In the history of herbal medicaments, they are conceived in a certain area and then they gradually spread to other area. But different climate, geographical features, and habitat of plants might cause availabilities of source materials. Then, as prevalence of herbal medicine, substitutions should become to be required for the people in different area or region [24,56,57].

Such substitutions should contain the ingredients or active substances, or the ingredients that has approximate efficacies. But people in those days had no analysers for scientific assays. Their judgments depended on their clinical experiences and appearance of natural materials [24,57].

And also, traditional medicine recognizes that different climate and/or geographical features influence people's constitutions, so that different medicament might be formulated for the same symptom for different people in different area or region. Those are feasible behaviours to solve health issues, but on the other hand, result in critical problems in health informatics because lots of polysemic terms erupted [24,32-36,47-52,56,57].

Those situation have led to the use of single specific names representing different natural materials or medicaments (polysemy [1]), different names often designate same natural materials or medicament (synonymy [1]). Anyway, such vernacular names have been established as customary in each area and region. Even today, such situation of terms occasionally influences different specialties [40-46].

Polysemy (and synonymy) causes confusion in trade and serious health hazards may occur as a consequence. Then there are discords among existing terminological resources, and scientific papers on clinical research. This means new misunderstandings might be continuously occurring among practitioners and researchers. It might be desperate struggle to establish the safety of herbal medicaments.

These problems should be resolved by standardization of the relations between terms and concepts by following specification for terminological resources.

**Note 1** In this Technical Specification, natural materials include not only plants but also animal products and minerals which occur naturally. In addition, adjuvant materials (e.g. rice, liquor, vinegar, honey) are often used, in order to add flavours, for detoxification, for support of extraction of active substances, etc.

**Note 2** In the trade of wine, tea or coffee, people are interested in the species of source plant, the specific part of source plant, the area or the district of harvest/gather, the timing and condition of harvest/gather (e.g. first flush tea, grapes with noble rot), blend of materials, and the methods of processing. Because herbal medicaments are also made of natural materials, similar properties are also significant not only to the qualities of natural materials but also to the contained chemical substances in them. Needless to say, different ingredients cause different efficacies and effects; some of those may be critical in medical usage and in health claim.

# Health Informatics — Categorial structures for representation of herbal medicaments in terminological systems

## 1 Scope

### 1.1 Main purpose

The scope of the present Technical Specification is to specify categorial structures [3,4] in the subject field of the herbal medicaments in plain medicine and formula. In precise,

[A] herbal medicaments made of single natural material with or without adjuvant material(s), and

[B] herbal medicaments that are composed of the herbal medicaments made of single natural material,

by defining a set of constraints for use within terminological resources.

Note 1 In this Technical Specification, adjuvant material means (e.g. rice, liquor, vinegar, honey) are often used in processing of natural materials, in order to add flavours, for detoxification, for support of extraction of active substances, etc.

Note 2 In this Technical Specification, herbal medicaments made of single natural material [A] are herbal medicament by themselves, while they are usually used as materials in formulas [B], i.e., the herbal medicaments that are made by combination with them [A].

The potential contributions of this conceptual framework are to:

- Support developers of new terminology systems concerning herbal medicaments;
- Support developers of new content areas of existing terminology systems concerning herbal medicaments to enable conformance;
- Facilitate the representation of herbal medicaments using a standard core model in a manner suitable for computer processing;
- Support the development of monitoring systems for adverse events and reactions;
- Provide the characterization of clinical research intervention of herbal medicaments;
- Supports evaluation of herbal formulations in prescriptions, identifying the component(s) which impact upon the effect of the formulation in order to reduce failures in dosages or incompatibilities;
- Promote smooth exchange of information and reduce the risk of adverse reactions and risks affected by the toxicity of herbal medicaments;
- Clarify the polysemy across and within different clinical specialties and systems.

### 1.2 Target groups

The target groups for this Technical Specification are:

- Developers of terminology systems concerning herbal medicaments;
- Developers of information systems that require a structured framework of concepts to facilitate implementation;
- Informaticians, analysts and epidemiologists who require common models of knowledge to facilitate analysis of current and legacy data from one or more information systems;

- Clinicians and coders to provide greater consistency in structure and organisation when entering and retrieving data using one or more terminology systems;
- Managers and administrative personal in providing a benchmark by which to judge terminology solutions: as to whether the potential options will deliver compatibility with legacy data and future proofing to emerging terminology products.

### 1.3 Topics out of scope

Topics considered out of scope of this Technical Specification include:

- The combinations of modern drug(s) and herbal medicament(s) or natural material(s);
- Any implementation models for management of manufactured drug products on herbal medicaments or herb related medicaments;
- Any process models of drug production and manufacturing;
- Any models or frameworks for quality control of
  - Cultivation of natural materials;
  - Drug products from natural materials, herbal medicaments, or the combinations of modern drug(s) and herbal medicament(s) or natural material(s).

The present Technical Specification does not include formulas of products that have already been formulated; therefore the scope of [B] is restricted to first order formulas that combine herbal medicaments made of single natural material with or without adjuvant material(s) [A].

The present Technical Specification does not necessarily focus on chemical and physical characteristics of ingredients, although they may be referred to.

Note        Ingredients are not always active substances, but are considered as chemical markers.



## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1087-1:2000, *Terminology work – Vocabulary – Part 1: Theory and application*

EN 12264:2005, *Health informatics – Categorial structure for systems of concepts*

ISO 17115:2007, *Health informatics – Vocabulary for terminological systems*

ISO/FDIS 11238, *Health Informatics – Identification of medicinal products – Data elements and structures for the unique identification and exchange of regulated information on substances*

IETF RFC 5646, *Tags for Identifying Languages*, September 2009

ISO 639-1:2002, *Codes for the representation of names of languages – Part 1: Alpha-2 code*

ISO 639-2:1998, *Codes for the representation of names of languages – Part 2: Alpha-3 code*

ISO 639-3:2007, *Codes for the representation of names of languages – Part 3: Alpha-3 code for comprehensive coverage of languages*

ISO 15924:2004, *Information and documentation – Codes for the representation of names of scripts*

ISO 3166-1:2006, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes*

ISO 3166-2:2007, *Codes for the representation of names of countries and their subdivisions – Part 2: Country subdivision code*

ISO 3166-3:1999, *Codes for the representation of names of countries and their subdivisions – Part 3: Code for formerly used names of countries*

IBC, *International Code of Botanical Nomenclature VIENNA CODE*, 2006

ICSP, *International Code of Nomenclature of Bacteria*, 1990

ICZN, *International Code of Zoological Nomenclature Fourth Edition*, 1999

CNMMN/CNMNC, *International Mineralogical Association Official List of Mineral Names*, 2009

ISO 19115:2003, *Geographic information – Metadata*

ISO 19115:2003, *Geographic information – Metadata, TECHNICAL CORRIGENDUM 1*, 2006

ISO/IEC 8824-1:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*

### 3 Terms and definitions

For the purposes of this Technical Specification, the following terms and definitions apply. Only key terms and definitions are provided in this section. Additional background terms and definitions from two normative references: ISO 17115:2007, Health informatics - Vocabulary for terminological systems are provided in Annex A [4]; ISO 1087-1:2000, Terminology work - Vocabulary - Part 1: Theory and application provided in Annex B [1]; EN 12264:2005, Health informatics - Categorial structure for systems of concepts [3]; IETF RFC 5646 [10]; ISO/FDIS 11238, Health Informatics - Identification of medicinal products - Data elements and structures for the unique identification and exchange of regulated information on substances [45].

#### 3.1

##### **natural material**

creature and mineral of which part is able to be utilized for medicinal purpose

#### 3.2

##### **herbal medicament**

medicament made of **natural material(s)** (3.1)

NOTE 1 In this Technical Specification, material(s) by which an **herbal medicament** (3.2) is made of include plants, animals and minerals by the definition of **natural material** (3.1)

NOTE 2 According to the scope (Clause 1.3), this Technical Specification does not include formulas of products that have already been formulated; therefore the scope of [B] is restricted to first order formulas that combine herbal medicaments made of single natural material with or without adjuvant material(s) [A].

#### 3.3

##### **script identifier**

identifier used to indicate the script or writing system variations that distinguish the written forms of a language or its dialects

[2.2.3 - IETF RFC 5646]

#### 3.4

##### **form of a language**

designator represented by a certain script in a certain language

#### 3.5

##### **jurisdiction domain**

territorial range of a law or a set of laws

EXAMPLE science, education, food, health, medicinal product

#### 3.6

##### **jurisdiction type**

extent of right and power of a law or a set of laws

EXAMPLE mandatory, recommendation, optional

#### 3.7

##### **binomial system**

binomial naming system

binomial nomenclature

formal system of naming species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms, the first part is the Genus to which the species belongs and the second part is the species name

#### 3.8

##### **type specimen**

particular specimen or a group of specimens of an living thing to which the scientific name of that living thing is formally attached

**3.9****kind of type**

kind of type specimen classified in delimiting level from other species

EXAMPLE holotype, paratype, neotype, syntype, lectotype, paralectotype, hapantotype

**3.10****kingdom**

one of the three parts into which the natural world is divided

[Longman Dictionary of Contemporary English, 5th]

**3.11****part of interest**

medicinal part

part of origin

part of **natural material** (3.1) that is intended to utilize as raw material for **herbal medicament** (3.2)

EXAMPLE bud, fruit, leaf, bark, rhizome, root

**3.12****initial procedure**

operation(s) carried out just after harvest in the place, usually intended to separate **part of interest** (3.11) from other part of **natural material** (3.1)

EXAMPLE roughly washing, sketchily cutting out from other part e.g. removing shell, drying; mildew and rot

**3.13****processing type**

**superordinate concept** (B.3.2.13) of treatment for making medicinal from **part of interest** (3.11)

EXAMPLE filtering, cutting, washing, decoction, heating, exposure to sunlight, fermentation

NOTE actual **processing method** (3.14) may be classified into several **processing types** (3.13)

**3.14****processing method**

**subordinate concept** (B.3.2.14) of treatment for making medicinal from **part of interest** (3.11)

EXAMPLE filtering by sieve, wind, and water; immersion, stewing, boiling, steaming; frying, calcining, roasting

**3.15****adjuvant material**

adjuvant

**natural material** (3.1) or processed **natural material** (3.1) that is not expected medicinal role by itself but has the role to help or enhance pharmacological efficacies and decrease toxicity of **part of interest** (3.11) during treatment for making medicinal from **part of interest** (3.11)

EXAMPLE rice, liquor, vinegar, honey

**3.16****substance**

any matter of defined composition that has discrete existence, whose origin may be biological, mineral or chemical

NOTE 1 In the context of specifying the conceptual framework of herbal medicament, substance is detectable by laboratory test result(s) or the profile of them, and usually perceived by them.

NOTE 2 Substances can be single substances, mixture substances or one of a group of specified substances. Single substances are defined using a minimally sufficient set of data elements divided into five types: chemical, protein, nucleic acid, polymer and structurally diverse. Substances may be salts, solvates, free acids, free bases or mixtures of related

compounds that are either isolated or synthesized together. Pharmacopoeial terminology and defining characteristics will be used when available and appropriate. Defining elements are dependent on the type of substance.

NOTE 3 Discrete existence refers to the ability of a substance to exist independently of any other substance. Substances can either be well-defined entities containing definite chemical structures, synthetic (i.e. isomeric mixtures) or naturally occurring (i.e. conjugated oestrogens) mixtures of chemicals containing definite molecular structures, or materials derived from plants, animals, microorganisms or inorganic matrices for which the chemical structure may be unknown or difficult to define. Substances may be salts, solvates, free acids, free bases and mixtures of related compounds that are either isolated or synthesized together.

[ISO/FDIS 11238] except NOTE 1

### 3.17

#### medical domain type

**specific concept** (B.3.2.16) of medical domain **generic concept** (B.3.2.15)

NOTE Broadly prevailed modern medicine is also one of types of medical domain.

EXAMPLE Ayurveda and traditional Indian medicine, traditional African medicine, traditional Australian medicine (Aboriginal medicine), traditional Canadian medicine, Chinese medicine or traditional Chinese medicine (TCM), traditional Japanese medicine (Kampo), traditional Mongolian medicine, traditional New Zealand medicine (Maori medicine), and Thailand, Tibetan, Vietnamese, and so on. See Annex E.

### 3.18

#### dose form

dosage form

physical form applied to medicament intended for adequate administration and/or consumption

EXAMPLE pill, tablet, capsule, syrup, decocted fluid, aerosol or inhaler, liquid injection, pure powder or solid crystal

### 3.19

#### value

**designator** (B.3.4.1) of **characterizing concept** (A.2.2.2) or **individual concept** (B.3.2.2) within a **characterizing generic concept** (A.2.3.3), i.e., **characterizing category** (A.2.3.3).

### 3.20

**characterizing concept** (A.2.2.2) [ISO 17115:2007]

**concept** (B.3.2.1) that is referenced by a **semantic link** (A.2.2.3) in a **composite characteristic** (A.2.2.1)

EXAMPLES "Bacterium" in the construct "Disease that hasCause Bacterium"; "Yellow" in the construct "SkinLesion that hasColor Yellow".

### 3.21 -1

**characterizing generic concept** (A.2.3.3) [ISO 17115:2007]

characterizing category

value domain

**formal category** (A.2.5.3) whose specialisation by a **domain constraint** (A.2.3.2) is allowed to be used as **characterizing concept** (A.2.2.2) in a particular context

EXAMPLE <INFECTIOUS\_ORGANISM> = {bacterium, virus, parasite}, in the context of "Infection that hasCause INFECTIOUS\_ORGANISM".

NOTE The context includes a **superordinate concept** (B.3.2.13) and a **semantic link** (A.2.2.3)

### 3.21 -2

**characterising category** (C.3.33) [EN 12264:2005]

range

value domain

set of **concepts** (C.3.1) which are allowed by a **domain constraint** (C.3.42) to specialise a concept in a particular **domain** (C.3.40)

NOTE The characterising category is usually described by a superordinate **concept** (3.15).

**EXAMPLE** Cause of inflammation: the set of bacteria, virus, parasite, autoimmune, chemical, physical, unknown, formally expressed e.g. "Cause Of Inflammation can Be (**semantic link**) set {bacteria, virus, parasite, autoimmune, chemical, physical, unknown}" (**characterising category**)

### 3.22 -1

**semantic link** (A.2.2.3) [ISO 17115:2007]

formal representation of a directed **associative relation** (B.3.2.23) or **partitive relation** (B.3.2.22) between two **concepts** (B.3.2.1),

**EXAMPLES** hasLocation (with inverse isLocationOf); isCauseOf (with inverse hasCause)

**NOTE 1** This includes all relations except the **generic relation** (B.3.2.21).

**NOTE 2** A semantic link always has an inverse, i.e. another semantic link with the opposite direction.

**NOTE 3** A semantic link can be part of a **composite characteristic** (A.2.2.1) where it describes the role of the **characterizing concept** (A.2.2.2). Similarly, it defines the role of a **characterizing generic concept** (A.2.3.3) in a sanctioned **characteristic** (B.3.2.4).

### 3.22 -2

**representation of relation type** (C.3.32) [EN 12264:2005]

semantic link

**formal representation** (C.3.5) of a directed **associative relation** (C.3.14) or **partitive relation** (C.3.13) between two y (C.3.1)

**EXAMPLE** has Location (with inverse is Location Of); is Cause Of (with inverse has Cause)

**NOTE 1** This includes all relations except the **generic relation** (3.11).

**NOTE 2** A semantic link always has an inverse, i.e. another semantic link with the opposite direction.

### 3.23

**formal category** (A.2.5.3) [ISO 17115:2007]

**generic concept** (B.2.1.4) represented by a **formal definition** (A.2.4.3)

**NOTE** This implies that the generic concept's **extension** (B.3.2.8) can be determined algorithmically and includes extensionally defined **concepts** (B.3.2.1) and formal **intensional definitions** (B.3.3.2).

### 3.24

**generic concept** (A.2.1.4) [ISO 17115:2007] [ISO 1087-1:2000]

category

**concept** (B.3.2.1) in a **generic relation** (B.3.2.21) having the narrower **intension** (B.3.2.9) [and the wider **extension** (B.3.2.8)]

## 4 Symbols (and abbreviated terms)

### 4.1

#### **HB**

herbal medicament (3.2)

### 4.2

#### **SNM**

single natural material (3.2)

### 4.3

#### **HB-SNM**

herbal medicament (3.2) made of single natural material

### 4.4

#### **HB-SNMs**

herbal medicaments (3.2) made of single natural material

NOTE Plural is targeted to HB (4.1).

## 5 Herbal medicaments made of single natural material

### 5.1 Overview

In the **formal concept representation system** (A.2.5.1) for the **subject field** (B.3.1.2) of the **herbal medicaments** (3.2) that is made of **single natural material** (3.1) with or without **adjuvant material(s)** (3.15) [A] abbreviated as HB-SNM (4.3), HB-SNM (4.3) has **semantic links** (A.2.2.3) to the following **characterizing categories** (A.2.3.3): **Source** (5.2.7), **Processing** (5.2.8), **Basic Characteristics** (5.2.9), **Constituent** (5.2.10), **Laboratory Test Profile** (5.2.11), **Biomedical Effect** (5.2.12), in addition, **Official Name** (5.2.1) and **Vernacular Name** (5.2.2).

For identifying HB-SNM (4.3), additional **characterizing categories** (A.2.3.3) are required, e.g. **Scientific Name** (5.2.3). Those are also specified in Clause 5.2.

**Semantic links** (A.2.2.3) among them are specified in Clause 5.3.

**Sanctioned characteristics** (A.2.3.1) is typically composed with **semantic links** (A.2.2.3) and **characterizing category** (A.2.3.3) to which **semantic link** (A.2.2.3) refers, as defined in EN 12264:2005 and ISO 17115:2007. Some of potential **characterizing categories** (A.2.3.3) in Clause 5.2 may be referred to by different **semantic links** (A.2.2.3) specified in Clause 5.3 because different relations may occur in different **contexts** (B.3.6.10), although the focused **subject field** (B.3.1.2) is adequately limited.

**Concept name** (A.2.4.4) in a **formal concept representation system** (A.2.5.1) is independent from the **terms** (B.3.4.3) used in the actual world, or, should be independently given. However, some International Standards on terminology work feasibly request the analysis of **terms** (B.3.4.3) or words used by people in general and the concept structures behind them [5-8]. In addition, anyway, only those **terms** (B.3.4.3) are able to designate certain **concepts** (B.3.2.1) in the real world. These are the reasons why the **categorial structures** (A.2.4.5) for **designators** (B.3.4.1) are also included in the present Technical Specification.

The outline of the relations among mentioned above is illustrated in a **concept diagram** (B.3.2.12) in Figure 1.





## 5.2 Characterizing Categories

### 5.2.1 Official Name

**designator** (B.3.4.1) of herbal medicament (3.2) which is defined in a pharmacopoeia or national authorized document(s) in each country

NOTE 1 **official name** (5.2.1) **characterizing category** (A.2.3.3) that is valid for representation of a herbal medicament (3.2) is: { official names of herbal medicaments addressed in pharmacopoeias }.

NOTE 2 **values** (3.19) for **official name** (5.2.1) are addressed in some references listed in bibliography [47-55] but not limited to them.

NOTE 3 **official name** (5.2.1) **characterizing category** (A.2.3.3) that are valid for representation of a herbal medicament (3.2) with: { source identifier }, { country identifier }, { language identifier }, { script identifier }, { jurisdiction domain }, { jurisdiction type }.

NOTE 4 **source identifier** (B.3.8.10), **country identifier** (B.3.8.9), and **language identifier** (B.3.8.8) are defined in ISO 1087-1:2000 [1]. **script identifier** (3.3) is defined in IETF RFC 5646 [10]. **jurisdiction domain** (3.5) and **jurisdiction type** (3.6) are defined in Cause 3 of this Technical Specification.

NOTE 5 **values** (3.19) for **country identifier** (B.3.8.9), **language identifier** (B.3.8.8) and **script identifier** (3.3) are respectively addressed in ISO 3166-1:2006 [15], ISO 3166-2:2007 [16], ISO 3166-3:1999 [17], ISO 639-1:2002 [11], ISO 639-2:1998 [12], ISO 639-3:2007 [13], and ISO 15924:2004 [14].

NOTE 6 **country identifier** (B.3.8.9) and **language identifier** (B.3.8.8) has better to be specified within IETF language tag defined in IETF RFC 5646 [10].

NOTE 7 Although in rare case, officially regulated **term** (B.3.4.3) designates different herbal medicament (3.2) **objects** (B.3.1.1) in a same country: one is in medicinal product domain, and another is in medical education domain [49,51,52]. This is the reason why **jurisdiction type** (3.6) is prepared.

NOTE 8 Some pharmacopoeia define “**official name** (5.2.1) in Latin” besides “**official name** (5.2.1) in country official language”, but those “Latin names” are not **scientific names** (5.2.3). Therefore, they vary among pharmacopoeias, in other words, there are lots of **synonyms** (B.3.4.19).

NOTE 9 Some pharmacopoeias often define “**official names** (5.2.1) in country language” at different levels on hierarchical relations among a group and the name of top node represents other **subordinate concepts** (B.3.2.14). However, there is no “**official name** (5.2.1) in Latin” equivalent for those names of subordinates. Such situation has the risks of confusion in the base if top word and subordinate words are morphologically similar in their **form of a language** (3.4) [50-52,54].

### 5.2.2 Vernacular Name

**designator** (B.3.4.1) of **origin** (5.2.4), **source** (5.2.7) or herbal medicament (3.2) in a **form of a language** (3.4) that ordinary people use in a certain country or locality, especially one that is not officially authorized **official name** (5.2.1) or **scientific name** (5.2.3)

NOTE 1 **vernacular name** (5.2.2) **characterizing category** (A.2.3.3) that is valid for representation of a herbal medicament (3.2) is: { vernacular name }.

NOTE 2 **values** (3.19) for **vernacular name** (5.2.2) are addressed in some references listed in bibliography [25-36] but not limited to them.

NOTE 3 **vernacular name** (5.2.2) **characterizing category** (A.2.3.3) that are valid for representation of a herbal medicament (3.2) includes: { country identifier }, { language identifier }, { script identifier }.

NOTE 4 **country identifier** (B.3.8.9), and **language identifier** (B.3.8.8) are defined in ISO 1087-1:2000 [1]. **script identifier** (3.3) is defined in IETF RFC 5646 [10].

NOTE 5 **values** (3.19) for **country identifier** (B.3.8.9), **language identifier** (B.3.8.8) and **script identifier** (3.3) are respectively addressed in ISO 3166-1:2006 [15], ISO 3166-2:2007 [16], ISO 3166-3:1999 [17], ISO 639-1:2002 [11], ISO 639-2:1998 [12], ISO 639-3:2007 [13], and ISO 15924:2004 [14].

NOTE 6 **country identifier** (B.3.8.9) and **language identifier** (B.3.8.8) has better to be specified within IETF language tag defined in IETF RFC 5646 [10].

NOTE 7 **vernacular name** (5.2.2) is not official, however, it is often like **official name** (5.2.1) and is commonly used in international trading. In addition, some of **vernacular name** (5.2.2) are polysemic. As a result, the extents of **polysemy** (B.3.4.24) refer not only to HB-SNM (4.3) but also **origin** (5.2.4) and **source** (5.2.7). Consequently, **vernacular names** (5.2.2), **official names** (5.2.1), name of **origin** (5.2.4) and name of **source** (5.2.7) may be lead to confusion in identification of herbal medicament (3.2) and related **objects** (B.3.1.1).

### 5.2.3 Scientific Name

**designator** (B.3.4.1) of **origin** (5.2.4) used by scientists, especially the name of taxonomic node of a creature

NOTE 1 **scientific name** (5.2.3) **characterizing category** (A.2.3.3) that is valid for representation of a HB-SNM (4.3) is: { scientific name of origin addressed in authorized terminological resources }.

NOTE 2 **scientific name** (5.2.3) **characterizing category** (A.2.3.3) that are valid for representation of a HB-SNM (4.3) with: { source identifier }, { type specimen }, { kind of type }.

NOTE 3 **source identifier** (B.3.8.10) is defined in ISO 1087-1:2000 [1]. **type specimen** (3.8) and **kind of type** (3.9) are defined in Cause 3 of this Technical Specification.

NOTE 4 **values** (3.19) for **source identifier** (B.3.8.10) **characterizing category** (A.2.3.3) that is valid for representation of a HB-SNM (4.3) is: [ International Code of Botanical Nomenclature | International Code of Nomenclature of Bacteria | International Code of Zoological Nomenclature | International Mineralogical Association Official List of Mineral Names ].

NOTE 5 **values** (3.19) for **scientific name** (5.2.3) are addressed in terminological resources specified with **source identifier** (B.3.8.10). Those resources are respectively maintained by International Botanical Congress [18], International Committee on Systematics of Prokaryotes [19], International Commission on Zoological Nomenclature [20], and International Mineralogical Association, Commission on New Minerals and Mineral Names / Commission on New Minerals, Nomenclature and Classification [21].

NOTE 6 "**official name** (5.2.1) in Latin" is quite different from **scientific name** (5.2.3). **scientific name** (5.2.3) is fundamentally unique in its domain due to the design of a terminology and the maintenance policy about those.

NOTE 7 In rarely, **designation** (B.3.4.1) with **binomial system** (3.7) with suffixed cannot identify what this living thing is. In such case, other **designator** (B.3.4.1) and/or **botanical feature** (5.2.5) **characterizing category** (A.2.3.3) may be utilized in order to identify **origin** (5.2.4), as a result, in identification of **source** (5.2.7) and HB-SNM (4.3) **object** (B.3.1.1).

### 5.2.4 Origin

plant, animal, or mineral of which part is interested as raw material for herbal medicament (3.2)

NOTE 1 **origin** (5.2.4) is officially designated by **scientific name** (5.2.3).

NOTE 2 **values** (3.19) for **origin** (5.2.4) are addressed in some references listed in bibliography [24-39,47-55] but not limited to them.

NOTE 3 **origin** (5.2.4) **characterizing category** (A.2.3.3) that is formally valid for representation of a HB-SNM (4.3) with: { kingdom }, { part of interest }.

NOTE 4 **values** (3.19) for { part of interest } subordinate **characterizing categories** (A.2.3.3) of **origin** (5.2.4) are described in some references listed in bibliography [25-39,47-55] but not limited to them.

NOTE 4 **origin** (5.2.4) **characterizing category** (A.2.3.3) that is recommended for valid representation of a HB-SNM (4.3) with: { botanical feature }.

NOTE 5 **origin** (5.2.4) is designated whether **scientific name** (5.2.3) or **vernacular name** (5.2.2). **origin** (5.2.4) is identified by **botanical feature** (5.2.5), this is helpful especially when its **scientific name** (5.2.3) is **polysemy** (B.3.4.24). **origin** (5.2.4) predetermines the **characteristics** (B.3.2.4) of **source** (5.2.7), and then HB-SNM (4.3) **object** (B.3.1.1).

### 5.2.5 Botanical Feature

biological and morphological features of a particular plant

NOTE 1 **botanical feature** (5.2.5) **characterizing category** (A.2.3.3) that is valid for representation of a HB-SNM (4.3) includes, but not limited to: { habit }, { geographical distribution }, { morphology }, { size }, { color }, { flowering time }, { vegetation }, { life cycle }.

NOTE 2 some subordinate **characterizing categories** (A.2.3.3) listed in NOTE 1 may be used in combination with each other.

NOTE 3 some **values** (3.19) for **botanical feature** (5.2.5) and its subordinate **characterizing categories** (A.2.3.3) are described in some references listed in bibliography [25-28,32-36,39,48,50,52] but not limited to them.

NOTE 4 **botanical feature** (5.2.5) belongs to **origin** (5.2.4) in the representation of a HB-SNM (4.3).

### 5.2.6 Harvest

collection of factors during harvest of **natural material** (3.1), that influence **characteristics** (B.3.2.4) of **source** (5.2.7)

NOTE 1 **harvest** (5.2.6) **characterizing category** (A.2.3.3) that are valid for representation of a HB-SNM (4.3) includes, but not limited to: { region }, { season }, { weather }, { age }, { condition }, { cultivation }, { initial procedure }.

NOTE 2 some **values** (3.19) for **harvest** (5.2.6) and its subordinate **characterizing categories** (A.2.3.3) are described in some references listed in bibliography [25-28,32-36,39,48,50,52] but not limited to them.

NOTE 3 **harvest** (5.2.6) qualifies the **characteristics** (B.3.2.4) of **source** (5.2.7), and then HB-SNM (4.3) **object** (B.3.1.1).

### 5.2.7 Source

part of **origin** (5.2.4) that is utilized as raw material for herbal medicament (3.2)

NOTE 1 **source** (5.2.7) **characterizing category** (A.2.3.3) that is valid for representation of a HB-SNM (4.3) includes: { part of origin }; and { origin }.

NOTE 2 **part of origin** (3.13) is defined in Cause 3 of this Technical Specification.

NOTE 3 **values** (3.19) for **part of origin** (3.13) subordinate **characterizing categories** (A.2.3.3) of **origin** (5.2.4) are described in some references listed in bibliography [25-39,47-55] but not limited to them.

NOTE 4 **source** (5.2.7) **characterizing category** (A.2.3.3) that is recommended for valid representation of a HB-SNM (4.3) with: { basic characteristics }, { harvest }.

NOTE 5 **values** (3.19) for **source** (5.2.7) are addressed in some references listed in bibliography [24-39,47-55] but not limited to them.

NOTE 6 **source** (5.2.7) is characterized by **harvest** (5.2.6) and can be identified by **basic characteristics** (5.2.9). **source** (5.2.7) provides **constituent** (5.2.10). **source** (5.2.7) may be processed by **processing** (5.2.8). **processing** (5.2.8) may modifies **constituent** (5.2.10).

### 5.2.8 Processing

minimum unit of making **source** (5.2.7) ready to be used with preserving or improving of their **characteristics** (B.3.2.4) on medicament in some way

NOTE 1 **processing** (5.2.8) **characterizing category** (A.2.3.3) that are valid for representation of a HB-SNM (4.3) includes: { processing type }, { processing method }, and { adjuvant material }.

NOTE 2 **processing type** (3.13), **processing method** (3.14) and **adjuvant material** (3.15) are defined in Cause 3 of this Technical Specification.

NOTE 3 **values** (3.19) for **processing** (5.2.8) and its subordinate **characterizing categories** (A.2.3.3) are described in some references listed in bibliography [25,39,48,50,52] but not limited to them.

NOTE 4 **processing** (5.2.8) processes **source** (5.2.7) with or without **adjuvant material** (3.15). **processing** (5.2.8) affects **basic characteristics** (5.2.9) of **source** (5.2.7). **processing** (5.2.8) may modifies **constituent** (5.2.10).

### 5.2.9 Basic Characteristics

macroscopic or organoleptic **characteristics** (B.3.2.4) of **source** (5.2.7) or HB-SNM (4.3)

NOTE 1 This definition implies that HB-SNM (4.3) is a product after **processing** (5.2.8). Some **processing** (5.2.8) changes **basic characteristics** (5.2.9).

NOTE 2 **basic characteristics** (5.2.9) **characterizing category** (A.2.3.3) that are valid for representation of a **source** (5.2.7) or a HB-SNM (4.3) includes, but not limited to: { shape }, { size }, { colour }, { gloss }, { texture }, { heaviness }, { smell }, { taste }, { condition }.

NOTE 3 some subordinate **characterizing categories** (A.2.3.3) listed in NOTE 2 may be used in combination with each other.

NOTE 4 **values** (3.19) for the subordinate **characterizing categories** (A.2.3.3) of **basic characteristics** (5.2.9) are described in some references listed in bibliography [25,26,28,32-36,48,50,52-54] but not limited to them.

NOTE 5 **basic characteristics** (5.2.9) belong to **source** (5.2.7) and HB-SNM (4.3) respectively, in the representation of a HB-SNM (4.3). **processing** (5.2.8) affects **basic characteristics** (5.2.9) of **source** (5.2.7) and changes it into **basic characteristics** (5.2.9) of HB-SNM (4.3). **basic characteristics** (5.2.9) is helpful to identify **source** (5.2.7) and HB-SNM (4.3).

### 5.2.10 Constituent

**substance** (3.16) present within a **source** (5.2.7) or a herbal medicament (3.2) [modified from ISO/FDIS 11238]

NOTE 1 Constituents can be not only chemical substances that have **biomedical effect** (5.2.12) but also impurities, degradants, markers or signature substances. [modified from ISO/FDIS 11238] [45]

- **source** (5.2.7) may contains not only degradation substance but also precursor, unstable substance in pathway of biochemical series of reactions, and derivatives