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## Plant Names around Kwan Phayao, Thailand: A Cognitive Linguistic Study

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### Abstract:

This study aimed to analyze metaphor, metonymy, and metaphonymy and their frequency of occurrence in northern plant names around Kwan Phayao (Phayao Lake), Phayao Province, Thailand. Qualitative and quantitative research collected 326 local plant names for 171 plant species from nine communities around the lake. The instrument consisted of pictures of each plant and recorders. Eighteen local people who were aged more than 50 years and had been living around the lake for more than 10 years were randomly selected from each community. According to the findings, arbitrariness between language form and its meaning accounted for the highest percentage of plant naming (57%), whereas cognitive linguistic processing, which included metonymies (34%), metaphors (7.3%), and metaphonymies (1.5%), accounted for 43%.

**Keywords:** plant names, cognitive linguistics, metaphor, metonymy.

## 泰国关帕尧周围的植物名称：一项认知语言学研究

### 摘要：

本研究旨在分析泰国帕天府关帕天（帕天湖）周围的北方植物名称中的隐喻、转喻和转喻及其出现频率。定性和定量研究收集了湖周围 9 个群落 171 种植物的 326 个当地植物名称。该仪器由每种植物的图片和记录器组成。每个社区随机抽取 18 名 50 岁以上、在湖边居住 10 年以上的当地人。研究结果显示，植物命名中语言形式与意义之间的任意性所占比例最高（57%），而认知语言处理则包括转喻（34%）、隐喻（7.3%）和隐喻（1.5%），占 43%。

**关键词：**植物名称、认知语言学、隐喻、转喻。

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## 1. Introduction

Many studies on various topics in both verbal and nonverbal languages have confirmed that metaphor and metonymy play dominant roles in cognitive linguistics and related fields, such as “people are plants” in the Hebrew Bible (Basson, 2006), “human being is a plant” in English and Polish (Filipczuk-Rosińska, 2016), food idioms in English (Negro, 2019), understanding creativity in the Japanese fashion (Uno et al., 2019), auto-part terms in Thai (Wongwattana, 2022), and older adults’ descriptions of stressful events that may lead to stress disorder (Rossi et al., 2023).

The study of metaphor and metonymy on plants could reveal some cognitive information related to the speakers of that language on how they conceptualize or interact with the plants. For example, “people are plants” in the Hebrew Bible (Basson, 2006) implies that people perceptualize plants as animate like human beings or vice versa, as appeared in “human being is a plant” in English and Polish (Filipczuk-Rosińska, 2016). Moreover, Singnoi (2011) showed that Thai people interact with plants by experiencing their functions and qualities through the plant names. The study of metaphor and metonymy on plants not only demonstrates a dominant role of the cognitive process of people in the language’s function but also expresses relations between language and the speakers’ concept of the environment around them – how the environment affects their ways of life.

Therefore, a cognitive linguistic study of metaphor and metonymy of the plant names from people around Phayao Lake, Thailand, could provide linguistic, cognitive, and ecolinguistic perspectives. In linguistics, the study of language by applying scientific methods, this research shows language variations among the Northern Thai dialect in Phayao province and some etymology of the names. In cognitive linguistics, this study presents the major cognitive processes coordinating with language use in the local dialect. In ecolinguistics, which views human beings as a part of the ecosystem as well as language, this research implies the roles of the people interacting with the plants, for example, cook or utiliser of the plants from the metonymy “cooking for plants” in [khaw6n+ɲ3] (rice-stream) ‘sticky rice’.

### 1.1. Objectives

1. To analyze metaphor, metonymy, and metaphonymy found in Northern Thai dialect (Phayao) plant names;
2. To analyze the frequency of metaphor, metonymy, and metaphonymy in Northern Thai (Phayao) dialect plant names.

## 2. Literature Review

Lakoff and Johnson (1999) proposed that metaphor and metonymy play significant roles in human language and cognition. Human beings understand new experiences on the basis of old experiences by using

these cognitive processes and then expressing their view through language use.

### 2.1. Metaphor

Metaphor is fundamentally a sub-branch of linguistics. A metaphor is a figure of speech that draws parallels between two dissimilar objects and emphasizes their similarities. A metaphor, as opposed to a straightforward comparison using words such as “like” or “as”, directly claims that one thing is another. By relying on the properties of the other object, this comparison is frequently used to communicate a deeper or more vivid knowledge of the subject. Metaphor is widely used in literature, poetry, and daily language to create imagery, elicit emotions, and communicate complicated ideas in a more relevant and understanding way.

### 2.2. Metonymy

Metonymy is a figure of speech that is similar to metaphor but with a slight difference in emphasis. Metonymy is a substitution of one word or phrase for another that is closely similar or associated with it in context or meaning. Unlike metaphors, this substitution is based on a logical or contextual connection rather than a literal parallel. Metonymy is frequently employed to achieve a specific impact, highlight a specific aspect, or bring variety to language. It is based on the assumption that the replacement phrase is closely related or linked to the intended meaning.

Metonymy enriches language by allowing writers and speakers to use shorthand to refer to thoughts, ideas, or objects related to the main subject. It is a type of figurative language that focuses on word associations and linkages within a specific context.

### 2.3. Metaphonymy

Goosens (1990) explained the above two terms, which can be described as two distinctive cognitive processes. The term “metaphonymy” is a combination of “metaphor” and “metonymy,” and they are used in a specific way. Goosen (2003, cited by Sanzharova, 2021, pp. 8-20) then identified four types of metonymies.

1. Metaphor from metonymy or metonymy from metaphor, which occurs when the cognitive process starts to form meaning from metonymy, then people use it as a metaphor. For example, “She giggled.” The word “giggle” in this sentence is from “a part for the whole” or “sound for action,” which is metonymy. However, in “She speaks as if giggling,” “giggle” was used as a metaphor.

2. Metonymy within metaphor refers to the process by which metonymy occurs as a part of a metaphor. For example, “to bite one’s tongue off” is formed from the “tongue for speaking” metonymy, but the whole expression is used as an idiom, which means someone regrets what s/he just said.

3. Demetonymization within a metaphor refers to the process when metonymy is less salient than metaphor. For instance, “to pay lip service to” means to support

someone with words. The main meaning is the “speech is service” metaphor, whereas the “lip for speech” metonymy becomes less noticeable.

4. Metaphor within metonymy refers to the process by which a metaphor is hidden within metonymy. To illustrate, “being/getting up on one’s hind legs,” which means disagreeing, hides the metaphorical concept of “a human is an animal” by mapping a horse to a human being. The action of a horse when it gets up on its back legs shows its struggle with someone or something. Therefore, the “a human is an animal” metaphor is underground in the “action for an objective” metonymy, representing the disagreement of someone.

### 3. Methodology

This research is both quantitative and qualitative. The qualitative study analyzed metaphor, metonymy, and metaphonymy, and the quantitative research showed the frequency of occurrence of the mentioned cognitive-linguistic processes in the local plant names. The following steps were used to conduct the research.

#### 3.1. Population and Sample

The population of this research was local people over 50 years old and domiciled in villages or communities around Kwan Phayao, Phayao Province, Thailand. Heads of the communities purposively selected the 2 samples from each community as those who were supposed to have expertise in local plants. Therefore, the samples were willing to participate because the informants in this research included 18 persons from 9 communities.

#### 3.2. Instruments

One hundred and seventy-four lists of standard Thai plant names (Kaewnandee & Chulalongkorn University, 1993) were used as a reference for research on local plants. Even though Central Thailand and Northern Thailand are different in geography, more than 80% of the plant names listed could be found in Northern Thailand in general. In addition, the lists include varieties of plant categories such as trees, plants, flowers, grains, and herbs. Therefore, the data collected would vary and reveal some variable metaphor and metonymy. Moreover, the photos illustrating the plants’ overview, fruits, and flowers were presented to the informants to name their terms in their native tongue. Recorders were also used to record the local names of the plants, folk etymology, and utility.

#### 3.3. Data Collection

The informants were asked to look at the pictures of the plants one by one in the Northern Thai dialect. Then, they told the name of each plant in their mother tongue (a northern Thai dialect) twice. Finally, they would inform the researchers of each plant’s folk etymology and utility. The inclusion criteria include all plant names from the lists that the informants could provide, and variations of the names might be found.

The exclusion criteria included plants that no informants could name.

#### 3.4. Data Analysis

The local plant names were analyzed based on the linguistic structures of Thai plant names (Singnoi, 2006), which consist of two types: plain and complex structures. The plain structure contains a head (core) + modifier(s). The complex structure is a combination of a folk taxonomic class term and the plain structure, for example, GNCLT (generic class term) + core in [tôn + campii] (stalk Magnolia x alba) ‘Magnolia x alba.’ The research applied only the plain structure of the names as basements to analyze metaphor, metonymy, and metaphonymy implied in the local terms. For instance, the name [bàʔkʰâwkʰay] (fruit-horn-water buffalo) ‘water caltrops’ consists of the fruit class term [bàʔ] and a core [kʰâwkʰay]. Thus, only the CORE part can be metaphorically analyzed. After analyzing qualitative data, the metaphors, metonymies, and metaphonymies were counted in terms of their frequency of occurrence and presented in percentages.

### 4. Results

From 171 plant species found in 9 communities around Kwan Phayao, 326 local plant names were collected and analyzed. Table 1 displays the results.

Table 1. Frequency of the occurrence of local plant names around Kwan Phayao (The authors)

Analysis	Frequency of occurrence (names)	Percentage
Arbitrariness	187	57.4
Metonymy	107	32.8
Metaphor	24	7.4
Metaphonymy	8	2.5
Total	326	100

The analysis showed the highest frequency of an arbitrary relation between language and meaning in the local plant names (57.4%). However, it presented some cognitive processes, including metaphor, metonymy, and metaphonymy (43.6%). In the cognitive process of naming the plants, the local people applied metonymy more than other types of processes, followed by metaphor and then metaphonymy.

Arbitrariness between language and meaning was presented in [cákkaí] ‘lemon grass’, [càncõ:] ‘Laportea interrupta’, and [bàʔkõ:] ‘pomegranate’. Metaphor was used in [bàʔkʰâwkʰay] (fruit-horn-water buffalo) ‘water caltrops’, and [prikduəykaì] (chili-spur-cock) ‘goat pepper’. Metonymy was revealed in [yā:cíyòm] (grass-touch-stoop) ‘sensitive plant’ and [pʰákkudkʰõŋ] (vegetable-crooked-bow) ‘edible fern’. Metaphonymy was shown in [bàʔkʰuəlaika:ŋkõb] (fruit-eggplant-line-jaw-frog) ‘cock roach berry’ and [dòkbuəpʰad] (flower-lotus-turn) ‘sunflower’. These cognitive processes are explained in detail below:

#### 4.1. Metonymy

Metonymy shows the referential relationship

between language and human cognition. People use a linguistic form as a referent point to refer to something it is closely related to within the same domain of the concept. Table 2 presents various types of metonymies found in the local plant names.

Table 2. Frequency of the occurrence of metonymy (The authors)

Metonymies	Frequencies of Occurrence (Names)	Percentage
Quality of the plant	52	48.5
Shape of the plant	21	19.6
Origin of the plant	13	12.2
Habitat of the plant	9	8.4
Part for the whole	5	4.7
Cooking of the plant	4	3.7
Season of the plant	1	0.9
Time of the plant	1	0.9
Motion of the plant	1	0.9
Total	107	100

The “quality of the plant” metonymy was demonstrated in the modifiers indicating specific characteristics of each plant, such as color, pattern, size, smell, taste, and quality. For example, [bàʔtæŋlai] (fruit-melon-stripe) ‘cantaloupe’ conveyed the words [bàʔtæŋ] (fruit-melon) ‘cucumber’ denoting the plant category and used the word [lai] ‘stripe’ to identify the specific plant species by its outstanding stripes. Therefore, people used the significant plant’s qualities to label the plant.

The “shape of the plant” metonymy was implied in [ŋiwsǝ:y] (Bombax ceiba-bunch) ‘Ceiba pentandra or white silk cotton.’ The word [sǝ:y] ‘bunch,’ which referred to shape of cotton wool from its pods, was applied to pinpoint this plant.

The “origin of the plant” metonymy refers to the understanding of using the plant’s origin as a reference point to distinguish it from other similar plants. For example, the name [campa:law] (Magnolia champaca-Lao) ‘Plumeria’ conveyed the word [law] ‘Lao,’ which referred to the Lao People’s Democratic Republic, the origin of this plant, to represent the plant specification. Hence, people could recognize the plant in terms of its origin.

The “habitat of the plant” metonymy revealed in the name [pʰàknǝ:ŋnàm] (vegetable-swamp-water) ‘water mimosa’. The word [nǝ:ŋnàm] (swamp-water) ‘swamp,’ which is the habitat of the water mimosa, is used to refer to this plant.

The “part for the whole” metonymy is presented in [bàʔŋǝŋ] (fruit-stem) ‘water caltrops.’ People used the word [ŋǝŋ] ‘stem,’ which is a part of the whole plant, to refer to the ‘water caltrops’ plant.

The “cooking of the plant” metonymy was used in [kʰâ:wŋûŋ] (rice stream) ‘sticky rice,’ where the word ‘stream’ is a cooking method and used to indicate particular rice.

The “season of the plant” metonymy was presented

in [tônlomlǝ:ŋ] (tree-wind-drought) ‘Cassia javanica or rainbow shower tree’ in which the word [lomlǝ:ŋ] (wind-drought) represents drought, the period of the flower blossom. The metonymic relationship was established by understanding the season or blossom period, which is one event in the plant’s life cycle in relation to the entire concept of this plant.

The “time of the plant” metonymy was revealed in the name [manhǎ:natʰi:] (five-minute sweet potato) ‘cassava’. The words [hǎ:natʰi:] ‘five minutes’ demonstrated the period of cooking this type of cassava. People used the concept of cooking time to represent the plant, so it was considered a metonymy.

The “motion of the plant” metonymy refers to the use of the plant’s motion concept to recognize the entire concept of that plant, as illustrated by the name [ÿa:cíÿǝm] (grass-touch-stoop) ‘sensitive plant.’ Stooing is the plant’s noticeable reaction when its leaves are touched. The words of this event were then used to advocate for the plant.

#### 4.2. Metaphor

Metaphor is the cognitive process that people use to understand one thing in terms of another. To compare the two things, there are two domains of concepts: the source domain and the target domain. The source domain is the known knowledge or thing that people already know, but the target domain is the unknown or new thing that people are trying to understand. The metaphor found from the analysis of the local plant names is presented in Table 3.

Table 3. Frequency of the occurrence of metaphor (The authors)

Metaphor	Source	Target	Frequency of occurrence	Percentage
A plant is an animal	Animal	Plant	17	70.8
A plant is material	Material	Plant	3	12.5
A plant is a human	Human	Plant	2	8.3
A plant is a container	Container	Plant	2	8.3
Total			24	100

Among the 24 metaphors in the plant names, animal metaphors appeared most often (70.8%). People tend to use the physical parts of animals to name similar-looking parts of plants such as [bàʔkʰáwkʰay] (fruit-horn-water buffalo) ‘water caltrops’ and [prikduǝykài] (chili-spur-cock) ‘goat pepper.’ The source domain presented the concept or knowledge about animals that people already knew (mostly physically). Meanwhile, the target domain was constructed with shared information from the source domain to conceptualize the new, similar — the plants. The name [bàʔkʰáwkʰay] (fruit-horn-water buffalo) ‘water caltrops’ applied the concept of the buffalo’s horns as the source domain to determine the dominant characteristics of the water caltrops’ roots in the target domain. Likewise, the name [prikduǝykài] (chili-spur-cock) ‘goat pepper’ applied the characteristics of the cock’s spur as the source

domain and matched the outstanding features of the fruits of the pepper in the target domain.

The material metaphors occurred in three names (12.5%), as shown in [dò:kk<sup>h</sup>ê:m] (flower-needle) ‘Ixora,’ [k<sup>h</sup>i:lèk] (dust-iron) ‘Cassia siamea,’ and [dò:kdáy] (flower-thread) ‘Celosia argentea or cockscomb.’ The source domain of the material metaphors included needles, iron, and thread. The target domain of the metaphors was plants. The mapping characteristics of these two domains were the figure and color of the materials, which looked like parts of the plants. The pointed shape of the ixora looked like a needle. The color of Cassia siamea leaves resembled the color of rust from iron. In addition, the color and thickness of the cockscomb flower seemed like the thread on the spool.

The human metaphors presented in [ỹa:cáwc<sup>h</sup>ũ:] (grass-flirtatious) ‘Chrysopogon aciculatus or burdock’ and [baʔk<sup>h</sup>ũ̀ə̀ɔ:lǎ:] (fruit-eggplant-unpleasant behavior for a girl to be a young mother) ‘Thai mini eggplant.’ People matched the characteristics of human beings in the source domain to the noticeable qualities of plants. The quality of the burdock that sticks to passing people’s pants easily in the target domain was conceptualized by the behavior of a flirtatious person who gets involved with or flirts with many people easily in the source domain.

The container metaphor was shown in the word [k<sup>h</sup>óŋ] ‘creel’ in the names [baʔbùəmk<sup>h</sup>óŋ] (fruit-Luffa

aegyptiaca or sponge gourd-creel) ‘Luffa aegyptiaca or sponge gourd’ and [baʔnóyk<sup>h</sup>óŋ] (fruit-Luffa acutangular or angled gourd-angle) ‘Luffa acutangular or angled gourd.’ The shape of the creel in the source domain was mapped to the shape of the angled gourd in the target domain.

It was found that people also applied metaphor and metaphor to name the plant [ŋa:6ha:ŋ5wa:j5] (grass-tail-Calameae) ‘Chromolaena odorata, Siam weed or bitter bush’. The word ‘tail’ refers to a part of an animal, and the word ‘Calameae’ refers to another plant. It shows that people call and conceptualize the Siam weed in terms of other conceptual domains with two metaphorical processes.

### 4.3. Metaphtonymy

Metaphtonymy is the interaction or cooperation between metaphor and metonymy (Goosens, 2003, cited by Sanzharova, 2021, p. 8). Two types of this interaction were found in this study. The cognitive process starts with a metaphorical concept and then extends the scope of meaning of the word by applying a metonymy named metaphor from metonymy or vice versa called metonymy from metaphor. In addition, when the interaction occurred, metonymy became less remarkable than metaphor. This process is called demetonymization inside a metaphor. The metaphtonymy found in the plant names is demonstrated in the following table.

Table 4. Frequency of the occurrence of metaphtonymy (The authors)

Metaphtonymy	Metaphor	Metonymy	Frequency of occurrence	Percentage
Demetonymization	Human plant	Motion	1	20
	Instrument	Shape	1	20
Metonymy from metaphor	Animal	Figure	2	40
Total			5	100

Three names demonstrated the interaction of demetonymization, such as [t<sup>h</sup>a:ntàwan] (eat-sun), which refers to a sunflower. [t<sup>h</sup>a:n] ‘eat’ (a polite word in standard Thai) was used as a “human” metaphor to compare the flower or plant to humans who can “eat” something. The word [t<sup>h</sup>a:n] ‘eat’ contains four main semantic features, including taking food into someone’s mouth, chewing and swallowing that food, and politeness (Singnoi, 2006). Therefore, this word is a collocation of ‘human being.’ Furthermore, the word [tàwan] ‘sun’ had a metonymy connection to a distinguishing feature of the sunflower, which always turns its flower toward the sun. This movement seems like the flower ‘eats’ the sunlight, which became the name of this plant. This interaction started from metaphor followed by metonymy; therefore, it was called metaphor-metonymy. In contrast, if the interaction started from metonymy, then metaphor, it would be called metonymy-metaphor. For instance, [baʔk<sup>h</sup>ũ̀ə̀ɔ:lǎ:yk<sup>h</sup>a:ŋkɔb] (eggplant-stripe-frog’s chin) ‘Thai green round eggplant’ presented the metonymy of vertical stripes of contrasting white and green colors on the surface of the eggplant’s fruits. Then, this pattern of stripes with white ground was mapped onto the pattern

of the frog’s vocal sac. Consequently, the source domain was “frog,” and the target domain was “eggplant.”

## 5. Discussion

This research shows findings relevant for Singnoi (2011) in several areas. First, the findings support that the locals mostly use proper names, revealing arbitrariness between meaning and form, to name the plants and tend to apply metaphor to conceptualize the plant names for the core part of the name and use metonymy for the modifier parts to identify the plants. Second, the animal metaphor and quality or characteristic metonymy demonstrated the highest frequency of occurrences in Thai plant names for both standard and local Thai uses.

Based on ecolinguistics in which Penz and Fill (2022) suggest expanding the research methodology to a multimodal perspective, for example, the relation of non-European languages and their environments, this research might be an example on how Northern Thai people present their view on their environment via their language. The people express their perception of the plants they know based on their experience, such as the

quality or usage of the plants. The study also reveals some exotic plants that come from other areas using the word ‘foreign’ or the country or area. Khudin (2019), who studied the phytonyms of medicinal plants in Russia, also found a relationship between language and the origin of the plant by tracing the etymology of the word.

Metaphonymy has rarely been mentioned in cognitive linguistic research because of its limited number of applications in human cognition compared with metaphor and metonymy. Therefore, limited research findings indicated specific types of metaphonymy, according to Goossens (1990). Fortunately, this research found two types of metaphonymy: metonymy from a metaphor and demetonymization inside a metaphor. This may provide those interested in metaphonymy with more examples and lead to a better understanding of this issue. Moreover, it is noticeable that in naming plants, the people can not only use a single metaphor or metonymy but also combine metaphor and metonymy at least once, as in [phikkhi:nu:diajkaj] (chili-feces-rat-spur-cock) referring to chili and [hɔ:mdɛ:ŋcin] (onion-red-China) referring to shallot.

Nevertheless, there are plenty of research topics waiting for linguists to discover from different languages and different perspectives, such as linguistic ethnobiology—the study of plant and animal names, for instance, animal terms (Rouhi & Mahand, 2011) and plant folk nomenclature (Addi et al., 2022).

However, based on the data collected, it was found that variations in the plant names appeared in this research because of the influence of the standard Thai language, which is presented in many names, especially when the informants could not recognize some names in their dialect at the time of giving the names.

## 6. Conclusion

The cognitive linguistic analysis of the 171 local plant names around Kwan Phayao or Phayao Lake in Northern Thailand found three processes playing an important role in naming the plant locally: metonymy, metaphor, and metaphonymy. Metonymically, people tended to associate the names with plant characteristics. Metaphorically, the locals experienced the plants most often in terms of animals. Metaphonymically, the interactions of the “animal” metaphor and “quality” metonymy, the “lotus” or “human” metaphor and “motion” metonymy, the “star” metaphor and “quality” metonymy, and the “gold” metaphor and “shape” metonymy were revealed. Thus, it is possible to conclude that local plant naming is typically based on the characteristics of each plant or depicted with animal similarity.

## 7. Limitations and Further Study

This study was conducted in a small area in a small province in the northern region of Thailand. Thus, the result of the study might not represent the whole

country and vary. As future research, a comparative study between people of different language backgrounds should be conducted.

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## Authors’ Contributions

In conducting this research, we first helped each other formulate the research topic and objectives. Then, we discussed and wrote the introduction together. After that, the first author wrote the literature review, and the second author is responsible for the research methodology. Fieldwork was conducted by the authors jointly. We wrote the result and discussion sections together. Finally, the second author put all the information from the research into the correct format and contacted the journal editor.

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