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Original Research Article

# Diversity, Traditional Uses of Convolvulaceae in That Phanom District, Nakhon Phanom Province, Thailand

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ABSTRACT

Species diversities of the Convolvulaceae in That Phanom District, Nakhon Phanom Province, Thailand, were studied between February and December 2021. The study identified eight genera and 28 species from the Convolvulaceae family. The genus *Ipomoea* was the most diverse species in the research area. The cultivated species include *Argyreia nervosa*, *Evolvulus glomeratus I. batatas*, *I. purpurea.* The species belonging to the family Convolvulaceae was found in four separate ecological types: deciduous dipterocarp forests, mixed deciduous forests, river basins, and cultivated areas such as home gardens or gardens. Native plants were more abundant than cultivated species. Many species experience peak blooming periods during the cold season, spanning from November to April, except for some species that flower during the rainy season, from May to October. Most species are herbaceous and woody climbers, except for *Ipomoea carnea* a non-climbing herb. Thirteen species were designated rare, while fifteen were labelled as plentiful. The IUCN database employs evaluation criteria to ascertain the conservation status of Convolvulaceae, identifying the inclusion of four species from this plant family. Members of this family have been used for various purposes, including as a source of food, medicinal plants, and decorative plants in local studies. *I. aquatica* and *I. barbatus* are utilised in culinary applications. The notable decorative plants are *Argyreia nervosa*, *Evolvulus glomeratus*, *Ipomoea batatas*, and *I. carnea.* The study provides comprehensive data on the biodiversity, conservation status, and traditional usage of the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, Thailand. This data can be harnessed as a significant renewable resource for future research.

***Keywords***: Diversity, Utilization, Convolvulaceae, That Phanom District, Nakhon Phanom Province

## Introduction

Thailand's great biodiversity is attributed to its tropical location north of the equator and its climate, which supports biodiversity development and habitation of various species. This environment supports the species in enduring changing climatic conditions. Thailand boasts the most diversified biological resources worldwide, owing to a combination of its unique topography and climate. Thailand is home to about 15,000 different plant species or 5.56% of all plant species worldwide. Thailand boasts a large number of woods. Thus, Thailand's plants can be used for various essential human needs, including food, fruits, and vegetables; building materials for homes (such as tables, chairs, and cabinets); medicine; and clothes.[1-8]

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The district of That Phanom is situated in the northeastern region of Thailand, in the province of Nakhon Phanom. It is 150-200 meters above sea level and ranges from a comparatively flat terrain to gently sloping slopes. It is currently among the regions in Northeastern Thailand with the least forest area, and its rate of forest area decrease is continuously declining.[9,10] This last remnant of an inheritance will most likely go soon. According to the district's forest status assessment, deciduous dipterocarp forests make up the majority of the forests. The people of That Phanom District benefit from diversification, including native cuisine, vegetables, medical procedures, ornaments, ceremonies, dye, indigenous cosmetics, and building supplies.[11] Traditions and wisdom from Thailand that have been passed down to the present day concern biodiversity. Thus, the vitality of That Phanom District lies in its ties to the local way of life, customs, and wisdom—a living capital that is inherent in all resources, including organisms, creatures, and forests—all of which signify numerous amounts and play a crucial role in the environment.[9-11]

As a result, research on plant diversity and how plants are used in community forests should be done. In addition to providing information to young people about plant species, their applications and the preservation of forest ecosystems and biodiversity are crucial elements to foster the study of conservation and understanding of utilizing plants in various disciplines.[12-20]

Attractive plants belonging to the Morning Glory Family (Convolvulaceae) are extensively grown as decorative plants. The Convolvulaceae family contains about 55 genera and 1930 species,

which have spread extensively across temperate and tropical climates, with tropical America and tropical Asia having the largest populations.[1-2] Judd *et al*.[2] identified the principal genera as *Ipomoea* (600 species), *Convolvulus* (250 species), *Cuscuta* (150 species), and *Jacquemontia* (120 species). Thai Convolvulaceae comprises ten genera, of which 26 species and one variant were investigated in Thailand by Na Songkhla and Khunwasi[5]. The taxonomy of twenty-seven species and one variant of Thai *Argyreia* was examined by Khunwasi *et al*.[7] Five genera and twenty-five species of Convolvulaceae were identified by Saensouk[6] in Muang District, Nong Khai Province. The climbing plant or herbaceous ground flora in Thai forests includes a sizable portion of the Convolvulaceae family. Numerous species are extremely uncommon and susceptible to extinction. This research aims to document and survey the species diversity of the Convolvulaceae family in the province of Nakhon Phanom, That Phanom District. This region is the least visited location in Northeastern Thailand near the Mekong River. However, this study's information on Convolvulaceae is crucial for the Flora of Thailand project. Consequently, there will undoubtedly be an increase in the number of species.

## Materials and Methods

*Plant material and diversity study*

A search and analysis were conducted for references to taxonomic studies on the Convolvulaceae. Between January and December 2021, field visits were conducted in the That Phanom District, Nakhon Phanom Province, Thailand, to gather voucher specimens of the Convolvulaceae family (Figure 1). Each specimen was deposited at the Herbarium of Mahasarakham University, located in the Maha Sarakham Province of Thailand. Convolvulaceae family diversity, colloquial names, ecological data, distribution data, and phenology were all noted in the field of the That Phanom District in Nakhon Phanom Province. The dominating features in the surrounding area were also identified, including colour. The plants under study were able to determine the accurate scientific name by consulting books and botanical publications from several countries that border Thailand. All the study's species were compared to specimens housed in herbaria abroad, such as those at the Department of National Parks, Wildlife and Plant Conservation (BKF), Bangkok Herbarium (BK), Khon Kaen University Herbarium (KKU), and Queen Sirikit Botanical Gardens Herbarium (QBG), as well as taxonomic literature and photographs that were readily available online.

*Traditional uses study*

Interviews with sixteen villagers, particularly those with knowledge of folk medicine, provided information on the traditional uses of the family Convolvulaceae from the study area. These uses included food, spices, ornamental plants, ritual plants, and environmental factors.

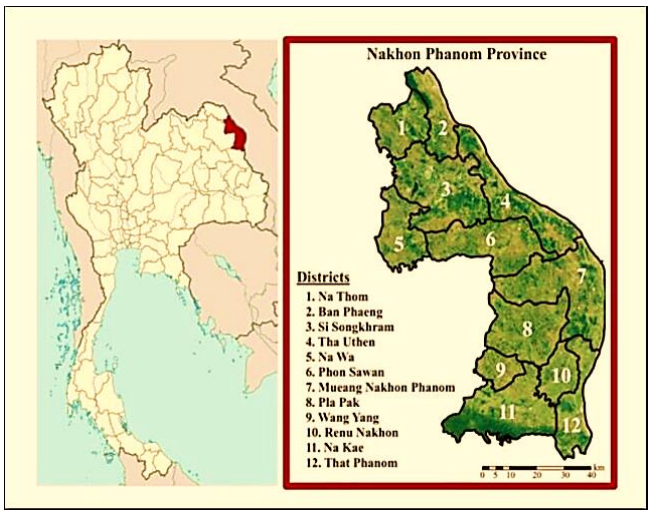


**Figure 1:** General location and details of That Phanom District, Nakhon Phanom Province. (Scale bar =10 km).[9-11,22]

*Conservation status study*

Endemic species study: a study was conducted on the endemic species of the family Convolvulaceae from That Phanom District in Nakhon Phanom Province, based on POWO.[21]

Conservation status in the research area: The evaluation criteria for conservation status in the geographical area were established based on data collected throughout the field investigation and categorized as common or uncommon species.

Conservation status from global data: an assessment of the conservation status of the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, was conducted using IUCN, the available database.[22]

## Results and Discussion

The research into the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, Thailand, from January 2021 to December 2021, showed that the Convolvulaceae family comprises eight genera and 28 species: *Argyreia capitiformis* (Poir.) Ooststr., *A. nervosa* (Burm.f.) Bojer, *A. osyrensis* (Roth) Choisy, *Camonea umbellata* (L.) A.R.Simões & Staples, *C. vitifolia* (Burm.f.) A.R.Simões & Staples, *Evolvulus alsinoides* (L.) L., *E. glomeratus* Nees & Mart., *E. nummularius* (L.) L., *Hewittia malabarica* (L.) Suresh., *Jacquemontia paniculata* (Burm.f.) Hallier f., *Ipomoea alba* L., *I. aquatic* Forssk., *I. batatas* (L.) Lam.,, *I. cairica* (L.) Sweet, *I. carnea* Jacq., *I. littoralis* Blume, *I. nil* (L.) Roth, *I. obscura* (L.) Ker Gawl., *I. pes-tigridis* L., *I. pileata* Roxb., *I. purpurea* (L.) Roth, *I. quamoclit* L., *I. triloba* L., *Merremia gemella* (Burm.f.) Hallier f., *M. hederacea* (Burm.f.) Hallier f., *M. hirta* (L.) Merr., *Operculina petaloidea* (Choisy) Ooststr. and *O. turpethum* (L.) Silva Manso (Table 1 and Figure 2). *Ipomoea* is the genus with the highest level of diversity, consisting of 13 species. The second most diverse genera are *Argyreia*, *Evolvulus*, and *Merremia*, each having 3 species. The third most diverse genera are *Camonea* and *Operculina*, each with 2 species. Lastly, the genera *Hewittia* and *Jacquemontia* are the least diverse, with only 1 species each. The results of the present study differ from the reports of various scientists.[5-8]

The ecology of all the species in this study is reported in Table 1. The family was found in four ecosystem types: 13 species (comprising *Argyreia* two species, *Camonea* one species, *Evolvulus* one species, *Jacquemontia* one species, *Ipomoea* six species, and *Merremia* two species) were collected from deciduous dipterocarp forest. Eight species (comprising *Jacquemontia* one species, *Ipomoea* five, and Merremia two) were found in mixed deciduous forests. Twelve species (comprising *Camonea* two species, *Evolvulus* one species, *Hewittia* one species, *Ipomoea* four species, *Merremia* two species, and *Operculina* two species were discovered in a river basin. Eleven species (comprising *Argyreia*, one species; *Evolvulus*, one species; and *Ipomoea*, four species) were cultivated in home gardens or gardens in That Phanom District, Nakhon Phanom Province. Therefore, 17 species were reported to be native plants in That Phanom District, Nakhon Phanom Province. Meanwhile, 11 species were recognized to be cultivated in home gardens and gardens in the research area due to the morphological characteristics of all species, especially the leaves and flowers, which agrees with several scientists' reports.[5-8]

According to the data presented in Table 1, the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, exhibits two distinct periods of flowering and fruiting. The first period occurs from November to April and consists of 15 species, while the second period occurs from May to October and consists of 13 species. This observation is consistent with previous.[5-8]

In That Phanom District, Nakhon Phanom Province, the Convolvulaceae family exhibits three distinct habits: climbing herb (a total of 24 species), woody climber (which are present in all three species of the *Argyreia* genus), and erect woody plant (which can be found specifically in *Ipomoea carnea* Jacq.). This outcome is consistent with the discoveries documented by several scientists.[1-8]

With respect to the conservation status of the species, Table 1 indicates that none of the plants in the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, are considered endemic. [18,21]

Evaluation criteria for the conservation status of Convolvulaceae from the research area showed from the survey of the specimens that thirteen species were identified as uncommon species, while fifteen species were classified as common species (Table 1).

Evaluation criteria for the conservation status of Convolvulaceae by database of IUCN.[23] Table 1 shows four Convolvulaceae family species in That Phanom District, Nakhon Phanom Province: *Ipomoea alba* L., *I. aquatica* Forssk., *I. cairica* (L.) Sweet and *I. littoralis* Blume were classified as Least Concern (LC) according to the IUCN.[23]

The plants in the Convolvulaceae family have traditionally served several purposes, such as providing food, serving as ornamental flora, and offering medicinal properties (Table 2). This result aligns with the findings reported by several researchers.[5-8, 24-28] According to the data shown in Table 2, a total of eleven species serve as a food source. Nine species have been identified as food sources for cattle and buffalo: *Camonea umbellata* (L.) A.R.Simões & Staples, *C. vitifolia* (Burm.f.) A.R.Simões & Staples, *Hewittia malabarica* (L.) Suresh, *Ipomoea obscura* (L.) Ker Gawl., *M. hederacea* (Burm.f.) Hallier f., *Operculina petaloidea* (Choisy) Ooststr., and *O. turpethum* (L.) Silva Manso. In addition, two species, *I. aquatica* Forssk. and *I. batatas* (L.) Lam. are also consumed by humans as food from young stems with leaves and storage roots or sweet potato tubers (Table 2). This result aligns with several of the findings reported.[5-8,24-28] Meanwhile, a total of 21 species (Table 2) are used as medicine from our survey, which is consistent with the discoveries documented by several researchers.[5-8, 24-28] Also, fifteen species have been identified as ornamental plants in the vicinity of the homes and gardens. This result is consistent with the literature.[5-8, 24--28]

## Conclusion

The study highlighted the significance of the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, Thailand. There are eight genera, namely *Argyreia*, *Camonea*, *Evolvulus*, *Hewittia*, *Jacquemontia*, *Ipomoea*, *Merremia*, and *Operculina*, which collectively consist of 28 species. Ipomoea is the most diversified genus. The family was discovered in four distinct ecosystem types: deciduous dipterocarp forest (13 species), mixed deciduous forest (8 species), river basin (12 species), and cultivated areas such as home gardens or gardens (11 species). Meanwhile, in the research area, 17 species of native plants and 11 species of cultivated plants were identified. The greatest number of species bloom during the cold season, which covers from November to April, except for certain species which blossom during the rainy season, occurring between May and October. In this geographical area of research, the Convolvulaceae family exhibited three unique habits: climbing herb, woody climber, and upright woody plant. The survey of the specimens involved examining the conservation status of Convolvulaceae species. Thirteen species were categorized as rare, whereas fifteen were classified as abundant. The evaluation criteria used by the IUCN database to determine the conservation status of Convolvulaceae indicate that four species of this plant family are included. Species of this family have been utilized for diverse reasons, such as food, medicine, and ornamental plants. The present research is the first documentation of this noteworthy family. The study includes exhaustive information on the biodiversity, conservation status, and traditional uses of the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, Thailand. This data can be utilized as a valuable natural resource for future research.

## Conflict of Interest

The authors declare no conflict of interest.

## Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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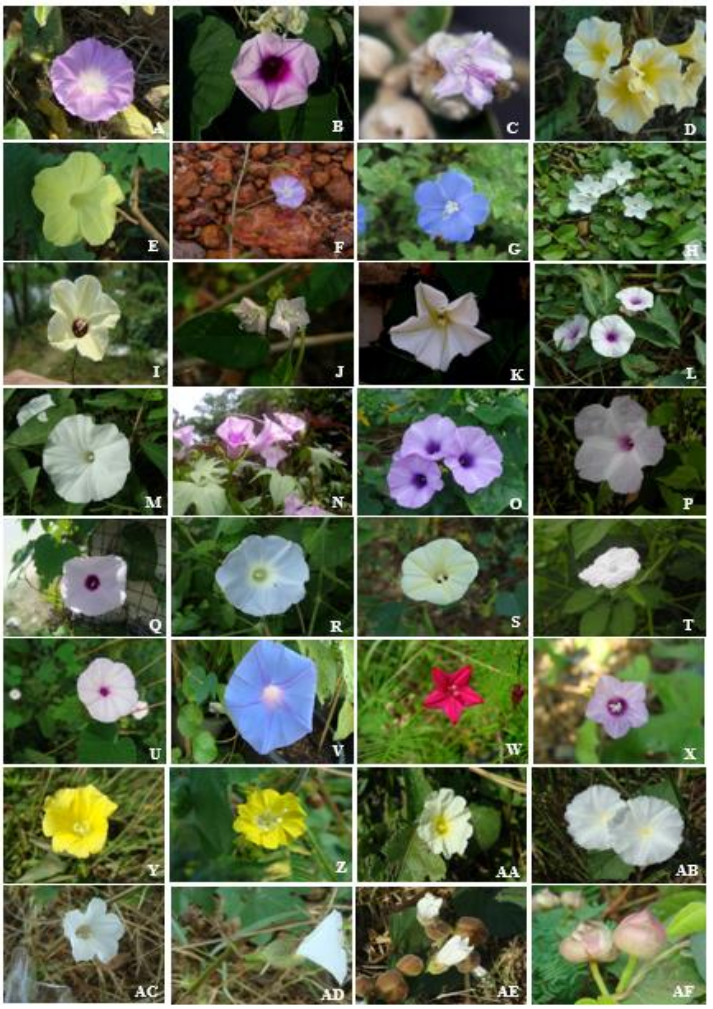


**Figure 2:** Species of the family Convolvulaceae found in That Phanom District, Nakhon Phanom Province, Thailand. A. *Argyreia capitiformis* (Poir.) Ooststr., B. *A. nervosa* (Burm.f.) Bojer, C. *A. osyrensis* (Roth) Choisy, D. *Camonea umbellata* (L.) A.R.Simões & Staples, E. *C. vitifolia* (Burm.f.) A.R.Simões & Staples, F. *Evolvulus alsinoides* (L.) L., G. *E. glomeratus* Nees & Mart., H. *E. nummularius* (L.) L., I. *Hewittia malabarica* (L.) Suresh., J. *Jacquemontia paniculata* (Burm.f.) Hallier f., K. *Ipomoea alba* L., L.-M. *I. aquatic* Forssk., N. *I. batatas* (L.) Lam., O. *I. cairica* (L.) Sweet, P. *I. carnea* Jacq., Q. *I. littoralis* Blume, R. *I. nil* (L.) Roth, S. *I. obscura* (L.) Ker Gawl., T. *I. pes-tigridis* L., U. *I. pileata* Roxb., V. *I. purpurea* (L.) Roth, W. *I. quamoclit* L., X. *I. triloba* L., Y. *Merremia gemella* (Burm.f.) Hallier f., Z. *M. hederacea* (Burm.f.) Hallier f., AA. *M. hirta* (L.) Merr., AB. *Operculina petaloidea* (Choisy) Ooststr., AC.-AF. *O. turpethum* (L.) Silva Manso

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**Table 1:** Diversity notes of Convolvulaceae found in That Phanom District, Nakhon Phanom Province, Thailand

| Genera | Species | Specimen examined | Local name | Ecology | Phenology | Habit | Conservation status | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Based on the study area | Based on IUCN[23] | Endemic Species[21] |
| *Argyreia* (3 species) | *A. capitiformis* (Poir.) Ooststr. | Saensouk Convol 1 | ฝนแสนห่า | DDF | Fl. & Fr. Dec.-Feb. | Woody climber | Uncommon species | - | Not endemic |
| | *A. nervosa* (Burm.f.) Bojer | Saensouk Convol 2 | ใบระบาด | Cult. | Fl. & Fr. Jul.-Aug. | Woody climber | Common species | - | Not endemic |
| | *A. osyrensis* (Roth) Choisy | Saensouk Convol 3 | หุน | DDF | Fl. & Fr. Jul.-Aug. | Woody climber | Uncommon species | - | Not endemic |
| *Camonea* (2 species) | *C. umbellata* (L.) A.R.Simões & Staples | Saensouk Convol 4 | จิงจ้อขาว | RB | Fl. & Fr. Dec.-Feb. | Climbing herb | Common species | - | Not endemic |
| | *C. vitifolia* (Burm.f.) A.R.Simões & Staples | Saensouk Convol 5 | จิงจ้อเหลือง | DDF, RB | Fl. & Fr. Dec.-Feb. | Climbing herb | Common species | - | Not endemic |
| *Evolvulus* (3 species) | *E. alsinoides* (L.) L. | Saensouk Convol 6 | ใบต่อก้าน | DDF | Fl. & Fr. Jul.-Aug. | Climbing herb | Uncommon species | - | Not endemic |
| | *E. glomeratus* Nees & Mart. | Saensouk Convol 7 | | Cult. | Fl. & Fr. May -Aug. | Climbing herb | Common species | - | Not endemic |
| | *E. nummularius* (L.) L. | Saensouk Convol 8 | ใบต่างเหรียญ | RB | Fl. & Fr. May -Aug. | Climbing herb | Common species | - | Not endemic |
| *Hewittia* (1 species) | *H. malabarica* (L.) Suresh | Saensouk Convol 9 | | RB | Fl. & Fr. Dec.-Feb. | Climbing herb | Uncommon species | - | Not endemic |
| *Jacquemontia* (1 species) | *J. paniculata* (Burm.f.) Hallier f. | Saensouk Convol 10 | จิงจ้อผี | DDF, MDF | Fl. & Fr. Dec.- Feb. | Climbing herb | Uncommon species | - | Not endemic |
| *Ipomoea* (13 species) | *Ipomoea alba* L. | Saensouk Convol 11 | บานดึก | Cult. | Fl. & Fr. May-Aug. | Climbing herb | Uncommon species | LC | Not endemic |
| | *I. aquatica* Forssk. | Saensouk Convol 12 | ผักบุ้ง | RB | Fl. & Fr. Feb.-Apr. | Climbing herb | Common species | LC | Not endemic |
| | *I. batatas* (L.) Lam. | Saensouk Convol 13 | มันเทศ | Cult. | Fl. & Fr. Feb.-Apr. | Climbing herb | Common species | - | Not endemic |
| | *I. cairica* (L.) Sweet | Saensouk Convol 14 | ผักบุ้งรั้ว | DDF, MDF, RB | Fl. & Fr. May - Aug. | Climbing herb | Common species | LC | Not endemic |
| | *I. carnea* Jacq. | Saensouk Convol 15 | ผักบุ้งบก | DDF, MDF | Fl. & Fr. Feb.-Apr. | Erect woody plant | Common species | - | Not endemic |
| | *I. littoralis* Blume | Saensouk Convol 16 | จิงจ้อเล็ก | DDF | Fl. & Fr. Aug. | Climbing herb | Uncommon species | LC | Not endemic |
| | *I. nil* (L.) Roth | Saensouk Convol 17 | ว่านผักบุ้ง | DDF, MDF | Fl. & Fr. Aug. | Climbing herb | Common species | - | Not endemic |
| | *I. obscura* (L.) Ker Gawl. | Saensouk Convol 18 | สะอึก | DDF, MDF, RB | Fl. & Fr. May - Aug. | Climbing herb | Common species | - | Not endemic |
| | *I. pes-tigridis* L. | Saensouk Convol 19 | ขยุ้มตีนหมา | MDF | Fl. & Fr. Jul.- Aug. | Climbing herb | Uncommon species | - | Not endemic |
| | *I. pileata* Roxb. | Saensouk Convol 20 | เถาสองสลึง | RB | Fl. & Fr. Nov.- Feb. | Climbing herb | Uncommon species | - | Not endemic |
| | *I. purpurea* (L.) Roth | Saensouk Convol 21 | | Cult. | Fl. & Fr. May - Aug. | Climbing herb | Common species | - | Not endemic |
| | *I. quamoclit* L. | Saensouk Convol 22 | คอนสวรรค์ | Cult. | Fl. & Fr. Jul.- Aug. | Climbing herb | Uncommon species | - | Not endemic |
| | *I. triloba* L. | Saensouk Convol 23 | หญ้าดอกขน | DDF | Fl. & Fr. Mar.- Apr. | Climbing herb | Uncommon species | - | Not endemic |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Merremia* (3 species) | *M. gemella* (Burm.f.) Hallier f. | Saensouk Convol 24 | เถาสะอึกใหญ่ | DDF | Fl. & Fr. Nov.- Feb. | Climbing herb | Uncommon species | - | Not endemic |
| | *M. hederacea* (Burm.f.) Hallier f. | Saensouk Convol 25 | เถาสะอึก | DDF, MDF, RB | Fl. & Fr. Jan. – Mar. | Climbing herb | Common species | - | Not endemic |
| | *M. hirta* (L.) Merr. | Saensouk Convol 26 | จิงจ้อนวล | DDF, MDF, RB | Fl. & Fr. Feb.-Apr. | Climbing herb | Common species | - | Not endemic |
| *Operculina* (2 species) | *O. petaloidea* (Choisy) Ooststr. | Saensouk Convol 27 | บานบ่าย | RB | Fl. & Fr. Mar.- Apr. | Climbing herb | Uncommon species | - | Not endemic |
| | *O. turpethum* (L.) Silva Manso | Saensouk Convol 28 | จิงจ้อเหลี่ยม | RB | Fl. & Fr. Mar.- Apr. | Climbing herb | Common species | - | Not endemic |

*Note:* DDF: deciduous forest, MDF: mixed deciduous forest, RB: river basin, Cult.: cultivated, Fl: flowering period, Fr: fruiting period, LC = Least Concern

**Table 2:** Traditional uses of the Convolvulaceae family in That Phanom District, Nakhon Phanom Province, Thailand

| **Species** | **Traditional uses** | | |
|---|---|---|---|
| | **Food** | **Medicine** | **Ornamental** |
| *Argyreia capitiformis* (Poir.) Ooststr. | | The whole plant is boiled in water to rejuvenate. | |
| *A. nervosa* (Burm.f.) Bojer | | | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *A. osyrensis* (Roth) Choisy | | The whole plant is boiled in water to rejuvenate. | |
| *Camonea umbellata* (L.) A.R.Simões & Staples | Feed for cows or buffaloes. | The whole plant is boiled in water to rejuvenate. | |
| *C. vitifolia* (Burm.f.) A.R.Simões & Staples | Feed for cows or buffaloes. | The whole plant is boiled in water to rejuvenate. | |
| *Evolvulus alsinoides* (L.) L. | | The whole plant is boiled in water to rejuvenate. | |
| *E. glomeratus* Nees & Mart. | | | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *E. nummularius* (L.) L. | | The whole plant is boiled in water to rejuvenate. | |
| *Hewittia malabarica* (L.) Suresh | Feed for cows or buffaloes. | The whole plant is boiled in water to rejuvenate. | |
| *Jacquemontia paniculata* (Burm.f.) Hallier f. | | The whole plant is boiled in water to rejuvenate. | |
| *Ipomoea alba* L. | | The flowers have properties to relieve internal heat, nourish the blood, prevent anaemia, prevent jaundice, act as a diuretic, and relieve haemorrhoids. | |
| *I. aquatica* Forssk. | It's fresh or boiled vegetables and as an ingredient or component of local food. | - The whole plant has a cool, moist flavour. It is used to nourish eyesight and cure nosebleeds, constipation, gonorrhoea, diarrhoea, bloody diarrhoea, and haemorrhoids.<br>- The root part is tasteless, discreet, and non-toxic. It is used to treat women with | |

| | | | |
|---|---|---|---|
| | | excessive vaginal discharge, toothache, holes in the teeth, diarrhoea, chronic cough, sweating, and swelling. | |
| *I. batatas* (L.) Lam. | - Young leaves and young stems are boiled vegetables. It is a component of food.<br>- Storage roots or sweet potato tubers are eaten by boiling, steaming, or grilling. | The leaves can be pounded into a poultice to treat an abscess, or they can be pounded and mixed with salt to be used as a poultice.<br>- Sweet potato tubers can help reduce blood fat by cooking the fruit into food to eat. | |
| *I. cairica* (L.) Sweet | | The whole plant has medicinal properties as a cough suppressant and relieves lung heat. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. carnea* Jacq. | | | Its beautiful flowers and leaves make it an ornamental plant around the house and garden. |
| *I. littoralis* Blume | | Boiled leaves cure headaches. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. nil* (L.) Roth | | Boiled water from the leaves relieves aches and pains. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. obscura* (L.) Ker Gawl. | Feed for cows or buffaloes. | Boiled water from the leaves relieves aches and pains. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. pes-tigridis* L. | | Boiled water from the leaves relieves aches and pains. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. pileata* Roxb. | | Boiled water from the leaves relieves aches and pains. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. purpurea* (L.) Roth | | | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. quamoclit* L. | | | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *I. triloba* L. | | | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |

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| *Merremia gemella* (Burm.f.) Hallier f. | | The leaves make a poultice for cracked hands and feet. In addition, the leaves are used as a poultice to reduce inflammation and heal abscesses. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *M. hederacea* (Burm.f.) Hallier f. | Feed for cows or buffaloes. | The whole plant is boiled for drinking water or soaked in water and applied to treat shingles. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *M. hirta* (L.) Merr. | | The whole plant is boiled in water to rejuvenate. | Its beautiful flowers and leaves make it an ornamental climbing plant around the house and garden. |
| *Operculina petaloidea* (Choisy) Ooststr. | Feed for cows or buffaloes. | The whole plant is boiled in water to rejuvenate. | |
| *O. turpethum* (L.) Silva Manso | Feed for cows or buffaloes. | The whole plant is boiled in water to rejuvenate. | |

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