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Original Article

# New Medicinal Plant Variety of *Trichosanthes tricuspidata* Lour. (*Cucurbitaceae*) from Northeastern Thailand

**Wannachai Chatan*, Wilanwan Promprom**

**ABSTRACT**

**Objectives:** This research was carried out for describing, illustrating and treating a new medicinal plant variety in the genus *Trichosanthes*. **Methods:** This research was carried out by collecting plant specimens in the Northeastern Thailand. Morphological characters were studied and compared with the closely related taxon and taxonomic literatures. **Results:** *T. tricuspidata* subsp. *rotundata* var. *longirachis*, was found. This plant is described and illustrated here and treated as a new variety. It differs from the other of *T. tricuspidata* subsp. *rotundata* by having the following combination characters: Comparatively stout herbaceous climber up to 20 m long, tendril 3–5-brached, probract obovate with obvious glands, mature blade unlobed or 3-shallowly lobed with 1-2 short angles, blade not deeply lobed (unlobed blade found in juvenile plants), blade size 5-11 cm diameter and raceme rachis length 10–130 cm. Its fruits and seeds were used as medicinal parts. **Conclusion:** Totally, three subspecies and four variety of *T. tricuspidata* in Thailand have been recorded so far. Important comparative morphological characters with some closely related variety are discussed. The local people used it as medicinal plant.

**Key words:** *Cucurbitaceae,* Ethnobotany, Taxonomy, Thailand, *Trichosanthes tricuspidata.*

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## INTRODUCTION

*Trichosanthes* was first treated by Linnaeus[1] in the family *Cucurbitaceae* with approximately 100 species distributed from South and East Asia to tropical Australia and the eastern Pacific.[2,3] *Trichosanthes* species are easily to recognized by the following characters: mostly climber habit, dioecious plant, mostly branched tendrils, receptacle tube elongate, apex of petiole without glands, distinctly fimbriate petals, and often brightly colored fruits.[4]

Among *Trichosanthes* species found in Thailand, *T. tricuspidata* Lour. subsp. *rotundata* W.J.de Wilde and Duyfjes was first treated by de Wilde and Duyfjes.[5] So far, three subspecies (i.e. *T. tricuspidata* Lour. subsp. *javanica* Duyfjes and Pruesapan, subsp. *rotundata* W.J.de Wilde and Duyfjes and subsp. *tricuspidata*) and two varieties (i.e. *T. tricuspidata* Lour. subsp. *javanica* Duyfjes and Pruesapan var. *javanica* and var. *flavofila* W.J.de Wilde and Duyfjes) have been reported.[6,7] After examination of plant specimens collected from Khon Kean and Maha Sarakham provinces, Thailand, and careful comparison with known taxa, this plant is distinct from other closely similar plants and is treated here as a new variety.

## MATERIALS AND METHODS

The specimens and their local utilization of the medicinal plant variety were collected from Ban Phai District, Khon Kean province and Kanthawichai District, Mahasarakham province during field trips in the Northeastern Thailand between the years 2010-2015. All specimens were pressed and dried before their morphological characters were studied in laboratory. In addition, careful studies and comparisons with both living and herbarium specimen (including the type specimen) in main herbaria in Thailand (BK and BKF) and Europe were performed. Taxonomic literatures[2-10,12] were used in this study.

## RESULTS

The Cucurbit plant field trips for this research were done in the Northeastern Thailand and many plant specimens were collected to study their morphology. After the plant materials were careful examination, there were *T. tricuspidata* subsp. *rotundata* specimens that their morphology differs from this subspecies. The new plants are recognized here as a new variety of this subspecies, namely *T. tricuspidata* Lour. subsp. *rotundata* W.J.de Wilde and Duyfjes var. *longirachis* Chatan and W. Prom prom. The characteristics of this plant is a comparatively stout herbaceous climber up to 20 m long, tendril 3–5-brached, probract obovate with obvious glands, mature blade unlobed or having 3-shallowly lobed with 1-2 short angles, blade not deeply lobed (unlobed blade found in juvenile plants), blade size 5-11 cm diameter and

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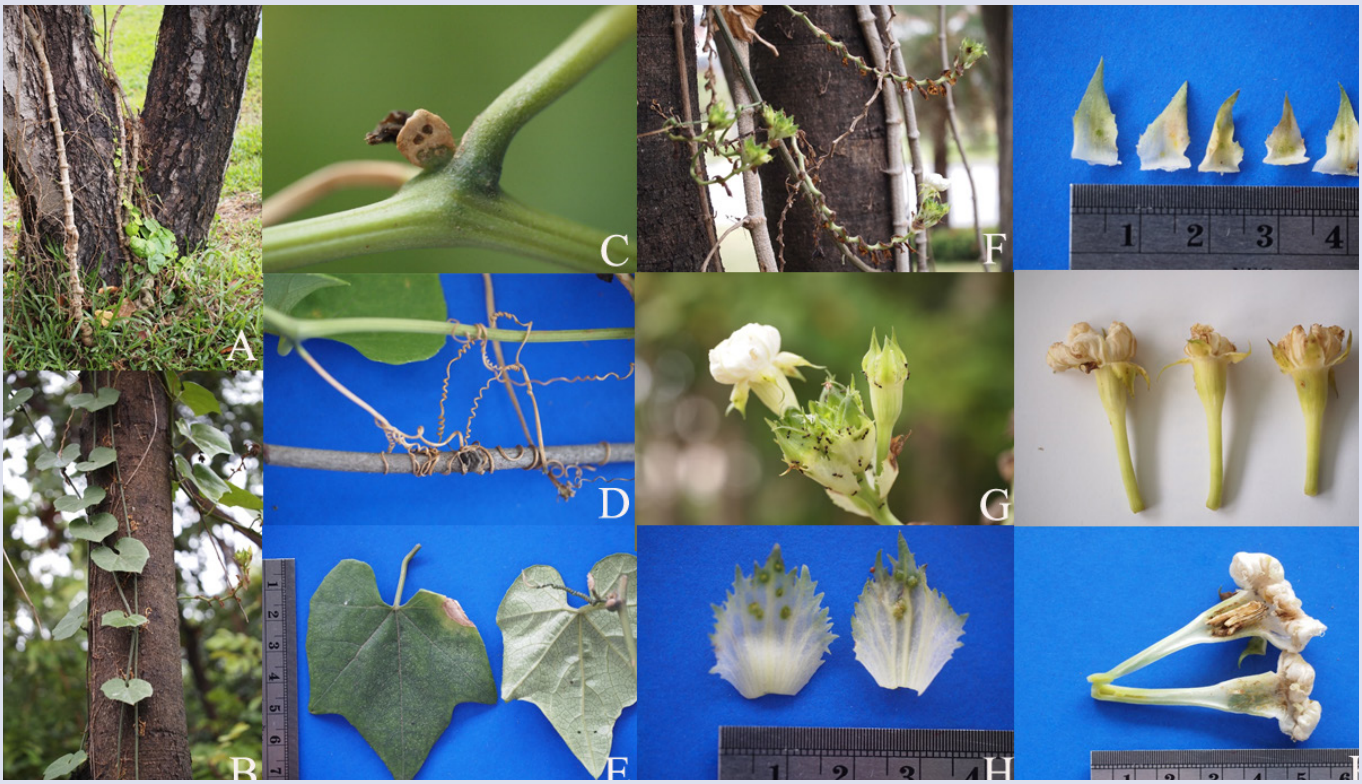


**Figure 1:** *Trichosanthes tricuspidata* subsp. *rotundata* var. *longirachis*. A- Habit and old stem, B- habit, C- Probracts with glands, D- Tendrils, E- Leaves: adaxial side (left) and abaxial side (right), F- Old stems and inflorescences, G- Inflorescence with buds and a floret during anthesis, H- Bracts with green glands, I- Sepals with green glands, J- Florets (side view), K- Floret (longitudinal section).

raceme rachis length 10-130 cm. The taxonomic treatment is shown below.

## Taxonomy

*Trichosanthes tricuspidata* Lour. subspecies *rotundata* W.J.de Wilde and Duyfjes var. *longirachis* Chatan and Promprom, *var. nov.* Figure 1.

Type THAILAND, Kanthawichai district, Maha Sarakham Province, location 48Q 0312952 UTM 1796680, alt. 140–150 m, 18 June 2013, *W.Chatan 1626* (Holotype: MSUT!)

## Diagnosis

The new plant variety differs from *T. tricuspidata* Lour. subsp. *rotundata* W.J.de Wilde and Duyfjes var. *rotundata* by having the following combination of characters: comparatively stout climber up to 20 m long, tendril 3–5-brached, probract obovate with obvious glands, mature blade unlobed or having 3-shallowly lobed with 1-2 short angles, not deeply lobed (unlobed blade found in juvenile plants), blade size 5-11 cm diameter and raceme rachis length 10–130 cm.

## Description

Large perennial herbaceous climber, comparatively stout, up to 20 m long, climbing on small to tall shrubs or trees. *Old stem* thick, 20–30 mm diameter, pale brown. *Young leafy stems* 2.5–3 mm diameter, surfaces glabrescent, striate and covered by cystoliths, green when fresh and brownish when dry; dioecious. *Probract* obovate, ca. 6 × 4 mm, surface with obvious glands, pale green when fresh and brown when dry. *Tendrils* 3-5-branched. The 5-branced tendrils usually found in large leafy branches. *Leaves* alternate; petiole (1–) 2.5–4.6 cm long, covered by numerous cystoliths; blade simple, orbicular in outline, 5–11 × 5-9 cm; margin of mature blade unlobed or 3- shallowly lobed with 1-2 angles (not deeply lobed) and with fine remote denticulate (un-lobed blade found in juvenile plants); if lobes present, lobe apex acute or acuminate or obtuse; blade texture membranaceous to subchartaceous ; upper side green when fresh and brown when dry, under side pale green when fresh and pale brown when dry; upper side covered by numerous cystoliths and underside glabrous except for numerous cystoliths on vein; veins 5, slightly straight; gland on blade absent. *Male inflorescences* raceme; peduncle 5-10 cm long, rachis obviously zigzag, 10–130 cm long, covered by numerous short min hairs and some cystoliths. *Buds* clavate. *Bracts* ovate or orbicular, concavo-convex, persistent, 22–25 × 20–25 mm; fresh specimens whitish green with green veins and the bract color is slightly darker near its apex, dry specimens brown; green glands on both surfaces when fresh, glands on adaxial side raised, the glands brown when dry; margin slightly triangular lobed or incised at upper part and entire at lower part; lobes apex acute or obtuse; base rounded or truncate; both surfaces covered by min hairs. *Pedicels* 3–4 mm long, green, caducous. *Receptacles* tube 25–35 mm long; ca. 10–13 mm diam. at throat and ca. 2.5 mm diam. at base; expanded portion covered by dense hairs inner side; narrow portion glabrous near base and covered by glandular hairs near expanded portion. *Sepals* ovate-triangular, 10–12 mm long and 4–8 mm wide at base; margin serrulate at lower part; surface with green glands when fresh and brown when dry. *Petals* obovate, 13–15 × 8–14 mm, threads 12–15 mm long, white with pale green veins. *Stamens* 3, pale brown, filaments 2–4 mm long, synandrium 10–13 mm long. *Pistillode* linear, 4.5–11 × 1–1.5 mm. *Female inflorescences and florets* not seen. Fruits globose.

**Table 1: Distinguishing features between *T. tricuspidata* Lour. subsp. *rotundata* var. *longirachis* and *T. tricuspidata* Lour. subsp. *rotundata* var. *rotunda*.**

| Features | *T. tricuspidata* Lour. subsp. *rotunda* var. *longirachis* | *T. tricuspidata* Lour. subsp. *rotunda* var. *rotunda* |
|---|---|---|
| 1. Habit | comparatively stout climber up to 20 m long | climber up to 5-8 m long |
| 2. Tendrils | 3–5-brached | 2-3-brached |
| 3. Probract | obovate with obvious glands | elliptic or blunt-triangular with not obvious gland |
| 4. Blade lobes | mature blade unlobed or 3- shallowly lobed with 1-2 angles (un-lobed blade in juvenile plants) | mature blade 3- or 5– or 7-lobed shallowly or deeply-lobed |
| 5. Blade size | comparatively small, 5-11 cm diameter | 8-20 cm diameter |
| 6. Raceme rachis length | 10-130 cm | 4-30 cm |

**Flowering and fruiting** Flowering of male flowers in April–August. Flowering of female flowers unknown. Fruiting in July-September.

**Distribution** *T. tricuspidata* subspecies *rotundata* var. *longirachis* is endemic to Thailand and known from Ban Phai District, Khon Kaen Province, and Kanthawichai District, Maha Sarakham Province, Northeastern Thailand.

**Ecology** This species grows in dry dipterocarp forest or near roadside at an elevation of 130–150 m. It climbs on shrubs or trees in slightly dense or open areas.

**Vernacular name** Tam Lueng Kok and Khi Ka

**Etymology** The name of variety is named after the distinct morphology of this plant, i.e the very long rachis of inflorescence.

**Uses** The local people use this plant variety as a medicinal plant. Its fruits and seeds were used as purgative. The seeds were used as laxative.

**Additional specimen examined** *W.Chatan 1630* (MSUT), THAILAND, Ban Phai District, Khon Kaen Province.

## DISCUSSION

*Trichosanthes* consists of ca. 100 species in the world and 17 species in Thailand. A slightly complete revision for the Thai taxa begin in 2004.[11] However, a more recently revision of this genus for Flora of Thailand was published by de Wilde and Duyfjes.[4] After examination of *Trichosanthes* specimens collected from the Northeastern Thailand and comparison with known taxa, there were *T. tricuspidata* subsp. *rotundata* specimens that differ from the other specimens. Therefore, *T. tricuspidata* subsp. *rotundata* var. *longirachis* was described as a new variety. It is characterized by the combination characters as follows: Comparatively stout climber up to 15 m long, tendril 3–5-brached, probract obovate with obvious glands, mature blade unlobed or having 3-shallowly lobed with 1-2 short angles (unlobed blade in juvenile plants), blade size 5-11 cm diameter, raceme rachis length 10–130 cm.

A key to variety of *T. tricuspidata* Lour. subsp. *rotundata* in Thailand is presented below and difference beween the new variety and the closely resemble, *T. tricuspidata* subsp. *rotundata* var. *rotundata* are summarized in Table 1.

Key to variety of *Trichosanthes tricuspidata* subsp. *rotundata* in Thailand

1. A comparatively stout climber up to 20 m long, tendrils 3–5-brached, probract obovate with obvious glands, blade size 5-11 cm diameter, blade unlobed or 3- shallowly lobed with 1-2 angles, raceme rachis length 10–130 cm…… a. var. longirachis

1. A slightly small climber up to 5-8 m long, tendrils 2–3-brached, probract elliptic or blunt-triangular with not obvious gland, blade size 8-20 cm diameter, blade 3- or 5– or 7-lobed shallowly or deeply-lobed, raceme rachis length ca. 4–30 cm……. ….. b. var. rotundata

## CONCLUSION

After examinations of plants collected from the Northeastern Thailand, both dried and living specimens, herbarium specimens in the main herbaria in Thailand (BK and BKF) and Europe and careful study of literatures, *T. tricuspidata* subsp. *rotundata* var. *longirachis* collected from Kantharawichai district, Mahasarakham province is described and recognized as a new variety, so until now two varieties of this subspecies are recognized. Totally, three subspecies and four variety of *T. tricuspidata* in Thailand have been recorded so far. This plant variety was used as the medicinal plant by local people. Its fruits and seeds were used as purgative, and seeds were used as laxative.

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## CONFLICT OF INTEREST

There is no conflict of interest.

## ABBREVIATION USED

**alt.:** altitude; **BK:** Bangkok Herbarium; **BKF:** The Forest Herbarium, National Park, Wildlife and Plant Conservation Department; **ca.:** circa; **MSUT:** Natural Medicinal Mushroom Museum, Mahasarakham University; **subsp.:** subspecies; **UTM:** Universal Transverse Mercator; **var.:** variety; **var. nov.:** varietas nova..

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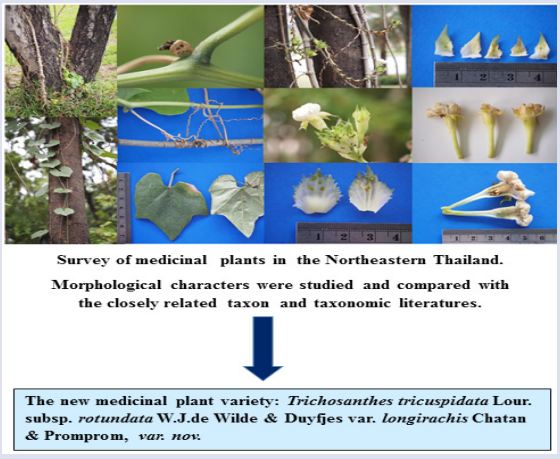
## GRAPHICAL ABSTRACT




## SUMMARY


- Survey of plants in the Northeastern Thailand. Morphological characters were studied and compared with the closely related taxon and taxonomic literatures.
- *Trichosanthes tricuspidata* subsp. rotundata var. longirachis, a new medicinal plant variety was found. This plant is described and illustrated.
- Its fruits and seeds were used as medicinal organs.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