A NOTE ON THE MORPHOLOGY OF *TELOSMA CORDATA* (BURM. F.) MERR. (ASCLEPIADACEAE)

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Abstract: Telosma cordata (Burm. F.) Merr. or Tongkin flower is a climber belonging to Asclepiadaceae. The morphology of the leaves and flowers were discussed in details. The species have a slender with cordate, thin leaves. The flowers are borne axially in cluster of two to 15. It is greenish during opening and later change to yellow-orange in colour. Observations on the ontogeny of the pistil, stamens, and corona reveals a pistil composed of two carpels with numerous ovules on a submarginal placenta, anthers with two locules, and twin pollinia. The corona originates as two vertically arranged protuberances on the dorsal surface of the filaments and develops rapidly during the late stages of floral ontogeny. *T. cordata* has great potential in lanscaping because of their strong fragrance at night.

Keywords: *Telosma cordata*, Morphology, Leaves, Flowers, Fragrance

INTRODUCTION

The Asclepiadaceae consists of 250 genera and 2000 species of tropical plants [10]. This family is closely related to Apocynaceae by the formation of distinctive waxy pollen masses, called pollinia. It contains a number of shrubs - erect and twining - also herbaceous parennials which occasionally are very fleshy and have reduced or non-functional leaves like some cacti. The foliage shows great variation, plants like *Huernia* and *Stapelia* having a fleshy cactus-like appearance, in some *Periploca* species the leaves are like leafless whip lashes and in the epiphytic *Dischidia rafflesiana* fashioned into pouches capable of storing rain-water. Some of the plants in this family are valuable and fragrance, such as *Telosma*. Actually, *Telosma* meaning from the Greek *Tele* (far) and *osme* (smell), referring to the distance over which the scent carries.

T. cordata is a climber belonging to the family Asclepiadaceae (Table 1). Sometimes is called Bunga Tongkin or Bunga Siam [7]. It was said that *T. cordata* was originated from India and China and there are ten (10) species native to Southern Asia [9]. Due to its climbing habit, *T. cordata* can be grown in a hanging basket or trellis. It is suitable to use *T. cordata* as a hedge plants for screening purposes.

Table 1: The hierarchy of *Telosma*

Categories	Taxa
Kingdom	Plantae – Plants
Subkingdom	Tracheobionta – Vascular plants
Superdivision	Spermatophyta – Seed plants
Division	Magnoliophyta – Flowering plants
Class	Magnoliopsida – Dicotyledons
Subclass	Asteridae
Order	Gentianales
Family	Asclepiadaceae – Milkweed family
Genus	*Telosma* – telosma
Species	*cordata*

Khelikuzzaman [6] listed about 50 selected species of fragrant plants including *T. cordata*. This 'nocturnal fragrance' plants can be used to extract essential oil or perfume. Arai *et al.* [13] found that there are a total of 43 compounds in flowers of *T. cordata* Merrill growing in Hawaii. Instead of its fragrant, *T. cordata* shoots and flower buds are also edible for their medicinal values.

T. cordata has great potential in landscaping and for their medicinal values. These climbing plants will reach their full height (up to 6 m in length) in 3-5 years [7]. This assumes that the climber has been established in its present position for two years, is happily sited, and is healthy [2]. The heart-shaped of *T. cordata* leaf can measure up to 5-11 cm length and 3-8 cm width, connected to a long petiole as reported by Saidin [8].

Due to the issues in landscape development and outline strategies in realizing our vision of creating a Garden Nation which is progressive, clean and attractive by the year 2005 [4], this study tried to explore the characteristics of *T. cordata*. Therefore, the description of the morphology of *T. cordata* was conducted to increase the knowledge and information of this potential landscape species.

MATERIALS AND METHODS

Fresh *T. cordata* stems, leaves and flowers were obtained from DIS Research Plot, UiTM Cawangan Pahang to study the structures of external morphology (study of form) of plants (Figure 1). About 50 cm of stems were used to examine their phyllotaxis, to determine the leaves type and their venation. A cluster of living flowers were plucked to identify the reproductive structures: pedicel, receptacle, sepals, petals, androecium and gynoecium by the aids of botany illustrated by Glimn-Lacy & Kaufman [3] and Jones & Luchsinger [5]. Under a compound microscope, a prepared slide of an anther cross sections were done to observed a pair of pollinia. A diagram of stem, leaf and parts of flower were draw to show the morphology of *T. cordata*.

Figure 1: *Telosma cordata* grown on trellis.

RESULTS AND DISCUSSION

SUBCLASS, ASTERIDAE; ORDER, GENTIANALES
Asclepiadaceae: Milkweed family
Scientific name: *Telosma cordata*
Local name: Bunga tongkin

Field Recognition: Sap milky; leaves opposite phyllotaxis , stipules absent; flowers 5-merous with distinctive corona, pollinia, translators, and corpuscula; fruit a follicle; $\bigcirc$, $CA^{5}CO^{5}A^{5}\underline{G}^{2}$

Description Habit: shrubs, woody climbers; with milky sap; sometimes beanlike; full sun.

Phytography:

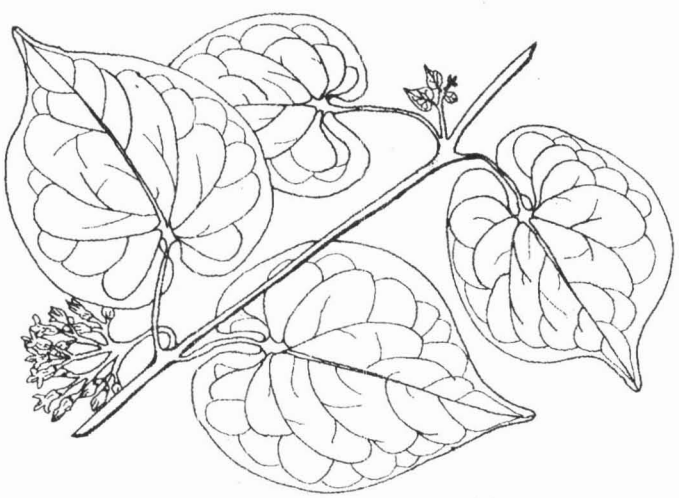
Leaves: Opposite, simple, thin, cordate, acuminate, cordate, entire; glabrous; reticulodromous, pinnately veined; without stipules. See Figure 2(a & b).
Inflorescences: Compound umbellate; flowers 2 to 15.
Flowers: Bisexual, actinomorphic, with an elaborate corona, whorled. Calyx of 5 sepals with a short tube, velvety pubescent beneath. Corolla of 5 united petals. Androecium of 5 stamens, short filaments, pollen in waxy pollinia. Gynoecium a compond pistil of 2 apically united carpels, apocarpous, ovules numerous, ovary hypogynous, placentation submarginal, styles 2 and united at style apices, stigma 1 with 5 lobes. See Figure 2(c & d).

The stamens and carpels are united into a complex structure, the gynostegium; the carpels are free below but united into the single 5-lobed stigma. Anthers with two locules, the pollinia are connected in pairs by the translators and corpusculum (gland). A corona may be present that consists of 5 hoods, which are sometimes mistaken for petals. A beak (horn) may be associated with each hood.

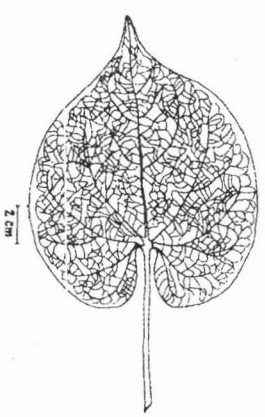
Fruit: A pair of follicles, both often abort.
Seed: Numerous, tiny; sterile.

Size, Distribution, and General Information: Throughout Southern Asia. *T. cordata* need full sun exposure to survive wealthy. The heart-shaped leaf, with basal notch measure up to 10 cm width, length of petiole measured up to 8 cm. The flowers are borne axially in cluster, greenish during opening and later change to yellow-orange in colour, nocturnal fragrance especially. The corona originates as two vertically arranged protuberances on the dorsal surface of the filaments and develops rapidly during the late stages of floral ontogeny.

Economic Importance: T. cordata has great potential in landscaping because it emits a strong fragrance at night, edible with medicinal values and provides several greenhouse plants.



(a)



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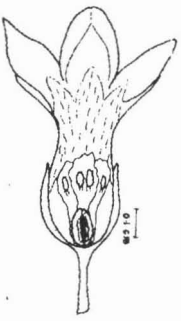
(c)



(d)

Figure 2: Diagrammatic views of *T. cordata*. (a) Patterns of leaves arrangement, (b) netlike veins, (c) flowers, and (d) vertical section showing superior ovary.

CONCLUSION

T. cordata has great potential in landscaping and also for their medicinal values. This plant has been neglected and it is difficult to find in our nurseries. Therefore, conservation of *T. cordata* should be taken into consideration to ensure their survival and reproduction.

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