

# SPECIES IDENTIFICATION OF ASTERACEAE FAMILY AT UNIVERSITAS INDONESIA, DEPOK

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## Abstrak

Penelitian identifikasi Asteraceae di Kampus Universitas Indonesia Depok di lakukan pada bulan September hingga Oktober 2012. Tujuan penelitian adalah mengetahui jenis-jenis Asteraceae yang terdapat di Kampus Universitas Indonesia, Depok. Tanaman diidentifikasi berdasarkan karakter morfologi menggunakan kunci determinasi buku *Flora of Java* dan buku morfologi tumbuhan. Terdapat 21 jenis dari 20 marga Asteraceae tersebar di Kampus Universitas Indonesia Depok. Asteraceae yang ditemukan di Kampus Universitas Indonesia tersebar di tempat - tempat yang terpapar cahaya matahari seperti lapangan, jalan raya, lahan bangunan, perbatasan hutan dan selokan. Lokasi yang memiliki jumlah jenis Asteraceae terbanyak adalah Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Indonesia dengan jumlah total jenis 16. Asteraceae yang umum dijumpai di Kampus Universitas Indonesia Depok yaitu *Mikania micrantha*, *Cyanthilliumcinereum*, *Synedrella nodiflora*, *Ageratum conyzoides*, *Tridax procumbens*, dan *Emilia sonchifolia*.

**Keywords:** Identification, description, morphology, Asteraceae, University of Indonesia

## INTRODUCTION

Asteraceae consist of herbaceous plants and shrubs which include one of the largest families in the flowering plant. These consist about 1.100 genera and more than 23.000 species (Taylor, 1985; Broholm *et al.*, 2008). Asteraceae are also plants that easy to be maintained and cosmopolitan plant that are scattered in various area such as fields, gardens, and the edge of the road. Several plants belong to Asteraceae are well known. These are *Helianthus annuus*, *Sphagneticola trilobata*, *Sonchus arvensis*, *Blumea balsamifera*, and *Ageratum conyzoides* (Tjiroosepomo, 1996; Burke *et al.*, 2002).

Asteraceae plants have many functions, such as ornamental, vegetable, and medicinal plants. These plants also have ecological roles in ecosystem (Tjitrosoepomo, 1996). One kind of Asteraceae, such as *Ageratum conyzoides* has big potential to cure various diseases. Another kind of these, such as *Ageratum*

*houstonianum*, *Eupatorium riparium*, and *Tegetes erecta* are known as biocontrol agents in pests controlling. Leaf extracts of *Eupatoriumriparium* effectively reduce a number of *Aedesaegypti* larvae.

Ecologically, Asteraceae plants have an important role in ecosystem. These plants prevent land erosion by reducing velocity of rain-water. Moreover, roots of Asteraceae plants can act as a habitat for soil biota and add organic materials to the soil. In addition, existence of these plants can increase soil resistance against erosion. A lot of potential in members of Asteraceae family make them interesting as an object of research (Kumolo and Utami, 2011).

## METHODS

The research was conducted at University of Indonesia, Depok during September to October 2012. The equipment which were used for scan location and identify species were a camera [Canon Power Shot

A2300], a black cloth, a ruler 30 cm [butterfly], a sewing meter, a stationary, a board, Flora of Java book (Backer and Brink, 1965), Tjitrosoepomo (2001) book, and map of UI campus.

The first step in the research was observation of the locations where Asteraceae can be found in the University of Indonesia area. Then, these locations were put into site plan. Next step, the plants were identified in the field. It was adjusting plants morphology data with determination keys in Flora of Java (Backer and Brink, 1965).

## RESULTS AND DISCUSSION

There are 21 species of 20 genera of Asteraceae family in University of Indonesia area. The species are shown in Figure 2. Asteraceae plants are found in almost all location in the campus, except in forest city (Figure 1 and Table 1). These plants were found scattered in places which more exposed to sun light such as in pitch, highway, building land, forest borders, and gutter. Location with highest number of Asteraceae species is in area of The Faculty of Mathematics and Natural Sciences. It is about 16 species. Common species of Asteraceae in University of Indonesia are *Mikania micrantha*, *Cyanthilliumcinereum*, *Synedrella nodiflora*, *Ageratum conyzoides*, *Tridax procumbens*, and *Emilia sonchifolia*.

Most of *Mikania micrantha* are found clambering in big trees and shrubs. These plants can cover all parts of host trees. These plants also can be found in several locations in the campus, such as in building land, forest

borders, curbs, and shrubs. *Cyanthilliumcinereum*, *Synedrella nodiflora*, *Ageratum conyzoides*, *Tridax procumbens*, and *Emilia sonchifolia* are kinds of Asteraceae plant which common in roadsides of UI campus, Depok.

*Tithonia diversifolia* is a herbaceous plant to 1,5 m tall. The stem is round, erect, and green. Length of peduncle can reach 35 cm. The leaves are simple, green, rhomboid, alternate, nerve palmate, acute at the apex, and serrate. The inflorescence consists of marginal and disk flowers. It is yellow and located in terminal. According to Jama *et al.* 2000, this plant is used as green fertilizer by farmer in Africa because it contains high N, P, and K. Also, it is used as bearing up erosion, treating hepatitis, and being fungicides. In addition, it is used as ruminant feed supplement especially during dry season when there is limitation in availability of animal feed (Firsoni, 2011).

*Clibadiumsurinamense* is a shrub plant to 2 m tall. The stem is round, erect, and green. The leaves are simple, green, elliptic, rounded at the base, acute apex, and shallowly serrate. The inflorescence consists of white marginal and purple pale disk flowers. It is located in terminal. According to Adijaya (2008), this plant can reduce erosion. Also, its leaves and young stem which are crushed can cure wounds.

*Synedrella nodiflora* is a herbaceous plant to 22 cm tall. The stem is round, erect, and green. The leaves are hairy, elliptic or ovate, nerve pinnate, acute apex, obtuse at the base, and serrate. The inflorescence consists of marginal and disk flowers. It is yellow and

located in terminal. According to Bhogaonkar (2011), this plant is used to cure arthritis pain. Juice of leaf can be used to treat earaches and headaches after child birth. Leaf's sap also can be used to cure abdominal pain. Decoction of root used as cough medicine. In addition, it can act as insecticidal and antimicrobial.

*Eclipta prostrata* is a herbaceous plant with  $\pm 5$  cm-20 cm tall. The stem is round, erect, and brown purplish. The Leaves are oblong  $\pm 12,5 \times 3,5$  cm, nerve pinnate, opposite, serrate, and acute at the apex and base. The inflorescence is corymbs which is located in head terminal and in the upper leaf axil. It consists of white marginal and disk flowers. The flower has yellow anther and white pistil. The fruits are achene oblong-turbinate, black, few hairs at the top, have needle shape, long  $\pm 2$  mm. According to Tzonev (2007) *Eclipta prostrata* widely used as a hairs supplement that makes these more health and black, antiseptic, antiviral, and for asthma and cough medication.

*Sphagneticola trilobata* is a herbaceous plant to 20 cm tall. The stem is erect or creeping, round, and green. The leaves are elliptic, opposite, serrate, hairy, and acute at the apex and base. The inflorescence consists of yellow marginal and disk flowers. It is located in terminal. The marginal flower is a female because it has pistil. It has 2-3 dentate. According to Kade *et al.* (2010) *Sphagneticola* can be used as medicine for diabetes.

*Chromolaena odorata* is a shrub plant to 2,5 m tall. The stem is erect, round, and green. The leaves are triangular, hairy, pinnate with

three nerved, opposite, dentate, acute at the apex, and cuneate at the base. The flower can not be founded. According to Arifin *et al.* (2012), it can be used as compost. It can improve the physical, chemical, and biological soil. Decomposition of *Chromolaena odorata* can increase organic material in soil and Cation Exchange Capacity (CEC). Moreover, it can provide nutrients such as nitrogen, phosphorus, potassium, calcium, and magnesium in soil.

*Mikania micranthais* a herbaceous plant. The stem habit is creeping and sprawling, round, and green. The leaves are broad cordate or shortly contracted base, acutely acuminate apex, pinnate with three nerved, opposite, and crenate. This plant can be found in place that is exposed to full sunlight. According to Asia – Pacific Forest Invasive Species Network (2007), this plant is used as animal feed, antibacterial, covering rubber plantation, and treatment for stomach ache and curative disease.

*Ageratum conyzoides* a herbaceous plant to 40 cm tall. The stem is erect, round, and green. The leaves are ovate, pinnate, serrate, obtuse at the apex, and rounded at the base. The inflorescence is corymbs, has many flowered, white purplish, and located in the terminal. According to Sukanto (2007), this plant is widely used to cure wounds, inflammation, and itching. Babadat on extract which is mixed with ginger extract effectively treat inflammation which is caused by *Staphylococcus aureus* bacteria in the experiment. Moreover, this plant can inhibit growth of *Bacillus subtilis*, *Escherichia coli*,

and *Pseudomonas aeruginosa*. The roots are useful to treat dysentery, diarrhea, and fever.

*Porophyllum ruderale* is a herbaceous plant to 40 cm tall. The stem is erect, round, and reddish purple. The leaves are pinnate, alternate, green, blunt ends, and inverted triangle at the base. The inflorescence is brown and located in terminal. According to Gabrielle *et al.* (2011), this plant is used as an aromatic herbal, anti-inflammatory, fungicide, anti-bacterial, anti-stress, antidote of snake, and arthritis and pain release.

*Cyanthillium cinereum* is a herbaceous plant with 14--20 cm tall. The stem is erect stems, round, and brown. The leaves are oblong, pinnate, alternate, serrate, green, and acute at the apex and base. The inflorescence has yellow disk flower and is located in terminal. The flowers of *Cyanthillium cinereum* that are founded at UI have a variety of colors such as pink, purple and white. According to Arifin *et al.* (2008), this plant can be used to cure fever, cough, dysentery, hepatitis, insomnia, and constipation. In India, the plant is used for uterine tumors treatment. Medicine from this plant also makes birth easier because it induces contraction of uterus. This plant contains alkaloid, saponins, and triterpene compounds.

*Bidens pilosa* is a herbaceous plant to 50 cm tall. The stem is erect, round, and combination green and red color. The leaves are oblong, pinnate, serrate, green, and acute at the apex and base. The inflorescence consists of white marginal and yellow disk flower. It is located in the terminal. Achene elongated slender, length 0.5 to 1, 3 cm, blackish brown

when ripen, with a similar hook-barbed needle jagged edges, useful to attach to the shirt and pants that help spread the seeds. According to Chang *et al.* (2007), this plant is used to cure stomach ache, malaria, liver diseases, and diabetes. In addition, phytochemicals which is contained in this plant can act as anti-inflammatory, immunosuppressive, anti-bacterial, and anti-malaria. The phytochemicals also can inhibit prostaglandin function in the synthesis pathway.

*Emilia sonchifolia* is a herbaceous plant to 32 cm tall. The stem is erect, round, and green. The leaves are cordate, elongate, alternate, dentate, green, pinnate, acute at the apex, and notched at the base. The inflorescence has purple disk flowers. It is located in the terminal. According to Couto *et al.* (2011), this plant has advantage as a medicinal plant. It is traditionally used to treat asthma, fever, wounds, and rheumatism by Brazilians. The leaves can be used either raw or cooked as a vegetable.

*Sonchus arvensis* is a herbaceous plant. Height of the plant is 10 cm and can reach up to 40 cm. The stem is erect, round, and green. The leaves are oblong and pinnate. Bottom of the leaves are large and attach directly to the soil (sessile). Also this leaves have dentate edge, green, rounded at the apex, and acute at the base. The inflorescence consists of yellow marginal and disk flower. It is located in the terminal. According to Katno (2006), the leaves of this plant can dissolve kidney stones. Also, the young leaves can be served as salads or cooked like spinaches. The leaves are rich in mineral salt and vitamin C. There are about

47 mg of vitamin C and 2% protein (dry weight). The root can be used as a coffee substitute.

*Youngiajaponica* is a herbaceous plant to 25 cm tall. The stem is erect, round, and green. The leaves are oblong, pinnate, lower leaves gatherina rosette and the other leaves on petioles. Upper leaves are smaller than lower. They are green, rounded at the apex, obtuseat the base, and wavy leaf margins (repand).The inflorescence has yellow color and islocated in the terminal. This plant can be used to treat a fever, ulcers, and snake bites. Moreover, this plant can act as anticancer and antimicrobial (Ooi *et al.*, 2006).

*Tridax procumbens* is a herbaceous plant with 15—20 cm tall. The stem is creeping on the ground, round, and green. The leaves are elliptice, pinnate, serrate, acute at the tip, sagitate at the base, and green. The peduncle of flower is erect. The inflorescence has yellow disk and white marginal flower.

According to Ankita and Jain (2012), the leaves of this plant can be cooked and eaten like a vegetable. This plant is used to treat bronchial catarrh, dysentery and diarrhea, liver disease, blood pressure, malaria, abdominal pain, headache, wound healing, and prevents hair loss. The flowers and leaves can be used as an antiseptic. They have pharmacological activitiesuch asanti-diabetic, antioxidant, and anti-inflammatory.

*Blumea balsamifera* is a herbaceous plant to 20 cm tall. The stem is erect, round, and green. The leaves are oblong, pinnate, alternate, dentate, acuminate at the tip and base, and green. Marginal flower is yellow and phalli shaped. According to Norikura (2008), this plant has benefit as medicinal plant to cure diarrhea, fever, and irregular menstruation. The leaves are an antioxidant. These are also used as a tea, a medicine for rheumatic, and anti fungal.



Figure 1. Locations of Asteraceae plants at University of Indonesia, Depok

*Conyza japonica* is a herbaceous plant to 25 cm tall. The stem is erect, round, green, and hairy. The leaves are oblong, pinnate, alternate, dentate, obtuse at the tip, acute at the base, and

green. There is no flower. According to Manguro (2010), this plant can cure small pox, sore, skin diseases, toothache, and can stop the bleeding which is caused by wound.

Table 1. Locations of Asteraceae plants at University of Indonesia, Depok

Locations	Species	Numbers of species
Behind Student HealthCenter(SHC), near rail roads.	<i>Tithonia diversifolia</i> , <i>Clibadium surinamense</i> , <i>Chromolaenaodorata</i> .	3
Boulevard	<i>Clibadium surinamense</i> , <i>Porophyllum ruderales</i> , <i>Bidens pilosa</i> , <i>Sphagneticola trilobata</i> , <i>Mikania micrantha</i> , <i>Conyza japonica</i> , <i>Tridax procumbens</i> , <i>Chromolaena odorata</i> .	8
Along Faculty of Engineering's road	<i>Chromolaenaodorata</i> , <i>Cyanthilliumcinereum</i> , <i>Emilia sonchifolia</i> , <i>Synedrella nodiflora</i> , <i>Mikania micrantha</i> .	5
Faculty of Mathematics and Natural Sciences (FMIPA) area	<i>Porophyllum ruderales</i> , <i>Synedrella nodiflora</i> , <i>Cyanthilliumcinereum</i> , <i>Elephantopus scaber</i> , <i>Ageratum conyzoides</i> , <i>Eclipta prostrata</i> , <i>Sphagneticola trilobata</i> , <i>Mikania micrantha</i> , <i>Emilia sonchifolia</i> , <i>Cosmos caudatus</i> , <i>Cosmos sulphureus</i> , <i>Sonchus arvensis</i> , <i>Tridax procumbens</i> , <i>Youngia japonica</i> , <i>Blumea balsamifera</i> , <i>Conyzajaponica</i> .	16
Faculty of Pharmacy – Senate Building – across Senate Building's street	<i>Elephantopus scaber</i> , <i>Cyanthilliumcinereum</i> , <i>Emilia sonchifolia</i> , <i>Sonchus arvensis</i> , <i>Synedrella nodiflora</i> , <i>Sphagneticola trilobata</i> , <i>Mikania micrantha</i> , <i>Tridax procumbens</i> .	8
Roadside along FMIPA UI area - Hockey field – Kukusan Kelurahan village	<i>Sonchus arvensis</i> , <i>Emilia sonchifolia</i> , <i>Eclipta prostrata</i> , <i>Cyanthilliumcinereum</i> , <i>Synedrella nodiflora</i> , <i>Elephantopus scaber</i> , <i>Tridax procumbens</i> , <i>Ageratum conyzoides</i> .	8
Faculty of Engineering's road-- Agathis Lake	<i>Cyanthilliumcinereum</i> , <i>Emilia sonchifolia</i> , <i>Synedrella nodiflora</i> .	3
Forest along Faculty of Engineering's road	<i>Cyanthilliumcinereum</i> , <i>Emilia sonchifolia</i> , <i>Chromolaena odorata</i> , <i>Synedrella nodiflora</i> , <i>Mikania micrantha</i> .	5
Road between FMIPA- Boulevard-FKM-Senggol Pondok Cina Lane	<i>Tridax procumbens</i> , <i>Eclipta prostata</i> , <i>Cyanthilliumcinereum</i> , <i>Emilia sonchifolia</i> , <i>Elephantopus scaber</i> , <i>Youngia japonica</i> , <i>Conyza japonica</i> , <i>Mikania micrantha</i> , <i>Synedrella nodiflora</i> , <i>Ageratum conyzoides</i> .	10
Water tower	<i>Cosmos sulphureus</i> , <i>Eclipta prostata</i> , <i>Emilia sonchifolia</i> .	3
Road side along Makara Inn	<i>Youngia japonica</i> , <i>Galinsoga parviflora</i> , <i>Mikania micrantha</i> , <i>Tridax procumbens</i> , <i>Synedrella nodiflora</i> .	5
Balai Sidang	<i>Tridax procumbens</i> , <i>Cyanthillium cinereum</i> , <i>Emilia sonchifolia</i> , <i>Youngia japonica</i> .	4
Rotunda - Road side of university head office - Science Park	<i>Tridax procumbens</i> , <i>Emilia sonchifolia</i> , <i>Elephantopus scaber</i> , <i>Synedrella nodiflora</i> , <i>Ageratum conyzoides</i> , <i>Cyanthillium cinereum</i> .	6



*Galinsoga parviflora* is a herbaceous plant to 15 cm tall. The stem is erect, round, and green. The leaves are oval, three midrib with pinnate vein, serrate, green, obtuse at the tip, cuneate at the base. The inflorescence consists of white marginal and yellow disk flowers. According to Plants for future (2012),

all part of the plant including leaves, stem, and fresh bud of flower can be as salads or added to soups. This plant can also be dried and become food flavouring powder. Moreover, this plant is mixed with tomato or other vegetable become a juice.

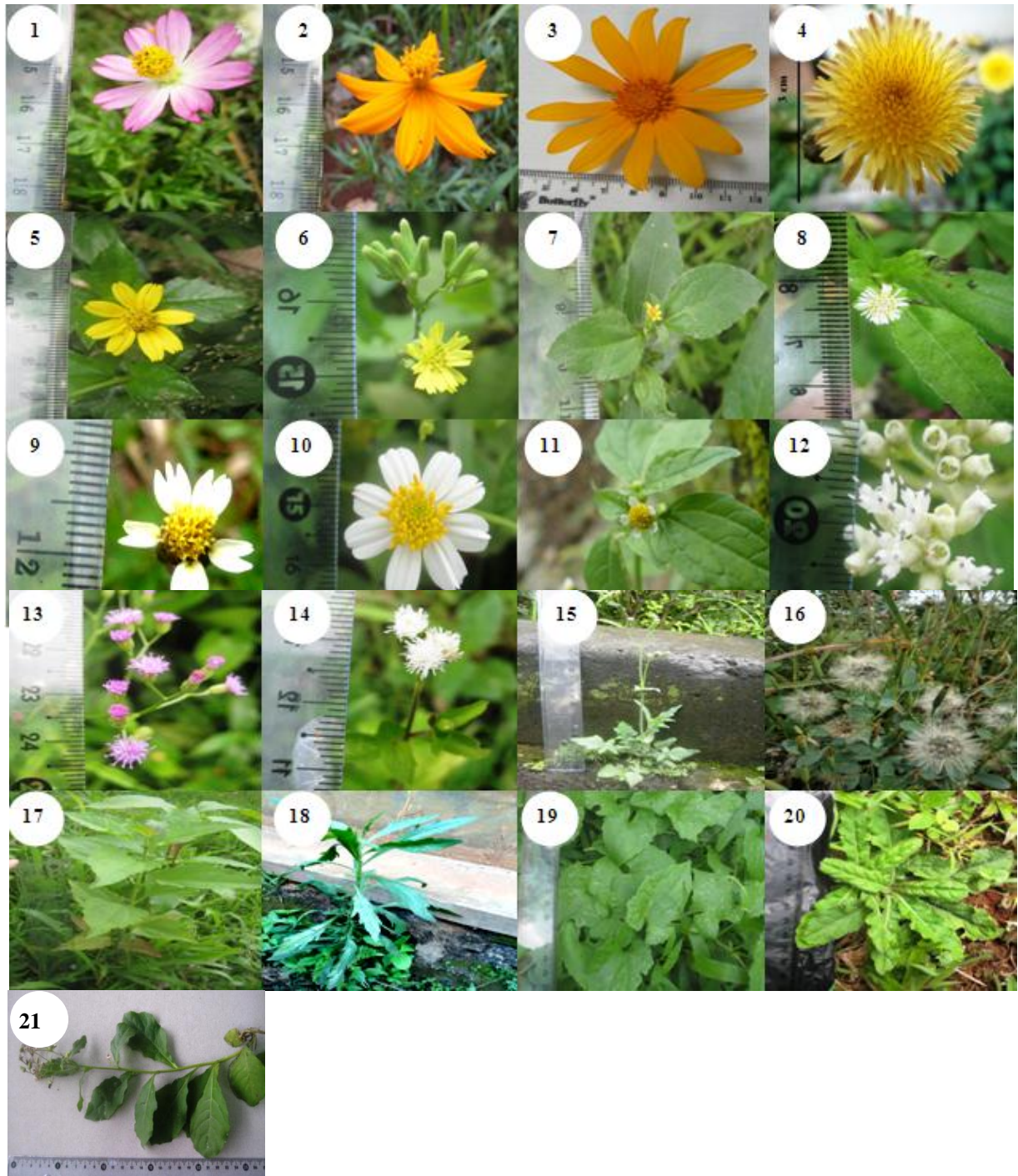


Figure 2. Species of Asteraceae around UI Campus

## CONCLUSION

There are 21 species of 20 genera in Asteraceae which are scattered around UI campus. The Location with the highest numbers of species which belong to Asteraceae family is in the Faculty of Mathematics and Natural Sciences. There are

16 species on this place. Asteraceae which are commonly founded are *Mikania micrantha*, *Cyanthilliumcinereum*, *Synedrella nodiflora*, *Ageratum conyzoides*, *Tridax procumbens*, *Emilia sonchifolia*. They generally are founded on the edge of the street.

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