

# WILD NATIVE PLANTS IN URBAN ECOSYSTEMS AROUND JAKARTA: A CHECKLIST OF THE WOODY SPECIES OF UNIVERSITAS INDONESIA

Wendy Achmmad Mustaqim<sup>1,2\*</sup>, Nisyawati<sup>3</sup>

<sup>1</sup>OMPT Canopy, Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok, Jawa Barat, Indonesia

<sup>2</sup>Botany Division, Generasi Biologi Indonesia (Genbinesia) Foundation, Gresik Regency 61171, Jawa Timur, Indonesia

<sup>3</sup>Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia

\*Corresponding author: [wendyachmmadm@gmail.com](mailto:wendyachmmadm@gmail.com)

## Abstract

*A study has been conducted on the diversity of woody plants which are wild and native in Universitas Indonesia, an urban ecosystem in the area of Jakarta Capital Region. This work is part of the flora inventory in Universitas Indonesia. A number of 118 species (34 families) were recorded, with three largest families are Fabaceae (14 species), Moraceae (12 species) and Phyllanthaceae (10 species). Among those numbers, 26 species are climbers, which is considerably remarkable for urban ecosystem. Twenty four were considered as lowland species. Five were exclusively distributed in Western Java. Twenty six species have been included in Flora van Batavia which showed that Universitas Indonesia will be an important component for the conservation of plants diversity in Jakarta and surroundings. An estimation on abundance also given for all species recorded, which resulting that about 41.52% species were locally rare. Discussion in future conservation in local scales also briefly discussed. Two species, namely Helicteres viscida and Phoebe declinata, are proposed for main conservation priorities of wild and native woody plants species in Universitas Indonesia.*

**Keywords:** checklist, Jakarta, native species, urban biodiversity, woody plants

## INTRODUCTION

The study on the plants diversity around the region of Jakarta Capital City is considerably limited. After the publications by Backer (1907), of which were not cover all plants families, only few research conducted were related to plant diversity in Jakarta and surroundings, such as Andayaningsih *et al.* (2013), Irsyam & Priyanti (2016) and Ulfa *et al.* (2013). The three latter also do not cover more than one families. Therefore, our knowledge in the plants diversity around Jakarta Capital City in recent period is far from complete. The newly published checklist by Mustaqim *et*

*al.* (2019) gives us a big picture of Jakarta's urban flora but is limited to spermatophytes.

Universitas Indonesia is located in the border of Jakarta and West Java province. It consist of area at about 320 hectares. Two main urban ecosystems are present in this area. The first is urban forest, namely Urban Forest of Universitas Indonesia and the second are green landscape around the building. Urban forest are locations where many species of plants are exist, especially the introduced species of trees (Departemen Kehutanan Jakarta, 1988). The latter, green landscape around the building sometimes considered as unused and rarely touched

lands, also become the home for many species of wild and native plants.

One of the most interesting result of the study of plants diversity in urban ecosystem are the presence of large number of non-native species. A good question for megabiodiversity country has been raised recently by Moro & Castro (2015) after their study in Fortaleza, Brazil, which revealed that exotics (introduced) species are often more popular and larger in number than native ones although in a megabiodiversity country. They questioning where the native plants are placed in the urban development and explained that native plants are often undervalued.

The introduction of exotic species in Universitas Indonesia has been begun since long time ago, more or less around the year of 1990. A lot of exotic plants species, mainly trees have been introduced to the urban forest. The goal of these works are to create an ex-situ conservation site for trees, provide material for studies and also build a miniature of Indonesian plants distribution (Departemen Kehutanan Jakarta, 1988). Consequently, sometimes the presence of native plants are neglected and become less important and get less attention, respectively.

This paper aimed to give a list of native and wild woody plants collected in the Universitas Indonesia in part from

Nisyawati & Mustaqim (2017). In the future, all species listed should be prioritized in conserving the plant diversity in Universitas Indonesia. Beside that, plants in this area will be important materials for future study of plants around Batavia especially the area now included in Jakarta.

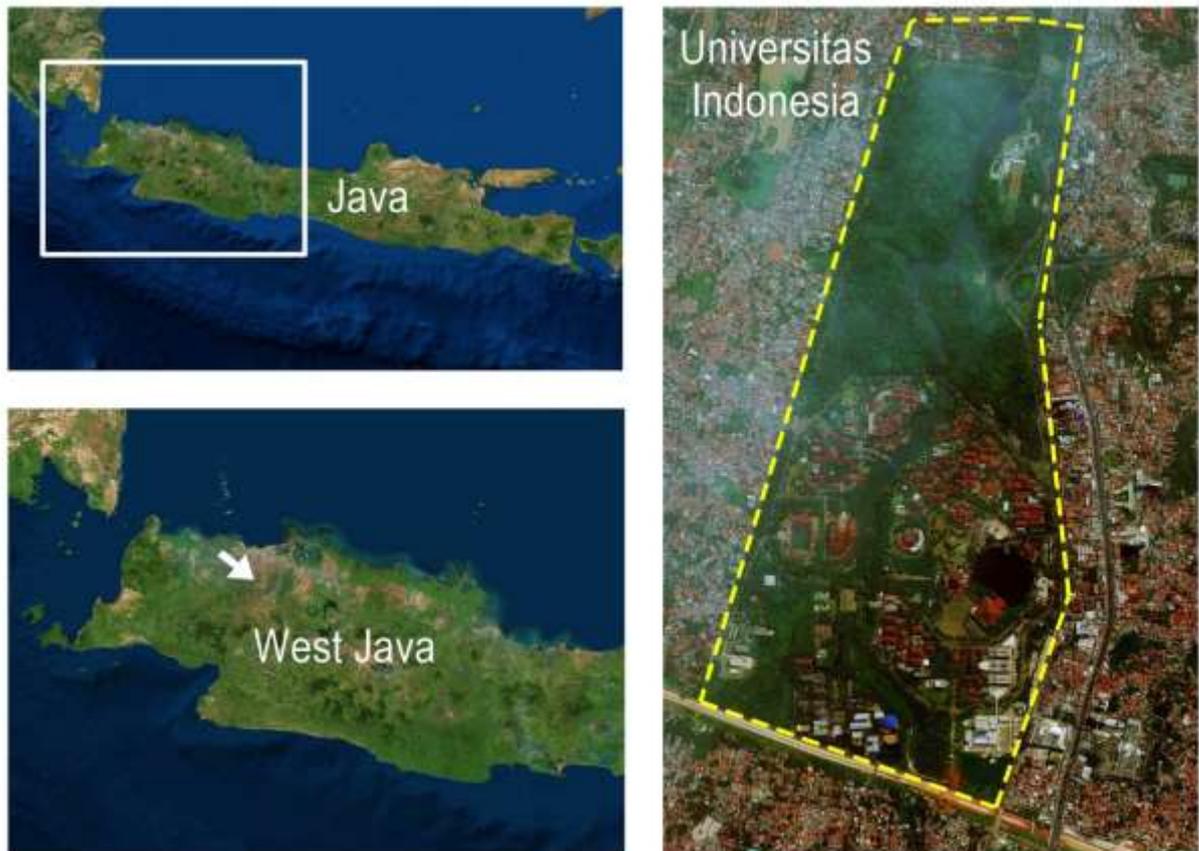
## **RESEARCH METHODE**

### **Study site**

The study has been conducted in the area of University of Indonesia, Depok, West Java Province (**Figure 1**). This area divided into two main categories, the first is urban forest or known as “Hutan Kota Universitas Indonesia” and second the green buildings. Some common species in urban forest are *Acacia mangium* and *Acacia auriculiformis*, as well as rubber (*Hevea brasiliensis*). All of these species are in cultivation. Beside the urban forest, several locations in Universitas Indonesia also harbor many woody plant species.

### **Checklist of Species**

Checklist has been based on examination of fresh or herbarium specimens collected from recent field exploration around the middle of 2014 to the end of 2015 in all areas inside the Universitas Indonesia, specimens kept in Herbarium of Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia and also literature review from Nisyawati & Mustaqim (2017).



**Figure 1.** Map showing the study site in Universitas Indonesia, Depok, West Java

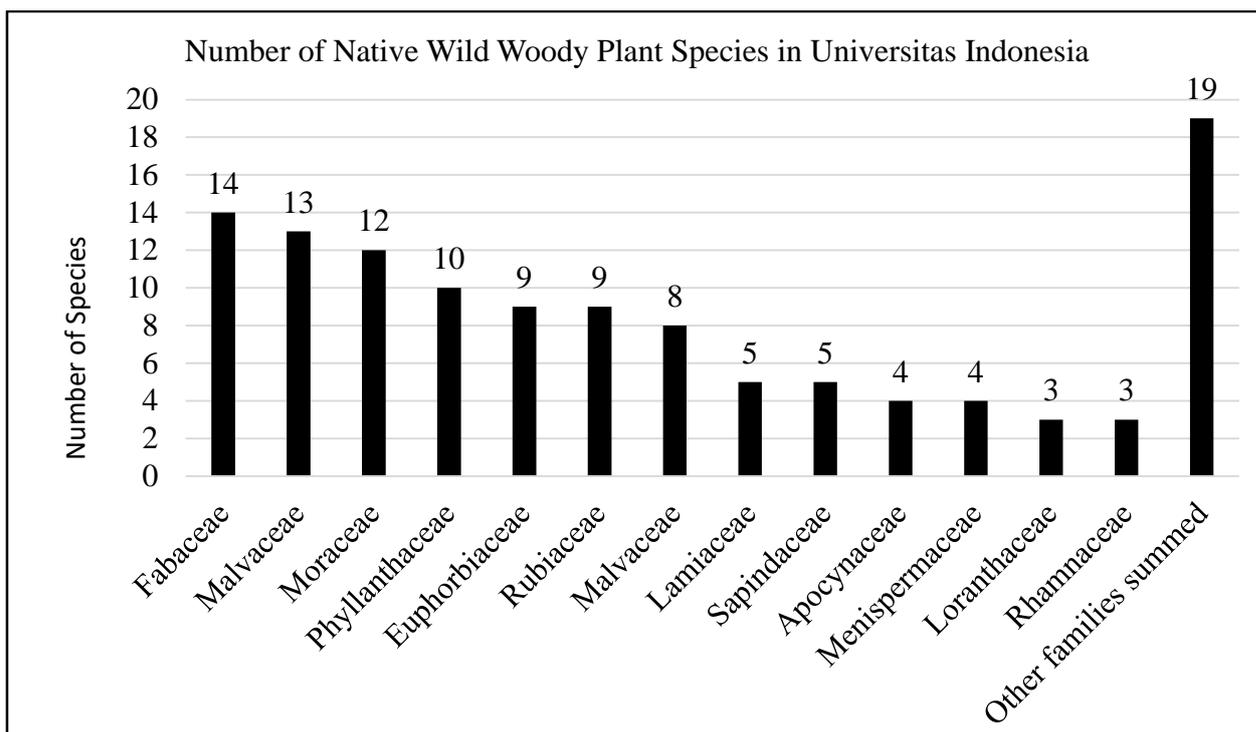
All recently collected specimens were kept in Herbarium of Department of Biology, Faculty of Mathematics and Natural Science, University of Indonesia, Depok, Jawa Barat. The taxa included in this paper is in a broad sense, vary from small herbs to large trees, more or less adopted from Kessler *et al.* (2002). Several name of species were validated in The Plant List (2013) and for *Fatoua villosa*

(*Moraceae*) we follow Berg *et. al.* (2006). We also present a rough estimation on the abundance of each species based on four categories which have been used by Moro & Castro (2015), but with more or less different or large modification has been applied to the delimitation of each criteria. We hope that such kind of estimation give us first impression about current state of plants in Universitas Indonesia.

**Table 1.** Subjective Abundance Criteria of Native Woody Plants in Universitas Indonesia Used in This Study

Abundance category	Criteria
Rare	Single or few localities with few individual
Moderate	Several localities with many individual
Common	Many localities with few to several individual
Very common	Many localities with many individual

Keterangan: Data disajikan berupa rata-ran  $\bar{X} \pm$  standar deviasi (SD). Rerata yang diikuti superskrip yang sama pada baris yang sama menunjukkan pengaruh tidak nyata ( $p > 0,05$ ) dengan uji t pada taraf kepercayaan 95%. K: kelompok kontrol, P: kelompok perlakuan.



**Figure 2.** Graphic show the number of species of each families for the wild and native woody plants in Universitas Indonesia

**RESULT AND DISCUSSIONS**

A total number of 118 species (34 families) of wild and native woody plants have been recorded from Universitas Indonesia. The range of life forms ranging from woody herbs, shrubs, trees and climbers. This also including two parasitic families, which are *Loranthaceae* and *Viscaceae*. Based on our result, three largest families are *Fabaceae* (14 species),

followed by *Malvaceae* (13 species) and *Moraceae* (12 species). The number of species within each family can be seen in **Figure 2**. In Universitas Indonesia, to determine whether a plants is wild or not is somewhat confusing. Therefore, several species are categorized as doubtful record for wild state and marked with asterisk (\*) in our list (**Table 2**).

**Table 2.** List of Native and Wild Woody Plants from Universitas Indonesia

No.	Family	Species	Life form <sup>1</sup>	Abundance
1	<i>Amaranthaceae</i>	<i>Deeringia amaranthoides</i> (Lam.) Merr.	C	Rare
2	<i>Annonaceae</i>	<i>Uvaria rufa</i> Blume	C	Moderate
3	<i>Apocynaceae</i>	<i>Calotropis gigantea</i> (L.) Dryand	S	Rare
4	<i>Apocynaceae</i>	<i>Parameria laevigata</i> (Juss.) Moldenke	C	Rare
5	<i>Apocynaceae</i>	<i>Wrightia pubescens</i> ssp <i>lanitii</i> (Blanco) Ngan.	T	Moderate
6	<i>Apocynaceae</i>	Sp.1	C	Rare
7	<i>Asteraceae</i>	<i>Blumea junghuhniana</i> (Miq.) Boerl.	H	Rare

Wendy Achmad Mustaqim *et al.*: Wild Native Plants in Urban Ecosystems Around Jakarta:  
A Checklist of The Woody Species of Universitas Indonesia

No.	Family	Species	Life form <sup>1</sup>	Abundance
8	Combretaceae	<i>Quisqualis indica</i> L.	S	Moderate
9	Convolvulaceae	<i>Lepistemon binectariferum</i> (Wall.) Kuntze	C	Moderate
10	Dilleniaceae	<i>Tetracera indica</i> (Christm. and Panz.) Merr.	C	Very common
11	Dilleniaceae	<i>Tetracera scandens</i> (L.) Merr.	C	Rare
12	Euphorbiaceae	<i>Acalypha indica</i> L.	H	Common
13	Euphorbiaceae	<i>Acalypha lanceolata</i> Willd. var. <i>lanceolata</i>	H	Rare
14	Euphorbiaceae	<i>Alchornea rugosa</i> (Lam.) Mull. Arg.	S	Rare
15	Euphorbiaceae	<i>Claoxylon indicum</i> (Reinw. ex Blume) Hassk.	S	Moderate
16	Euphorbiaceae	<i>Cnesmone javanica</i> Blume	C	Moderate
17	Euphorbiaceae	<i>Euphorbia hirta</i> L.	H	Very common
18	Euphorbiaceae	<i>Euphorbia thymifolia</i> L.	H	Common
19	Euphorbiaceae	<i>Macaranga tanarius</i> (L.) Mull. Arg.	T	Very common
20	Euphorbiaceae	<i>Mallotus paniculatus</i> (Lam.) Mull. Arg.	H	Very common
21	Fabaceae	<i>Abrus fruticulosus</i> Wall. ex Wight & Arn.	C	Rare
22	Fabaceae	<i>Aganope thyrsoiflora</i> (Bth.) Polhill	C	Rare
23	Fabaceae	<i>Alysicarpus vaginalis</i> (L.) D.C.	H	Common
24	Fabaceae	<i>Archidendron jiringa</i> (Jack) Nielsen *	T	Rare
25	Fabaceae	<i>Dalbergia latifolia</i> Roxb. *	T	Moderate
26	Fabaceae	<i>Desmodium heterocarpon</i> (L.) D.C.	H	Rare
27	Fabaceae	<i>Desmodium triflorum</i> (L.) D.C.	S	Very common
28	Fabaceae	<i>Flemingia strobilifera</i> (L.) R.Br.	S	Rare
29	Fabaceae	<i>Indigofera hirsuta</i> L.	H	Moderate
30	Fabaceae	<i>Mucuna macrophylla</i> Miq.	C	Moderate
31	Fabaceae	<i>Paraderris elliptica</i> (Wall.) Adema	C	Rare
32	Fabaceae	<i>Pueraria phaseoloides</i> (Roxb.) Benth.	C	Moderate
33	Fabaceae	<i>Uraria crinita</i> (L.) Desv. ex D.C.	S	Rare
34	Fabaceae	<i>Uraria lagopodioides</i> (L.) Desv. ex D.C.	H	Rare
35	Gnetaceae	<i>Gnetum latifolium</i> Blume	C	Moderate
36	Lamiaceae	<i>Clerodendrum paniculatum</i> L.	S	Rare
37	Lamiaceae	<i>Clerodendrum serratum</i> (L.) Moon.	S	Rare
38	Lamiaceae	<i>Clerodendrum villosum</i> Blume	S	Very common
39	Lamiaceae	<i>Vitex pinnata</i> L.*	T	Rare
40	Lauraceae	<i>Phoebe declinata</i> (Blume) Nees*	T	Rare
41	Leeaceae	<i>Leea aequata</i> L.	S	Very common
42	Leeaceae	<i>Leea indica</i> (Burm.f.) Merr.	S	Very common
43	Loranthaceae	<i>Dendrophthoe pentandra</i> (L.) Miq.	S-P	Very common
44	Loranthaceae	<i>Macrosolen cochinchinensis</i> (Lour.) Tiegh	S-P	Rare
45	Loranthaceae	<i>Scurulla atropurpurea</i> (Blume) Danser	S-P	Rare
46	Malvaceae	<i>Abelmoschus moschatus</i> Medik.	H	Rare
47	Malvaceae	<i>Abroma augusta</i> (L.) Willd.	H	Rare

No.	Family	Species	Life form <sup>1</sup>	Abundance
48	Malvaceae	<i>Corchorus aestuans</i> L.	H	Rare
49	Malvaceae	<i>Corchorus olitorius</i> L.	H	Rare
50	Malvaceae	<i>Grewia</i> sp.	C	Rare
51	Malvaceae	<i>Helicteres viscida</i> Blume	S	Rare
52	Malvaceae	<i>Melochia corchorifolia</i> L.	H	Common
53	Malvaceae	<i>Melochia umbellata</i> L.	S/T	Common
54	Malvaceae	<i>Microcos tomentosa</i> Sw.	S/T	Very common
55	Malvaceae	<i>Sida rhombifolia</i> L.	H	Very common
56	Malvaceae	<i>Sida subcordata</i> Span.	H	Moderate
57	Malvaceae	<i>Urena lobata</i> L.	H	Common
58	Malvaceae	<i>Waltheria indica</i> L.	H	Moderate
59	Melastomataceae	<i>Melastoma malabathricum</i> L ssp. <i>malabathricum</i>	S	Common
60	Menispermaceae	<i>Cyclea barbata</i> Miers	C	Common
61	Menispermaceae	<i>Pericampylus glaucus</i> (Lam.) Merr.	C	Common
62	Menispermaceae	<i>Stephania japonica</i> (Thunb.) Miers.	C	Very common
63	Menispermaceae	<i>Tinospora glabra</i> (Burm.f.) Merr.	C	Rare
64	Moraceae	<i>Artocarpus elasticus</i> Reinw. ex Blume	T	Rare
65	Moraceae	<i>Fatoua villosa</i> (Murray) Nakai	H	Very common
66	Moraceae	<i>Ficus benjamina</i> L.	T	Common
67	Moraceae	<i>Ficus callosa</i> Willd.	T	Very common
68	Moraceae	<i>Ficus grossularioides</i> Burm.f.	T	Rare
69	Moraceae	<i>Ficus hirta</i> Vahl	S	Common
70	Moraceae	<i>Ficus hispida</i> L.f.	T	Common
71	Moraceae	<i>Ficus microcarpa</i> L.f.	T	Moderate
72	Moraceae	<i>Ficus montana</i> Burm.f.	H	Common
73	Moraceae	<i>Ficus obscura</i> Blume	T	Rare
74	Moraceae	<i>Ficus septica</i> Burm.f.	T	Very common
75	Moraceae	<i>Ficus virens</i> Ait.	S	Rare
76	Myrtaceae	<i>Syzygium lineatum</i> (D.C.) Merr. & Perry	S/T	Rare
77	Oxalidaceae	<i>Biophytum sensitivum</i> (L.) D.C.	H	Rare
78	Phyllanthaceae	<i>Antidesma bunius</i> (L.) Spreng.	T	Common
79	Phyllanthaceae	<i>Breynia cernua</i> L.	S	Common
80	Phyllanthaceae	<i>Breynia microphylla</i> (Kurz ex T. & B.) Mull. Arg.	S	Rare
81	Phyllanthaceae	<i>Breynia racemosa</i> (Blume) Mull. Arg.	S	Rare
82	Phyllanthaceae	<i>Bridelia tomentosa</i> Blume	S/T	Very common
83	Phyllanthaceae	<i>Flueggea virosa</i> (Roxb. ex Willd.) Royle	S	Rare
84	Phyllanthaceae	<i>Glochidion rubrum</i> Blume	S	Rare
85	Phyllanthaceae	<i>Phyllanthus niruri</i> L.	H	Very common
86	Phyllanthaceae	<i>Phyllanthus urinaria</i> L.	H	Common
87	Phyllanthaceae	<i>Sauropus androgynus</i> (L.) Merr.	S	Moderate

Wendy Achmad Mustaqim *et al.*: Wild Native Plants in Urban Ecosystems Around Jakarta:  
A Checklist of The Woody Species of Universitas Indonesia

No.	Family	Species	Life form <sup>1</sup>	Abundance
88	<i>Piperaceae</i>	<i>Piper sarmentosum</i> Roxb. ex Hunter	H	Moderate
89	<i>Rhamnaceae</i>	<i>Ziziphus oenoplia</i> (L.) Mill.	T	Common
90	<i>Rhamnaceae</i>	<i>Ziziphus rotundifolia</i> Lam.*	T	rare
91	<i>Rhamnaceae</i>	<i>Guoania leptostachya</i> D.C.	C	Rare
92	<i>Rubiaceae</i>	<i>Chassalia curviflora</i> (Wall.) Thw.	S	Common
93	<i>Rubiaceae</i>	<i>Dentella repens</i> (L.) J.R. Forst.	H	Moderate
94	<i>Rubiaceae</i>	<i>Ixora nigricans</i> R.Br. ex Wight & Arn.	S	Common
95	<i>Rubiaceae</i>	<i>Morinda citrifolia</i> L.	T	Very common
96	<i>Rubiaceae</i>	<i>Paederia scandens</i> (Lour.) Merr.	C	Common
97	<i>Rubiaceae</i>	<i>Oldenlandia biflora</i> L.	H	Common
98	<i>Rubiaceae</i>	<i>Oldenlandia corymbosa</i> L.	H	Very common
99	<i>Rubiaceae</i>	<i>Oldenlandia diffusa</i> (Willd.) Roxb.	H	Rare
100	<i>Rubiaceae</i>	<i>Psychotria viridiflora</i> Reinw. ex Blume	S	Very common
101	<i>Rutaceae</i>	<i>Acronychia pedunculata</i> (L.) Miq.	T	Rare
102	<i>Rutaceae</i>	<i>Clausena excavata</i> Burm.f.	S	Common
103	<i>Sapindaceae</i>	<i>Allophylus cobbe</i> (L.) Raeusch.	S/C	Very common
104	<i>Sapindaceae</i>	<i>Arytera littoralis</i> Blume	S	Moderate
105	<i>Sapindaceae</i>	<i>Cardiospermum halicacabum</i> L.	C	Moderate
106	<i>Sapindaceae</i>	<i>Lepisanthes amoena</i> (Hassk.) Leenh.	S/T	Rare
107	<i>Sapindaceae</i>	<i>Lepisanthes rubiginosa</i> (Roxb.) Leenh.	T	Rare
108	<i>Simaroubaceae</i>	<i>Brucea javanica</i> (L.) Merr.	S	Common
109	<i>Solanaceae</i>	<i>Solanum superficiens</i> Adelb.	S	Very common
110	<i>Solanaceae</i>	<i>Solanum verbascifolium</i> L.	S	Common
111	<i>Ulmaceae</i>	<i>Trema orientalis</i> (L.) Blume	S	Common
112	<i>Urticaceae</i>	<i>Pouzolzia zeylanica</i> (L.) Benn.	H	Very common
113	<i>Urticaceae</i>	<i>Boehmeria pilosiuscula</i> (Blume) Hassk.	T	Moderate
114	<i>Verbenaceae</i>	<i>Callicarpa candicans</i> (Burm.f.) Hochr.	S	Rare
115	<i>Viscaceae</i>	<i>Viscum auriculatum</i> Burm.f.	S-P	Very common
116	<i>Vitaceae</i>	<i>Cayratia geniculata</i> (Blume) Gagnep.	C	Rare
117	<i>Vitaceae</i>	<i>Cissus repens</i> Lam.	C	Rare
118	<i>Vitaceae</i>	<i>Tetrastigma coriaceum</i> (DC.) Gagnep.	C	Rare

Notes: <sup>1</sup> = (C: vines or climbers, H: herbs, S: shrubs; S-P: parasitic shrubs; T: trees)

From all recorded life forms, one of the most interesting is the presence of some woody climbers, especially the twiner species. The plants belong to this type consist of 26 species or about 22.03% of all species recorded. Since this type of plants

often depend on the presence of the host, high attention of their occurrence should be prioritized, especially several largest species which attain 10 m or longer or species that not yet found flowering when grow without host plants of trees or shrubs.

These species including *Abrus fruticosus*, *Aganope thyrsoiflora*, *Cayratia geniculata*, *Cissus repens*, *Gnetum latifolium*, *Paraderris elliptica*, *Parameria laevigata*, *Tetracera indica*, *Tetracera scandens*, *Tetrastigma coriaceum*, *Uvaria rufa* and *Ziziphus oenoplia*, added with *Lepistemon binectariferum* which has not been seen in flowering stage.

Regarded to abundance of each species, most of species are in rare category with 49 species or 41.52 % from total species recorded, followed by common (25 species), very common (23 species) and moderate (20 species). Some species in rare category have only been found in one locality with one to few individual during field works, namely *Biophytum sensitivum*, *Blumea junghuhniana*, *Breynia racemosa*, *Corchorus olitorius*, *Deeringia amaranthoides*, *Ficus grossularioides*, *Ficus obscura*, *Ficus virens*, *Guoania leptostachya*, *Helicteres viscida*, *Scurulla atropurpurea*, *Phoebe declinata*, *Tetrastigma coriaceum*, *Tinospora glabra*, *Uraria lagopodioides* and *Ziziphus rotundifolia*. These added with *Parameria laevigata*, only found once in wild state, but it has been planted as medicinal plant, so its future is rather safe.

## Discussion

Based on those result above, three major point will be discussed here, including the comparison to the Flora van Batavia (Backer, 1907), discussion on distribution either elevation or geographical compared to Java and some species that should be put at top of local conservation priorities.

First, comparison that has been made to the species included in *Flora van Batavia* (Backer, 1907) resulting that 26 species (from 10 families) are mentioned there. Species names are updated since several name of those account are outdated. List of species and current accepted names are provided in **Table 3**. This result indicates that the role of Universitas Indonesia in preserving the plant diversity of Jakarta and surroundings should not be neglected.

Related to geographical distribution of species in Java, a comparison also has been made based on Backer & Bakhuizen van den Brink (1963; 1965). Six species known to have distribution restricted in Western Java, namely *Archidendron jiringa*, *Guoania leptostachya*, *Helicteres viscida*, *Phoebe declinata*, *Solanum superficiens*, and *Wrightia pubescens* ssp. *lanitii*. The latter had been treated by Backer & Bakhuizen van den Brink (1965) as a distinct and endemic species to West Java.

**Table 3.** List of Plant Names that Listed in *Flora van Batavia*

No	Family	Current names	Names in Flora van Batavia
1	Annonaceae	<i>Uvaria rufa</i> Blume	<i>Uvaria rufa</i> Blume
2	Dilleniaceae	<i>Tetracera indica</i> (Christm. & Panz.) Merr.	<i>Tetracera assa</i> D.C.
3	Dilleniaceae	<i>Tetracera scandens</i> (L.) Merr.	<i>Tetracera hebecarpa</i> Boerl.
4	Leeaceae	<i>Leea aequata</i> L.	<i>Leea aequata</i> L.
5	Leeaceae	<i>Leea indica</i> (Burm.f.)	<i>Leea sambucina</i> Willd.
6	Malvaceae	<i>Abroma augusta</i> (L.) Willd.	<i>Abroma denticulata</i> Miq.
7	Malvaceae	<i>Corchorus olitorius</i> L.	<i>Corchorus olitorius</i> L.
8	Malvaceae	<i>Helicteres viscida</i> Blume	<i>Helicteres viscida</i> Blume
9	Malvaceae	<i>Melochia arborea</i> L.	<i>Melochia arborea</i> Blanco
10	Malvaceae	<i>Melochia corchorifolia</i> L.	<i>Melochia corchorifolia</i> L.
11	Malvaceae	<i>Microcos tomentosa</i> Sw.	<i>Grewia tomentosa</i> Juss.
12	Malvaceae	<i>Sida rhombifolia</i> L.	<i>Sida rhombifolia</i> L.
13	Malvaceae	<i>Urena lobata</i> L.	<i>Urena lobata</i> L.
14	Malvaceae	<i>Waltheria indica</i> L.	<i>Waltheria indica</i> L.
15	Menispermaceae	<i>Cyclea barbata</i> Miers	<i>Cyclea peltata</i> Hook.f. & Thoms.
16	Menispermaceae	<i>Pericampylus glaucus</i> (Lam.) Merr.	<i>Pericampylus incanus</i> Miers
17	Menispermaceae	<i>Stephania japonica</i> (Thunb.) Miers	<i>Stephania discolor</i> Spreng.
18	Menispermaceae	<i>Tinospora glabra</i> (Burm.f.) Merr.	<i>Tinospora uliginosa</i> Miers
19	Rhamnaceae	<i>Ziziphus oenoplia</i> (L.) Mill.	<i>Ziziphus oenoplia</i> Mill.
20	Rutaceae	<i>Acronychia pedunculata</i> (L.) Miq.	<i>Acronychia laurifolia</i> Blume
21	Rutaceae	<i>Clausena excavata</i> Burm.f.	<i>Clausena excavata</i> Burm.
22	Sapindaceae	<i>Alophyllus cobbe</i> (L.) Raeusch.	<i>Alophyllus cobbe</i> Blume
23	Sapindaceae	<i>Arytera littoralis</i> Blume	<i>Arytera littoralis</i> Bl
24	Sapindaceae	<i>Cardiospermum halicacabum</i> L.	<i>Cardiospermum halicacabum</i> L.
25	Sapindaceae	<i>Lepisanthes rubiginosa</i> (Roxb.) Leenh.	<i>Erioglossum edule</i> Blume
26	Simaroubaceae	<i>Brucea javanica</i> (L.) Merr.	<i>Brucea sumatrana</i> Roxb

**Table 4.** List of Species Exclusive to Lowland (500 m or lower) Area of Java Compared to Data from Backer & Bakhuizen van den Brink (1963; 1965).

No	Family	Species	No	Family	Species
1	Annonaceae	<i>Uvaria rufa</i>	13	Rhamnaceae	<i>Ziziphus oenoplia</i>
2	Apocynaceae	<i>Parameria laevigata</i>	14	Rhamnaceae	<i>Ziziphus rotundifolia</i>
3	Apocynaceae	<i>Wrightia pubescens</i> ssp. <i>lanitii</i>	15	Rubiaceae	<i>Ixora nigricans</i>
4	Dilleniaceae	<i>Tetracera indica</i>	16	Rubiaceae	<i>Oldenlandia biflora</i>
5	Dilleniaceae	<i>Tetracera scandens</i>	17	Rubiaceae	<i>Morinda citrifolia</i>
6	Euphorbiaceae	<i>Acalypha indica</i>	18	Sapindaceae	<i>Lepisanthes rubiginosa</i>
7	Euphorbiaceae	<i>Acalypha lanceolata</i> var. <i>lanceolata</i>	19	Simaroubaceae	<i>Brucea javanica</i> <sup>1</sup>
8	Euphorbiaceae	<i>Cnesmone javanica</i>	20	Solanaceae	<i>Solanum superficiens</i>

No	Family	Species	No	Family	Species
9	<i>Fabaceae</i>	<i>Uraria lagopodioides</i>	21	<i>Sterculiaceae</i>	<i>Helicteres viscida</i>
10	<i>Menispermaceae</i>	<i>Tinospora glabra</i>	22	<i>Sterculiaceae</i>	<i>Waltheria indica</i>
11	<i>Oxalidaceae</i>	<i>Biophytum sensitivum</i>	23	<i>Tiliaceae</i>	<i>Corchorus aestuans</i>
12	<i>Rhamnaceae</i>	<i>Guoania leptostachya</i>	24	<i>Tiliaceae</i>	<i>Corchorus olitorius</i>

Note: 1. The elevational records in Java up to 550 m.

Beside that, comparison for the elevational distribution also has been done. Since urban forest of Universitas Indonesia is categorized as a lowland, an attempt has been made to check elevational distribution of plants compared to Java as whole based on data available in Backer & Bakhuizen van den Brink (1963; 1965). Sometimes, elevational records are not available or considerably needed to be updated, therefore data were taken from various sources which of course not exactly represent the Javanese range. These including Berg *et al.* (2006) for *Fatoua villosa*, Sagun *et al.* (2010) for two species of *Acalypha*, Hoogland (1951) for *Tetracera scandens*, and Wen *et al.* (2013) for *Tetrastigma coriaceum*, which sometimes unfortunately also not available. A number of 24 species known as exclusively lowland species, which distributed below 500 meters from sea level (Table 4). These are considered lowland based on altitudinal classifications in Java based on Steenis (2010). A record expand on elevational distribution also has been recorded on *Breynia microphylla* (ca. 70 masl), which previously in Java only known

from 600–2000 m (Backer & Bakhuizen van den Brink, 1963).

We also tried to highlight some species that need attention for their occurrence in Universitas Indonesia is an important component of future conservation. Here, three factors are used to roughly determine whether a species is urgently needed to be conserved or not, which are the local abundance, distribution in Java and elevational distribution. The two latter factors are based on information available in previously mentioned literatures (Backer & Bakhuizen van den Brink, 1963; 1965; Berg *et al.*, 2006; Sagun *et al.*, 2010; Nielsen, 1992; Wen *et al.*, 2013). Two species so far considered as conservation priorities in Universitas Indonesia, namely *Helicteres viscida* and *Phoebe declinata*. Both of them only have been found once in Universitas Indonesia and compared to phytogeographical region of Java, only can be found in western part (W).

Beside that, the presence of climbing plants is rather remarkable for an urban ecosystem. One of them is a host plant of parasitic *Rafflesia*, namely *Tetrastigma coriaceum*, a widespread species from India,

China, Indochina, Peninsular Malaysia, Singapore, Indonesia, New Guinea, and Philippines (Wen *et al.* 2013). This species, should also listed on top priorities of local conservation in Universitas Indonesia.

## CONCLUSIONS

A total number of 188 species from 34 families of wild and native woody plants were found in a 320 hectares urban ecosystem of Universitas Indonesia. The three most diverse families are Fabaceae, Malvaceae, and Moraceae, while the most diverse genus is *Ficus* (Moraceae). Some plant species mentioned in Backer (1907) can be found in Universitas Indonesia, indicates that this area is important for the conservation of plant diversity in Jakarta (=Batavia). Besides that, this area is also an important habitat for some lowland West Javan plant species.

## ACKNOWLEDGEMENTS

Authors give many thanks to UPT-K3L, Universitas Indonesia, who gave permission during field explorations and Herbarium of Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia for providing facilities during the research. Thanks also to Mr Taryana, Department of Biology, who give many information about the history of urban forest as well as the states of some encountered species. Thanks

also to the editors and reviewers for improving the quality of this paper.

## REFERENCES

- Andayaningsih D, Chikmawati T & Sulistijorini. 2013. Keanekaragaman tumbuhan paku terrestrial di hutan kota DKI Jakarta. *Berita Biologi*, 12(3): 297-305.
- Backer CA & Bakh.f van den Brink. 1963. *Flora of Java 1*. Groningen: NVP Nordhoff.
- Backer CA & Bakh.f van den Brink. 1968. *Flora of Java 2*. Groningen: NVP Nordhoff.
- Backer CA. 1907. *Flora van Batavia*. Batavia: G. Kolff & Co.
- Berg CC, Corner EJJ & Jarret FM. 2006. *Moraceae: Genera other than Ficus. Flora Malesiana I*, 17(1): 1–152.
- Departemen Kehutanan Jakarta. 1988. *Rencana induk pembangunan Hutan Kota, Kampus Universitas Indonesia – Depok 1988 s.d. 1999*. Jakarta: Kantor Wilayah Departemen Kehutanan.
- Hoogland RD. 1951. Dilleniaceae. *Flora Malesiana I*, 4(3): 141-174.
- Irsyam ASD & Priyanti P. 2016. Suku *Fabaceae* di Kampus Universitas Islam Negeri (UIN) Syarif Hidayatullah, Jakarta, bagian 1: Tumbuhan polong berperawakan pohon. *Al-Kaunyah Jurnal Biologi*, 9(1): 44-56.
- Kessler PJA, Bos MM, Sierra Daza SEC, Kop A, Willemsse LPM, Pitopang R & Gradstein SR. 2002. Checklist of woody plants of Sulawesi, Indonesia. *Blumea (Supplement)*, 14: 1-160.
- Moro MF & Castro ASF. 2015. A check list of plant species in the urban forestry of Fortaleza, Brazil: where are the native species in the country of megadiversity? *Urban Ecosystems*, 18: 47-71.
- Mustaqim WA, Panggabean IPDR & Putrika A. 2019. *Flora Jakarta*:

- Daftar awal jenis-jenis tumbuhan berbiji*. Gresik: Yayasan Generasi Biologi Indonesia.
- Nielsen IC. 1992. *Mimosaceae (Fabaceae-Mimosoideae)*. *Flora Malesiana I*, 11(1): 1-226.
- Nisyawati N & Mustaqim WA. 2017. *A guide to the urban plants of Universitas Indonesia: Spermatophytes*. Jakarta: UI Press.
- Sagun VA, Levin GA & van Welzen PC. 2010. Revision and phylogeny of *Acalypha (Euphorbiaceae)*. *Blumea*, 55: 21-60.
- Steenis CGGJ van. 2010. *Flora Pegunungan Jawa (Bahasa Indonesia)* translated by J.A. Kartawinata, *The Mountain Flora of Java*. Jakarta: LIPI-Press.
- The Plant List. 2013. The Plant List version 1.1. *Online* at <http://www.theplantlist.org> [accessed 29 September 2016].
- Ulfa E, Wardhani W & Sedayu A. 2013. The contribution of Ragunan fern data to the Indonesian urban pteridology studies. 4<sup>th</sup> International Conference on Global Resource Conservation & 10<sup>th</sup> Indonesian Society for Plant Taxonomy Congress. Malang, February 7-8<sup>th</sup> 2013. Malang (ID): Brawijaya University.
- Wen J, Lu L-M & Boggan JK. 2013. Diversity and evolution of *Vitaceae* in the Philippines. *The Philippines Journal of Science*, 142: 223-244.