Supplementary Materials

1. Taxonomy of Melastomataceae

Melastomataceae, the seventh largest family of flowering plants, belong to the order myrtales along with aristolochiaceae, combretaceae, crypteroniaceae, halorrhagidaceae, lythraceae, memecylaceae, myrtaeae, onagraceae and rhizophoraceae.

Table S1. Summary of Melastomataceae taxonomy (Adapted from Renner, 1993 [2]).

| Subfamilies          | Tribes                                                                 |
|----------------------|------------------------------------------------------------------------|
| Melastomatoideae     | Astronieae (Triana, 1865) 4 Genera, 149 species                        |
|                      | Blackeeae (Hook,1867) 2 Genera, 162 species                           |
|                      | Microlieae (Naudin, 1849) 11 Genera, 67 species                        |
| Melastomatoideae     | Rhexieae (D.C 1828) 1 Genus, 13 species                               |
|                      | Sonerileae (Triana, 1865) 40 Genera, 560–600 species                  |
|                      | Miconieae (D.C 1828) 38 Genera, 2200 species                           |
|                      | Merianieae (Triana, 1865) 16 Genera, 220 species                       |
|                      | Melastomeae (Osbeckae, D.C 1828) 47 Genera, 850 species               |
| Kibesioideae         | Kibessieae (Krasser, 1893) Pternandra (15 spp.)                        |

Jussieu (1789) first recognized the melastomataceae as a natural unit; however, David Don (1823) was who put structure into the family. Triana, a Colombian native with extensive knowledge in the field, published his system in 1865 and slightly modified it in 1871. Triana’s system grouped the melastomataceae in three subfamilies, melastomatoideae, astronioideae and memecyloideae; which include thirteen tribes. Owing to the size of this family, the internal classification has been reviewed several times. A recent systematic analysis of melastomataceous plants re-structured and placed them into two subfamilies, kibesioideae and melastomatoideae, which contains only nine tribes (see Table S1) and separated memecyloideae and crypteronioideae to upgrade them to the family status, memecylaceae and crypteroniaceae respectively [2].

2. Folk Medicinal Uses of Melastomataceous Plants

Melastomataceous plants have been long used as traditional medicines, especially in Asia and Latin America. In Indonesia, Malaysia and China, some species of this family, such as Melastoma, Medinilla and Osbeckia species, have been used as remedies for diarrhea, dysentery, leukorrhea, and various skin diseases, as well as astringents or hemostatics [8]. The tannins and the presence of alkylated derivatives of ellagic acid in various plants of this group may be responsible for these medicinal applications [9]. Various phytochemical studies have revealed ellagitannins as the main constituents.

In China, a decoction of the leaves of Melastoma dodecandrum Lour. is suggested to be effective as a wash for scrofula, hemorrhoids, dermatitis, leprosy, scabies, athlete’s foot, and snakebites, as well as to prevent abortion. The root juice is taken as a remedy for postparturient abdominal pains and dysentery [8]. The whole plant has been used as a traditional antipyretic, antitoxic, diuretic, hemostatic and anti-rheumatic medicine. An 80% aqueous acetone extract of the whole plant exhibited anti-allergic activity in the passive cutaneous anaphylaxis test and toward histamine release from rat peritoneal mast cells with an antigen antibody reaction in vitro [10]. The leaves of Melastoma malabathricum Linn.,
which is known as “daunharendong” in Indonesia and Malaysia, have been used as a crude drug for the treatment of diarrhea, dysentery and leucorrhoea [11–13].

In Chiapas Mexico, people eat the leaves of *Arthrostema ciliatum* Pavón ex Don. In another parts of Central America, the decoction of the whole plant is used as diuretic, purgative and as refreshment [14]. A syrup prepared from flowers of *Rhychanthera grandiflora* (Aubl.) DC. has been cited as a natural medicine against respiratory illnesses in French Guyana [15].

*Arthrostema volubile* (Bompl. Ex Naudin) Triana and *A. macrodemos* Gleason are used in Colombia in decoction of their stems or whole aerial part of the plant as a febrifuge, especially in the treatment of malaria. The stems are chewed or in the form of sap to quench the thirst and to cure the gum irritations. The decoction of the whole plant of *Brachyotum strigosum* (L.f.) Triana is used against the calculus of the bladder and other ailments of genitourinary tract; whereas the decoction of *Chaetolepis microphylla* (Bompl.) Miq. is used as diuretic [16].

*Bellucia dichotoma* Cogn. is one of various plant species used in folk medicine in the west of the state of Pará, Brazil, to treat snake bites. The extract inhibits the local effects of *Bothrops atrox venom* as suggested by the inhibition of phospholipase A2, hemorrhagic and edematogenic activities [17].

In Colombia, some species of the family have been used as folk medicine for the treatment of malaria, infections, skin injuries, respiratory diseases, bladder calculus and other genitourinary ailments, as diuretic and as a topical remedy for gum irritations. Verbal information submitted by settlers from Caldas, Colombia indicates that *Tibouchina ciliaris* Vent.) Cogn. and *Monochaetum multiflorum* (Bonpl.) Naudin are traditionally used for treatment of skin infections and injuries.

A recent and concise review on melatomataceous plants medicinal uses has been published [18], and another review correlating the chemical structure and gastric anti-ulcer activity of tannins [19].

| Tribes | Species | Compounds |
|--------|---------|-----------|
|        |         | **Triterpenoids** | **Alkyl Benzoquinones** | **Acyl Glycosides** | Ref. |
| 1      | *Tibouchina candolleana* | (1a); (2a) | (1); (2); (3) | | [12] |
| 2      | *Miconia stenostachya* | (1b); (1c) | | | [9] |
|        | *Miconia lepidota* | | | (4); (4a) | [10] |
| 3      | *Centrademia grandiflora* | (1b) | | | [9] |
|        | *Dissotis perkinsiae* | (1a); (2a) | | (3a) | [11] |

Tr: 1. Melastomeae, 2. Miconieae, 3. Sonerileae. Compounds: (1): β-amirin; (1a): Oleanolic acid; (1b): Sumaresinolic acid; (1c): 3-epi-sumaresinolic acid; (2): α-amirin; (2a): Ursolic acid; (3): β-sitosterol; (3a): sitosterol 3-O-β-D-glucopyranoside; (4): 2-Methoxy-6-pentyl-3,5-cyclohexadiene-1,4-dione; (4a): 2-Methoxy-6-heptyl-3,5-cyclohexadiene-1,4-dione.
Table S3. Flavonoids, flavonoid glycosides and acyl glycosides reported for melastomataceous plants.

| Tribes | Species                         | Flavonoids | Flavonoids Glycosides | Flavonoids Acyl Glycosides | Ref. |
|--------|--------------------------------|------------|-----------------------|----------------------------|------|
|        |                                |            |                       |                            |      |
|        | Monochaetum multiflorum        | (5)        | (6c); (8c); (8d)     | (8h); (8i)                 | [15,16,19] |
|        | Melastoma malabathricum        | (9a)       | (5)                   |                            | [11,29] |
|        | Melastoma normale              | (5)        | (9a)                  |                            | [30] |
|        | Melastoma dodecandrum          | (5)        | (5e)                  |                            | [31] |
|        | Tibouchina candolleana         | (7)        | (8f); (8g)            |                            | [12] |
| 1      | Tibouchina semidecandra         | (8); (9); (10); (10a) | (8a); (8c); (8e); (8l) |                            | [28] |
|        | Miconia cabuc                  | (5); (8); (9) | (6f); (8b); (8c); (8k); (9a); (9b); (9c) | (14) | [26] |
|        | Miconia rubiginosa             | (9); (11); (12a) | (9a); (9b); (9c) | (13a); (13b); (13c); (13d); (13e) | [22] |
| 2      | Miconia prasina                | (6)        | (11); (12); (12a)   | (9a); (9b); (9c)            | [24] |
|        | Medinilla magnifica            | (6); (8); (10); (10a) | (13a); (13b); (13c); (13d) | (13e) | [13] |
|        | Clidemia floribunda            | (6)        |                       |                            | [13] |
|        | Clidemia rubra                 | (11); (12); (12a) | (9a); (9b); (9c) | (13a); (13b); (13c); (13d); (13e) | [23] |
| 3      | Bertolonia marmorata           | (8); (10); (10a) | (8b); (8i)            |                            | [13,14] |
|        | Centrademia grandiflora        | (6)        |                       | (8f); (8g)                 | [13,25] |
|        | Centrademia floribunda         | (6)        |                       | (8f); (8g)                 | [13] |
| 4      | Huberia glazioliana            | (5); (6)   | (5a); (5b)            | (8c); (8d); (8e)            | [20] |
|        | Huberia minor                  | (5)        | (6b); (6c); (8e); (8d); (8e) | (8a); (5b); (6f); (8c); (8d); (8e) | [21] |
|        | Huberia nettoana               | (5)        | (6c); (8e); (8d); (8e) | (8a); (5b); (6f); (8c); (8d); (8e) | [21] |
|        | Huberia ovalifolia             | (5)        | (6b); (6d); (6e); (8c); (8e) | (8a); (5b); (6f); (8c); (8d); (8e) | [21] |
|        | Huberia semisserrata           | (5); (6)   | (5a); (5c); (8e)     | (8a); (5b); (6f); (8c); (8d); (8e) | [21] |
|        | Huberia carvalho               | (5)        |                       | (8a); (5b); (6f); (8c); (8d); (8e) | [21] |
|        | Huberia consimilis             | (5)        |                       | (8a); (5b); (6f); (8c); (8d); (8e) | [21] |

**Tribes:** 1. Melastomeae, 2. Miconieae, 3. Sonerileae, 4. Merianeae. **Compounds:** (5): Apigenin; (6): Kaempferol; (7): Luteolin; (8): Quercetin; (9): Myricetin; (10): Leucocyanidin; (10a): Leucodelphinidin; (11): Catechin; (12): Epicatechin; (12a): Epigallocatechin gallate; (5a): Apigenin 7-O-glucoside; (5b): Apigenin 7-O-(Glucose-rhamnose); (5c): Vitexin; (6b): Kaempferol-7-O-glucoside; (6c): Trifolin; (6d): Kaempferol-7-O-(galactose-xyllose); (6e): Kaempferol-7-O-(glucose-rhamnose); (6f): Kaempferol-3-O-β-D-(6′-coumaroyl)-glucopyranoside; (8a): Avicularin; (8b): Quercetin 3-O-α-L-(2′″-O-acetyl)-arabinofuranoside; (8c): Hyperin; (8d): Isoquercitrin; (8e): Quercitrin; (8f): Isoquercitrin 6″-O-gallate; (8g): Hyperin 6″-O-gallate; (8h): Hyperin 6″-O-cafeate; (8i): Isoquercitrin 6″-O-cafeate; (8k): Quercetin-3-O-α-L-rhamnopyranosyl-(2-1)-O-β-D-xlyopyranoside; (8l): Quercetin 3-O-α-L-rhamnopyranoside; (9a): Myricitrin; (9b): Myricetin 3-O-glucoside; (9c): Myricetin 3-O-rhamnosyl-glucoside; (13a): Matteucinol; (13b): Farrerol; (13c): Desmethoxymatteucinol; (13d): Miconioside C; (13e): Miconioside B; (14): Hydroxy-4″,7-dimethoxyflavone-(6-C-6″)-5″-hydroxy-3′″,4″″,7″″-trimethoxyflavone.
**Table S4.** Anthocyanins isolated from melastomataceous plants.

| Tribes       | Species                        | Anthocyanins                | Malvidin Acyl Glycosides | Ref.        |
|--------------|--------------------------------|-----------------------------|--------------------------|------------|
| 1            | Melastoma malabathricum        | (15); (16); (17); (18); (19)| (19a); (19b); (19c); (19d) | [27,33,34] |
|              | Tibouchina grandiflora         | (17a); (17b); (19a); (19b); (19h) |                        | [36]       |
|              | Tibouchina granulosa           | (19d); (19e); (19f); (19h)  |                          | [35]       |
|              | Tibouchina urvilleana          | (19g)                       |                          | [37]       |
|              | Tibouchina semidecandra        | (15); (16); (17); (18); (19)| (19a); (19b); (19c)      | [27,33,34] |
|              | Tibouchina multiflora          | (19g)                       |                          | [36]       |
| 2            | Clidemia hirta                 | (16a); (16b); (18a); (18b); (18c); (19c); (19e); (19f) | | [23]       |
| 3            | Dissotis perkinsiae            |                             |                          |            |

**Table S5.** Phenol acids and derivatives from melastomataceae species.

| Tribes       | Species                        | Compounds                  | Ref. |
|--------------|--------------------------------|----------------------------|------|
| 1            | Monochaeta multiflorum         | (20); (20a); (20b); (21); (21a); (22); (23); (24) | [19] |
|              | Tibouchina semidecandra        | (21a)                      | [32] |
| 2            | Phylagathis rotundifolia       | (21b); (21c)               | [42] |
|              | Clidemia floribunda            | (23)                       | [41] |
| 3            | Dissotis perkinsiae            | (21)                       | [11] |

**Table S6.** Galloylated cyanogenic glucosides from melastomataceae species.

| Tribes       | Species                        | Compounds                  | Ref. |
|--------------|--------------------------------|----------------------------|------|
| 1            | Monochaeta multiflorum         | (26); (27); (28)           | [19,23,37] |
| 2            | Phylagathis rotundifolia       | (25); (25a); (25b); (25c); (25d); (25e); (25f) | [19,42,44] |
### Table S7. Galloyl glucoses and Monomeric ellagitannins reported for melastomataceae species.

| Tribes | Species                      | Galloyl Glucoses | Monomeric Ellagitannins | Ref. |
|--------|------------------------------|------------------|-------------------------|-----|
|        |                              |                  |                         |     |
| 1      | Monochaetum multiflorum      | (20b); (29b); (29l); (31a) | (30); (31); (32); (32a); (32c) | [19] |
|        | Melastoma malabathrichicum  | (29l); (31a)     | (30); (31); (32); (32a); (32b) | [29] |
|        | Melastoma normale           | (29l); (31a)     | (31); (32); (32a); (32b) | [30] |
|        | Melastoma dodecandrum       | (20c)            | (32); (32a)             | [31] |
|        | Tibouchina semidecandra      | (29b); (29c); (31a) | (30); (31b); (32a); (32d); (34) | [71] |
|        | Heterocentrum roseum        |                  | (30); (32); (32b)      | [29] |
|        | Medillinia magnifica        | (34a)            |                         | [71] |
|        | Phylagathis rotundifolia    | (29d); (29h); (29i); (29j); (29k) | (32a); (35) | [48, 53] |

**Tribes:** 1. Melastomeae, 2. Miconieae, 3. Sonerileae. **Compounds:** (20b): Benzyl 6'-O-galloyl-β-D-glucopyranoside; (20c): Gallic acid 3-O-(6-O-galloyl)-β-D-glucopyranoside; (29b): 1,2,6-tri-O-galloyl-β-D-glucopyranose; (29c): 1,2,3,6-tetra-O-galloyl-β-D-glucopyranose; (29d): 1,2,3,4,6-penta-O-galloyl-β-D-glucose; (29h): 6-O-galloyl-D-glucose; (29i): 1,2,3-O-galloyl-β-D-glucose; (29j): 1,2,3,4,6-penta-O-galloyl-β-D-glucose; (29k): 3,4,6-tri-O-galloyl-D-glucose; (29l): 1,2,4,6-tetra-O-galloyl-β-D-glucopyranose; (30): Nobotanin D; (31): Pterocaryanin C; (31a): Praecoxin B; (32): Casuarictin; (32a): Pedunculagin; (32b): Strictinin; (32c): Isostrictinin; (32d): 2,3-O-(S)-HHDP-D-glucopyranose; (34): Praecoxin A; (35): 1,3-di-O-galloyl-4,6-O-(S)-HHDP-β-D-glucopyranose; (34a): Medillinin A.

### Table S8. C-Glucosidic monomeric ellagitannins reported for melastomataceae species.

| Tribes | Species                      | Compounds | Ref. |
|--------|------------------------------|-----------|-----|
|        |                              | (36); (36b) | [31] |
|        |                              | (40); (40a); (41); (41a) | [79] |
|        |                              | (39)      | [80] |
|        |                              | (36)      | [71] |
|        |                              | (36a); (37); (37a); (37b) | [91] |
| 2      | Bredia tuberculata           | (37)      | [30] |

**Tribes:** 1. Melastomeae, 2. Sonerileae. **Compounds:** (36): Causarinin; (36a): Stachyrin; (36b): Casuariin; (37): Castalagin; (37a): Vescalagin; (37b): Methylvestalagin; (38): 1,3-di-O-galloyl-4,6-O-(S)-hexahydroxydiphenoylglycopyranose; (39): Geraniin; (40): malabathrin A; (40a): malabathrin E; (41): stenophyllanin A; (41a): stenophyllanin B.
Table S9. Dimeric and Dimeric C-glucosidic ellagitannins from melastomataceae species.

| Tribes | Species               | Compounds                                                                 | Ref. |
|--------|-----------------------|---------------------------------------------------------------------------|------|
|        |                       | Dimeric Ellagitannins          |   Dimeric C-Glucosidic Ellagitannins   |      |
| 1      | Monochaetum multiflorum | (42); (42a); (42b); (42c); (43); (43b) | (43); (43a); (43c); (43d); (43e); (43f) | [30]  |
|        | Melastoma malabathrichum | (43); (43a); (43c); (43d); (43e); (43f) | (41b) | [92]  |
|        | Hetrocentron roseum   | (42); (43); (43a); (43g) | | [80]  |
|        | Tibouchina semidecandra | (42); (42a); (43); | | [61]  |
|        | Tibouchina multiflora  | (42); (42a); (42d); (43); (43a); (43b) | | [98]  |
|        | Medinilla magnifica    | (42d) | | [30]  |
| 2      | Bredia tuberculata    | (42); (42a); (42b); (43); (43a) | | [30]  |

**Tribes:** 1. Melastomeae, 3. Sonerileae. **Compounds:** (42): Nobotanin F; (42a): Nobotanin A; (42b): Brediatin B; (42c): Nobotanin R; (42d): Medilllinin B; (43): Nobotanin B; (43a): Nobotanin G; (43b): Nobotanin O; (43c): Malabathrin C; (43d): Nobotanin H; (43e): Malabathrin B; (43f): Malabathrin D; (43g): Nobotanin I; (41b): Alienanin B.

Table S10. Trimeric, tetrameric and pentameric ellagitannins ellagitannins from melastomataceae species.

| Tribes | Species               | Compounds                                                                 | Ref. |
|--------|-----------------------|---------------------------------------------------------------------------|------|
|        |                       | Trimeric Ellagitannins          | Tetrameric Ellagitannins | Pentameric Ellagitannins |      |
| 1      | Monochaetum multiflorum | (44); (45); (45a); (46); (46b); (46c); (47) | (48); (48a); (48b); (48c) | [80]  |
|        | Melastoma malabathrichum | (45) | (46) | [98]  |
| 1      | Hetrocentron roseum | (44); (44a); (44b); (44c); (44d) | (46a) | [80]  |
|        | Tibouchina semidecandra | (44); (44a); (44c); (45) | (46a) | [92]  |
| 2      | Bredia tuberculata | (44) | | [98]  |

**Tribes:** 1. Melastomeae, 2. Sonerileae. **Compounds:** (44): Nobotanin E; (44a): Nobotanin C; (44b): Nobotanin L; (44c): Nobotanin M; (44d): Nobotanin N; (45): Nobotanin J; (45a): Nobotanin V; (46): Nobotanin K; (46a): Nobotanin P; (46b): Nobotanin Q; (46c): Nobotanin T; (47): Nobotanin S; (48): Melastoflorin A; (48a): Melastoflorin B; (48b): Melastoflorin C; (48c): Melastoflorin D.