

TAXONOMIC STUDY ON TWENTY FIVE SPECIES OF ANGIOSPERMAE FOUND IN WAINGMAW TOWNSHIP, KACHIN STATE

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Abstract

This research deals with taxonomic study on 25 species of Angiospermae found in Waingmaw Township in Kachin State. The total area was 1883.17 sq km and the elevation ranges from 146 m to 1992 m above sea level. The species from Waingmaw Township were collected from June 2017 to May 2019. All collected specimens were studied, identified and have been preserved in the Herbarium. A total of 25 species under 16 genera belonging to 13 families were recorded. Of these Basal Angiosperm was represented by 1 species under 1 genera and 1 family, Magnoliids was represented by 1 species under 1 genera and 1 family, Eudicots was represented by 1 species under 1 genera and 1 families, Rosids was represented by 4 species under 4 genera and 3 families and Asterids was represented by 18 species under 9 genera and 7 families. Among them, these 25 species belonging to 8 species are not recorded in previous list of Myanmar. These species are very valuable for compilation of Flora of Myanmar.

Keywords : Taxonomic study, Angiospermae, Waingmaw Township

Introduction

The present research deals with the some members Angiospermae plants growing Waingmaw Township in Kachin State. It has lots of mountain ranges which ranges from north to south. One third of the Waingmaw Township is covered by forest vegetation. The Waingmaw Township is established by 13 quarters, 3 towns and 170 village tracts within the township. The elevation of Waingmaw is 146 m (481') to 1992 m (6534') above the sea level. It has a warm, wet climate. The average annual rainfall is about 98 cm. The coldest months of Waingmaw Township are December and January with an average temperature being 17° C except Kampaitee having 4° C and April, May and August being the hottest with an average temperature ranging from 32° C to 34° C.

The aim and objectives of this research is to identify and classify the members of Angiospermae plants found in Waingmaw Township, to record the taxonomic characters and information of various kinds of plants and to ascertain the nomenclature of natural plant resources distributed in Waingmaw Township.

Materials and Methods

The families of the collected specimens were determined by referring to literature of Hutchinson (1967) and Geesink (1981). Identification of genera and species were carried out by referring to the available literature such as Hooker (1897), Lingdi, L. & G. Cuizhi, L. Chaoluan, C. Alexander, B. Bartholomew and A.R. Brach.(1994), and Qi-ming and De-Lin (2007-2009).

The nomenclatural data was referred to Index Kewensis by which the names and synonyms of plants up to the rank of species being confirmed. All of nomenclatural studies were finalized by referring to the web site of International Plant Names Index (www.ipni.org) and online Botanical Database of Tropicos Plants (www.tropicos.org). Myanmar names and their distribution were followed to the Checklist of Hundley & Chit KoKo (1987) and Kress *et al.* (2003).

The studied species were systematically arranged into families according to the classification system of APG IV (2016). The generic and species arrangement under the

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family were systematically arranged alphabetically. The artificial key to the study species were also constructed by using their different characters. The dried specimens were mounted with a label of field data on a herbarium sheet. They were kept in the Herbarium of Botany Department, University of Mandalay for references and other academic purposes.

Results

Altogether 25 species belonging to 16 genera of 13 families of plants were resulted. The characters of photographic records were mentioned in Figures 1 to 4.

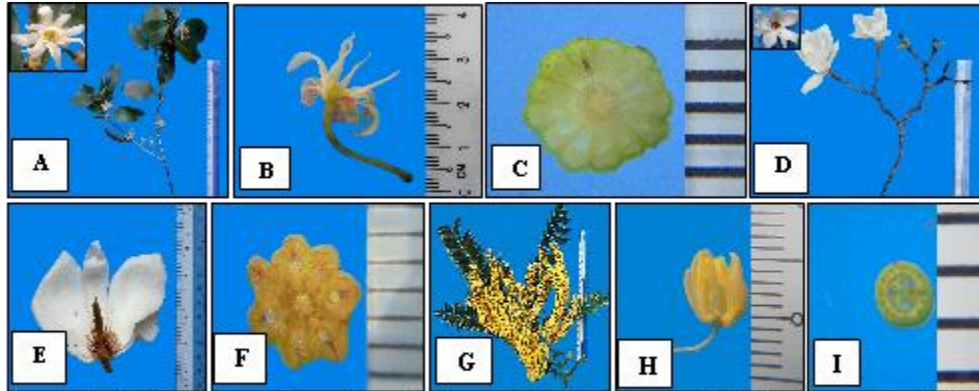


Figure 1. *Illicium angustisepalum* A.C. sm. A. Inflorescence, B. L.S of flower, C. T.S of ovary; *Magnolia grandiflora* D. Inflorescence, E. L.S of flower, F. T.S of ovary; *Mahonia napaulensis* DC. G. Inflorescence, H. L.S of flower, I. T.S of ovary.

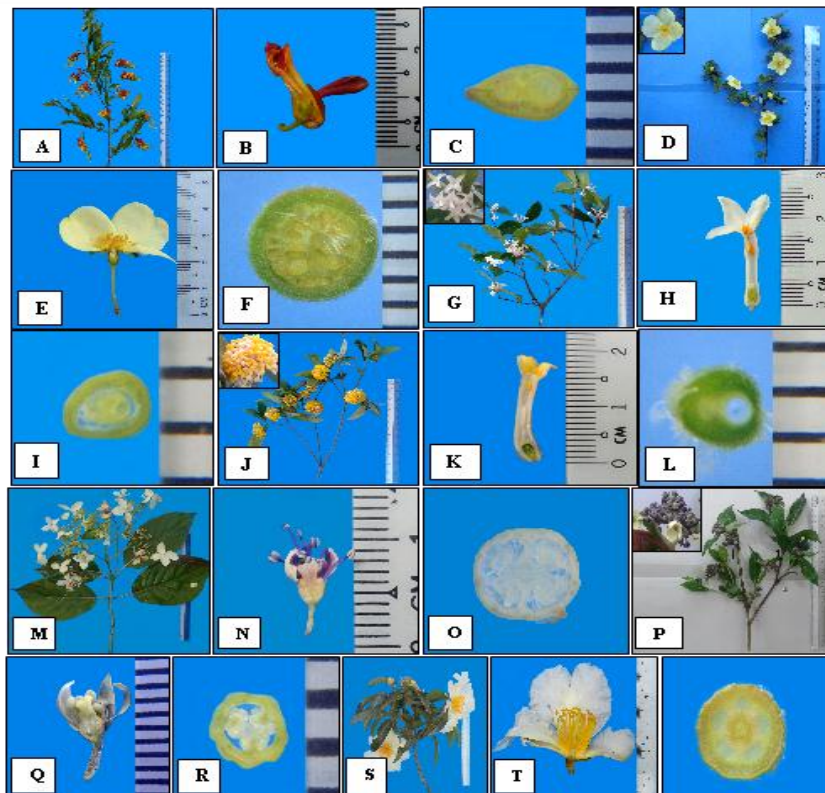


Figure 2. *Polygala arillata* Buch.-Ham. ex D. Don. A. Inflorescence, B. L.S of flower, C. T.S of ovary; *Rosa omsiensis* Rolfe D. Inflorescence, E. L.S of flower, F. T.S of ovary; *Daphne odora* Thunb. G. Inflorescence, H. L.S of flower, I. T.S of ovary; *Edgeworthia chrysantha* Lindl. J. Inflorescence, K. L.S of flower, L. T.S of ovary; *Hydrangea macrophylla* (Thunb.) Ser. M. Inflorescence, N. L.S of flower, O. T.S of ovary; *Hydrangea serrata* (Thunb.) Ser. P. Inflorescence, Q. L.S of flower, R. T.S of ovary; *Polyspora axillaris* (Roxb. ex Ker Gawl.) Sweet ex G. Don S. Inflorescence, T. L.S of flower, U. T.S of ovary.

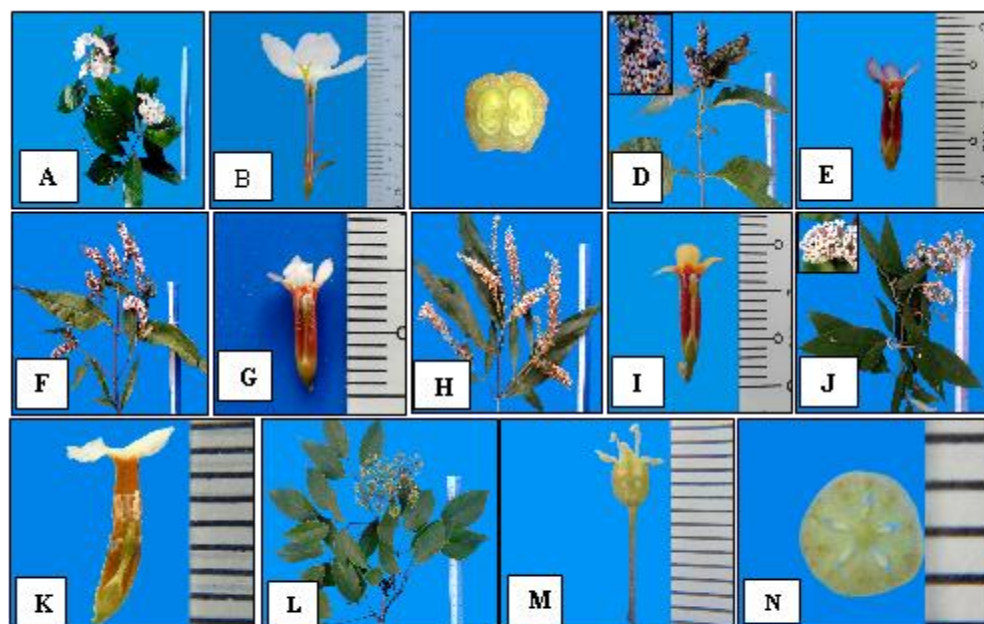


Figure 4. *Luculia pinceana* Hook. A. Inflorescence, B. L.S of flower, C. T.S of ovary; *Buddleja davidii* Franch. D. Inflorescence, E. L.S of flower; *Buddleja forrestii* Diels. F. Inflorescence, G. L.S of flower; *Buddleja macrostachya* Wall. ex Benth. H. Inflorescence, I. L.S of flower; *Buddleja officinalis* Maxim. J. Inflorescence, K. L.S of flower; *Dendropanax dentiger* (Harms) Merr. L. Inflorescence, M. L.S of flower, N. T.S of ovary.

An Artificial Key to the Studied Species

1. Tree ----- 19
1. Shrub ----- 2
 2. Leaves simple ----- 3
 2. Leaves compound ----- 18
3. Petals 4 ----- 13
3. Petals 5 ----- 4
 4. Anthers dehiscing by longitudinal ----- 10
 4. Anthers dehiscing by apical pore ----- 5
5. Rootstock with swollen ----- 6
5. Rootstock without swollen ----- 8
 6. Anthers with Spur ----- 13. *Agapetes hosseana*
 6. Anthers without Spur ----- 7
7. Filaments ovate and glabrous ----- 14. *Agapetes incurvata*
7. Filaments oblong and pubescent ----- 15. *Agapetes sikkimensis*
 8. Blades entire along the margin ----- 9
 8. Blades serrate along the margin ----- 16. *Lyonia villosa*
9. Ovary with furrow ----- 17. *Rhododendron arborerum*
9. Ovary without furrow ----- 18. *Rhododendron veitchianum*
 10. Style inserted ----- 11
 10. Style exserted ----- 12
11. Stigma bifid ----- 19. *Luculia gratissima*
11. Stigma simple ----- 9. *Hydrangea serrata*
 12. Stamens equal ----- 20. *Luculia pinceana*
 12. Stamens unequal ----- 8. *Hydrangea macrophylla*
13. Ovary glabrous ----- 6. *Daphne odorata*
13. Ovary silky pubescent ----- 14

- 14.Placentation pendulous-----7. *Edgeworthia chrysantha*
 14. Placentation axile -----15
15. Style purple-----21. *Buddleja davidii*
 15. Style creamy white-----16
 16.Flower large more than 0.9 cm in diameter-----17
 16. Flower less than 0.5 cm in diameter -----
 -----24. *Buddleja officinale*
17. Flower pink-----23. *Buddleja macrostachya*
 17. Flower orange-----22. *Buddleja forrestii*
 18.pistil non-embedded within the hypanthium-----
 -----3. *Mahonia napaulensis*
 18. pistil embedded within the hypanthium -----
 -----5. *Rosa omeiensis*
19. Flower actinomorphic-----20
 19. Flower zygomorphic-----4. *Polygala arillata*
 20.Stamens indefinite-----21
 20.Stamens definite-----25. *Dendropanax dentiger*
21. Perianth differentiated into sepals and petals-----22
 21. Perianth not differentiated into sepals and petals -----24
 22.Inflorescence cauliflorous -----12. *Saurauia roxburghii*
 22. Inflorescence axillary or terminal -----23
23. Fruits capsular -----10. *Polyspora axillaris*
 23. Fruits berry -----11. *Saurauia napaulensis*
 24.Bracts present-----2. *Magnolia grandiflora*
 24.Bracts absent-----1. *Illicium angustisepalum*

Discussion and Conclusion

The present research deals with the taxonomic study on some member of Angiospermae plants growing in Waingmaw Township. It is located in east bank of Ayeyarwaddy river. It has been presented that the totally 25 species belonging to 16 genera of 13 families in 11 orders were studied in the present work.

The growing habits of the collected plants vary in the study area. These species were grown in moist, and shady places, sunny and wet places and open fields and dry places. The comparable data attributed from 25 study species, 7 species were tree, such as *Hydrangea macrophylla* and *Polyspora axillaris*, were abundantly found, other 18 species were growing as shrubs.

1 species was Basal Angiosperm, 1 species was Magnoliids and 23 species were Seeds leaves two. Totally 23 species are simple leaves and compound leaves were found in 2 species. Stipulate leaves are found in 8 species and without stipules are 17 species. Indefinite stamens are 6 species and 19 species are definite stamens. Inferior ovary are 4 species and 21 species are superior ovary. 13 species were fruit capsular, 6 species were berry, 3 species were drupaceous, 1 species was follicle, 1 species was aggregate and 1 species was hip.

Mahonia napaulensis was commonly found in about 2075 m above sea level and together grow with *Viola riviniana* and Fabaceae member plants. *Hydrangea macrophylla* was abundantly found in about 2070 m above sea level and along the mountain slope mixed with *Luculia gratissima* and *Luculia pinceana* plants. *Rhododendrum veitchianum* was abundantly found in about 2102-2137 m above sea level and mixed with Rosaceae members plants. *Illicium angustisepalum* and *Magnolia grandiflora* were rarely found in study area.

Qi-ming and De-lin, (2007, 2008 and 2009) mentioned that *Magnolia grandiflora*, *Daphne alba*, and *Hydrangea macrophylla* were ornamental plants and *Polygala arillata*, *Saurauia napaulensis*, *Saurauia roxburghii* and *Dendropanax dentiger* were medicinal plants. Lawrence (1964) stated that *Illicium angustisepalum* was edible and ornamental plants and *Mahonia napaulensis*, *Rosa omeiensis*, *Edgeworthia chrysantha* and *Rosa omeiensis* were ornamental plants.

Among them, *Illicium angustisepalum*, *Rosa omeiensis*, *Daphne alba*, *Hydrangea serrata*, *Agapetes hosseana*, *Agapetes incurvata*, *Agapetes sikkimensis* and *Buddleja davidii* are not recorded in previous list of Myanmar. These species are very valuable for compilation of Flora of Myanmar.

In the research work, many valuable species not only can be recorded but also various forest products can be found. Taxonomy was essential in theoretical and applied biology. Nevertheless, these natural plants resources will also be applied for future researchers. Therefore, the threatened and endangered species were needed to conserve. It was hope that this research work of floristic study on angiosperms of Waingmaw Township in Kachin State will provide valuable taxonomic information, affinities and distribution of plants for further researchers.

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