

CHAPTER II

LITERATURES REVIEW

Taxonomic Background

Argyreia is one of the largest genera of Convolvulaceae. It contains about 90 species and distributes in the tropical continental Asia, Malaysia and Australia (Austin, 1980). Most of them are woody twiners with large showy flowers or inflorescences. Parts of plants usually covered with various types of indumentum, especially on the outside of midpetaline bands. Fruits are indehiscent, fleshy, leathery or berry with orange, red or purplish to yellowish color. (van Ooststroom, 1943,1953; Austin, 1980)

The genus *Argyreia* which was firstly described by Joao de Louriero in 1790, in his Flora Cochinchinensis, contained 3 species, i.e. *A. obtusifolia* Lour., *A. acuta* Lour. and *A. arborea* Lour. He described his new genus as having 5-partite corolla with oblong reflexed segments, a capitate emarginate stigma and a subglobular, 4-celled berry. The first two species doubtless belong to the family Convolvulaceae, as representatives of well-defined genus. However, the last one, *A. arborea* Lour., was later transferred to the Boraginaceae by Hallier in 1898 as a synonym of *Cordia myxa* L. (van Ooststroom, 1943)

In 1824, William Roxburgh established the new genus *Lettsomia*, in the first edition of Flora Indica vol. II, which was very similar to *Argyreia* Lour., except its 2-locular ovary. He subdivided the *Lettsomia* into two groups according to the corolla form, i.e. campanulate group and infundibuliform (or rather hypocrateriform) group. From his description, it is clear that all species with campanulate corolla has a biglobular stigma, but infundibuliform group has a linear stigma (van Ooststroom, 1943)

In 1833, it was Jacques Denis Choisy, in Mém. Soc. Phys. Genève vol. VI, who treated the genus *Lettsomia* Roxb. as a synonym of the genus *Argyreia* Lour. He transferred all *Lettsomia* species with campanulate corolla and biglobular stigma to

the *Argyreia*. He also united all species with infundibuliform corolla and linear stigma into the new genus *Rivea* Choisy. Among these *Rivea tiliaefolia* Desr. was afterward changed to the genus *Stictocardia* by Hallier under the name *Stictocardia tiliaefolia* (Desr.) Hallier f. (van Ooststroom, 1943)

Choisy (1845) divided the Convolvulaceae into 4 tribes, i.e. Cuscutaeae, Dichondreae, Convolvuleae and Argyreiae. The first tribe contains only one parasitic genus, *Cuscuta*. The second one is differ from the others by its deeply 2-lobed ovary and contains only two genera, *Dichondra* and *Falkia*. The third one includes all species having dehiscent capsules. The last one comprises of indehiscing fruits. He put the *Argyreia* in the last tribe and still mentioned *Lettsomia* p.p. as a synonym. Eventhough Choisy's opinion was followed by a number of authors, but some taxonomists still keep these two genera separate, however with some hesitation. Ridley (1923) separated *Lettsomia* from *Argyreia* in his publication, The Flora of the Malay Peninsula vol. II, but still mentioned that the *Lettsomia* is very near to *Argyreia* and may pass into it.

Van Ooststroom (1943) gave the conclusion that the differences in the number of cells of the ovary appears to be of little value and the species which previously classified in *Lettsomia* have so many characters in common with those of *Argyreia*. The separation of these two genera would be a very unnatural one.

In 1893 Hallier, in Bot. Jahrb. vol. 16, was the first one who used pollen morphology as an important character in the classification of Convolvuloideae. (Ferguson, Verdcourt and Poole, 1977). He used the presence of spines on the exine to separate the genera of Convolvulaceae into two groups, namely Echinoconiae which pollen grains have spines and Psiloconiae which pollen grains have no spines (Erdtman, 1971). The Hallier's system was later adopted by van Ooststroom (1953). He subdivided the family into two subfamilies, the Cuscutoidae and the Convovuloideae. The last subfamily was then further divided into two tribes, the Convolvuleae (or Psiloconiae group of Hallier f.) and the Impomoeae (or Echinoconiae group of Hallier f.).The *Argyreia* was classified in the tribe *Ipomoeae* with its very closely related genus *Ipomoea*. (van Ooststroom, 1953)

Taxonomic study of *Argyreia* in nearby countries

The taxonomic data of *Argyreia* (and *Lettsomia* p.p.), was published in many Floras by various taxonomists. On the westward asian countries of Thailand, the presence of *Argyreia* was reported in Flora Indica (Roxburgh, 1824), Flora of British Burma (Kurz, 1877), Flora of British India (Clarke, 1885), Flora of Presidency of Madras (Gamble, 1915), Flora of Assam (C.B. Clarke, 1939), Flora of Eastern Himalaya (Hara and Yamazaki, 1966), Flora Indica or descriptions of Indian Plants (Roxburgh, 1975), Flora of Hassan District (India) (Gandhi, 1978), Flora of West Pakistan (Austin and Ghazanfar, 1979), Flora of Ceylon (Austin, 1980), Flora of Bangladesh (Khan, 1985), Forest Plants of Eastern India (Chaudhuri, 1993), and Flora of Bhutan (Grierson and Long, 1999).

The occurrence of *Argyreia* in Laos, Cambodia and Vietnam was only found only in Flora Générale de L' Indochine (Gagnepain & Courchet, 1915). Fang and Staples (1995) nearly completely reported the *Argyreia* found in China in Flora of China vol. 16.

On the southern regions to Thailand, *Argyreia* was reported in Malay Peninsula (Ridley, 1923), Malesiana (van Ooststroom, 1943, 1945, 1950, 1952, 1953 and Hoogland 1952). So afterwards in 1953 Van Ooststroom & Hoogland were published Flora Malesiana and reported 46 species of *Argyreia* and finally in 1965 Backer & Bakhuizen reported 3 species of *Argyreia* in Indonesia, in Flora of Java.

Taxonomic study of *Argyreia* in Thailand

The first taxonomic publications about *Argyreia* in Thailand was done by William Grant Craib. He primarily reported 4 species of *Argyreia* in 1911 (*A. obtusifolia* Lour., *A. roxburghii* Choisy var. *siamica*, *A. wallichii* Choisy) and added one more species in 1914 (*A. henryi* (Craib) Craib). A few years later, he mentioned about *Rivea collinsae* Craib found in Thailand, which was later changed to *Lettsomia* and *Argyreia*, respectively (Craib, 1911, 1914, 1916)

The data of Thai species of *Argyreia* was later extended by Arthur Francis G. Kerr. He studied and verified 7 new Thai species of *Argyreia*, but at that time, under the generic name *Lettsomia*, viz. *L. brachypoda* Kerr, *L. breviscapa* Kerr, *L. calcicola* Kerr, *L. ionantha* Kerr, *L. roseopurpurea* Kerr, *L. stenophylla* Kerr and *L. versicolor* Kerr and transferred *Rivea collinsae* to *Lettsomia*.(Kerr, 1941). In 1954, he finally reported 7 species of *Argyreia* and 21 species of *Lettsomia* found in Thailand (Kerr, 1954)

The occurrence of *Argyreia* in Thailand was also found scattered in various works of plant taxonomists who studied Thai Flora in particular regions, such as Doi Inthanon, Chiang Mai and Phu Kradung, Loei (Koyama, 1986), Pa Hin Ngam National Park, Chaiyaphum (สมราน สุดดี, 2538), Queen Sirikit Botanic Garden, Chiang Mai (วัชนะ บุญชัย, 2542). Phu Phan National Park, Sakon Nakhon, (ปวีณา ไตรเพิ่ม, 2542) Toan Nga Chang waterfall, Songkhla (พวงเพ็ญ ศิริรักษ์ และคณะ, 2542), Khao Wang Kamen, Kanchanaburi (วรรณชัย หาแพน, 2543) Chiang Dao Cave, Chiang Mai (จิรภากรานต์ ปาละหล้า, 2543), Doi Suthep-Pui National Park, Chiang Mai (Maxwell & Elliott, 2001).

Table 1. (Continued) Comparison of *Argyreia* spp. found in different Floras

No.	Species	Publications													
		Clarke 1885 British India	Gandhi, 1978 Hassan District	Austin, 1980 Ceylon	Khan, 1985 Bangladesh	Austin & Ghazanfar, 1979 West Pakistan	Kurz 1877 British Burma	Grierson & Long, 1999 Bhutan	Hara & Yamazaki, 1966 Eastern Himalaya	Fang & Staples, 1995 China	Gagnep. & Courchet, 1915 IndoChina	Ridley 1923 Malay Peninsula	Ooststroom & Hoogland, 1953 Malesiana	Ooststroom, 1965 Java	
85	<i>A. pierreana</i> Bois									X	X				
86	<i>A. pilosa</i> Wight & Arn.	X	X												
87	<i>A. pomacea</i> (Roxb.) Choisy	X	X	X											
88	<i>A. populifolia</i> Choisy	X		X											
89	<i>A. pseudorubicunda</i> Ooststr.												X		
90	<i>A. reinwardtiana</i> (BL.) Miq.												X		
91	<i>A. reticulata</i> (Prain) Hoogl.												X		
92	<i>A. ridleyi</i> (Prain) Prain ex Ooststr.										X		X		
93	<i>A. robinsonii</i> (Ridl.) Ooststr.												X		
94	<i>A. roxburghii</i> Choisy	X			X			X	X		X				
95	<i>A. rubens</i> (C.B. Clarke) Raizada	X													
96	<i>A. rubicunda</i> Choisy *****	X									X		X		
97	<i>A. samarensis</i> Ooststr.												X		
98	<i>A. scortechinii</i> (Prain) Hoogl.										X		X		
99	<i>A. sericea</i> Dalz. & Gibs.	X													
100	<i>A. setosa</i> (Roxb.) Choisy	X							X		X				
101	<i>A. sikkimensis</i> (C.B. Clarke) Ooststr.	X						X							
102	<i>A. sorsogonensis</i> (Elmer) Ooststr.												X		
103	<i>A. speciosa</i> Sweet	X													
104	<i>A. sphaerocephala</i> (Prain) Hoogl.										X		X		
105	<i>A. splendens</i> (Hornem.) Sweet *****	X		X	X					X					
106	<i>A. strigillosa</i> C.Y. Wu									X					
107	<i>A. strigosa</i> *****	X													
108	<i>A. sumbawana</i> Ooststr.												X		
109	<i>A. thomsoni</i> (C.B. Clarke) Babu	X						X							
110	<i>A. thorelii</i> Gagnep.										X				
111	<i>A. thwaitesii</i> (C.B. Clarke) D.F. Austin			X											
112	<i>A. tiliaefolia</i> Wight	X			X		X				X				

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113	<i>A. velutina</i> C.Y. Wu										X				
114	<i>A. venusta</i> Choisy						X		X						
115	<i>A. wallichii</i> Choisy	X					X				X	X			
116	<i>A. walshae</i> Ooststr.													X	
117	<i>A. zeylanica</i> Gaertn.							X							
		Total	46	5	10	7	2	4	9	4	23	17	12	46	3

* *Argyreia aggregata* Choisy as a synonym of *Argyreia osyrensis* (Roth) Choisy

** *Lettsomia atropurpurea* C.B. Clarke in British India as a synonym of *Argyreia pierreana* Bois in Flora China

*** *Argyreia capitata* (Vahl) Choisy as a synonym of *Argyreia osyrensis* (Roth) Choisy

**** *Lettsomia penangiana* miq. in Flora British India & Malay Peninsula as a synonym of *Argyreia penangiana* (Choisy) Boerl.

***** *Lettsomia rubicunda* C.B. Clarke in Flora Hassan District & in Flora Malay Peninsula as a synonym of *Argyreia rubicunda* (C.B. Clarke) Raizada

***** *Argyreia splendens* (Roxb.) Sweet in Flora Ceylon & Flora Bangladesh as a synonym of *Argyreia splendens* (Hornem.) Sweet, cause of this name are not effective.

***** *Lettsomia strigosa* Roxb. in Flora British India as a synonym of *Argyreia capitata* (Vahl) Choisy in Flora Malesiana (Van Ooststroom, 1953)

According to the limited reference some species are not able to solved about author confusion.