Floristic Interchanges Between Formosa and the Philippines

HUI-LIN LI[1]

INTRODUCTION

THE FLORAS of Formosa and the Philippines are, in spite of their geographic proximity, distinctive in their general nature. The two regions were separated by the Formosan rift (the Bashi Channel), probably in the early Tertiary, long before their connections with other respective neighboring areas were severed. Thus the bulk of the Formosan flora was derived from China or from other floras that spread to Formosa through the Chinese mainland, while the bulk of the Philippine flora was derived from Malaysia and other lands south of the Asiatic continent.

The distinctiveness of the two floras has been amply demonstrated by Merrill (1923). It will suffice to mention here the many tropical and southern families that are present in the Philippines but absent from Formosa, such as the Dipterocarpaceae, Centrolepidaceae, Monimiaceae, Nepenthaceae, Cunoniaceae, Erythroxylaceae, Dichapetalaceae, Datiscaceae, Clethraceae, Epacridaceae, and Salvadoraceae. On the other hand, many other families, clearly of northern origin, occur in Formosa but are entirely absent from the Philippines, such as Cephalotaxaceae, Taxodiaceae, Cupressaceae, Betulaceae, Lardizabalaceae, Trochodendraceae, Papaveraceae, Geraniaceae, Callitrichaceae, Pyrolaceae, Diapensiaceae, Valerianaceae, and Dipsaceae.

However, though the basic constituents of the two floras are quite different, indicating their separate origins, their close geographic proximity allows certain floristic interchanges, apparently of relatively recent times. The distance between the main islands, Formosa and Luzon, is about 350 kilometers. Stretching in the sea between the two is a chain of small islands, parts of the same volcanic line. The first group consists of three islands off the southeastern coast of Formosa, Hoshaotao (Kotosho in Japanese), now called Lutao, Hungtauyu (Katosho in Japanese), now called Lanyu and commonly known as Botel Tobago, and the tiny island, Little Botel Tobago. These islands are separated from the Batan (or Batanes or Bashi) Islands by the Bashi Channel at a distance of about 100 kilometers. The Batan Islands are separated from the Babuyan Islands, which are close to the northern coast of Luzon, by the Balintang Channel, about 70 kilometers wide. The distance is nowhere great enough to make plant migration difficult. At South Cape, the southernmost tip of Formosa, the small island Y'Ami of the Batan group, the northernmost of the Philippine Islands, is actually within sight.

These small islands show remarkable affinities with the Philippine flora, even the northernmost ones, Lutao and Lanyu, which are closest to Formosa. The conspicuous relationship of the floras and faunas of the two latter islands to the Philippines has led some to suggest extending the Neo-Wallace Line northward from the Philippines, passing it between the main island of Formosa and these

[1] Research Associate, Morris Arboretum, University of Pennsylvania, Philadelphia. Manuscript received July 1, 1952. The author is indebted to Dr. A. C. Smith of the Smithsonian Institution for his kindness in reading the manuscript and offering suggestions for its improvement.

two small islands (Kano, 1931). However, it has been shown that the southern tip of Formosa, commonly known as the Hunchuen (Koshun) Peninsula, has a flora quite distinct from that of the Formosan mainland but very close to that of these two small islands, showing similarly, distinctive relationships with the Philippine flora. There is a marked infiltration of austral elements from the Philippines to Formosa, particularly in the extreme southern part of the island and in these two small islands (Li and Keng, 1950).

SOUTHWARD MOVEMENT OF TEMPERATE ELEMENTS

Before the inception of this northward migration of relatively recent occurrence, as will be discussed later, there occurred another expansion of floristic elements in the opposite direction, that is, from Formosa to the Philippines. These elements, in contrast to the southern tropical elements, mostly of the lowlands, are cold–temperate in nature and limited to montane or alpine regions. In Formosa, because of the massive and lofty mountain ranges which occupy most of the central portion of the island, there developed an extensive alpine-montane flora rich in number of species. These plants show distinctively close relationships with those of western China and the eastern Himalayas and also to some extent with the montane flora of Japan in the north.

There are over 40 peaks in the Formosan mountain systems that exceed 1,000 meters in height. The highest peak is Yu Shan, or Mt. Morrison, towering to a height of 1,950 meters, the highest of all eastern Asia. Such an extensive, high mountain chain permits the existence of an alpine flora that otherwise exists only in the Himalayas, western China, and other mountain regions far north of Formosa.

From Formosa, a large number of temperate elements, mostly of mountain regions, extend southward to the Philippines. In the Philippine Islands, these Asiatic elements are largely confined to medium and high altitudes in northern Luzon. Such characteristically northern or Asiatic elements, mostly common genera in the mountains of Formosa, such as *Lilium*, *Liriope*, *Saururus*, *Thesium*, *Arenaria*, *Sedum*, *Duetzia*, *Rosa*, *Skimmia*, *Buxus*, *Pistacia*, *Androsace*, *Hoppea*, *Salvia*, *Ellisiophyllum*, *Hemiphragma*, *Peracarpa*, *Aster*, *Solidago*, *Anisopappus*, and *Artemisia*, occur nowhere in the Malayan region outside of northern Luzon (Merrill, 1923–26). It is apparent that Formosa is an important route of migration of these Asiatic types to the regions in the south (Van Steenis, 1946).

We may picture that during the Pleistocene or earlier, when the general temperature was much lower than now, these montane species would have inhabited lower elevations and thus had greater ranges. Their ranges might have been more or less continuous, extending from the Himalayas and western China through the mountains of southern China to Formosa and Luzon. Subsequent rising of temperatures forced these plants to higher elevations until finally they occupied the present isolated mountain regions suitable for their existence. Thus, species like *Hemiphragma heterophyllum* Wall. and *Ellisiophyllum pinnatum* (Wall.) Makino now have widely disjunct ranges on the high mountains of Luzon, Formosa, western China, and the eastern Himalayas, etc.

These Philippine plants of northern origins are sometimes specifically or subspecifically distinct from their congeners in Formosa, while others may be specifically identical. That some of these show morphological differentiation indicates that their separation must have been for a considerable length of time. As such plants are now confined to isolated and distant mountain regions and as there were drastic changes in climate during the geologically recent past, such a southward migration of the montane flora may be considered largely a matter of the past, there being little possibility that the same process is going on extensively at the present.

NORTHWARD MOVEMENT OF TROPICAL ELEMENTS

In contrast to the southward migration of these temperate elements, the northward movement of tropical elements from the Philippines to Formosa is limited practically to the lowlands and particularly to the southern extreme of the island of Formosa. Favored by the gradual rising of temperature since the Pleistocene, these tropical, or southern, plants that find their way to Formosa are able to establish themselves there.

Apparently many strand plants migrate by the help of ocean currents. In the case of Formosa, the main current is supplied by the Japan Stream from the south which passes along the island chain connecting the Philippines and Formosa. This chain of small islands also acts as a series of stepping stones for the migration of plants, especially from south to north. This northward migration of plants is also aided by wind. The prevalent monsoon during the summer and fall and the general track of typhoons rampant in the eastern Pacific during this same period of the year are also in a northeastern direction from the tropics, often leading from the Philippines to Formosa.

That these islands serve as an efficient migration route of the northward movement of southern plants can be demonstrated by the presence of the following floral elements in Formosa: (1) species of wide tropical distribution, (2) species common to the Philippines and Formosa, (3) species common to the Philippines and the southernmost part of Formosa, and (4) species common to the Philippines and the islands of Lutao and Lanyu.

In the first group are many paleotropic species that extend to the whole island of Formosa but more commonly only to the southern part of the island. Such common species are *Dodanea viscosa* (L.) Jacq., *Croton cumingia* Muell.-Arg., *Litsea cubeba* Pers., and *Murrya paniculata* (L.) Jack. Those that also occur in the northern part are mostly along the coastal lowlands. Their wide ranges are due apparently to their more aggressive nature and especially to their wider tolerance of temperature extremes.

In the second group are species like *Acacia confusa* Merr., *Ipomoea polymorpha* R. & S., and *Oreocnide trinervis* Wedd., which occur widely in the Philippines and extend also to Formosa, especially along the coasts and lowlands, from south to north. The number of such species with wide ranges in Formosa is few, indicating the insignificance of such elements and possibly also their recent and scattered arrival.

There are many more species common to the Philippines and Formosa but confined in the latter island to the southern part. These species are sometimes limited only to the southernmost tip of the island—the Hunchuen Peninsula and the small islands of Lutao and Lanyu. Such species as *Illigera luzonensis* Merr., *Schizostachyum diffusum* Merr., *Goniothalamus amuyon* Merr., *Aglaia elliptici-folia* Merr., *Maba buxifolia* Pers., *Guettarda speciosa* L., *Morinda citrifolia* L., *Pemphis acidula* Forst., etc., are often important elements in the local vegetation. That their occurrence is often limited to the seashore and coastal areas in Formosa distinctly indicates that they are relatively recent arrivals.

The flora of the two small islands, Lutao and Lanyu, off the southeast coast of Formosa is much more intimately related to the southernmost part of Formosa than is generally understood (Li and Keng, 1950). The southernmost tip of Formosa manifests close floristic relationships with the small islands as well as with the Philippines in general. Its flora is quite distinct from that of northern Formosa. The fact that some species are present on these two small islands but absent in the southernmost part of Formosa is due apparently to human factors, as the mainland of Formosa has been more severely exploited. As a result, there are a number of Philippine species that are present on these islands but do not occur on the mainland of Formosa, such as *Myristica cagayanensis* Merr., *Boerlagiodendron pecti-*

natum Merr., *Dysoxylum cumingiana* DC., *Styrax kotoensis* Hay., *Turpinia lucida* Nakai, *Macaranga dipterocarpifolia* Merr., etc.

The importance in floristic migration played by the chain of small islands between the Philippines and Formosa can be illustrated more precisely by a few cases. Among the wide paleotropic species, chiefly along or near the coast and common throughout the Philippine Islands, are *Morinda citrifolia* L. and *Maba buxifolia* (Rott.) Pers. (=*Diospyros ferrea* Bakh.). These species extend through the Batan and Babuyan Islands to Formosa, limited in the latter case only to Lutao and Lanyu and the southernmost Hunchuen Peninsula. Among the less wide species are *Aglaia formosana* Hay. and *A. ellipticifolia* Merr., both of the northern part of Luzon. These species also extend northward, following the same route, through the Batan and Babuyan Islands to Hunchuen Peninsula in Formosa and to Lutao and Lanyu.

That these southern tropical elements are relatively recent arrivals in Formosa can be attested by their occurrence in coastal regions and in secondary forests as well as by their specific identity with Philippine plants. In most cases, the species in Formosa are exactly the same as in the Philippines. These species have not been isolated long enough to have undergone any morphological differentiation. It may be presumed that this northward migration is not only very recent but is still continuing at the present. Success of establishment of these southern species in Formosa is controlled mainly by climate factors. With probable continued rise of temperature in the future, there may be more southern species entering into the flora of Formosa. At the same time, many of the species will be able to extend their range to the northern part of the island.

SOME FLORISTIC NOTES

In the past, this southern affinity of the Formosan flora has not been properly emphasized because of our inadequate information. The floras of Formosa and the Philippines have been studied, in most cases, independently of one another. Many of the species proposed from Formosa are later found to be conspecific with earlier-named Philippine species. Such scattered findings are increasing in number. More recently, with ample reference collections from the Philippine Islands at hand, the present writer restudied many Formosan plants in connection with related species from neighboring regions. It was discovered that many species, especially those considered endemic to southern Formosa or Lanyu (Botel Tobago), are synonymous with certain generally widespread species of the Philippine Islands, especially of Luzon and the northern small islands. Some of these notes have been published in a few scattered papers (Li, 1950, 1952). A number of recent findings are enumerated below. Cited specimens are selected from the herbarium of the National Taiwan University, Formosa (NTU), and the U.S. National Herbarium, Smithsonian Institution (US).

Urticaceae

1. **Laportea batanensis** C. B. Robinson in Philip. Jour. Sci. 5. Bot.: 481, 1910.
   Laportea kotoensis Hay., Gen. Ind. Fl. Formos. 70, 1916, nomen; Kanehira, Formos. Trees 529, 1917; *ibid.*, rev. ed. 170, 1936. *Syn. nov.*
   Batan Islands, Botel Tobago.

   Neither Hayata nor Kanehira cited specimens, but Kanehira's very brief description shows that the plant is identical to the Philippine species, *L. batanensis*, known from the Batan Islands only.

Myristicaceae

1. **Myristica cagayanensis** Merr. in Philip. Jour. Sci. 17: 255, 1920; Kanehira, Formos. Trees rev. ed. 193, f. 141, 1926.
   Myristica glomerata Kudo & Masamune in Ann. Taihoku Bot. Gard. 2: 89, 1932. *Syn. nov.*

Luzon; Formosa, in southern part, and in Botel Tobago.

Formosa: Cuntin, Hunchuen Peninsula, *H. Keng*, Oct. 31, 1950 (US).

Myristica glomerata Kudo & Masamune is a name based on *Sterculia glomerata* Blanco, Fl. Filip. ed. 1. 764. 1837, which had earlier been made into the combination *Knema glomerata* (Blanco) Merr. in Jour. Str. Branch. Roy. As. Soc. 76: 81. 1917, Sp. Blanco. 151. 1918, a species of Borneo and the Philippines but not of Formosa. Kudo and Masamune were misled by the previous misidentification of the Formosan plant in question as *Myristica heterophylla* sensu Hay., Gen. Ind. Pl. Formos. 61. 1917, etc., non F.-Vill. *Myristica heterophylla* F.-Vill. is a synonym of *Knema glomerata* (Blanco) Merr. The two plants in question differ greatly and are now placed in two different genera.

Rutaceae

1. **Evodia confusa** Merr. in Philip. Jour. Sci. 20: 391, 1922.

   Evodia merrillii Kanehira & Sasaki in Kanehira, Formos. Trees rev. ed. 313, f. 267, 1936.

   Evodia roxburghiana sensu Matsum & Hay. in Jour. Coll. Sci. Tokyo 22: 70, 1906 (Enum. Pl. Formos.); Hay. Icon. Pl. Formos. 1: 118, 1911, non Benth.

Celebes and Philippines, widely distributed and common in forests at low and medium altitudes; Formosa, mostly in northern part.

Formosa: Shirin, Taihoku, *T. Tanaka & Y. Shimada 11163* (US); Kangu, *H. Keng*, Oct. 26. 1950 (US); Sinten, *H. Keng 1811* (US); Tykutan, Taihoku, *Sou-Gen Lin*, Aug. 30, 1932 (NTU).

Kanehira and Sasaki cited no specimen for their species. The description and illustration are distinctive. This characteristic plant with large leaves is in all respects referable to the common Philippine species *Evodia confusa* Merr., known earlier as "*E. glabra*."

2. **Glycosmis cochinchinensis** (Lour.) Pierre ex Engl. & Prantl, Nat. Pflanzenfam. III. 4: 185, f. 106, 1895; Kanehira, Formos. Trees rev. ed. 314, f. 269, 1936.

   Toluifera cochinchinensis Lour. Fl. Cochinch. 262, 1790.

   Glycosmis citrifolia Lindley in Trans. Hort. Soc. 6: 72, 1826.

   Glycosmis pentaphylla Correa in Ann. Mus. Nat. Hist. Paris 8: 386, 1806; Matsum. & Hay. in Jour. Coll. Sci. Tokyo 22: 73, 1906; Hay. Icon. Pl. Formos. 1: 121, 1911.

   Citrus erythrocarpa Hay. Icon. Pl. Formos. 6: 13, 1916. *Syn. nov.*

   Glycosmis erythrocarpa Hay. Icon. Pl. Formos. 8: 14, 1919. *Syn. nov.*

India to Malaysia, Philippine Islands, Hainan; Formosa, common in forests at low altitudes.

Formosa: Taipei, *H. Keng 1044* (US), *K. Odashima 13607* (US), *Kei-Dai Lin*, Nov. 12, 1930 (NTU); Tamali, Taitung, *H. Keng 1376* (US); Bankinsing, *A. Henry 1487* (US), *1587* (US); Kuraru, Koshun, *E. H. Wilson 11038* (US).

This is a polymorphous tree, very variable in its features. Hayata's plant is described with smaller leaves which are usually ternate, but the characters are within the range of variation of the species.

Anacardiaceae

1. **Semecarpus gigantifolia** Vidal, Sinopsis Atlas 22, t. 36, f. A. 1883.

   Semecarpus vernicifera Hay. & Kawakami in Hay. Icon. Pl. Formos. 2: 108, 1912; Kanehira, Formos. Trees rev. ed. 367, f. 322, 1936. *Syn. nov.*

Widely distributed in the Philippines, in forests at low altitudes; Formosa, along seashore of the south and east coasts, and on Botel Tobago Island; cultivated in other places.

Formosa: Taihoku, cult., *E. H. Wilson 9910* (US), *Kei-Dai Lin*, Nov. 5. 1936 (NTU).

The Formosan plant proves to be identical with this common Philippine species, many specimens of which are available for comparison.

Aquifoliaceae

1. **Ilex asprella** (Hook. & Arn.) Champ. in Kew Jour. 4: 329, 1852; Kanehira, Formos. Trees rev. ed. 370, f. 324, 1936; S. Y. Hu in Jour. Arnold Arb. 30: 269, 1950.
   Prinos asprella Hook. & Arn. Bot. Beech. Voy. 176, pl. 36, f. 1, 2, 1833.
   Ilex arisanensis Yamamoto, Suppl. Icon. Pl. Formos. 1: 30. f. 10, 1952; Kanehira, Formos. Trees rev. ed. 370, 1936. *Syn. nov.*

Luzon to southeast China; Formosa, in the thickets from low to medium altitudes throughout the island.

Formosa: Sozan, Taihoku-shu, *T. Tanaka & Y. Shimada 11009* (US), *Y. Kudo, S. Suzuki & K. Mori*, April 21, 1929 (NTU); Mt. Kwannon, Taihoku-shu, *T. Tanaka & Y. Shimada 11094* (US); Taipei, *H. Keng 1024* (US), *T. Tanaka 76* (US); Shirin to Sozan, *E. H. Wilson 10293* (US); Musha, Nanto, *E. H. Wilson 10065* (US); South Cape, *A. Henry 1334* (US); Arisan, *Faurie 186* (cotype of *I. arisanensis* Yamamoto, photo US).

Photograph of Yamamoto's type together with his original description prove that *I. arisanensis* Yamamoto is clearly conspecific with *I. asprella*. This species has characteristically thin leaves with caudate tips and long slender pedicels. Faurie's plant, a mature fruiting specimen, has relatively larger leaves than others and also was collected at higher altitudes than most others. *Ilex arisanensis* Yamamoto was not considered in S. Y. Hu's study of the genus, and it was maintained as a distinct species by Kanehira.

Icacinaceae

1. **Gonocaryum calleryanum** (Baill.) Becc. in Malesia 1: 123, 1877.
   Phlebocalymna calleryanum Baill. in Adansonia 9: 147, 1896.
   Gonocaryum diospyrosifolium Hay. Icon. Pl. Formos. 2: 106, 1912; Kanehira, Formos. Trees rev. ed. 400 f. 359, 1936. *Syn. nov.*

Luzon, Batan Islands; Formosa, in forests along the coast, rare in Hunchuen Peninsula only.

Formosa: Koshun, Kuraru, *Y. Kudo & S. Suzuki 15889* (NTU); Kuraru, *B. Hayata & Sasaki 15621* (isotype of *G. diospyrosifolium* Hay., photo US).

Gonocaryum diospyrosifolium Hay. proves to be the same as the Philippine *G. calleryanum* (Baill.) Becc. (*G. tarlacense* Vidal). The plant is a common tree in Luzon and is also found on the Batan Islands between Luzon and Formosa. In Formosa, it is a rare plant grown only in the shore forests of Kuraru, Hunchuen Peninsula, sometimes on coral rocks.

Melastomataceae

1. **Astronia ferruginea** Elm. Leafl. Philip. Bot. 4: 1205, 1911; Merr. in Philip. Jour. Sci. 8: Bot. 342, 1913.
   Astronia formosana Kanehira, Formos. Trees 259, 1917. *Syn. nov.*
   Astronia pulchra sensu Hay. in Jour. Coll. Sci. Tokyo 30(1): 114, 1911; (Mat. Fl. Formos.), Icon. Pl. Formos. 2: 25, 1912; non Vidal.
   Astronia cumingiana sensu Kanehira, Formos. Trees rev. ed. 507. f. 469, 1939; non Vidal.

Philippine Islands, from Mindanao to Luzon; Formosa, in forests, Hunchuen Peninsula, Lutao and Lanyu (Botel Tobago).

Formosa: South Cape, *A. Henry 658* (US); Kuskus, *Y. Kudo & S. Suzuki 16066* (NTU).

The Formosan plant is neither a distinct species nor referable to either *A. pulchra* or *A. cumingiana* of the Philippines. The species is actually identical with *A. ferruginea* Elm., a more or less common species of the Philippines. The ferrugineous lepidote inflorescence and undersurface of the leaves are very distinctive and characteristic of this species.

Boraginaceae

1. **Cordia cumingiana** Vidal, Phan. Cuming. Philip. 187, 1885, Rev. Pl. Vasc. Filip. 192, 1886.

Cordia kanehirai Hay. Icon. Pl. Formos. 6: 31, 1916; Hou in Taiwania 1: 207, 1950. *Syn. nov.*

Luzon; Formosa, in the thickets in southern part only, scarce.

Formosa: Koshun, *E. Matuda 1553* (NTU); Kuraru, Koshun, *R. Kanehira 7* (isotype of *C. kanehirai*, photo US).

Hayata originally placed this plant as a close ally of *C. cumingiana*. In comparing specimens from the two regions, it is found that the Formosan plant cannot be differentiated from the Luzon plant and must be considered as conspecific.

2. **Cynoglossum lanceolatum** Forsk, Fl. Aegypt. Arab. 41, 1775; Hou in Taiwania 1: 217, 1950.

Cynoglossum alpestre Ohwi in Acta Phytotax. Geobot. 2: 150, 1933; Hou in Taiwania 1: 218, 1950. *Syn nov.*

India, Southern China to the Philippines; Formosa, mountain regions.

Formosa: No precise locality, *A. Henry 1015* (US); Arisan, *T. Tanaka 520* (US); *S. Suzuki*, July 17, 1937 (NTU).

No isotypes of Ohwi's species are available, but, among the cited specimens, *Suzuki s. n.* most closely approaches the original description of *C. alpestre* in having longer, denser hairs and smaller, thicker leaves than other specimens of *C. lanceolatum*. These characters are, however, evidently due to higher elevations, whereas there are no structural differences between plants of higher and lower altitudes. *Cynoglossum alpestre* Ohwi can at most be considered an alpine form of the species *C. lanceolatum*, but, in view of the wide distribution and variable nature of the species, it seems not desirable to recognize it taxonomically.

3. **Ehretia navesii** Vidal, Rev. Pl. Vasc. Filip. 194, 1886.

Ehretia resinosa Hance in Jour. Bot. 299, 1880; Hou in Taiwania 1: 203, 1950. *Syn. nov.*

Ehretia formosana Hemsl. in Jour. Linn. Soc. Bot. 26: 144, 1896. *Syn. nov.*

Philippine Islands; Formosa, in southern part, along the seashore.

Formosa: Takao, *A. Henry s. n.* (US), *K. Moritani 2308* (NTU); Kuraru, *E. H. Wilson 10967* (US).

The Formosan plant proves to be the same as the Philippine *E. navesii* Vidal, a characteristic plant readily distinguished by the long-linear and persistent calyx-lobes which enclose the globose fruit at maturity.

Verbenaceae

1. **Premna nauseosa** Blanco, Fl. Filip. 489, 1837.

Premna integrifolia Blanco, Fl. Filip. ed. 2. 342, 1845; Matsum. & Hay. in Jour. Coll. Sci. Tokyo 22: 299, 1906 (Enum. Pl. Formos.); non Linn.

Premna obtusifolia sensu Sasaki, List. Pl. Formos. 353, 1938; Mori in Masamune, Short Fl. Formos. 181, 1936; non R. Br.

Premna odorata sensu Yamamoto in Jour. Soc. Trop. Agr. 6: 554, 1934, p. p.; Kanehira, Formos. Trees rev. ed. 654, 1936, p. p.; non Blanco.

Philippine Islands; Formosa, in southern part only.

Formosa: No precise locality, *A. Henry 613, 791* (US).

This is an exceedingly common species in the Philippine Islands, generally known as "*P. integrifolia.*" This species was confused by many authors, including Kanehira, with *P. odorata*, another Philippine species that occurs also in southern Formosa. In *P. odorata* the leaves are densely tomentose beneath. In *P. nauseosa* the leaves are more or less glabrous beneath.

2. **Premna odorata** Blanco, Fl. Filip. 488. 1837; Yamamoto in Jour. Soc. Trop. Agr. 6: 554, 1934, p. p.; Kanehira, Formos. Trees rev. ed. 654, f. 610, 1936, p. p.

Premna vestita Schauer in DC. Prodr. 11: 631, 1847; Henry in Trans. As. Sci. Jap. 24. Suppl.: 70, 1896.

Widely distributed in Luzon; Formosa, in forests near seashore in northern and southern parts.

SUMMARY

The floras of Formosa and the Philippines are distinctive in their general nature. The former is related especially to the Chinese mainland and the latter to Malaysia. Their close geographic proximity, however, has allowed certain floristic interchanges in relatively recent times. An earlier movement was the southward migration of temperate elements from Formosa to the Philippines. These are mostly montane and alpine elements and, in the Philippines, largely confined to the mountains of northern Luzon. These elements are now of wide disjunct distribution and are related to the alpine floras of western China and the Himalayas. A more recent movement is the northward expansion of tropical elements from the Philippines to Formosa. These are usually lowland plants and are found in Formosa limited mostly to the southern extreme of the island and the adjacent small islands Lanyu and Lutao. Floristic notes on certain species common to the Philippine and Formosan floras but considered by former authors as distinct are given.

REFERENCES

KANO, T. 1931. Notes on Pachyrrhynchides from Kotosyo and their zoogeographical significance. *Biogeogr. Soc. Jap., Bul.* 2: 193–208. [In Japanese.]

LI, H. L. 1950. Studies in the Scrophulariaceae of Taiwan. *Quart. Jour. Taiwan Mus.* 3: 55–80.

——— 1952. Notes on some families of Formosan phanerogams. *Wash. Acad. Sci., Jour.* 42: 39–44.

——— and H. KENG. 1950. Phytogeographical affinities of southern Taiwan. *Taiwania* 1: 103–128.

MERRILL, E. D. 1923. Die pflanzengeographische Scheidung von Formosa und den Philippinen. *Bot. Jahrb.* 58: 599–604.

——— 1923–26. *An enumeration of Philippine flowering plants.* 4 vols. Bureau of Printing, Manila.

VAN STEENIS, C. G. G. J. 1946. Preliminary revision of the genus Lonicera in Malaysia. *Arnold Arboretum, Jour.* 27: 442–452.