Vascular Flora of the Sattahip Area

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The Sattahip area is situated at 101° East Longitude and 12.5° North Latitude about 175 kilometers south of Bangkok along the Gulf of Thailand (**Fig. 1**). The actual field study area of about 25 square kilometers centered about the town of Sattahip and the most intensively studied area was the village of Thung Prong about 3 kilometers north of Sattahip. The flora of the area was studied from January 1969 to December 1972. Thung Prong was selected as the primary collecting site because of the numerous representative habitats that the area offers. Basically the Sattahip area is a low lying plain with isolated and severely weathered hills up to ca 300 meters in elevation. The topography of Thung Prong includes these hills, a well defined and undisturbed beach, swamp meadow, and a mature swamp forest.

Thung Prong is composed of ca 200 families where the major activities are tapioca farming (the main cash crop), fishing, and charcoal making. In this paper only those vascular plants that are either native or have successfully escaped cultivation have been enumerated. The field and garden crops which are common throughout the area include *Manihot esculenta* Crantz, *Glycine soja* (L.) S. & Z., *Citrullus lanatus* (Thunb.) Mansf., *Zea mays* L., and *Oryza sativa* L. Most of these crops are cultivated in fields about the base of the hills and most of the open, low lying areas. In general the hill vegetation has not been greatly disturbed except in those regions directly adjacent to inhabited areas.

Past Research

The flora of the Siracha area (Chon Buri Province) was extensively sampled by Mrs. D.J. Collins mostly during the 1920's. Jacobs (1962) notes that Mrs. Collins was inspired by Dr. A.F.G. Kerr, the most outstanding and active plant collector ever in Thailand, in 1911. Mrs. Collins collected some 2501 specimens most of which came from the Siracha area, but unfortunately none of her field notes have ever been published. Mrs. Collins was not a trained botanist, therefore almost all of her specimens were identified by Kerr in Bangkok or Craib at Kew. There was never an enumeration of the Siracha flora ever published. Only a few specimens were collected in the Sattahip area (most of which came from Ko Khram (Khram Island) by Mrs. Collins, and collectors since her time have also generally neglected this and most all other areas in the Province. No exten-

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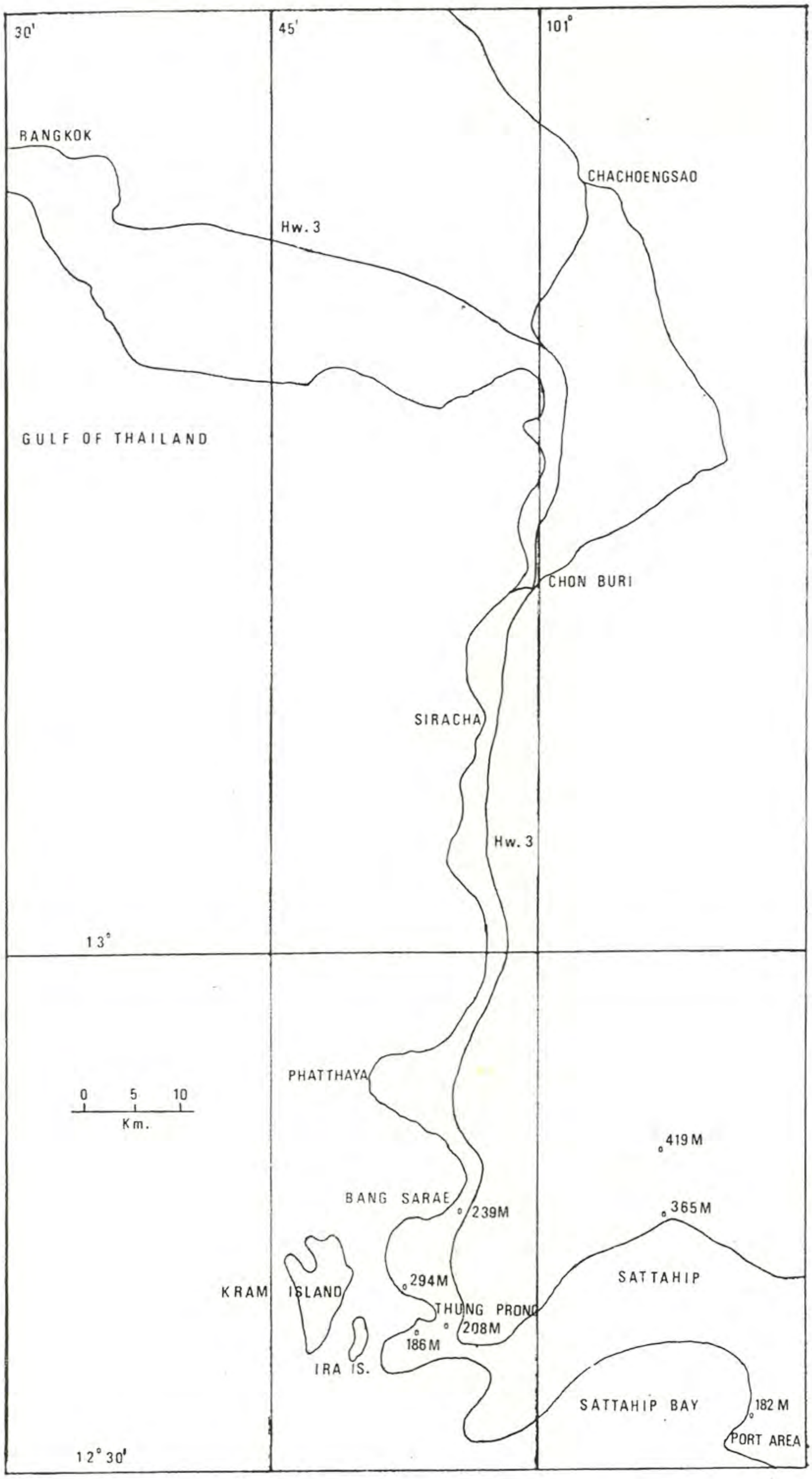

Fig. 1. Location of the research area. Elevation in metres.

sive floristic work was ever done in the Sattahip area before this present research. Fortunately most of the specimens that Mrs. Collins collected in the Siracha and Sattahip areas have been enumerated in *Florae Siamensis Enumeratio* (1925–1962, incomplete), but adequate field information from most of her specimens is generally lacking.

The Siracha area has produced many new vascular species, almost all of which were described by Craib from collections made in the 1920's by Mrs. Collins, Dr. Kerr, and his collecting assistant Put. Many of these new species were named in honor of Mrs. Collins, e.g. *Stemona collinsae* Craib, *Dioscorea collinsae* Prain & Burk., *Phyllanthus collinsae* Craib, *Premna collinsae* Craib, etc. While not all of the species described from Siracha material were found during this research many, including those listed above, were collected. Notable exceptions include *Diospyros collinsae* Craib, *Walsura angulata* Craib, *Lagerstroemia collinsae* Craib, *Euonymus carinatus* Craib, and several other species. Several of these new species from the Siracha area are virtually indistinguishable from closely related taxa, e.g. *Ixora collinsae* Craib vs. *I. cibdela* Craib, and *Tarenna collinsae* Craib vs. *T. vanprukii* Craib; therefore some of these Siracha species may eventually be reduced to synonyms or variants of other species (Craib, 1926, Fl. Siam. En. II, 2).

Other Taxonomic Problems

I have been unable to adequately distinguish or agree with any separation of *Prismatomeris albidiflora* Thw. into *P. malayana* Ridl. and *P. tetranda* K. Schum. I feel that the two latter species are indistinguishable from *P. albidiflora* Thw., from which they have been separated on the basis of rather indistinct and inconsistent characteristics, and have considered all the Sattahip specimens of this species as *P. albidiflora* Thw.

For several other species listed in this paper I have also included what I believe to be synonyms of other species or varieties that have generally been considered as separate taxa.

Another difficult problem involves the separation of *Dioscorea glabra* Roxb. from *D. oryzetorum* Prain. & Burk., including var. *latifolia* Prain & Burk. (the staminate type of this variety collected at Siracha by Mrs. Collins). Prain and Burkill (1927) note that *D. oryzetorum* is very close to *D. glabra*, the main distinctions being based on the leaf shapes (especially in var. *latifolia*), tubers, and capsule size. It is also noted that *D. oryzetorum* may be an environmental variant of *D. glabra*. Unfortunately, I have been unable to distinguish the Thung Prong specimens (staminate) from *D. glabra*, since the range of leaf variation of this species is wide and separation of the two species is quite difficult in the

absence of mature capsules. I have, therefore, tentatively considered all the relevant Sattahip material as *D. glabra*, even though further study and the collection of mature capsules may necessitate a change to *D. oryzetorum*.

The distinction of *Cayratia tenuifolia* (W. & A.) Gagn. and *C. japonica* (Thunb.) Gagn. is based on several minute details, and I have included both of these species in the enumeration because I am uncertain as to whether or not the two species should be united. I have been unable to distinguish, with confidence, several of the specimens collected in the Thung Prong area since several of the diagnostic characteristics of each species are mixed.

Due to the fact that I have not had the opportunity to examine the types of *Hoya ovalifolia* W. & A. or *H. diversifolia* Bl., I have been unable to determine the actual relationship of *H. graveolens* Kerr to them. *Hoya graveolens* Kerr (the type having been collected at Siracha) does indeed resemble *H. ovalifolia* and perhaps *H. diversifolia* also, however since there are no flowers on the type of *H. graveolens* in the Botany Section Herbarium I cannot be certain of what the Thung Prong material really is since the descriptions of the flowers for all three species are quite similar. Vegetatively (also in habit and habitat) the type of *H. graveolens* Kerr which I have examined matches quite closely with the Thung Prong specimens, therefore I have, with reservation, considered this as being the most appropriate species fully realizing that with further study it may be reduced to *H. ovalifolia* or *H. diversifolia*.

Another confusing genus is *Pterospermum*. I have listed two species of *Pterospermum* viz. *P. grandiflorum* Craib and *P. littorale* Craib, although the actual relationships of these two species to *P. diversifolium* Bl. is quite close. The two species collected at Thung Prong do, in fact, match Craib's types, however I feel that they are merely extreme forms (size) of *P. diversifolium* Bl. At this time I do not feel that enough material is available for study and also I have not seen the type of *P. diversifolium* Bl. Therefore, I have included both of Craib's species in this report because of the fact that they so closely resemble the types.

Climate of the Sattahip Area

The climate of Thailand, including the Sattahip area, has been described by Dhararaks (1959). There are three basic seasons which include:

1. The NW monsoon or cool season, from November to February.
2. The dry and hot season, from February to May.
3. The SW monsoon or rainy season, from May to November.

TABLE 1. Climatic Data of the Sattahip* (*Period of Records 1951-1970*)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Average Rainfall (mm.)	28.9	67.0	64.7	78.5	195.1	74.6	102.6	92.7	215.2	290.9	96.3	19.2
Average Rainy Days	2.7	5.2	4.7	7.7	14.0	11.0	14.3	13.9	16.2	17.9	8.5	1.9
Greatest Fall in 24 hrs. (mm.)	49.4	117.6	116.1	100.6	120.0	56.0	155.0	89.7	107.7	302.7	319.6	87.0
Average Temperature (°C)	28.1	28.9	30.2	30.9	30.0	29.7	29.2	29.2	28.7	28.1	27.7	27.4
Maximum Temperature (°C)	39.0	39.4	39.5	40.5	40.5	37.2	37.8	37.2	37.4	36.2	37.4	38.3
Minimum Temperature (°C)	12.3	18.3	18.7	21.0	21.7	20.9	19.0	21.5	19.0	19.5	16.1	18.8
Average Relative Humidity (%)	69.4	74.6	75.9	75.8	78.3	76.2	77.6	77.6	80.3	83.0	76.6	70.9
Minimum Relative Humidity (%)	25.0	17.0	32.0	33.0	45.0	43.0	47.0	48.0	45.0	38.0	33.0	30.0
Prevailing Wind Direction	N	S	S	S	S	SW	SW	SW	SW	N	N	N
Average Velocity (knots)	5.9	7.8	7.6	7.4	7.9	10.0	9.5	9.0	7.7	5.8	6.8	7.0
Greatest Wind { Direction	N	NE	SE	E,SE	NW	WSW	W	W	WNW	W	NNW	SSE
Greatest Wind { Velocity (knots)	35.0	36.0	48.0	46.0	57.0	58.0	52.0	52.0	49.0	59.0	73.0	38.0

* From : Meteorological Department, Office of The Prime Minister, Bangkok.

The climatic data for the Sattahip area is outlined in **Table 1.** It must also be noted that Chon Buri Province has less rainfall than other nearby Provinces. The area from Chon Buri to Rayong has less annual rainfall (1300–1500 mm) than both the Prachin Buri-Nakhon Nayok area to the north (1500–2000)mm and the Chanthaburi-Trat area to the east (3000–4000 mm) ("The Climate of Eastern Thailand"). The Sattahip area has been considered semi-arid in nature, and this is generally true for the entire Province (Ogawa, *et al.*, 1961).

Soils of the Sattahip Area

The hills and fields in the Sattahip area are composed of a sandy-loam type soil described by Pendleton and Montrakun (1960) as the Khuntan Sandy-Loams. This soil is an erosional product from the granitic and gneissic hills of the area and is generally very rocky. The residual rocks are mostly quartz and feldspars, the former being very resistant and the latter readily decomposing into the typical reddish-brown clays of the area. Much of the exposed and cultivated low lying areas have been severely leached and deep erosion scars due to runoff are common.

The hills generally have little soil development, and large boulders and outcrops are quite common. Closer to the beach the soil becomes increasingly more sandy: a sandy clay gradually changing to a clay-sand and finally to an entirely sandy (often mixed with rocks) beach and backshore area. In the Thung Prong area there are several areas of deeply eroded shale and chalk deposits, the latter being periodically mined by the villagers. These areas are not distinguishable floristically from adjacent areas.

Soil - Plant Relationships

The evergreen hardwood forests of Chon Buri Province, especially the Siracha area, have been severely denuded in the past 25 years. Pendleton (1953) has described the basic soil-plant relationships for the Siracha area which is also applicable for the Sattahip area. The hardwood forests which cover the hills depend on the recycling of organics (leaf litter and leaf mold) for their nutrition. The underlying soil, even though it is extremely weathered, is relatively infertile and does not supply much in soluble nutrients to the forest flora except to the deeply rooted forest trees. The development of an organic layer is dependent on shade and high humidity, therefore due to the semi-arid climate of the entire area an organic layer has not developed to any appreciable extent. Examination of the forest floor in the research area proves this point because not only is there a thin and quickly decaying leaf litter, but also only a very thin black organic

layer at the surface. Pendleton (1953) also notes that the roots of many forest species in semi-arid areas are "surface feeders" with an extensive fibrous root system close to the surface of the soil. This fact has also been observed in the forests of the Sattahip area.

The rapid decay of the forest litter combined with the very rapid uptake of nutrients from these organics by the hardwood species prevents the development of a deep organic layer. This delicate, but remarkably stable, balance between decay and uptake is sufficient for the maintenance of evergreen forests. In many locales in Chon Buri Province, including the research area, this balance has been disrupted by logging and burning. When the constant supply of organics has been disrupted the soil is unable to support the original evergreen forests; thus vast areas of the Province now have a generally worthless and monotonous secondary type of growth—mostly of low scrub species and bamboo. The regeneration of these secondary forest communities into the original primary hardwood associations will take centuries if in fact, there is any regeneration at all. There are areas that have remained virtually undisturbed since their original clearing during World War II, which have remained in a scrub-bamboo state and have shown no signs of primary forest re-development.

Those primary or climax forest areas in the Sattahip area, which have been cleared for tapioca cultivation, generally provide a good crop every 2 or 3 years provided that the fields are left fallow for a year or two between harvests. Apparently the soil is rich enough to cultivate tapioca, but not good enough for primary forest species to become established. Several years after being denuded these forest areas rapidly lose most of the available nutrients required by many primary hardwood species due to percolation and runoff (Pendleton, 1953).

In the Sattahip area almost all of the low land and areas around the hills have been cleared for tapioca cultivation. The more rocky and steep areas have not been burned, but in many locales most of the taller and canopy layer trees have been cut by the charcoal makers. This as a consequence, has resulted in many changes in the original under-story flora with typical replacement by low scrub and bamboo. These scrub and bamboo thickets have only developed where the original hardwood flora has been either entirely burned or severely exposed by over cutting.

Vegetation Zones

The forests of South-Eastern Thailand are in two floristic regions (Craib, 1925): the Prachin Buri region (including all of Chon Buri Province) and further to the east, the Chanthaburi region. These two regions are rather distinct in much

of their flora because of their rainfall characteristics. While the northern sector of the Prachin Buri region (Nakhon Nayok-Prachin Buri area) has more rainfall than the semi-arid Chon Buri Province area, detailed floristic information is lacking for both areas to warrant the northern area as a distinct floristic zone. Much more work will be required from the Chanthaburi region to correlate the relationships between its flora and that of the Prachin Buri region.

The vegetation zones in the Sattahip area are quite varied and distinct. The Thung Prong region can be divided into 7 primary and 3 secondary floristic zones. The general characteristics of the primary zones are more or less pantropical and have been described in detail by van Steenis (1958, 1965). Many species found in these primary zones are often quite restricted to a particular habitat, while other species may be found in several different zones. In general, however, the species found in the primary zones are not as flexible in their overall interzonal distribution as the species comprising the secondary or replacement flora.

Floristic Zone 1 : Hydrophytes

This group includes those vascular plants that are confined to an aquatic environment—either fresh, brackish, or salt water. Several species are quite seasonal, e.g. *Ottelia alismoides* (L.) Pers., and appear in temporary ponds during the rainy season. During the dry season these ponds become completely dry and no trace of any of these species can be found. Other species are more or less found in ponds, ditches, and on the bottom of the Gulf throughout the year. Typical hydrophytic families include *Nymphaeaceae*, *Lemnaceae*, *Hydrocharitaceae*, etc. These families generally do not survive during dry conditions, however there are several hydrophytes that do tolerate partial and temporary dryness without withering, e.g. *Marsilea crenata* Presl and in some cases more robust specimens of *Eichhornia crassipes* (Mart.) Solms .

Floristic Zone 2 : Tidal Zone Species

While the Sattahip area does not have a well developed mangrove forest flora, it does have many species that are typical mangrove components, e.g. *Ceriops tagal* (Perr.) C.B. Rob., *Bruguiera cylindrica* (L.) Bl., *Avicennia sphaerocarpa* Stapf, etc. One of the major reasons why a mangrove zone has not developed is because there is not enough mud and silt or swampy, eutrophic soil for such

a development. The shoreline of Chon Buri Province is almost entirely sandy or rocky, and only a few isolated places provide the proper conditions for the growth of mangrove species. These areas, while not being truly mangrove in nature and too wet to be considered as part of the Barringtonia formation, have been considered tidal zone species in this paper. —**Fig. 2**

Floristic Zone 3: Pes-caprae Formation

This zone is well defined throughout the entire area, and is generally restricted to areas along the Gulf of Thailand, especially on and just behind the beach. The vegetation in this group is very tolerant to exposure and salt, and many of the species are low, fleshy herbs. Included in this zone are *Ipomoea pes-caprae* (L.) R.Br., *Canavalia maritima* (Aubl.) Piper, *Crotalaria medicaginea* Lamk., *Thuarea involuta* (G.Forst.) R.Br. ex R. & S., *Spinifex littoreus* (Burm. f.) Merr., etc. These species are almost exclusively confined to sandy and very porous calcareous soils, but occasionally *Ipomoea pes-caprae* (L.) R.Br. or *Canavalia maritima* (Aubl.) Piper may be found in exposed inland locales.— **Fig. 3**

Floristic Zone 4: Barringtonia Formation

While *Barringtonia* has not been found in the Sattahip area several other species which are typical components of this floristic group are present. These include mostly woody trees and shrubs found on the beach and shores where a Pes-caprae formation has not or is poorly developed. In the Sattahip area all of the rocky beaches and perhaps 50% of the sandy beaches have this type of vegetation (**Fig. 2**). Common species include: *Xylocarpus moluccensis* (Lamk.) Roem., *Guettardia speciosa* L., *Pyrrosia adnascens* (Sw.) Ching, *Pemphis acidula* Forst., *Sophora tomentosa* L., *Cocos nucifera* L., *Thespesia populnea* (L.) S. & C., *Hibiscus tiliaceus* L., *Opuntia elatior* Mill., etc. Generally most of these species are only found along the beach with the exception of *Cocos nucifera* L. which is found in a variety of inland habitats also. —**Figs. 2, 3**

Floristic Zone 5: Swamp Forest

While true swamp forests are rather poorly developed and few in number in the research area, there is one locale near Thung Prong that does have tall trees with a low, scrubby understory in a very low and wet area. This zone is distinctly separated from the adjacent swamp meadow by the abundance of tall trees and a shaded undergrowth. Most of the former forest and swamp meadow areas have been destroyed not only for the valuable timber but also for use as rice fields. Common species in the swamp forest include: *Dipterocarpus alatus* Roxb., *Ptero-*

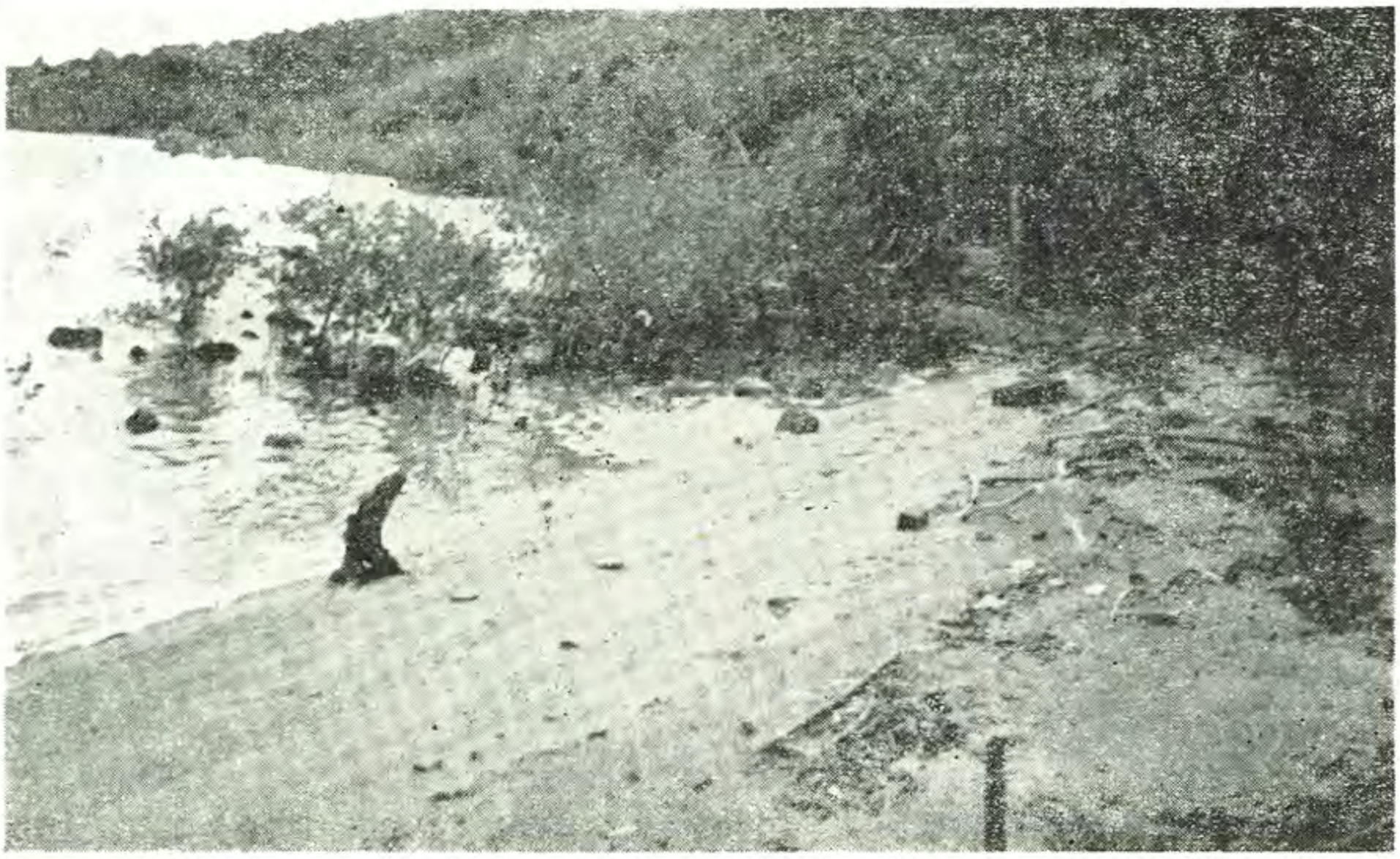

Fig. 2. Tidal zone and *Barringtonia* formation. The tidal zone component here is *Avicennia sphaerocarpa* Stapf which is inundated daily. Just behind the high tide zone are several representatives of the *Barringtonia* formation : *Xylocarpus moluccensis* (Lmk.) Roem. and *Excoecaria agallocha* L. Note that there are no Pes-caprae formation species here. Thung Prong, 3 September 1972.

Fig. 3. A typical Pes-caprae formation. Common components illustrated here are : *Ipomoea pes-caprae* (L.) R.Br., *Spinifex littoreus* (Burm. f.) Merr., *Crotalaria medicaninea* Lamk., *C. mucronata* Desv. Note *Avicennia sphaerocarpa* Stapf in the tidal zone and *Pemphis acidula* Forst. in the *Barringtonia* zone. Thung Prong, 2 September 1972.

spermum littorale Craib, *Stenochlaena palustris* (Burm.) Bedd., etc. The water in the swamp forest is generally stagnant and there are few places that are not wet or muddy throughout the year.

Floristic Zone 6: Swamp Meadow, Swamp Thickets, and Termite Hills

These low lying, open, and wet areas are well defined and contain many species that are generally not found in any other zone. Undisturbed swamp meadows are dominated by *Cyperus compactus* Retz., *C. pilosa* Vahl, *Rhynchospora corymbosa* (L.) Britt., *Eleocharis dulcis* (Burm. f.) Hensch., *Jussiaea repens* L., *Ottochloa nodosa* (Kunth.) Dandy, *Panicum repens* L., etc. In the more brackish areas *Acrostichum aureum* L. and several species often found near the beach are common.

The swamp thickets often separate the swamp meadow from the swamp forest zones. These thickets are composed of a variety of woody and herbaceous species most of which are typically found in either of the adjacent areas. Very often these thickets are disturbed areas and the mixture of species found can often, but not always, be considered as a secondary form of growth. Typical thicket species include: *Sterculia foetida* L., *Mucuna suberosa* Gagn., *Colocasia esculenta* (L.) Schott, *Samanea saman* (Jacq.) Merr., *Thelypteris gongylodes* (Schukr.) Sm., *Breynia glauca* Craib, etc. **—Fig. 4**

The termite hills are almost exclusively confined to the open swamp meadow, however they are occasionally found in the hills. These mounds range from 50 cm to 3 meters in height with a basal diameter of 20 cm to over 2 meters. Most of these termite hills have been invaded by typical secondary growth species especially *Streblus asper* Lour., *Vernonia elliptica* DC., *Lantana camara* L., *Eupatorium odoratum* L., etc. Those termite hills in the vicinity of the swamp forest are often covered with the swamp thicket flora. In general, there is little succession on these hills and those mounds in close proximity usually have the same species covering them. **—Fig. 5**

Floristic Zone 7: Evergreen Forests

This zone of vegetation is confined to the undisturbed upland areas throughout the area. In the Sattahip area these hills are very rocky and often quite steep. Several herbaceous forest floor species are present including: *Psilotrichum ferrugineum* (Roxb.) Moq., *Pseuderanthemum dalatiferum* Radlk., *Peliosanthes violacea* Wall., and a few grasses. Common canopy components of the evergreen forest include: *Diospyros curranii* Merr., *D. retrofracta* Bakh., *Maerua siamensis* (Kurz) Pax, *Ficus altissima* Bl., *F. superba* Miq., *Dialium*

Fig. 4. Swamp thicket/swamp forest interface. In the foreground *Stenochlaena palustris* (Burm.) Bedd. marges with *Schumannianthus dichotomus* Gagn. (centre) and in the background several tall specimens of *Dipterocarpus alatus* Roxb. constitute the beginning of the swamp forest. Thung Prong, 2 September 1972.

Fig. 5. Swamp meadow and termite hills. This entire area is usually wet throughout the year. Dominant species in the meadow include : *Cyperus compactus* Retz., *C. pilosus* Vahl, *Rhynchospora corymbosa* (L.) Britt., *Panicum repens* L., *Ottochloa nodosa* (Kth.) Dandy, etc. The termite hills are covered with *Streblus asper* Lour., *Lantana camara* L., and *Vernonia elliptica* DC. Thung Prong, 20 April 1969.

cochinchinense Pierre, and *Afzelia xylocarpa* Craib. Some of the more common understory species are: *Antheroporum pierrei* Gagn. var. *paucijugum* Craib, *Melodorum fruticosum* Lour., *Memecylon floribundum* Bl., and *Streblus taxoides* (Heyne ex Roth.) Corner.

There is one remarkable area on an open shale bluff near Thung Prong facing the Gulf that has one of the most diverse assemblages of hardwood species for the entire research area. Almost all of the species in this area are stunted, but still manage to flower and fruit. In general, the maximum height for the species in this zone is 2 meters, while in the surrounding forest they are much larger.—**Fig. 6**

Some of the species that were collected by Mrs. Collins in the Siracha area that were not found during this research include: *Brucea javanica* (L.) Merr., *Irvingia malayana* Oliv. ex Benn., and *Lagerstroemia calyculata* Kurz.

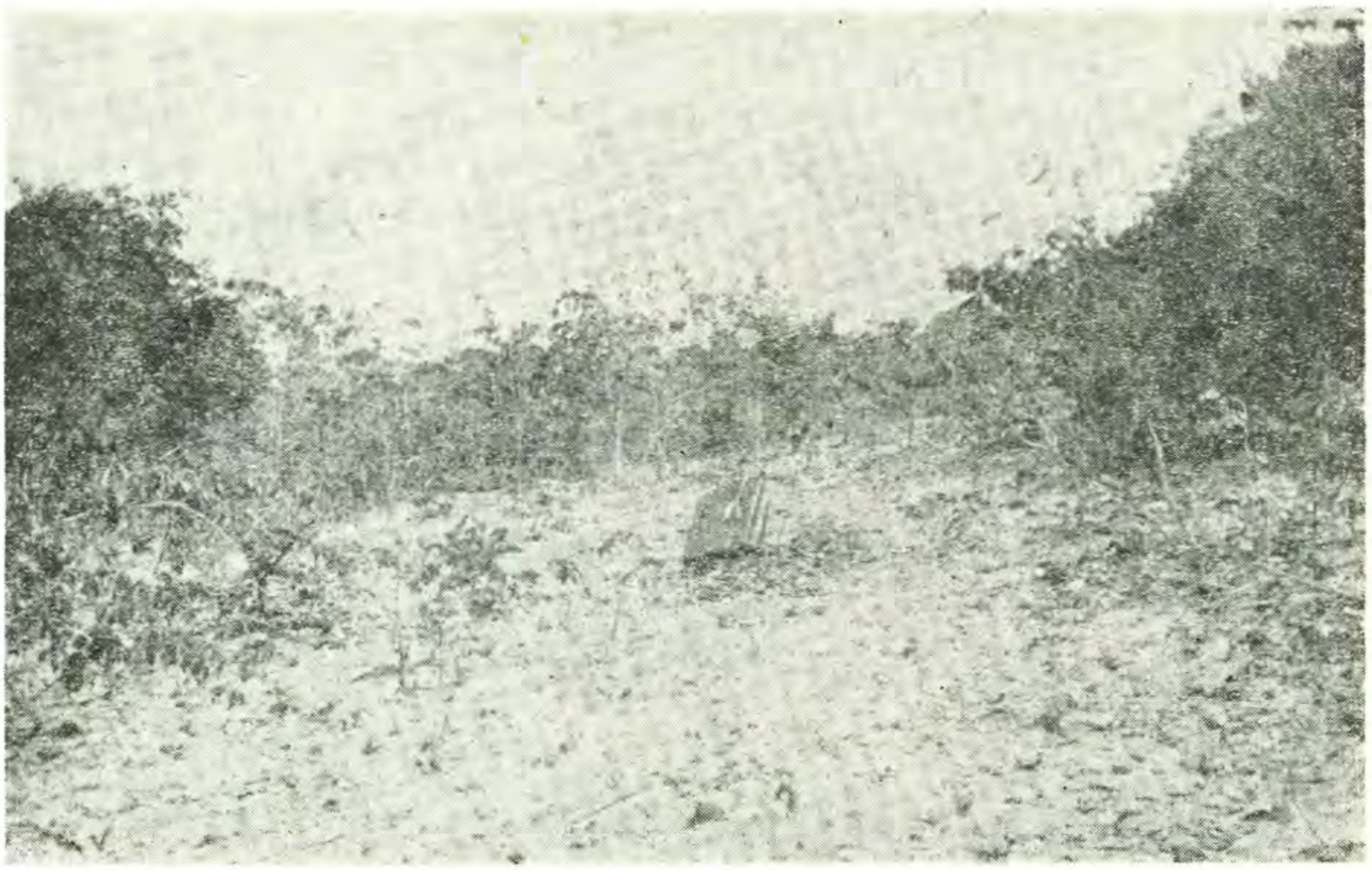

Fig. 6. Open shale bluff elevation ca 100 meters facing the Gulf in an evergreen hardwood forest. Note the extremely stunted growth of all the species here which are generally much taller in other areas of the forest. Illustrated are: *Connarus cochinchinensis* Pierre, *Croton robustus* Kurz, *Maerua siamensis* (Kurz) Pax, *Chaetocarpus castanocarpus* (Roxb.) Thw., *Diospyros hermaphroditica* (Zoll.) Bakh., *Dialium cochinchinense* Pierre, *Ixora cibdela* Craib, and *Vitex pubescens* Vahl. Thung Prong, 3 September 1972.

Secondary Growth Groups

The secondary growth association of the Sattahip area may be divided into three groups composed of many species that are often found in more than one of these groups. These three groups are not based on habitat, but rather on the type of growth. In general, these secondary species do not dominate any of the primary vegetation zones and are usually found in disturbed and cultivated areas.

Floristic Group 8 : Open Thicket Vegetation

These are common areas of diverse habitat where the original vegetation has been destroyed. The species in this area are generally quite vigorous and invade an area soon after the primary vegetation has been removed. These thickets are composed of both herbaceous and woody species which include: *Harrisonia perforata* (Blanco) Merr., *Grewia paniculata* Roxb., *Lantana camara* L., *Croton robustus* Kurz, *Bambusa arundinacea* (Retz.) Willd., *Eupatorium odoratum* L., and many others. Generally, even years after the burning or cutting of the primary forest, this thicket type of growth persists with little change in the character of the secondary flora.

Floristic Group 9 : Species that have Escaped Cultivation

In the Sattahip area, as well as throughout the entire Kingdom, there are many non-native species that are cultivated in flower pots, gardens, and plantations. Several of these species have successfully escaped cultivation and are now rather common in many disturbed areas. Several common escapees include: *Ipomoea nil* (L.) Roth, *Mangifera indica* L., *Carica papaya* L., *Psidium guajava* L., and others.

Floristic Group 10 : Noxious Weeds

Included in this group are many native as well as non-native species that cause much trouble in the tapioca, rice, etc. fields. These rapidly growing herbs require much nutrients, therefore their existence is at the expense of the crops under cultivation. In the Sattahip area weeds are removed manually (insecticides and herbicides are rarely used), thus the fields require constant attention in an effort to produce maximum crop yields. Fallow fields are allowed to become overgrown and these weeds apparently provide sufficient nourishment for the crops (especially the legumes) after the weed cover has been either burned

or plowed. Some of the more abundant and troublesome weed species are: *Digitaria longiflora* (Retz.) Pers., *Eleusine indica* (L.) Gaertn., *Dactyloctenium aegyptium* (L .) P. Beauv., *Tridax procumbens* L., *Euphorbia hirta* L., *Crotalaria elliptica* Roxb., and many others.

Enumeration

The Angiosperm families in this report are arranged according to the Bentham and Hooker system and the ferns according to Holttum (1968). The species are listed alphabetically under each family. An effort has been made to use the most up to date Family names, taxa, and authorities throughout this report. For all species listed the basic floristic zone or group (1–10), relative abundance, and whether or not the species was collected in the Siracha area are noted. Because of the fact that the *Florae Siamense Enumeratio* is complete only to the Gesneriaceae (Barnett, 1962) all the proceeding families, from Lentibulariaceae to Urticaceae and all the monocots, have not been thoroughly checked for Siracha records. While many of the Siracha specimens have been deposited in the Botany Section Herbarium (mostly all duplicates) the most complete collection can be found at Kew. Those species that have been collected in the Siracha area are indicated by " + " and those without any collecting record are noted with a "—" .

Finally, in an effort to indicate the most common habit or life form of each species, I have denoted the following letters:

H = herb

V = vine; non-woody climbers

C = climber; woody climbers; scandent

S = shrub

T = tree

P = parasite

Voucher specimens for this research have been deposited in the Botany Section Herbarium, Department of Agriculture with many duplicates in the Aarhus Herbarium, Denmark, and Leiden, Netherlands.

Capparidaceae

Capparis micrantha DC.; 7, 8; common, +, S

C. pyrifolia Lamk.; 7, 8; common,—, S

Cleome chelidonii L. f. ; 8, 10; common,—, H

C. gynandra L.; 10, common,+, H

Crateva nurvala Ham. var. *nurvala*; 7, common,—, T

C. odorata Ham.; 8, 9, not common, —, T

Maerua siamensis (Kurz) Pax; 4, not common; 7, very common, +, T

Moringaceae

Moringa pterygosperma Gaertn.; 9, not common, —, T

Violaceae

Rinorea scorpioidea (de Boss.) Gagn.; 7, not common, —, T

R. virgata (Thw.) O. Kuntze; 7, common; 8 not common, —, S

Flacourtiaceae

Casearia grewiaefolia Vent.; 7, not common; 8, common, +, T

Flacourtia indica (Burm. f.) Merr.; 4, not common; 8, common, +, T

Hydnocarpus ilicifolius King; 7, not common, +, T

Portulacaceae

Portulaca oleracea L.; 8 & 10, common, —, H

P. pilosa L. ssp. *pilosa race* "tuberosa"; 8 and rocky cliffs, common, —, H

Guttiferae

Garcinia cowa Roxb. ; 7,8; not common, +, T

Dipterocarpaceae

Dipterocarpus alatus Roxb. ; 5, common, +, T

Hopea odorata Roxb. ; 7, not common, —, T

Ancistrocladaceae

Ancistrocladus tectorius (Lour.) Merr.; 7, not common, +, C

Malvaceae

Abutilon indicum (L.) Sweet; 8, common, —, H

Gossypium purpurascens Poir.; 3, not common,—, H

Hibiscus sabdariffa L.; 8, not common,—, H/S

H. tiliaceus L.; 4, very common, +, T

Sida cordifolia L.; 8, common, +, H

S. veronicaefolia Lamk.; 7 & 8, not common,—, H

Thespesia populnea (L.) S. & C.; 4, very common, +, T

Urena lobata L.; 6, 8; common,—, H

Bombacaceae

Ceiba pentandra (L.) Gaertn. var. *indica* (DC.) Bakh.; 9, common, +, T

Sterculiaceae

Helicteres angustifolia L.; 7, not common, +, H/S

Heritiera littoralis Dryand ex W. Ait.; 4, not common, +, T

Melochia cordifolia L.; 8, 10, very common,—, H

Pterospermum grandiflorum Craib; 5, common,—, T

P. littorale Craib; 5, common; rocky cliffs, not common, +, T (Siracha type)

Sterculia foetida L.; 5,8; common, +, T

Waltheria americana L.; 8, common,—, H

Tiliaceae

Corchorus aestuans L.; 8, 10; common,—, H

C. capsularis L.; 8, 10; common, +, H

Grewia paniculata Roxb.; 7, not common; 8 common, +, T/S

Triumfetta repens (Bl.) Merr. & Rolfe; 3, not common,—, H

T. rhomboidea Jacq.; 8 common,—, H

Erythroxylaceae

Erythroxylum cuneatum (Miq.) Kurz; 7, common, +, S/T

Malpighiaceae

Hiptage lucida Pierre; 7, common, +, C

Zygophyllaceae

Tribulus cistoides L.; 3, common, +, H

Rutaceae

Acronychia pedunculata (L.) Miq.; 4 not common; 7 common, +, T

Aegle marmelos (L.) Corr.; 8, 9 (?); not common,—, T

Atalantia monophylla (L.) DC.; 7, very common, +, T

A. trimera Oliv.; 4, common, +, T

Clausena excavata Burm. f.; 7, common, +, S

Glycosmis pentaphylla (Retz.) Corr.; 4, common, +, T/S

Luvanga scandens Ham.; 7, not common,—, C

Micromelum minutum (Forst. f.) W. & A.; 7, common, +, S

Murraya paniculata Jack 7, not common, +, T

Simaroubaceae

Eurycoma longifolia Jack; 7, not common, +, T

Harrisonia perforata (Blanco) Merr.; 4 common; 8 very common, +, S

Ochnaceae

Ochna integerrima (Lour.) Merr.; 4, 7 not common, +, S

Meliaceae

Aglaia oblanceolata Craib; 7, not common,+, T

A. pirifera Hance; 7, not common, +, T

Azadirachta indica A. Juss. : 9, not common,+, T

Melia azedarach L.; 8, common, +, T

Sandoricum koetjape (Burm. f.) Merr.; 8, 9 (?), not common,+, T

Turraea humilis (Blanco) Merr.; 8, 10 common, +, H

Xylocarpus moluccensis (Lamk.) Roem.; 4, common, +, T

Olacaceae

Olax imbricata Roxb.; 7, common,—, C

Ximenia americana L.; 4, not common,—, S

Celastraceae

Loeseneriella pauciflora (DC.) A.C. Smith, 7, common,—, C

Maytenus diversifolia (Maxim.) Ding Hou; 4 common; 8 less common,—, C

Salacia chinensis L. ; 7, common, +, C/S

S. erythrocarpa K. Schum., 7, not common, NEW RECORD, C

S. verrucosa Wight; 7, not common, +, C/S

Rhamnaceae

Colubrina asiatica (L.) Brongn.; 4, very common, +, S

Ventilago cristata Pierre; 4, common, 7, very common,—, C

Zizyphus oenophila (L.) Mill.; 8, common, +, C

Z. rotundifolia Lamk.; 8, common, +,T

Vitaceae

Cayratia japonica Gagn.; 7, not common,—, V

C. tenuifolia Gagn.; 5, common,—, V

C. trifolia (L.) Dom.; 3, 8, not common,—, V

Cissus hastata Miq.; 5, common, +, V

C. siamica Planch.; 4, not common,—, V

Tetrastigma harmandii Planch.; 7, not common,—, V

Sapindaceae

Allophyllus racemosus Radlk. ex Engl. & Prantl; 7, common; 8, less common, +, T (most likely a synonym of *A. cobbe* (L.) Raeus.)

Arytera littoralis Bl.; 7, not common,—, T

Cardiospermum halicacabum L.; 8 common; 10, less common,—, V

Lepisanthes fruticosa (Roxb.) Leenh.; 9, not common,—, T

L. rubiginosa (Roxb.) Leenh.; 7, not common; 8, common, +, T

L. senegalensis (Poir.) Lamk. 7, not common; 8, common, +, S

Mischocarpus sundiacus Bl.; 7, common, +, T

Xerospermum intermedium Radlk.; 7, very common, +, T

Zollingeria dongnaiensis Pierre; 7, not common,—, T

Anacardiaceae

Buchanania reticulata Han.; 7, common, +, T

Mangifera duperreana Pierre; 7, not common, +, T

M. indica L.; 9, very common,—, T

Spondias pinnata Kurz; 7, not common, +, T

Connaraceae

Cnestis palala (Lour.) Merr.; 7, common, +, C

Connarus cochinchinensis (Baill.) Pierre; 4, common; 7, very common, +, C

Rourea minor (Gaertn.) Leenh.; 7, common, +, C/S

Leguminosae

Abrus precatorius L.; 8, common, +, V

A. pulchellus Wall.; 8, common, +, V

Acacia pennata Willd.; 4, 8, common,—, C

Adenanthera microsperma Teijsm. & Binn.; 8, not common,—, T

Aeschynomene americana L.; 8, common,—, H

Afzelia xylocarpa Craib; 7, common,+, T

Albizzia milletii Benth. var. *siamensis* Craib; 7, 8, not common,+ (Siracha type variety), C

Alysicarpus bupleurifolius (L.) DC. ; 3, not common,—, H

A. vaginalis (L.) DC. ; 8, common; 10, very common,+, H

Antheroporum pierrei Gagn. var. *paucijugum* Craib; 7, common,—, T

Bauhinia binata Blanco; 4, common,+, S

B. bracteata (Grah. ex Benth.) Baker; 7, common,+, C

Caesalpinia bonduc (L.) Roxb. emend. Dandy & Exell; 4, common,+, S/C

C. digyna Rottl.; 8, common,+, S/C

Canavalia maritima (Aubl.) Piper; 3, very common,+, V

Cassia alata L.; 6, common,—, T

C. fistula L.; 8, 9, not common,+,T

C. garrettiana Craib; 7, 9, not common,+, T

C. occidentalis L.; 8, common,+, S

C. pumila Lamk.; 8, not common,+, H

C. siamea Lamk.; 8, 9, not common,—, T

C. timoriensis DC.; 8, not common,+, T

C. tora L.; 8, common, +, H

Centrosema pubescens Benth. (blue and white forms); 8, very common,—,C

Christia vespertilionis (L.f.) Bakh. f.; 8, not common,+,C

Clitoria ternatea L. (blue and white forms); 8, very common,+, C

Crotalaria elliptica Roxb.; 8, 10, very common,+, H

C. medicaginea Lamk.; 3, common,+, H

C. mucronata Desv.; 3, common; 8, very common,—, H

Dalbergia candenatensis (Denn.) Prain; 4, not common,—, S/C

D. pinnata (Lour.) Prain; 7, 8, not common,—, C

Derris scandens Benth.; 7, 8, common,+, C

Desmodium gangeticum DC.; 8, common,+, H

D. heterocarpon (L.) DC. ssp. *heterocarpon* var. *heterocarpon*; 8, common,+, H

D. heterocarpon (L.) DC. var. *strigosum* van Meeuwen; 8, common,—, H

D. heterophyllum (Willd.) DC.; 6, 8, common,—, H

D. obcordatum (Miq.) Kurz; 7, common,+, H

D. triquetrum (L.) DC.; 7, 8, common,+, H

D. velutinum DC. var. *plukenetii* Schindl.; 8, common,+,H

Dialium cochinchinense Pierre; 7, common,+, T

Dunbaria scortechinii Prain; 6, common,+, V

Erythrina orientalis (L.) Merr.; 4, 9 (?), not common,+, T

Indigofera hirsuta L.; 8, common,+,H

I. linifolia (L.f.) Retz.; 3, not common,—, H

Leucaena leucocephala (Lamk.) de Wit; 8, very common,+, S

Mimosa invisa Mart.; 8, 10, common,—, H

M. pudica L.; 8, 10, common,+, H

Mucuna pruriens (L.) DC.; 7, 8, not common,+, V

M. suberosa Gagnep.; 5,6, common,—, V

Neptunia oleracea Lour.; 1, common,—, H

Peltophorum pterocarpum (DC.) Back.; 4, not common,—, T

Phaseolus lathyroides L.; 8, common,—, H

Pithecellobium dulce (Roxb.) Benth.; 8, 9, (?), common,—, T

Pterocarpus macrocarpus Kurz; 8, 9 (?), not common,—, T

Pycnospora lutescens (Poir.) Schindl.; 8, 10, common,+, H

Samanea saman (Jacq.) Merr.; 6, 8, common;—, T

Sesbania bispinosa (Pers.) Fawc. & Rend.; 6, common,+, H

S. grandiflora (L.) Pers.; 9, not common,—, T

Sindora siamensis Teijsm. ex Miq.; 7, common,+, T

Sophora tomentosa L.; 4, common,+, S

Tamarindus indica L.; 8, 9; common,+, T

Tephrosia wallichii Grah. ex Fawc. & Rend.; 8, common,+, H

Uraria crinita (L.) Desv.; 8, common,+, H

Uraria lagopodioides Desv. ; 8, common,—, H

U. rotundata Craib; 7, common; 8, less common,+ (Siracha type), H

Crassulaceae

Kalanchoe pinnata (Lamk.) Pers.; 8, not common,+, H

Rhizophoraceae

Bruguiera cylindrica (L.) Bl.; 2, common,+, S

Ceriops tagal (Pers.) C.B. Rob.; 2, common,+, S

Combretaceae

Calycopteris floribunda (Roxb.) Lamk. ; 7, not common,+, C

Combretum latifolium Bl.; 7, not common,+, C

C. quadrangulare Kurz; 5, 6, very common; 8, less common,+, T

Lumnitzera racemosa Willd.; 4, common,+, S

Quisqualis indica L.; 8, 9 (?), not common,+, V

Terminalia catappa L.; 3, 8, not common,—, T

Myrtaceae

Eugenia cumini (L.) Druce; 8, not common,+, T

Psidium guajava L.; 9, not common,+, T

Rhodamnia siamensis Craib; 7, common,+, S

Melastomataceae

Melastoma polyanthum Bl.; 5, 6, common, +, S

M. villosum Lodd.; 5, 6, common, +, S

Memecylon edule Roxb. var. *scutellatum* (Naud.) C.B.Cl.; 7, common, +, T
(*M. scutellatum* (Lour.) Naud.)

M. floribundum Bl.; 7, common, +, T

M. laevigatum Bl.; 7, not common, +, T

Lythraceae

Ammannia baccifera L.; 10, not common, +, H

Lagerstroemia floribunda Jacq.; 5 less common; 8 common, +, T

L. loudonii Teijsm. & Binn.; 5, less common; 8, common, +, T

Pemphis acidula Forst.; 4, common, +, S

Onagraceae

Jussiaea linifolia Vahl; 1, 6, common,—, H

J. repens L.; 1,6, common,—, H

J. suffruticosa L.; 8, common, +, H

Ludwigia parviflora Roxb.; 8, common,—, H

Passifloraceae

Passiflora foetida L.; 8, very common,—, V

Caricaceae

Carica papaya L.; 9, common,—, T

Cucurbitaceae

Alsomitra sarcophylla Roem.; 7, not common,+, V

Coccinia indica (Naud.) W. & A. ; 6, 8, very common, —, V

Trichosanthes integrifolia Kurz; 8, 9, common,—, V

T. quinqueangulata A. Gr.; 5, 6, not common, +, V

T. tricuspidata Lour.; 8, common,—, V

Cactaceae

Opuntia elatior Mill.; 4, common, +, S

Aizoaceae

Gisekia pharmacioides L.; 8, common, +, H

Glinus oppositifolius A. DC.; 8, 10, common, +, H

Mollugo nudicaulis Lamk.; 8, 10, common,—, H

M. pentaphylla L.; 10, common, +, H

Sesuvium portulacastrum L.; 3, common, +, H

Trianthema portulacastrum L.; 3, common,—, H

Umbelliferae

Centella asiatica (L.) Urb.; 1,6, common,—, H

Rubiaceae

Adina polycephala Benth.; 7, not common,—, T. (= *A. polycephaloides* Craib)

Borreria articularis (L. f.) Will.; 8, 10, common, H

Canthium umbellatum Wight; 7, common,—, T

Guettardia speciosa L.; 4, common, +, T

Hedyotis biflora (L.) Lamk.; 8, rocky cliffs, common,—, H

H. coronaria (Kurz) Craib; 8, 10, common,—, H

H. corymbosa (L .) Lamk.; 8, 10, common,—, H

H. dichotoma Koen. ex Roth.; 8, common,—, H

H. diffusa Willd.; 6, 8, common, +, H

H. hedyotidea (DC.) Merr. var. *pitardiana* (Craib) Fuk.; 5, common, +, H

H. horneriana (Miq.) Fuk.; 8, common,—, H

H. ovatifolia Cav.; 7, common, +, H

Ixora cibdela Craib; 7, common, +, T/S

I. finlaysoniana Wall. ex G. Don; 7, common, +, T/S

I. javanica (Bl.) DC.; 7, common, +, S

Lasianthus andamanicus Hook. f.; 7, common, +, T/S

Morinda citrifolia L.; 7, not common,—, T

M. cochinchinensis DC.; 7, not common,+,C

M. coreia Ham.; 7, common,—, T

Paederia hirsuta Craib; 7, 8, not common, +, V

P. tomentosa Bl. var. *glabra* Kurz; 7, common, +, V

Pavetta indica L.; 7, common, +, S

Pavetta indica L. var. *hispida* Pierre ex Pit.; 7, common,—, S. (= *P. aspera* Craib var. *breviflos* Craib)

Prismatomeris albidiflora Thw.; 7, common, +, S

Randia siamensis Craib; 7, 8, very common, +, C

Scyphiphora hydrophyllacea Gaertn. f.; 4, common, +, S

Tarenna collinsae Craib; 4, common, + (Siracha type), T

T. harmandiana Pierre ex Pit.; 4, common, New Record, C

Xantonnea parvifolia (O. Kuntze) Craib; 7, 8, not common, —, S

Compositae

Ageratum conyzoides L.; 6, 10, very common,—,H

Blumea membranacea DC.; 6, common,—, H

Eclipta prostrata (L.) L.; 6, very common, +, H

Epaltes australis Less.; 8, 10, common,—, H

Erechtites hieracifolia Raf. ex DC.; 6, not common,—, H

Eupatorium odoratum L.; 6,8,10, very common, +, H

Pluchea indica (L.) Less.; 8,10, common,—, S

Sphaeranthus africanus L.; 6, 10, common,—, H

Synedrella nodiflora (L.) Gaertn.; 8, 10, common, +, H

Tridax procumbens L.; 8, 10, very common,—, H

Vernonia cinera (L.) Less.; 8, 10, very common,—, H

V. elliptica DC.; 8, common, +, H

Wedelia biflora (L.) DC.; 8, common,+, H

Goodeniaceae

Scaevola taccada (Gaertn.) Roxb.; 4, common,+, S

Sphenocleaceae

Sphenoclea zeylanica Gaertn.; 10 (rice fields), common,—, H

Myrsinaceae

Ardisia helferiana Kurz; 7, not common, +, 5, S

Sapotaceae

Manilkara hexandra (Roxb.) Dub.; 4, not common, +, T

Ebenaceae

Diospyros apiculata Hiern.; 7, not common,—, T

D. areolata K. & G.; 8, common,—, T

D. curranii Merr.; 7, common,+, T

D. ferrea (Willd.) Bakh.; 4, 7, not common; 5, common,+, T

D. filipendula Pierre ex Lec.; 7, not common,—, T

D. hermaphroditica (Zoll.) Bakh.; 7, very common,+, T

D. malabarica (Desv.) Kost.; 4, not common,—, T

D. montana Roxb.; 7, not common,+, T

D. retrofracta Bakh.; 7, common,+, T

Symplocaceae

Symplocos laurina (Retz.) Wall. ex G. Don.; 5, 6, not common,+, C

Oleaceae

Jasminum scandens (Retz.) Vahl; 7, 8, common,+, V

Linociera ramiflora (Roxb.) Wall.; 7, common,+, T

Olea salicifolia Wall. ex G. Don; 7, common,+, C

Salvadoraceae

Azima sarmentosa (Bl.) Benth. & Hook. f.; 4, common; 6, less common,+,S

Apocynaceae

Aganosma harmandiana Pierre ex Spire; 7, not common,+, V

A. marginata (Roxb.) G. Don; 7, 8, common+, V

Carissa cochinchinensis Pierre ex Pit.; 4, not common,—, S/T

Cerbera manghas L.; 4, not common,+, S

Ichnocarpus frutescens (L.) R. Br.; 7, common,+, V

I. fulvus Kerr; 7, 8; not common, + (Siracha type), V

I. ovatifolius A. DC.; 7, not common,— New Record, V

Parameria laevigata (Juss.) Mold.; 7, common,+, V

Strophanthes siamensis Kerr; 7, not common,+(Siracha type), S

Urceola lucida (DC.) Hook. f.; 7, 8, common, —, V

Wrightia javanica A. DC.; 7, not common,+, T

Asclepiadaceae

Calotropis gigantea (Willd.) Dryand. ex Ait.; 3, common,+, S

Gymnema tingens (Roxb.) Spreng.; 7, common,+, V

Heterostemma piperifolium K. & G.; 7, common,—, V

Hoya graveolens Kerr.; 4, common, + (Siracha type,) V

H. parasitica (Roxb.) Wall. ex Wight; 4, 7, common,+, V

Ischnostemma carnosum (Schltr.) M. & R.; 4, not common,—, V

Marsdenia glabra Cost.; 7, not common,+, V

Raphistemma hooperianum (Bl.) Decne.; 6, 7, common,+, V

Sarcostemma brunonianum W. & A.; 4, common,+,V

Secamone ferruginea Pierre; 4, 7, common,+, V

S. lanceolata Bl.; 7, 8, very common,+, V

Streptocaulon juventus (Lour.) Merr.; 7, 8, common,+, V

Toxocarpus villosus (Bl.) Decne.; 7, common,+, V

Tylophora indica (Burm. f.) Merr.; 4,7,8, very common,+, V

Zygostelma benthami Baill.; 8, not common,+, V

Loganiaceae

Strychnos axillaris Colebr.; 7, common,—, C

S. colubrina L.; 7, very common,—, C

Boraginaceae

Coldenia procumbens L.; 6 (rice fields), common,+, H

Cordia cochinchinensis Gagnep.; 8, not common,—, T

C. subcordata Lamk.; 4, common,+, T

Ehretia laevis Roxb.; 7, not common,+, T

Convolvulaceae

Argyreia obtecta C.B.Cl. 7. not common,+, C (= *A. mollis* (Burm.f.) Choisy)

Erycibe cochinchinensis Gagn.; 7, not common,+, C

Evolvulus alsinoides (L.) L.; 7, not common,—, C

Hewittia sublobata (L. f.) O. Kuntze; 7, not common,—, C

Ipomoea aquatica Forsk.; 1, very common; 8, not common,—, V

I. cairica (L .) Sweet; 8, common,—, V

I. crassicaulis (Benth.) B. L. Rob.; 8, not common,—, S

I. digitata L.; 5, common,+, V

I. maxima (L.f.) Don ex Sweet; 6, common,—, V

I. nil (L.) Roth; 9, not common,—, V

I. obscura (L.) Ker–Gawl.; 8, not common,—, V

I. pes-caprae (L.) R. Br.; 3, very common,+, V

I. pes-tigridis L.; 8, common,+, V

I. tuba (Sch.) G. Don; 3, common,+, V

Jacquemontia paniculata (Burm. f.) Hall. f.; 8, common,+, V

Lettsomia collinsae (Craib) Kerr; 7, 8, common,+ (Siracha type), V

Merremia gemella (Burm. f.) Hall. f.; 8, common,—, V

M. hederacea (Burm. f.) Hall. f.; 6, 8, common,+, V

M. hirta (L.) Merr.; 8, common,+, V

M. tridentata (L.) Hall. f. ssp. *hastata* (Desr.) van Ooststr.; 8, common,+, V

M. umbellata (L.) Hall. f.; 8, common,+, V

Neuropeltis racemosa Wall.; 7, not common,+, C

Porana spectabilis Kurz; 7, not common,+, C

Solanaceae

Physalis minima L.; 8, common,—, H

Solanum torvum Sw.; 8, common; 6, not common,+, H

Solanum verbascifolium L.; 7, not common,—, T

Scrophulariaceae

Artanema longifolium (L.) Vat.; 6, not common,+, H
Limnophila heterophylla Benth.; 1, not common,—, H
Lindernia antipoda (L.) Alst.; 6, not common.—, H
L. ciliata (Colsm.) Penn.; 8, common,+, H
L. crustacea (L.) F. v. M; 8, common,—, H
L. pusilla (Willd.) Merr.; 6, 8, common,+, H
L. viscosa (Willd.) Merr.; 8, common,—, H
Scoparia dulcis L.; 8, common,—, H
Striga lutea Lour.; 4, less common; 8, common,+, H

Lentibulariaceae

Utricularia aurea Lour.; 1, not common,—, H

Bignoniaceae

Spathodea campanulata Beauv.; 8, not common,—, T

Pedaliaceae

Sesamum indicum L.; 8, common,—, H

Thunbergiaceae

Thunbergia grandiflora Roxb.; 9, not common,—, V

Acanthaceae

Dipteracanthus repens (L.) Hassk.; 5, 6, not common,—, H
Hygrophila erecta (Burm.) Hochr.; 6, common,—, H
Pseuderanthemum palatiferum (Wall.) Radlk.; 7, not common, —, H
Ruellia tuberosa L.; 8, 10, common,—, H

Verbenaceae

Avicennia sphaerocarpa Stapf; 2, very common,+, S
Clerodendrum disparifolium Bl.; 8, not common,—, H
C. indicum Kuntz; 6, 8, not common,—, H
C. inerme Gaertn.; 4, common,—, S

Clerodendrum schmidtii C.B. Cl.; 7, not common,+, H
Congea tomentosa Roxb.; 7, common, +, C
Glossocarya mollis Wall. ex Griff.; 8, not common,—, C
Hymenopyramis siamensis Craib; 7, 8, common,+, C
Lantana camara L.; 6 (termite hills), 8, common,—, S
Phyla nodiflora (L.) Greene; 8, common,—, H
Premna collinsae Craib; 8, not common,+ (Siracha type), S/T
P. corymbosa (Burm. f.) R. & H.; 4, not common,—, S
Sphenodesme pentandra Jack; 7, 8, common,—, C
Stachytarpheta jamaicensis (L.) Vahl; 6, 8, very common,—, H
Tectona grandis L.; 8, 9 (?), not common,—, T
Vitex limonifolia Wall. ex Kurz; 7, common,—, T
V. pubescens Vahl; 7, 8, common,—, T
V. trifolia L.; 4, common,—, C/S/T

Labiatae

Leucas lanata Benth.; 8, 10, common,—, H
Ocimum sanctum L.; 9, common,—, H

Nyctaginaceae

Boerhaavia diffusa L.; 8, 10, very common,—, H
Pisonia aculeata L.; 4, common,+, C

Amaranthaceae

Achyranthes aspera L.; 8, 10, common,—, H
Aerva monsonia Mart.; 8, not common,—, H
Alternanthera sessilis (L.) DC.; 6, common,—, H
Amaranthus gracilis Desf.; 8, common,—, H
A. spinosus L.; common,—, H
Gomphrena celosioides Mart.; 8, 10, very common,—, H
G. globosa L.; 9, not common,—, H
Psilotrichum ferrugineum (Roxb.) Moq.; 7, not common,—, H

Polygonaceae

Polygonum minus Huds.; 6, common; 8, less common,+, H
P. tomentosum Willd.; 6, not common,—, H

Piperaceae

Piper longivaginatus A. DC.; 8, not common,—, V

P. sarmentosum Roxb.; 8, not common,—, V

Myristicaceae

Knema globularia (Lamk.) Warb.; 7, not common,+, T

Lauraceae

Cassytha filiformis L.; 3, common,—, P

Litsea glutinosa (Lour.) C.B. Rob.; 7, not common,+, T

Loranthaceae

Dendrophthoë pentandra (L.) Miq.; 7, 8, very common,—, P

Macrosolen cochinchinensis (Lour.) v. Tiegh.; 8, not common,+, P

Viscum articulatum Burm.; 7, 8, common,—, P

V. ovalifolium Wall. ex DC.; very common,—, P

Opiliaceae

Cansjera rheedi Gmel.; 4, 7, common,—, S

Euphorbiaceae

Acalypha indica L.; 8, 10, not common,—, H,

Aporusa planchoniana Baill. ex Muell. Arg.; 7, not common,+, T

Breynia glauca Craib; 6, 8, common,—, S

Bridelia ovata Decne.; 6, 8, common,+, S

B. tomentosa Bl.; 8, common,—, T

Chaetocarpus castanocarpus (Roxb.) Thw.; 7, not common,+, T

Cladogynos orientalis Zipp. ex Span.; 7, not common,+, S

Cleistanthus hirsutulus Hook. f.; 7, common,+, S

C. tomentosus Hance; 7, very common,+, S

Croton cascarilloides Raeus.; 7, common,—, S

C. robustus Kurz; 7, not common; 8, very common,—, T

Epiprinus siletianus (Baill.) Croiz.; 7, not common,—, T

Erismanthus sinensis Oliv.; 7, common,+, T

Euphorbia antiquorum L.; 4, common,—, S

E. atoto Forst. f.; 4, less common; 8, common,—, H

Euphorbia heterophylla L.; 8, 10, very common,—, H

E. hirta L.; 8, 10, very common,—, H

Excoecaria agallocha L.; 4, common,—, T

E. cochinchinensis Lour. var. *viridis* (P. & H.) Merr.; 7, not common,—,S

Jatropha gossypiifolia L.; 3, less common; 4, common,+, S

Mallotus philippensis (Lamk.) Muell. Arg.; 7, less common; 8, more common,+, T

M. repandus (Willd.) Muell. Arg.; 5, 6, common,+, C

Phyllanthus acidus (L.) Skeels; 8, 9, (?), common, —, H

P. amarus Sch. & Thonn.; 8, 10, common,—, H

P. collinsae Craib; 7, 8, common, + (Siracha type), S

P. virgatus Forst. f.; 8, common,+, H

Ricinus communis L.; 8, common,—, S

Sauropus androgynus (L.) Merr.; 8, common,—, S

Securinega virosa (Roxb. ex Willd.) Baill.; 6, 8, common,—, S

Strophioblachia glandulosa Pax var. *pandurifolia* Airy Shaw; 3, not common, —, H/S

Suregada multiflora (A. Juss.) Baill.; 7, 8, common,+, S/T

Synostemon bacciformis (L.) Web.; 3, 8, not common,+, H

Stilaginaceae

Antidesma ghaesembilla Gaertn.; 6, 8, common,+, T

A. thwaitesianum Muell.-Arg.; 7, not common,—, T

Ulmaceae

Trema orientalis (L.) Bl.; 8, very common,—, T

Moraceae

Artocarpus heterophylla Lamk.; 9, common,—, T

Ficus altissima Bl.; 7, common,—, T

F. fistulosa Reinw. ex Bl.; 7, not common,—, T

F. hispida L. f.; 6, 8, not common,+, T

F. microcarpa L. f.; 7, common,—, T

F. superba Miq.; 6, 8, common,+, T.

F. superba Miq. var. *japonica* Miq.; 7, common,—, T

Ficus tinctoria Forst. f. ssp. *gibbosa* (Bl.) Corner var. *gibbosa* Corner; 8, not common,—, T

Maclura cochinchinensis (Lour.) Corner; 8, not common,+, C

Streblus asper Lour.; 6, 8, very common,—, T

S. taxoides (Heyne) Kurz; 4, less common; 7, common,—, T

Cannabinaceae

Cannabis sativa L.; 9, not common,—, H

Urticaceae

Pouzolzia indica Gaud. var. *angustifolia* Wedd.; 6, very common,+, H

MONOCOTYLEDONES

Hydrocharitaceae

Halophila minor (Zoll.) Hart. ; 1, common,—, H

Ottelia alismoides (L.) Pers.; 1, not common,—, H

Orchidaceae

Eulophia graminea Lindl.; 10, not common,—, H

Zingiberaceae

Alpinia siamensis K. Schum.; 9, not common,—, H

Marantaceae

Maranta arundinacea L.; 9, not common,—, H

Schumannianthus dichotomus Gagn.; 6, common,—, H

Dioscoreaceae

Dioscorea alata L.; 5, not common,+, V

D. collinsae Prain & Burk.; not common, + (Siracha type), V

D. glabra Roxb.; 8, not common,+, V

Roxburghiaceae

Stemona collinsae Craib; 5, 6, not common, + (Siracha type), H

Smilacaceae

Smilax helferi A. DC.; 8, not common,—, V

Liliaceae

Asparagus racemosus Willd.; 8, common,+, V

Gloriosa superba L.; 8, common,—, V

Peliosanthes violacea Wall.; 7, not common,—, H

Pontederiaceae

Eichhornia crassipes (Mart.) Solms.; 1, common; 6, less common,—, H

Monochoria vaginalis (Burm. f.) Presl; 1, common,+, H

Commelinaceae

Commelina benghalensis L.; 8, common,+, H

C. diffusa Burm. f.; 6, common; 8, less common,—, H

Cyanotis axillaris (L.) D. Don ; 6, common,+, H

Murdannia nudiflora (L.) Bren.; 8, common,—, H

Flagellariaceae

Flagellaria indica L.; 5, 6, common,—, V

Palmae

Borassus flabellifer L.; 8, common,—, T

Calamus viminalis Willd. var. *fasciculatus* (Roxb.) Becc.; 4, 6, common,—, C

Caryota mitis Lour.; 5, not common,—, T

Cocos nucifera L.; 4, 8, very common, —, T

Licuala spinosa Thunb.; 6, not common,+, S

Phoenix humilis Royle; 2, less common; 5, more common,—, S

Salacca wallichiana Mart.; 6, not common,—, S

Pandanaceae

Pandanus odoratissimus L. f.; 4, common,—, S/T

Typhaceae

Typha angustifolia L.; 1, not common,—, H

Araceae

Colocasia esculenta (L.) Schott; 5, 6, common, —, H

Lasia spinosa (L.) Thw.; 5, 6, not common,—, H

Pseudodracontium lacouri (L. & A.) N.E. Br.; 4 (on rocks), common,—, H

Typhonium trilobatum (L.) Schott; 8, common, H

Lemnaceae

Lemna perpusilla Torr.; 1, very common,—, H

Zannichelliaceae

Halodule tridentata (Stein.) F.v.M.; 1, common,—, H

Cyperaceae

Bulbostylis barbata (Rottb.) C.B. Cl.; 8, 10, common,—, H

Cyperus compactus Retz.; 6, common,+, H

C. corymbosus Rottb.; 6, common,—, H

C. difformis L.; 6, not common,—, H

C. diffusus Vahl; 8, 10, common,+, H

C. digitatus Roxb.; 6, not common,—, H

C. distans L. f.; 8, 10, common,—, H

C. dubius Rottb.; 3, 8, common,—, H

C. haspan L.; 8, 10, common,+, H

C. javanicus Houtt.; 6, 8, common,—, H

C. pilosus Vahl; 6, common,—, H

C. pulcherrimus Willd. ex Kunth; 8, common, —, H

C. stoloniferus Retz.; 3, 8, common,—, H

C. trialatus (Boeck.) Kern; 4 (on cliffs), not common,+, H

Eleocharis dulcis (Burm. f.) Hensch.; 1, common; 6, less common,+, H

Fimbristylis dichotoma (L.) Vahl; 8, 10, common,—, H

F. eragrostis (Nees.) Hance; 4, (on cliffs), 8, common,—, H

F. ferruginea (L.) Vahl; 6, 8, common,—, H

F. griffithii Boeck.; 5, not common,—, H

F. milliacea (L.) Vahl; 6, very common,—, H

F. pauciflora Br.; 8, 10, common,—, H

Fuirena ciliaris (L.) Roxb.; 8, 10, very common,+, H

Rhynchospora corymbosa (L.) Britt.; 6, 8, common,—, H

Scirpus grossus L. f.; 6, not common,+, H

Scleria lithosperma (L.) Sw.; 7, common,+, H

S. oblata S.T. Blake; 6, common,—, H

Gramineae

Acroceras zizanioides (H.B.K.) Dan.; 7, common,—, H

Aristida balansae Hern.; 8, 10, very common,—, H

Arundinella setosa Trin.; 3, 4 (cliffs), not common,—, H

Brachiaria reptans (L.) G. & H.; 8, not common,—, H

Cenchrus echinatus L.; 8, 10, not common,—, H

Centotheca lappacea (L.) Desv.; 7, common,+, H

Chloris barbata (L.) Sw.; 8, 10, very common,+, H

Chrysopogon orientalis (Desv.) A. Camus; 4 (on cliffs), 8, not common,—,H

Cymbopogon flexuosus (Nees ex Steud.) Wats.; 3, not common,+, H

Cynodon dactylon Pers.; 8, common,+, H

Cyrtococcum accrescens (Trin.) Stapf; 7, common,—, H

Dactyloctenium aegypticum (L.) P. Beauv.; 8, 10, very common,—, H

Digitaria longiflora (Retz.) Pers.; 3, less common; 8, 10, very common,—, H

Echinochloa colonum (L.) Link.; 8, 10, very common,—, H

E. crusgalli (L.) P. Beauv.; 8, 10, very common,—, H

Eleusine indica (L.) Gaertn.; 8, 10, common,+, H

Eragrostis ciliata (Roxb.) Nees; 3, less common; 8, 10, very common,—, H

E. viscosa Trin.; 8, 10, common,—, H

Eriochloa procera (Retz.) C.E. Hub.; 6, common,—, H

Hymenachne pseudointerrupta C. Muell.; 6, common,—, H

Imperata cylindrica (L.) P. Beauv.; 6, common,—, H

Ischaemum muticum L.; 3, common,—, H

Lepturus repens (G. For.) R. Br.; 3, common,—, H

Oplismenus compositus (L.) P. Beauv.; 8, common,+, H

Ottochloa nodosa (Kunth) Dandy; 6, common,—, H

Panicum auritum Presl ex Nees; 6,8, common,—, H

P. repens L.; 6, very common,—, H

P. sarmentosum Roxb.; 8, 10, common,—, H

Paspalum orbiculare Forst. f.; 6, common,—, H

Pennisetum polystachyon (L.) Schult.; 8, 10, not common,—, H

P. purpureum K. Schum.; 8, common,—, H

Phragmites karka (Retz.) Trin. & Steud.; 6, not common,—, H

Saccharum spontaneum L.; 8, 10, not common,—, H

Spinifex littoreus (Burm. f.) Merr.; 3, very common,—, H

Sporobolus virginicus Kunth; 3, less common; 8, more common,—, H

Thuarea involuta (G. Forst.) R. Br. ex R. & S.; 3, very common,+, H

Bambusaceae

Bambusa arundinacea (Retz.) Willd.; 6, less common; 7, 8, very common,—,S

PTERIDOPHYTES

Schizaeaceae

Lygodium flexuosum (L.) Sw.; 7, common,—, V

L. polystachyum Wall.; 8, 10, not common,—, V

L. scandens (L.) Sw.; 5, common,—, V

Polypodiaceae

Pyrrosia adnascens (Forst.) Ching; 4, common,—, H

Thelypteridaceae

Thelypteris gongylodes (Schk.) Sm.; 5, 6, common,—, H

Aspleniaceae

Aspidium nidus L.; 7, not common,—, H.

Dennstaedtiaceae

Acrostichum aureum L.; 6, common,—, H

Nephrolepis biserrata (Sw.) Schott; 6, not common,—, H

Stenochlaena palustris (Burm.) Bedd.; 5, 6, common,—, V

Tectaria variolosa (Wall. ex Hook.) C. Chr.; 7, not common,—, H

Adiantaceae

Adiantum caudatum L. var. *subglabratum* Holtt.; 7, not common,—, H

Ceratopteris thalictriodes (L.) Bron.; 6, common,—, H

Marsileaceae

Marsilea crenata Presl.; 1, very common; 6, common,—, H

Salviniaceae

Salvinia cucullata Roxb. ex Bory; 1, not common,—, H

Azollaceae

Azolla pinnata R. Br.; 1, not common,—, H

SUMMARY

The vascular flora of the Sattahip area, as enumerated in this report, is summarized below.

Families		Species and Varieties
Dicotyledones	83	444
Monocotyledones	20	99
Pteridophytes	9	15
Total	112	558

This includes three new records for Thailand:

1. *Salacia erythrocarpa* K. Schum. (Celastraceae)
2. *Tarenna harmandiana* Pierre ex Pit. (Rubiaceae)
3. *Ichnocarpus ovatifolius* A. DC. (Apocynaceae)

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