AMERICAN PLANTS IN PHILIPPINE ETHNOBOTANY

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This study forms an element in the much larger and more complex problem of the ethnobotany of the Philippines, a large topic because of the rich tropical flora available to the inhabitants of the Philippines, and because of the clever uses to which they have put that flora.

A discussion of the American plants in the culture of the Philippines should have value, since it was by way of the Philippines that many American plants entered Asia; the subject thus ties up with the larger problem of American plant migration.

I must acknowledge special indebtedness to Dr. E. D. Merrill, of the New York Botanical Garden, whose work in the botany of the Philippines reduced chaos to order and furnished the foundation for research in Philippine ethnobotany. I am further indebted to him for correspondence and suggestions in the preparation of this paper. I have also had the advantage of the interest of Dr. Paul C. Standley, of the Field Museum of Natural History, from whose encyclopedic work, The Trees and Shrubs of Mexico, I have often quoted. He was kind enough also to go over this paper and has made many valuable suggestions with reference to the botany involved. Prof. Robert Redfield, of the University of Chicago, has given me many suggestions regarding plants in Mexican culture.
Technic.—There is an almost world-wide, primitive, tropical, agricultural technic, consisting in simply cutting down the trees and clearing the land by burning the dried remains. This gives a temporary clearing sufficient to start a crop before the land is reclaimed by wild vegetation.

Cook (19, p. 71) in an excellent discussion of this technic in tropical America, terms it the milpa system and shows how, with even the crudest stone implements and the use of fire, man is enabled to steal a march on Nature and secure a subsistence without the necessity of plowing, hoeing, and weeding. In parts of Central America planting is still done with only the use of a sharpened stick. This represents about the simplest possible agricultural technic.

The same author points out a great advance in American agriculture when specialized and permanent systems of terrace agriculture were developed for the cultivation of maize in Peru and Central America. Now does he fail to note similar systems of terracing used for the cultivation of rice and other crops in Eastern Asia. In both areas the advanced groups practicing this technic are surrounded by more primitive neighbors who use the milpa system.

In the Philippines, the area under discussion in this paper, both systems are practiced. Here there can be no doubt that similar natural conditions of a tropical country and a people with a primitive culture have produced a counterpart of the milpa system, here called the kaingin system. This primitive system is typical among the Negritos everywhere; the Benguet of the eastern Cordillera of northern Luzon; and throughout the mountains of Mindanao, as described among the Subanons of Zamboanga Peninsula; (6, p. 89) and the Banaue of Davao Gulf, (14, p. 125) who only use the digging stick. (3, p. 89) In general, the kaingin system is used to the exclusion of other terrains by the peripheral groups in the Philippines.

Corresponding to the most-developed terrace system of America, the tribes of the mountainous Luzon use a rice-paddy system which permits the cultivation of lowland rice. In these mountains this rice-paddy technic has developed into the most magnificent system of terraces in the world. (33, pl. 24, p. 140) Jenks, in discussing these terraces, flirts with the idea of a trail introduction from China, but decides that it is an early trait,
"which spread from the nest of the primitive Malayean culture."

To the writer, however, it seems simpler and more in keeping with the facts to recognize that these terraces are essentially rice paddies that have been constructed to fit the topography of the mountainous terrains. So as population outgrew the small areas available in the sloping valleys, the people were forced to hang their paddies on the mountain ridges, by the "invention" of terraces, which we see after all invented themselves as an adaptation of the old trick (the rice paddy) to a new condition.

Content of the agricultural complex.—In the terraces only lowland rice is produced and the groups that use the terrace also make use of the bulbulia system for producing more than half of their food supply.

Rice is the prized and esteemed food to which the ceremony and ritual and prestige attach.

From the huts, however, the agricultural complex is completed with pali (Colocasia antiquorum), tuba (Ricevava sp.), and the American plants manao and corn. The essential native fruits are mangoes, bananas, and coconuts. Bamboo is everywhere of great importance.

Important in the ethnobotanical configuration is the hano nipa, or hano, complex, which enters the agricultural complex as the vine Piper betle, which produces the leaf, and the palm Areca catechu, which furnishes the nut.

The hano nipa complex in Philippine culture.—An understanding of the hano (or hano-kah) complex is pertinent in this paper because of the fact that the American plant tobacco attached itself integrally to it, modified it, and has tended to displace it.

The hano complex is one very widely integrated into the culture of this part of the world. This striking habit was noted by Pigafetta upon the discovery of the Philippines, and is thus well described by de Morga, 1609 (12.16.17-49):

The ordinary daily throughout these islands and in many barangays of the mainland is hano. This is made from a climbers (Piper betle) whose leaf is shaped like a needle, and from a palm (Areca catechu) as secured a fruit which resembles an oak acorn. This fruit, which is called bongao, is cut lengthwise into strips and each strip is wrapped in an unripe paddy made from the leaf. With the bongao is thrown in a powder of lime. This compound is placed in the mouth and chewed; it is so strong a mixture, and hence so much that it induces sleep and intoxication. The active and all the mouth is made so as not to bleed. It does not taste bad.
They consider it very beneficial, whatever quantity goes into the stomach for strengthening it, and for various diseases. It strengthens and preserves the teeth and gums from all inflammations, decay and aches.

Even the Spaniards took it up, and served it on trays like chocolate in New Spain (Mendoza).

The natives (especially the chiefs), whenever they leave their houses, take for show and entertainment their boxes of betel which they call barreza. These are often beautiful, being made of metal and other materials. They also carry a needle and other tools for making bids with cleanliness and readiness. Whenever they stop they make and use their bids.

The chewing of the elaborate barreza is no longer seen in Luzon, but is still characteristic in Mindanao among the Moros where the buyo complex has been much less influenced by tobacco. Among them still, as throughout the Philippines in pre-Spanish days, the amenities of friendship and hospitality are expressed in a ceremonial chewing of the betel nut.

The betel nut entered into death ceremonies and burial preparations. Chirino in 1594 records: The dead body is swathed with aromatic barks which prevent corruption, especially fleshy. For the living it is a notable stimulant and the Indians put it in their mouths as they use the maize (Erythrina pseudomusa) in Pita. With the juice of this plant they swathed the body, and as injected it through the mouth that it penetrated the whole body.

This is also recorded by Colin in 1563.99

The ceremonial use of betel as an offering to the spirits (spirits) was everywhere a commonplace and is still characteristic of the mountain peoples, though more prominent in Mindanao.1, p. 184

TOBACCO IN THE ETHNOBOTANY OF THE PHILIPPINES

Into this elaborate betel-nut complex of use, ceremony, offering, and social custom the American plant, tobacco (Nicotiana tabacum), promptly became integrated. Sturtevant in an excellent account of the place of tobacco in the ethnobotany of North America says:13 (p. 396)

Tobacco was regarded by the Mayas as a sacred or magic herb. It was used in their ceremonies and religious rites in the form of incense. They also inhaled its smoke and chewed its leaves together with lime.

Its use for chewing with lime is a striking convergence with the betel complex with which it integrated in the Philippines.

So widely spread was tobacco at the time of the discovery of America that although a plant of subtropical origin it was found in cultivation as far north as the St. Lawrence River.
At meetings of ambassadors, councils of colonies, treaties of peace, and the reception of visitors, the absent, or even the pious of peace was invariably condescended to. (p. 161)

Upon its introduction into the Philippines it was badly taken out of this context yet promptly joined itself readily into the ritualistic and social complex of honor. It was first chewed but soon came to be smoked and has displaced hemp in most parts of the Philippines as the common form of hospitality and friendship, except in Mindanao.

Tobacco was introduced into the Philippines by the missionaries in the last quarter of the sixteenth century, (M.N.) and met with remarkable popularity throughout the world. Many references to it show how quickly "it became the most acceptable gift and a thing the Philippine esteem highly," (p. 161)

In Mindanao the social implications of the betel-leaf-tobacco complex is then interestingly described in the following account by the English lieutenant Dampier who visited the year 1695-97 in the Philippine, attired therewith by the annual treasures galore.

Under the heading, A Comical Custom at Mindanao, (p. 161) he says:

There is one kind of beggar rascals at Mindanao that I have yet not elsewhere in my Travels. When strangers arrive there, the Mindanao Man will come ahead and say, "Ah, sir, you have heard of a Comodo, who has a negro, (which word, I believe, they have learnt from the Spanish,) or a Pugilist, and who has not. A Comodo is a family who eat nothing but nuts; so they have no provisions for the day, but bring their satchel daily [Note word for Caxapé, satchel or folio, also paper, pills, and medicine, belted.]" The latter word for reseller is taken a negro pagánizor. B. and E. note I am an honest Pugilist of the other sex.

All strangers are in a manner obliged to accept this entertainment and refreshment, which are first be purchased with a small present, and afterwards furnished with some coffee or other to satisfy the Apropiatedes. And as often as the stranger give some he is welcomed at his Comodo or Pugilists house where he may be entertained for his money to Eat, Drink or Sleep, and is complimented as often as he sates with Tobacco and Shew the, which is all the Entertainment he must expect.

The islanders Mark's wine are allowed the freedom to converse with her Pugilists, or must or may receive presents from him. Even Dampier's own master, the Governor, or Pugilist, is not by any means despised; for it is a custom, that he at times offers the strangers Cigars, when a stranger proves him; and shows them if he wants a Pugilist, and to invite him to their friendship, will send a Present of Tobacco and Return to him by their Servants.

Though the "Pugilist" custom has disappeared in Mindanao, up to the present time this betel-leaf-tobacco complex has been but
little modified; and among the pagans of the interior Flaxley's description of the Subanuno of Zambonga Peninsula is characteristic.

The entire chewing oat is composed of a small leaf of tobacco, a series of backbone, one boys' leaf and a small quantity of paste made from shell lime; together with a small local variant of the complex sometimes mixed with water or wine. Women generally omit the tobacco, but Meno and pagans use it in this combination.

The remarkable combination for chewing is placed in a button box which may be suspended from the shoulder, carried in a bag at the side, or in a belt or cool at the waist. (p. 25)

The smoking of tobacco has made some headway among this group, for he continues:

Tobacco are very kind of making a sort of cigarettes made of native leaf tobacco, and the oat inner half of the oat. The tobacco is wrapped within this half, and the whole is so folded as to take the shape of a cigarette. (p. 29)

Tobacco, having attached itself to the batik complex in chewing, ritual, social customs, etc., soon became used for smoking, and thus to a large degree displaced the chewing of betel.

In 1767, Padre Belardo writes of the Visayan:

Everywhere it is prized by the natives, like their daily food, and just as they cannot live without bread, they cannot pass through life without tobacco. There is not a man of rich or poor that is not finished with a cigar. (p. 27)

On Lenon: the same thing is true to-day. The immense cigar, often 2 inches in diameter and 18 inches long, smoked all day by men, women, and even children in the Bacacan provinces, still attract attention. Among them tobacco is an important economic crop for local use and export.

The Visayan which is a marginal group between the Bacacan and the more-primitive mountain people, show tobacco actually displacing betel. Cola thus describes the old importance of the boys complex still preserved in conservative tradition:

Tobacco still survives but the leaf (tayao hale) and the roots past still play an important part in all ceremonies. According to the women, it is said to the boys the other time to roll the date of an ancestor crowned by the conditions of the rice planted by him prior to his departure. (p. 29)

Beyond this peripheral Visayan area, in the higher mountains, are the Bongos. More secure in isolation the boys complex has not been as greatly affected by tobacco. Here, Barton says, "betel nut chewing ranks second to drinking in religious impor-
tance, and first in social and economic importance as a luxury."
(22, p. 415)

The Bontoc area, situated on the Rio Chico, a tributary of
Cagayan River permitting communication with Cagayan Valley
where tobacco is the principal crop, has been more affected by
affluence. Here it is a definite trail linked with a folkmansfa-
tura of brass pipes for smoking. One seldom sees a Bontoc
without a pipe in his mouth, or tucked in his peculiar little cup,
hang on the back of his head.

Across the Cordillera in the valley of Cagayan River tobacco
comes into its own. In the lower province it is the only econ-
omic crop, and from here come the best and most of the Philip-
inese tobacco. Here, since the Spaniards came, civilization has
been built on the basis of two American plants, corn and tobacco.
The rough terrain swept by typhoons and plagued by locusts
was not suitable for rice; and the missionaries introduced corn,
which is the staple food, but tobacco is even more important.
The great Cagayan River, the longest river in the Philippines,
overflows annually and deposits a rich alluvium. In the little
pockets of land so affected is raised the tobacco par excellence
of the Philippines.

Tobacco is much used by the people; and here, I am reliably
informed, they hang a gigantic cigar by a string from the ceiling
from which each member of the family smokes in turn.

By 1783, the plant had become so profitable that Governor
Bueno y Vargas established a government monopoly in order
to support the colonial government, which up to that time had
been largely supported by an annual subsidy from Mexico.
The next year the income was established, and by 1805 the net
profit was half a million dollars. (4, 1:173, 458-9)

Of the American plants introduced into the Philippines, to-
bacco is the most important in export and world trade from
which arises the largest business organization in the islands, the
Compañía General de Tabacos de Filipinas, founded in 1859;
(9, p. 260) which is the locally well-known Tabacalera and em-
 pleys more men than the Insider Government.

Tobacco is universally known in the Philippines by its Spanish
name, tabaco; varying only in Bula to dibako). (15, 8: 453)

STAPLE FOOD PLANTS INTRODUCED FROM AMERICA

ARGUMENTS FOR BOTH AN OLD AND NEW WORLD ORIGIN OF THIS
PLANT HAVE BEEN PUT FORTH, THOUGH AN AMERICAN ORIGIN IS NOW
accepted. De Candolle review "powerful arguments in favor of an American origin of this plant under its early name, batata, which later refers by mistaken transfer to the potato (Dioscorea tarassenae); and later the new common term camote (Nabatou, cassava)." He then summarizes the argument for an Asiatic origin (p. 34).

Lauter (45, pp. 520-61) dismisses the early Chinese mention of Breckelckerer (p. 54). Hummelus says that this plant was introduced into the Malay Peninsula from Manila (p. 44). As is the case with many other New World plants, the Philippine was the center of dispersal into Asia and consequently forms an important link in the chain, meriting a close examination.

Strangely enough the first reference to batatas in the Philippines comes from the first writer to have seen it, Figuertex in 1521 mentions batatas near Carabao Island (p. 31-32). Lauter shows the real likelihood that Figuertex mistook another species like Ipomea nesavesca, a cumber in the plant with an edible root but of distinct botanical character, or more likely a yam. Dolewore, 61, pp. 350-441.

Camotes were likely introduced into the Philippines by the Villalbes expedition of exploration in 1541, that we know planted corn. The natives attached special importance to every-thing the Europeans gave them, as attested by Legaspí's finding the Santa Núñez at Cebu, which had been left by Magellan upon the conquest in 1511. The camote would be more highly prized.

That later observers are more particular in observing plants in the Philippines as shown by a reference in 1573, the time of the conquest of the Philippines, Captain Arias notes, "certain roots resembling sweet potatoes (Ipomea nesavesca), called upolapu, as well as yams (yutanes) and camotes." (2, 3, 203)

By 1592 camotes were recognized in Cebu as an American plant by Lescar, who notes, "roots resembling the potatoes of Santo Domingo, and called by the natives camotes." (2, 5, 41)

This reference clinches the matter, along the writer's knowledge of the plant in the New World removes the doubt of a mistake in the identification; and more important, that the natives of Cebu at that early date called the plant camotes, which is a Na-huatl word. To-day, as well, no other name is commonly used in the Philippines, although lecu (121); ponga-bogua (254); ripu (Bicol); rapi (Bun) are names for it in isolated tribes where Spanish contact was slight. (2, 5, 564)
By 1559 camotes were of sufficient importance, as a product, to merit mention by the governor to the Spanish king: "The land abounds in rice, fish and camotes." (23, 8:30) Thirty years after the conquest, the agricultural complex of the Philippines had assumed its characteristic form. So we see that the camote spread with the greatest rapidity. Indeed the camote reached the mountains before the Spanish were attracted by Igorote gold. In 1523 the characteristic cultivation of the camote under the kafiffin system was seen by the first explorers among them. (23, 8:40)

In 1600 de Morga mentions "camotes (which are sweet-pota-
to's)." (23, 11:69) In 1640 Bobadilla mentions "camotes which are the potatoes of New Spain." (23, 12:188) In 1640 a Relation of the early Franciscan Missions states, "The Spanish brought . . . camotes, or potatoes, which have resulted very well, and are a cause of great support to this kingdom." (23, 12:187)

In 1713 Mino says that the root and the name of camotes were brought from Mexico. (23, 8:40) This statement is repeated by Blanco in 1837. (23, 1:129)

This American plant soon came to be of paramount impor-
tance to the people of the Philippines. It figures only second to rice in the diet and livelihood of the people. It is not only of vital importance as a catch-crop when frequent typhoons lay waste the rice paddies, but has become a staple food among the Filipinos.

Writing in 1751 Dolendo suggests this importance when he says:

When in the Visayas they have their camotes (corn-cornstalk) they are all too anxious of their breed for consumption and their families. It is planted from shoots or bulbs which soon extend long branches and are propagated. Thus they plant long rows, and by this simple operation assure their future.

Though in America and Europe they need permission to store up their crop, these natives have it always in the ground at the doors of their houses. (23, 8:148)

Blanco in 1837 adds this to our knowledge of the use of the camote:

Its preparation for the kitchen is variable. It serves the Filipino from soup to dessert (by roasting it in fine slices and toasting it). It is also boiled and roasted in the skin. (23, 4:130)

This plant is known as camote all over the Philippines, though there is a variety called igo, of which Blanco says: "In Ca-
marinas there is a species called Tigui, which yields a carrot of very large size.” (13. 139)

As a staple food this is the most valuable of the American plants; and it is so commonly grown and used in the Philippines both in the mountains and the lowlands that it is sold only to rice, by reason of the simplicity of its cultivation, and the ease with which it can be used.

In the mountains it is especially valuable, as it is best adapted to the mountain system and is the staple mountain cereal, which are also easier to work as the worker does not have to sleep over so far. Burton says:

The corn is the most important of all crops in the Islands. Nevertheless the Hapao despise cannalos. To say a man has only cannalos is set in to pronounce him poverty-striken. Yet cannalos are the chief food of more than half the people. (13. 139)

According to Jenks, (13. 233) however, their neighbors, the Bontocs, are more appreciative of the cannalos and honor its planting with the Lechid ceremony. The people “priests” perform this ceremony by killing a chicken or pig and petition Limasaw (the chief deity) as follows: “May there be no many cannalos that the ground will crack and burst open.”

SEA RICE (Oryza). Bold rice, millet.

In the Philippines male is called male (Sp.-Fil.) and bowan, 13(1. 140) presumably by transfer from an earlier foreign plant—millet. Among isolated people to whom the Spanish name did not carry, the names are: pubiling (Cif.); 1st (Bun.); unal (D.), nongui (Tin.), tigui (Bun.) (13. 1. 213). It was first planted in the Islands in 1543 by members of the Villalobos expedition, which explored the Archipelago before its conquest under Legazpi thirty years later. (1. 1. 40) They had brought it from Mexico so food.

In 1751, Bolan says that the Filipinos do not make tortillas, but make gruel, or when it is not yet ripe the elite (Mest. a tender ear of corn) is roasted. (13. 2. 527)

A century later Blanco says:

It is first become popular as a cash-crop since it was grown in seven months. When the rice is harvested, this spread their eyes to its value as a staple. It is generally used boiled or roasted in the husk. Some parts of Cina produce the largest ear, but in Luzon it does well enough. Anthony eat the rice when they are dry, though some clever Filipinos wet it for gruel when there is no gruel. (13. 2. 90)

To-day, as when Blanco wrote, besides being eaten an roasting ear, the kernels are cracked into “pinto” and then cooked in the same manner as rice.
The Amaranth plant was known in pre-Columbian times in the Americas and was valued for its nutritional content and medicinal properties. It was a staple food in the diets of many indigenous peoples.

Zingiber: American Plants

Corn entered folk medicine in the Philippines. De Vaca (1521) describes how the Maize plant was used to treat various ailments.

**Zingiber**

The Maize plant was introduced to the Americas by Native Americans and was subsequently adopted by various cultures across the continent. It became an essential staple in the diets of many indigenous peoples, providing a source of nutrition and energy. The cultivation of Maize continued to spread throughout the Americas, with various parts of the plant being used in different ways, such as for food, medicine, and construction.

Among the primitive peoples of Mexico today it is still produced under the primitive milpa system. The whole plant, including the seeds, is used to make maize-husk bread and other foods.

The Maize plant was widely used by pre-Columbian peoples in Central and South America, with various parts of the plant being used for food, medicine, and construction. It became a staple crop in many indigenous cultures, providing a source of nutrition and energy. The cultivation of Maize continued to spread throughout the Americas, with different varieties adapted to local conditions.

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take its present important place in the ethnobotany of the Philippines. As indicated by Blanco its utilitarian value as a catch-
crop in case of need was recognized and used.

The Spanish missionaries were able to show its value, espe-
cially in regions where but little rice could be produced. To-day
the people of Cebu (the most populous island) live largely on
corn; and it has become the staple food of the lower Cagayan
Valley in Luzon.

Upon its introduction into the Islands, it was completely taken
taken out of its Mexican pattern, but unlike tobacco did not attach
itself to local patterns to mold them. Corn left behind its
complex of maiztio, metcalpil, and its products tulel and
fumbe, though Delgado records its use in the Philippines as
tole (gruel), though the word is not now in common use.

Instead of using the Mexican metate, the Filipino prepares
corn by pounding the hard flinty kernels (these are the var-
ieties prized) in a mortar with a pestle, the husk is for boiling
rice, after which it is boiled and eaten like rice. Thus we see
corn taken out of its Mexican context, and molded into the pre-
vailing rice patterns.

A small mill of stone grinders, the upper of which revolves
within the grooves of the lower is an improvement in techinie
that is sometimes seen. Elsewhere the corn is simply parched
before being eaten, and commonly it is eaten green as "roasting
ears."

Among the mountain people of Luzon, Cole reports that the
common method of preparation of corn among the Tingguian is
to place the grains on the large stone over which a smaller stone
is rocked until a fine powder is produced. The stone disc mill
before described have been introduced from the lowlands as well.

Corn is raised in hilipin, and the terraces serve
only for rice.

Farther into the mountains Janks(15, p. 248) reports that in
Bontoc the ears are hulled, the silk is removed, and the corn
is eaten from the cob without rails. Among the Ifugao Barton
(13, p. 403) reports that among the recent Bajan immigrants
corn is the chief food supplementary to rice. This is expli-
citable as an introduction from the adjacent Cagayan Valley, where
corn is a staple food. Among the Ifugao it is prepared for food
by being parched or by being pounded into a meal in a rice mortar
and made into corn porridge.

In the mountains of Mindanao corn is raised in the hilipin
with upland rice and the canoe as staple foods among the Be-
Despite the fact that it is one of the most important crops, it has never gained the status of an essential commodity, nor has it acquired a place in the staple diet. (12, p. 221)

The explanation of this is not far to seek. In southeastern Asia, throughout an area as large as the indigenous corn culture area in America, rice occupies the key position, and about it attaches all the ceremony and ritual. It is the staff of life and has an enormous importance in the lives and thoughts of the people. They not only prize it more than all other foods but among the primitive groups, in deference to rice, both are fished; and a multitude of ceremonies are carried out in connection with the planting, harvesting, and storing of rice.

Other foods are not so prized. Among the mountainous and mountainous a man maintains a status of wealth and greatness by eating rice three times a day. Other foods are for the poor and despised.

Among the more-advanced peoples of the lowlands, even on the two of the most densely populated islands, the people have become corn eaters, since the natural conditions have forced the situation upon them. Yet corn is much less prized than rice, and the native attitude finds expression in apologizing offered when corn in some form is not before a guest, the inference being that the host is tacitly admitting poverty in not offering rice. (12, p. 221)

Notwithstanding this prejudice, next to rice, corn has become the only important cereal in the Philippines. During 1910, 447,000 hectares were planted to corn with a yield worth over $5,500,000. The provinces that lead in the production are Cebu, OrientalNegros, Isabela, Leyte, Cagayan, and Bohol. (40, p. 227) In Cebu, the most populous province, with a million inhabitants, corn is the staple food.

Less important native American food plants

The American plants, pumpkin and squash, we think of as associated with corn, but in the Philippines there is no such association. They are, however, important garden vegetables.
Despite de Candolle's doubts, this plant is now known definitely to be of American origin, and was generally cultivated by the Indians in their own fields.

In the Philippines it is known to the Tagalogs as halabasa (T.) and rehala-basa-pada (T.), which slight variation extended from north to south of the Archipelago, as well as: kalsae (Sa.), kalesas (Bu.), kalesas (Bu.), kalesas (Bu.), ovaria variations from kalisua (Sr.), (Ch. 2: 865).

It is now grown in all gardens throughout the Archipelago.

It is one of the most important vegetables in the Islands and is eaten as a vegetable with meats (30, p. 347). But squash escaped the American manioc-squash complex, and in the Islands is cultivated alone.

ALFALFA LUPINUM ENG. TUNA (37): 652.

This common and important plant, probably native of Peru, was eaten by the aborigines of Mexico, and called tewi among the Nahuel nation, (15, p. 243) from which our name and the Spanish one derive. Mixed with chili it is commonly eaten as a sauce in Mexico.

It was introduced into the Philippines from Mexico at an early date and is there universally known by the Spanish name tomates or corruptions as: tomatas (R. M. T. S.), tomatas-bod-oh (T.), and tomatas (C.), (15, p. 599). While the isolated Ilongos say may. (Ch. 2: 166). It is now extantively cultivated and is also thoroughly naturalized throughout the Archipelago. The spontaneous form has evidently reverted, as the fruits are small and inferior. (30, p. 34). From fresh American seed, however, the fruit is large and excellent, but it rapidly deteriorates in succeeding crops in the Tropics. (15, p. 146).

'Tarlac Province is now famous for its excellent tomatoes for the Manila market.

In 1574, Delgado says that they were little cultivated and were not used in cooking. (7, p. 177). To-day, however, they are one of the most important vegetables in the Philippines and are cultivated wherever there are people. The fruit forms part of almost all their meals as it supplies an important deficiency in their diet.

PHALACDA VULGARIS (Linnae.): Kibun, kibun.

This is an American plant, though its cultivation has extended over the whole world. The mention of beans in Mexico is frequent. Sturtevant says of beans.

The Osages had them before the time of the Teutons and they were produced by the latter Antes. The native Mexican word was specif, though
they were the eil of the Aztecs, and when baked in the pod were referred to... of string beans.)

Today the bean, next to corn, is the most important food plant in Mexico; it is raised all over the country. No meal in Mexico is complete without beans, and many a meal consists of nothing else except corn (55, p. 339) but in the Philippines beans are not so prominent, being used mainly as string beans.

In the Philippines this species is known by the same names as *Phaseolus vulgaris*, beans, and *Phaseolus acutifolius* (Sp.-V.), *Bereng* (T.), and *Bintang* (T. FV.). In beautiful the towns the term malaup appears. [54, p. 110]

At the present time this annual herb is commonly grown for its legume bean, which are peeled and eaten immature as “string beans,” although it has been shown that they can be successfully grown and dried in the dry season. (56, p. 185) as they are in Mexico.

**Pisum sativum** Linn. (Lentil bean)

The lentil bean is unquestionably of American origin and de Caudill assigns its origin to Brazil. (59, p. 439) from where it was disseminated in earliest times by cultivation and has become naturalized in Peru and tropical America. It was probably introduced into Africa through the slave trade. (5, p. 346)

In the Philippines it has a variety of names which are freely applied also to the kidney bean (*P. vulgaris*): *Jehe, masohe, and bokho*bokho* (58, p. 339) are Spanish terms often used. The most prominent name is *patiot* (58, p. 339) used by the Tagalog, Bicol, Visayan, and Bascon. The Tagalog sometimes say *boni-pa-kaal*, *tubing* or *baing* (56, p. 310). The Eboones of northern Luzon say *pokolen*, *porda*, or *perecor* (56, p. 310). The Bontocs of Bontoc say *pokol*. The non-Christian Bontocs of Minda-nan call this plant *bukak* (56, p. 310)

The non-Christians of northern Luzon use these terms: *bokho-bokho*, *tubing*, and *baing* (58, p. 339); the last is a possible derivative from the common term *palatin*; all are reported for the Bontocs. TheJEHOVAH also say *pokol*. The non-Christian Bontocs of Minda-nan call this plant *bukak* (56, p. 310)

The nomenclature of this American plant shows a strong tendency to use the Spanish terms or patani among all the Christian people in close cultural contact, but varies widely among the marginal groups, where contacts were much less frequent.

Here it is of wide distribution and common cultivation and at the present time it is thoroughly naturalized in many parts of the Philippines. There are at least seven distinct forms, of
which the white-seeded varieties are best for culinary purposes. The colored or variegated beans should be boiled and the water changed two or three times to make them wholesome. (46, p. 176)

In 1751 Delgado writes:

In Temazcal the red beans are never absorbed, while in Lotez the gray bean produce more. The Aztecs are not native to the Philippines or of China. The sacred guineas from Mexico bring sugar, coffee and firewood and from them the plants do not die unless destroyed by typhoons. (47, p. 176)

There is a similarly ambiguous reference to this species in Hixoxo, who says:

The seeds are eaten, also the pod in little longer than two inches. It is not so much appreciated as patent. (P. vulgaris). The seeds are white with red and yellow spots. (6, p. 270)

CAPSIUM FRUTICOSUM Linn.: Chile pepper. (6, p. 270)

An herbaceous plant, with small red fruits which have a very pungent taste, universally cultivated and used as a condiment. (6, p. 181)

De Candolle says that no Capsicum appears to be indigenous in the Old World, while its ancient and extensive distribution in South America indicates that it is indigenous there. (6, p. 182) Irish, who has carefully worked over the whole problem of Capsicum, says:

No use as a condiment is universal throughout the Tropics. When mixed with turmeric and opium it forms Curry powder. Capsicum pepper is the fruit of these small pungent varieties ground to a powder. Piquinho is made from the fruit by grinding after removing the seeds, as much less pungent. Blended to strong before or vinegar it makes Tolusso sauce. In Mexico Chileon comes from one of these small peppers finely ground and they also form an important ingredient in tacos.

The variety with which the plants spread in tropical countries together with the increased commercial trade following the discovery of America caused a wide dissemination into the Old World tropics.

The first explorers to the New World found it commonly used as a condiment in Spain and India as early as the 16th century it was used in drinking mates, and supposed to be valuable in epigastric (27, p. 277)

This plant is the ajo or waha seen by Crem de Leon in 1565-66 in Peru (16, p. 181) and it is called ají in Cuba and Porto Rico (17, p. 180). In 1579 it was found by Magellan and Villalobos had visited the Islando prior to this time.
At the present time Merrill says of the distribution of this plant that it is "throughout the Philippines planted here and there about dwellings but also thoroughly naturalized in open waste-places in the settled areas." (15, p. 475). Since its early introduction, this plant has assumed some little importance in Philippine culture as evidenced by the fact that it has carried modifications of its Spanish name into the languages of the regions where Spanish influence was strong.

The Spanish term ají is not uncommon, but is more often varied to aji in most dialects. The Tagalogs vary it to chileng-bileng, siling iligil, or siling jelit. One Tagalog term, peurra, escapes the Spanish pattern.

The Basque term ezki-dablo, "chile of the devil," expresses an interesting folk reaction to its pungent taste.

The Bicol, of southern Luzon, in addition to aji has several synonyms and kinds. The latter appears to have carried to Borneo, where it is used or varied to aji.

Among the Visayan local terms are biligol and bintiroman. Although the visayan form aji is common.

This latter term does not appear to have reached more marginal peoples. The Igorots of northern Luzon use polito; while among the isolated Maguindanaos of Cotabato and Mindanao the term is history. (15, p. 474).

Thus we see an American plant of general distribution, but of only minor importance, able to carry its Spanish name only within considerable variations to the regions of strongest Spanish contact. Even here local names have arisen, while among the peoples outside the area of Spanish influence, the plant left its name behind.

In the Philippines it is commonly used as a condiment and as a native herb medicine. Pardo de Tavera says of it:

As a spice and a strewing, it is a useful article of food in hot countries where the slippery fritters become draggy. When used in medicine it is thought to prevent dyspepsia and consequent diarrhoea and as a purge for asthma. (15, p. 274).

Blanco records that the Filipinos took the leaves with alms to get a good fast yellow dye. Also he has seen them apply the crushed leaves to the wounds made by mad dogs. (15, p. 274).

CAPSIDUM ANOMALUM. Buildings 10 (3) half page.

This plant is definitely of American origin, probably from Brazil, though common in Mexico and the West Indies before the conquest. (15, p. 283)
This chile pepper, common and characteristic in the Mexican food as a condiment, is an herb or shrub of which many varieties have had a wide distribution.

In Mexico many kinds are used both in the seasoning of food and in making chile azuca. The sauce is made by crushing the red pepper (usually the long red one) with ripe tomatoes or sometimes the crushing is done in a clay dish with a pestle, or more often in the stone mortar molcajete. It is used with almost all kinds of food, especially with beans and meats. (18, p. 18)

This plant is of sufficient importance in Philippine culture to have been able to carry a slight variation of its Spanish name throughout the regions where Spanish contacts were strong. Among the Tagalogs, Ilocanos, and Bisayas the plant is known as culun (18, p. 404) a term also applied to C. frutescens. However, beyond the contact of the missionaries, the non-Christians have local terms exemplified by Bantuc where it is known as iduldec-por or jahabean-por. (18, p. 404)

UNIMPORTANT SOUTH AMERICAN FOOD PLANTS

It is worthy of note that the American plants of greatest utility in the Philippines are those from Mexico. This would show, were other evidence of a historical nature not available, that the plants, together with some of their possibilities, uses, values, and technics were brought over by the Spaniards. The Spanish friars not only brought the Filipinos “under the bell,” but also through their organization, the Mission, taught them either new or improved ways of meeting their everyday problems. Until 1828 when the American garrison trade was stopped by the independence of Mexico, the Philippines were administered as a colony of New Spain. The friars all came through Mexico and were familiar to some extent with Mexican plants. This continuous contact and communication with Mexico is shown in the uses of American plants in the Philippines.

Of the South American plants only the pineapple (which was introduced from China) found an important place in Philippine culture. The peanut and the potato were in use in aboriginal Mexico, and consequently assume a more important place in the Philippines than arrowroot and cassava.

These are potentially very valuable plants, the latter being especially valuable to the natives of Central and South America, but in the Philippines they made very little impression, although the North American cannot almost immediately supersed
The potato is a South American plant from the highlands of Peru and Chile where it is known as "chuño". In Mexico, the potato is known as "chucrut".

In Mexico, potatoes are grown in the state of Chiapas, where they are known as "chuchitl". The potato is a starchy root vegetable that is often used in various dishes, including tacos, tamales, and chiles rellenos.

In the Philippines, the potato is also grown extensively. It is a staple food in many parts of the country, particularly in the mountainous regions.

The potato is a very versatile plant that can grow in a wide range of climates and soil types. It is a valued crop in many parts of the world, and its cultivation has been an important source of food for millions of people over the centuries.
this plant is the staff of life to the numerous tribes of Indians. It has been well named utilization. About it Standley says:

Camoru (Radian Guari), bread, from the root parenchyma, is one of the edible food plants of the world. Two well marked varieties occur, one that may be used without special treatment (pure starch), while the other has a very poisonous juice made harmless by heat. Most starch, and camoru meal, is prepared from the roots. Meal is prepared by pouting the root, which must also be boiled in case of the poisonous variety. Starch is obtained by a precipitation from an infusion of the grated roots. To-

\[ \text{ples} \] is prepared by boiling the starch.

It is a native of Brazil but is cultivated in most tropical regions. It was cultivated in southern Mexico in pre-Columbian times, and in some places has escaped from cultivation. It was called by the Aztec zapote-
cuautl (tree-potato). (23, p. 644)

Strangely enough it is most commonly known in the Philip-
pines by the local equivalent of the same name: camocyn-camocyn (tree-potato), other names being: balungay (V.), javiote de More (potato of the Morente) (11), 469, p. 222. The last name has

bas in fact. The plants are cultivated and used as a common

arti ces of food even among the Yakan, the natives in the interior of Bataan Island, which is the largest of the Sulu Archipelago. Here it enters with rice and corn, ubi and camotods in the fundamental food complex. (66, p. 34, 373). It is extensively

used in Jodo. More isolated tribes call it: wardena (Tagb),

pulang (Bem.), mungk-sunul or Shl.) (12, p. 485).

Thus it is of universal distribution, it is otherwise very little

used and of comparatively slight importance. (46, p. 449). A few foreigner's plantations in Mindanao produce it as a profitable

commercial crop for its high content of starch (25 per cent),

but it is still insignificant.

De Candolle, in a classic analysis of authority, decides that this plant is of Brazilian origin, where it is known as eucalod;

from there it was introduced into Africa by the slave trade, and into southern Asia by the Portuguese at the end of the

fifteenth century. (5, p. 413-33).

This useful plant had a wide dispersal in America before the arrival of the Spaniards. In Peru it was known as cacho. Arcola in 1598 mentions the American name mani, which was

adopted by the Spaniards. In Mexico after its introduction it was called falcunaste because of its resemblance to the choco-

late bean.

In the Philippines it is known by the Spanish name mani, and correbo, which is the best evidence that it was introduced
Zoog: American Plants

by the Spaniards from Mexico. The plant left behind its Spanish name before getting to Sulu, where Spanish influence was very slight. Here it is called betun-agowane, which shows a folk recognition of its earlier introduction. (7, p. 183)

It is extensively grown but is chiefly utilized for forage at the present time, although the nuts are commonly eaten by the people and are often seen for sale in the markets. Blumen, writing in 1897, says: "(7, p. 183)

They give it in their horse after it has dried some time, although the nuts are eaten. It is well known that the natives do not use all of its (utilized) value.

AMERICAN FORER PLANTS

The flora of the Philippines is astonishingly rich in fiber plants, and sasa, bamboo, abaca, cotton, etc., are cleverly utilized in many ways by the Filipinos.

America had little to offer the Philippines in fiber. Abaca (Musa textilis) is a fiber plant par excellence, which yields only in the Islands though it also grows in Sumatra. It furnishes a fiber 6 feet long, and, I am told, stronger by weight than steel. This fiber furnished the fabric for the native costume and in Spanish Philippine. These fabrics were woven on the backstrap or semispindle loom, which is distributed among all the primitive peoples of the Philippines to-day. Both's study in primitive boats shows their general distribution in northwestern India, among the Tibetans, Chinese, Burmese, Assamese, Sea Dyaks, Japanese and Aeta, Erenia (in Asia), among the Santa Cruz Islanders and Caroline Islanders (in Oceana), and among the ancient Aztecs and modern Mexican tribes.(35, p. 394)

I suppose this extraordinary distribution has not been overlooked by the extreme "diffusionists," and it certainly offers a fascinating problem for the study of prehistoric contacts between the New and the Old World.

The Speciale found the Espana spinning cotton and with a considerable cotton industry for trade with the Chinese. The industry persists to-day among the Tingites, that fascinating marginal people, much as it was described by the early Spanish writers to have been practiced by the more-advanced Bajoes.

It was among the Bajoes particularly that the fiber of the spaced and will favor and still persists as an important money crop. In the Visayan Islands, especially in Pocaya, which since prehistoric times has been a commercial and export center for fabrics, the space was substituted for abac in making the gauzy
fibers called abaca, now unknown. Later they found that the
pineapple gave a more silky fiber, and now agave is no longer
used, a complete substitution of the pineapple fiber having been
made. So far as I can find out, it is only in the Philippines
that the pineapple plant is of greater value for its fiber than
for its fruit.

Though costume in the Philippines would be a study beyond
this paper, it may be pertinent to say that the best Spanish ac-
counts show that most of the Filipinos wore a costume of shirt
similar to that still worn by the Bagobos of Mindanao, which is
thin and loosely woven.

A thin and loosely woven fabric of abaca is still made. It is
known as "kinamay," but is less prized than "pilha." The char-
acteristic Philippine costume to-day is an interesting adaption
of a forgotten Spanish influence. In contrast to the other
Malays, who commonly wear the sarong, the Filipinos men when
they dress in native style wear "calasans," or trousers, with
a "camisa," or shirt, hanging over them, as do the Mexicans;
either is the adaption of the Spanish costume to a hot climate.
The camisa is often made from pilas fiber, and is thin, airy, and
easy.

The women of the Philippines wear a peculiar costume, the
charm of which is attested by every writer on the Philippines.
The long skirt with its starched train is a heritage of a forgotten
Spanish style. The train is sometimes tucked in at the waist
or pinned up revealing a considerable portion of beautifully
embroidered or lace petticoat, often of silk. Over the skirt is
worn a "lipit," a sort of apron, often very fancy. The woman's
"camisa" is of this same pilas, or other sheer material, under
which is worn a chemise. Its most noteworthy characteristic is
the bell-bottom effect, the skirt being carefully pressed up-
ward. About the neck is a curiously folded neckerchief, of the
same stuff. This characteristic and charming costume is becom-
ing more a dress and ceremonial costume, as the camisa must be
taken to pieces when it is washed and its use entails a great
dish of care and trouble. However, the older women even
among the poor, still wear it considerably. Among the Ilocanos
there is a common variation in the use of the voluminous plain
skirt. The slack is often drawn between the legs and tucked
into the waist behind, giving a short-dresser effect, very prac-
tical for crossing streams and for the rough work that the poor
women are constantly about.
This American plant (16, p. 151) was first seen by white men in Tucuman. (16, p. 21) This peculiar and extraordinary plant, which is so important in its many varieties in the life of Mexico, is known in the United States as the "century plant."

In Mexico the national drink pulque is fabricated from the seeded sap of the large leaf agave (16, p. 197). A large cup or bowl is filled out of the center of the plant's canopy, by taking out the core or heart, and into this cavity the sap flows and is gathered below a day. When fermented it furnished the name, tequila, pulque. The distilled drink served, or now more commonly called, tequila, is made from the small albinoed species. The Indians and Mexicans of the mountainous west wild species, these to the mesa, these tequilas are cultivated in large plantations. (16, p. 255)

An excellent and useful fiber, called pilte, is made from the leaves (16, p. 197). This fiber is spun into thread and rope by the Mexicans. The fiber is spun is used in weaving. In pre-Spanish Mexico this fiber furnished the material for Indian garb.

This hardy xerophytic plant was early introduced into the Philippines, and it is mentioned in 1699, (16, p. 134). This species does best in a tropical climate in certain drier regions, especially in the Bicol Province, Luzon, and Negros. In the dry and sandy soil of the Bicol Province it furnishes one of the most important economic crops and is extensively cultivated. The fiber is striped only after the leaves have decomposed in the sea. The fiber is similar to sisal or henequen of Central America.

In the Philippines it is known as: agave (16, p. 134); maízal (16, p. 134), an obvious corruption; and nipa and nipa (Celeb). A name often used in Central America for the plant and their fibers, (16, p. 134) words of Spanish introduction descriptive of the cloth made from it. Padre Navarrete in 1699 mentioned its use as a bedf. It is never used to parsnish alcoholic drink to the Filipinos.

This plant was used to furnish a fabric for cloth until pineare cloth took its place in general esteem. Padre Delgado in 1739 described nipa, woven of matapay, and made into light mantas, airy and suitable for the Tropics. (16, p. 742)

The characteristic part of the dress of the Filipinos, both men and women, was thus made of agave fiber, but has since been woven of the fiber of another American plant, the pineapple (Ananas comosus), which is more highly prized for its fineness and glossy texture. This act, as the preceding, still exists in the Vincent, especially in Iloilo and Jaro.
The magay fiber is still commonly used for rope. Since (1, 2, 3, 4) also tells us that the folk doctors use this plant in medicine by mashing the prickly leaves and applying it to cancer.

**American Fruits in the Philippines**

Edible fruits abound in the Philippines, and some of them are the best in the world, offering an attraction to life in the Tropics. Most of these fruits are not native, but introduced, including both mango and mangosteen.

Some of the American fruits, like the guava and the papaya, are of general distribution and in constant use everywhere, being so common that the casual traveler would think them native to the Islands.

Certainly not least among the Spanish contributions to the culture of the Philippines was its enrichment with many of the most delicious fruits now in use.

**Ananas Comosus (Linn.) Merr.** Fux (p. 321) reports:

This is an American plant (5-6, 311) propagated by slips or buds; wild plants capable of producing seed are found only in South America (5-6, 49). The Brazilian (79p) name, none, was changed by the Portuguese to ananass, from which its scientific name, and many common names of Africa, India, Malaysia, and Europe derive; only the Spaniards called it piña because of the resemblance of its fruit to a pine cone (51, p. 247). Kircher says that the Chinese cultivated it in the seventeenth century, but it was believed to have been brought from Peru (5, p. 311).

Although we commonly find that American plants were introduced to the mainland of Asia from the Philippines, in this case the reverse seems to be the case. In 1586 Bishop Solano reports pineapples among the fruits imported to the Philippines from China (5, 1-24). Loefler shows that the Portuguese introduced this Brazilian plant, and its name ananass, into Saint Helena in 1585, into India and Malaya by 1599, and into China soon after through Macao. Chinese records of its use from the beginning of the seventeenth century (5, p. 247). Thus we see how the American plant traveled eastward and was introduced from China into the Philippines only sixty-five years after its discovery.

In 1602, Father Naveotes finds the pineapple on Mexico and Manila the same, and is familiar with the existence of Malaya.

(5, 30-39)

In the Philippines this plant preserves its Spanish nomenclature: piña (p. 31) and piñas (5—6, 31). except in isolated regions
of little Spanish contact as Bontoc; epaguda or pagsuld, (33, 2:116) It grows well everywhere and is widely distributed, being esteemed for its delicious fruit and even more for its fiber from which the beautiful guava fabric of the national costume are made. These are mostly manufactured in Ilocos and Jaro, where there is a wide interisland commerce.

**PUNYAP GUAYABA**

A shrub or small tree bearing a fruit from which the well-known guava jelly is made. This is an American plant apparently distributed throughout tropical America before the Europeans came. (55, 2:245) Stoddard gives us this account of its folk-uses in Mexico:

In Mexico the bark is sometimes used in teething and a decoction of the bark is a local Mexican remedy for diarrhea. The leaves are reported to be a remedy for the itch and a decoction of the rhizome, alone or with bark is applied to sores and taken internally for pain of the abdomen.

It is known generally as guayabo, a name of Antillean origin. (55, 2:245)

By 1609 the plant was common enough to merit mention by de Morga, (55, 2:245) and by 1650 Nuinardo says that it was spreading so fast that it was destroying the pastures due to the fact that the seed is dropped by birds which have eaten the fruit. (55, 2:160) It is now very common everywhere in the Archipelago; the fruit is commonly made into jelly.

The Filipinos took over some of the Mexican medicinal uses and found or fancied they found others. Delgado writes:

Even green, it is an astrigent, but very ripe it is a laxative and enervates body warm. The cooked leaves are beneficial for obstructions of the spleen, and for swellings of any nature. (55, 2:245)

Bianco records that the juice of the tender shoots is used to clear up clouds from the corners of the eyes. (55, 2:245) Tirso (55, 2:245) considers the tree valuable only by saying that the bark is strongly antiseptic and a decoction of it is used for diarrhea and as a wash for ulcers. (55, 2:245)

The nonspecificity of this common plant of minor use is valuable for this study, since the value of the tree enables it to carry its Antillean name, punayap, everywhere in the Archipelago. The wide variation of the terms within the patterns indicates a minor importance, but still considerable.

Only the Tagalogs call it pagsuld, (33, 2:116) as they are near the center of diffusion, but they vary it as far as this is possible, (33, 2:116).
which may be a descriptive term, unlike another term, say "papaya."

Among the Tagalogs, the Visayans of Cebu, Bohol, and
Baguia (of the Cagayan Valley) it is called "baguia,
"unlike Cebuano term "say "papaya," a variation
greater than another Bajoano term "say "papaya."

Among the non-Christians of northern Luzon, the Ilocano term
"say "papaya" becomes "say "papaya" among the Igorots
(of Benguet). Among the Bontoc people term "say "papaya"
seems to be on the other Ilocano term "say "papaya."" Further off, in Ifugao, it passes among the Say "papaya" or
say "papaya." The pattern carries to the southernmost part of the Phillip-
ines, being termed "papaya." In Sulu.

CARLA FERNANDA LAGAÑA.  Papaya (19: 1). 1917.

All species of this family are American. This one seems to
have been cultivated from Brazil to the West Indies before the
arrival of the Europeans. Papaya derives from the Carib word
"papaya." The ripe fruit is smooth and yellow, and the insides resembles
that of a muskmelon. It is a very popular one of the most popular
tropical fruits and resembles the muskmelon in taste and
texture, although sweeter.

It is an extraordinary plant because the fruit and other parts
of the plant contain an abundant milky juice containing an
enzymz, papain, resembling animal papain in its digestive action.
(21, p. 184) The strong digestive properties of this plant were
known to the ancient as to the modern Mexicans, and upon its
introduction into the Philippines the peoples there soon learned
them.

The papaya was early brought to the Islands by the Spaniards
since it is mentioned by binóez in 1564 (cf. 22: 143) It has
deservingly become one of the commonest and most popular fruits
in the Islands.

The green fruit is cooked with meat in order to make it ten-
der—a trick every Filipino cook is familiar with. Too much
of the fruit will cause the meat to fall into chunks. Some go to
the length of saying that it is only necessary to hang meat in a
papaya tree in order to soften it. (19, p. 184)

The Filipinos use a cold infusion of the leaves to wash clothes
spoiled with blood and the spots disappear immediately by virtue
of the ferment, papain, which digests the blood. The infusion
Zingya: American Plants

It is useful as a wash for sores and gangrenous sores. Small pieces of the green fruit are used to remove freckles. (19, p. 133)

The leaves are excellent for the treatment of diarrhoea if applied to the afflicted members. Blanco (14, p. 230) however, observed that the cure was not permanent.

The leaves serve the washermen in place of soap. The crushed leaves will bleach new cloth and clean dirty lines, promptly taking out all stains. (13, p. 132)

Delgado in 1769 notes the general distribution and the above uses and goes on to observe that "From the sheets of the leaves, which are hollow, the boys make trumpets which sound very pretty."

(13, p. 135)

A not without edification interest.

The non-Christian Bun lasers in the Philippines patterns very closely around the Spanish word pepepa as a native, even in isolated regions where Spanish contact was slight, showing the ability of a new trait to carry its foreign name beyond the limits of organized diffusion.

The somewhat isolated Bimar and Leyte Visayas vary the term to pepepa. (15, p. 119) which term is carried as far south as Sulu, where it is also varied to pepeya. (16, p. 119)

The Bicol term is pepeya. (15, p. 119) which is closer to the original, as would be expected nearer to Manila. Even among the non-Christian Buntas the term does not escape the Spanish pattern in their word pepeya. (16, p. 119) while the non-Christian Subanuns of Mindanao retain the pattern in varying the Sulu term pepeya to pepeya. (16, p. 119)

AKARNO: BUNAIS: Ligneous. One species (15) mentioned.

This is a tall tree with wide-spreading branches. The sap produces the chico wares to commerce, and the fruits are universally liked. The tree is found wild in the forests of southern Mexico and eastern Guatemala and no one doubts its American origin. (15, p. 205)

Stanley, writing of the trees and shrubs of Mexico, says:

In some, chico sapote derives from the Malvaceae (mallow family). The ancient Aztecs were well acquainted with chico gum which was chewed by the women and children. Figures were also made in it. The tree is hard and durable, and is used in the high roads of the Yucatan.

The bark is said to produce an abhatto, suetitio, which is employed in Mexico as a bulk remedy for lice. This plant has a wide distribution through the tropics and is common in South India and Ceylon. (15, p. 119)

In the Philippines, it is commonly known as chico, also rice, (V.) and tena (T.), obvious corruptions of the Spanish chico,
which is the general term in use in the Islands. It is cultivated in the Philippines to a considerable extent for its edible fruit. There is a large local production of this fruit near Manila for the Manila market. It is commonly seen in the markets and sold by women who meet the passing trams.

The use of the gum—an adaptive complex taken over in toto from the ancient Mexicans by the American of the United States—is unknown in the Philippines; although the coming of the American régime brought with it the gum-chewing complex, and in every little Chinese tienda neat packages of American chewing gum are for sale. American chewing gum also has a common sale in Mexico, where it is called chicle. This is really carrying coals to Newcastle, or in anthropological terms, reintroducing an old trait in modified form.

By 1764 the plant was common around Manila but not in the Visayas. At present it is of general distribution in the Archipelago and is a favorite dessert fruit.

**Anona reticulata Lam.**

**Note.**

This is a tree 4.5 to 6 meters in height with grayish bark. The fruit, the size of an orange, is heart-shaped with a tuberculate surface. The pulp is yellowish white, creamy, custard-like, sweet, and pleasantly flavored.

De Candolle gives a scholarly review of the evidence for its American origin in the West Indies or the neighboring part of North America. (6, p. 168-73) Cupullo, in his history of Yucatan, quotes an early source to the effect that the first Moctez expedition (1527) found avocados growing in Yucatan. Shortestent thinks that Mexico or the Amazon Valley is the home of this tree. (13, p. 80) It is widely cultivated in Mexico, where it is known by a variety of names. In southern Mexico it is known as plata, from which is derived the Spanish term etc. (13, p. 393)

In the Philippines it is known by variations of this Spanish name: sites, etc. etc. etc. (13, p. 393) It was introduced by the Spaniards at an early date, as stated by Chirino in 1601. (5, p. 314) In 1607, Navarrete writes of sites, "which for odor and taste I consider superior to all fruits, which God has created." (5, p. 314)

By 1792 the tree had become common on Luzon and Panay that Delgado thought it indigenous. (4, p. 287)

It is universally prized in the Philippines for its edible fruit, but it is commoner in Luzon than in the Visayas, though excepted.
The roots of the tree are sometimes boiled with lime to obtain a faint red coloring. (p. 341)


A small semi-deciduous tree from 5 to 7 meters high with a brownish yellow, heart-shaped fruit with a pulp that is sweetish, juicy, and tallowy. It is cultivated in Mexico, and in some plains duodécem native. (p. 234) It occurs wild in the West Indies and Central America. (p. 314) It is certainly of tropical American origin. (p. 55)

In Mexico it is said to have astringent and tonic properties which are used in medicine. (p. 234) The young branches have a useful fiber.

In the Philippines it is known only by its native name anonan, except in Sulu where it is called maramfa, (p. 175) It was brought from Mexico in the eighteenth century. (p. 234)

It produces well in Luzon and Visayas, but it is rare, having been brought from New Spain. It has its market value, since only a few foreigners are willing to pay for fruits, except in Manila where there are many Spaniards, so the Chinese purchase the fruit for resale.

The fruit in the Philippines has a cream-colored, juicy pulp inferior to the species. (p. 55) It is common in Luzon, but scarce in the Visayas and Mindanao.

In some parts of the Philippines a curious superstition still persists about the ananans. In cases of sickness, the local folk doctor ties up the toes and fingers of the patient with ananas bark to drive out the malevolent, or evil spirit. (p. 234)

*Annona reticulata* Linn. Carambola, (Sp.) star apple.

This tree grows wild in the West Indies, and was early cultivated throughout tropical America. (p. 314) It is sometimes naturalized on the continent of South America near dwellings. (p. 234) Standley, writing on the tree in Mexico, says: (p. 234)

It is widely cultivated in Mexico where it is called guanabana, the West Indian name. The fruit of the rear are is highly esteemed in tropical regions. It is eaten fresh, used in the preparation of beverages, and made into jelly. Sometimes, in Mexico, it is fermented to produce an interesting drink.

There are the seeds, and green fruit, being astringent, are used as a remedy for dysentery.

The tree is valued in the Philippines for its fruit, which is eaten fresh or made into preserves. It is the most widely cul-
tinted species of the genus. The very large green fruit is covered with long soft spines. The flesh is white, rather fibrous, juicy, pleasantly acid, and of good flavor.

The medicinal properties of this plant did not escape the Filipinos. Here the urupu fruit is also used to treat dysentery, though the ripe fruit is used for diseases of the liver. [10, p. 291]

BIANCON says, [5.2:249] "Dr. Chevalier assures us that there is no better cure in Europe for diarrhoea and dysentery than this aqueous."

The roots are boiled with lime by the natives to secure a faint

In the Philippines it is known by variations of its Antillian name, paanambon, introduced with the Spaniards. The Tagalogs use the true term paanambon [5.2:277] and vary it to gupanbon, gupanbon, or gupanbon. [11, p. 277] The last term carries to the Spanish.

The name failed to carry to all thebarages of Cagayan Valley for they call it abo [5.2:177] a variation of the common term for the similar A. paanambon. Some of them, however, use the Ilocano term gupanbon [11, p. 277] which is evidence of early cultural contact, now so prominent between these two peoples. Another Ilocano term is buapaboon [14, p. 211]

When the term leaves Luzon, it becomes more and more modified. On Panay it is corrupted to baboon [15, p. 277] and another Visayan term is bababon [15, p. 277] (and aboon).

In Sulu this Visayan word, like a battered coin still showing traces of its minting, paanambon kamasabon [15, p. 277] This variation of the Visayan word is valid testimony of a great deal of history. Most of the contacts of the Mohammedan Moros of Sulu with the rest of the Philippines have been slave and piratical fizzes so that beginnings in Sulu is a word meaning slave. Since the introduction of steam guntboats by the Spaniards in the ninetenth century, this has changed, and the contact is now more trading vessel, which are still seen in Cebu and Dole. Hence it is not surprising that the Sulu word for this vessel is varied from the Visayan.

*Pithecellobium article (Malabar forest).* Quammod (Mac-do.)

This is an American tree native on the west coast of Mexico and Central America, whence it was introduced into the Philippines, and from there into India where its fruits are known as Manilla tamarind.

Its seeds are considerably used by the natives of the west coast of Mexico, where it is sometimes planted for its fruit. It is
found throughout tropical Mexico, where it is apparently native. The man and boys gather the pods by the bushelful. The large fleshy arill which surrounds and hides the seeds is eaten raw, being crisp, sweeter, and very palatable. (p. 216)

The bark yields a yellow dye and is also useful in tanning, and has local medicinal use because of its antiseptic properties. The gum exuding from the bark makes good nailing. In Mexico the plant is called guanozcal or quesoquil from the Nahautl quesoquil. (p. 283)

In the Philippines, where it was only introduced, the Setsby will surrounding the seed is everywhere eaten, as in Mexico. (p. 170) and the bark is extensively used in tanning leather. The word is commonly learned to make charcoal.

Among the Tagalogs near Manila the Aztec word quesoquil is retained with a slight variation, though considerable variation would be expected upon introducing to foreign a name as Aztec into Philippine linguistic patterns. Tagalog words for this plant are: hanambo, hanamal, hanamal, hanumal, hanamal, and hanumal. (p. 222)

At some distance from Manila, in contact with the Tagalog in northern Luzon, the Bicolos use a Tagalog variation, hanamal. (p. 243) The term, in reaching Cagayan Valley in north-central Luzon, among the Ilanags takes on a new life, becoming han-ec-ecnic. (p. 247)

The Ilanag word hananon, having substituted a "u" for "o" from the Tagalog, becomes a fertile racial word which was disseminated to northwestern Luzon. Among the non-Christians of the western cordillera, Ilanag linguistic influence is very strong due to trade between the mountains and the Ilanag coast. This influence is seen in the Tinggan group—a geographical intermediary between the Ilocanos and the Iloitos. Here the plant is called hananon, a close variation from the Bicolano hananoni. (p. 247) The Iloitos of Bontoc name it further in saying hananon, and it takes still more to dissimilarity of the Bontoc. (p. 247) This is a direct geographic and linguistic chain from Aztec quesoquil to faraway Bontoc dononidilla.

When the Tagalog word hanambo hasz to Luzon it changes on Panay (Visayan) to hanambo, and ilaan in the Bicolos' language (p. 170) is keeping with the strong cultural interchange we know existed between these two islands. Another Visayan word, ananai, (p. 247) still falls within the pattern.

This extraordinary divergence in nomenclature in the Philippine for this Mexican plant is very illuminating to the student.
of culture because of the relative unimportance of the plant. While the rocky area surrounding the seed is everywhere eaten in both Mexico and the Philippines, this use is only casual and nowhere becomes important. The use of the plant as a dye, for tanning, and as a medicine are minor.

Thus it shows not only an interesting philologic variation, but shows also the inability of an unimportant plant to carry a new name unmodified into new patterns in contrast to the unmodified American nomenclature of important plants like the cacao, tobacco, corn, etc.

**Cassava (Manihot utilissima)**

This tree is found wild in southern Mexico, Central America, and on the banks of the Orinoco, and is cultivated in the West Indies and in tropical America generally,(23) p. 288) Burtavant gives its origin as the West Indies and South America where it is known as manihot.(30) p. 380) Blandy writes,(31) pp. 133-22)

It is a tree cultivated for its edible root. It is widely distributed in the warmer parts of Mexico and its fruit is highly esteemed by the Mexicans, though others must cultivate a taste for it. The fruit is often made into jelly. The beverage made from the fruit is known in Mexico as "pulque" or "march" and is served with venison and pork as a breakfast course on the morning of the harvest. There is a common belief in Mexico that the oil from these seeds will restore fallen hair and the Aztecs used it in hairdressing.

In northern Mexico it is called "manihot" or "march" (or march) from the Spanish word for sweet (sp. mar), which seed (sp. mar) is used for sweetening. The plant is known in the Philippines by an introduced Spanish name, "manihot" or "march"(21) p. 294) It was introduced rather late in the Spanish régime, for by 1731 it was still rare in the Visayas,(17) p. 214) however, a century later it was so common around Manila that Blumen thought it indigenous.(20) p. 44) Today it is seen only occasionally planted in Luzon—in Cavite and Laguna, etc., near Manila, the center of diffusion of the American plants.

The fruit is similar to the chico (Arceus angustifolius) but about 5 inches long.(20) p. 44) It is like a very large oblong chico in appearance. The pulp somewhat resembles thick reddish brown marbles, and is delicious and aromatic. It is now cultivated mainly in Cavite and Laguna,(44) p. 214) but is not a common fruit throughout the Archipelago.
Zingib.: American Plants

DIOSCOREA PENTHAREA (Linnaeus. C.-I. 1753) syn. Dios. 88

A small spreading deciduous tree about 6 meters high, cultivated for the edible fruit, the size of a small plum, a little longer than broad. It contains a large seed, but the fruit is of good flavor and is eaten as a dessert fruit in the Philippines.(10, p. 217)

It is widely distributed in Mexico and tropical America, where it is native.(11, p. 260) It is called ciruela (Sp. plum) in Mexico.

In Mexico large quantities of the fruit are eaten raw or cooked. It is also used for beverages and intoxicating drinks. The fruit is reputed to have diuretic and antispasmodic properties.

(11, p. 260)

In the Philippines it is universally known by corruptions of the Spanish name. The Tagalog keep closest to the Spanish word ciruela when they say ciruela,(12, p. 271) which the nearby Bicolans take over as ciruela.(13, p. 271)

Another Tagalog term is ciruelo,(12, p. 271) in Bisaya the term gets further from the prototype in apogul (Sp. apple) and ciruela,(14, p. 271) This last may have influenced the Ilongo angagool,(15, p. 271) especially in view of the ecclesiastical organization of Bisaya and Cebuano Valley as the bishoprics of Nueva Segovia.

According to F. Villalobos,(16, p. 53) it was introduced into the Philippines in the eighteenth century.

Bisaya tells us that the fruit, though aromatic, is eaten, and used medicinally in treatment of dysentery. The root, he reports, is polyvalent. (3, p. 143)

Dioscorea penthera. (Photo page 260.)

A large, wide-spreading tree producing a rather large smooth fruit, the pulp of which is black and soft.(17, p. 320) This plant is now known to grow wild in Central America. It is mentioned in Mexico by the older writers, and Merrill states that it was carried to the Philippines from Mexico during the early colonial period.(5, p. 257)

The tree was described in Mexico by Hernandez, under the Nahautl name xitlautog (black root) and used by the Indians as a remedy for leprosy, ringworm, and itch, as well as for killing fish in streams.(8, p. 220)

Its Nahautl name is baptized into southern Mexico into za-pote negro, by which name it is known in the Philippines.(7, p. 217, 10) or simply as zapote,(8, p. 209)
The natives of the Philippines rarely cultivate it for its edible but inferior fruit. It is one of the rarest fruits in the Islands, hence, the paucity in commerce.

The green fruit is used to poison fish. The leaves, and even more so the bark, serve as a medicine (11, p. 229). The wood is one of the clombos.

**American Medicinal Plants in the Philippines**

A discussion of the important subject of folk medicine in the Philippines is not within the scope of this paper. Suffice it to say that there is no Philippine village without its curanderas. In connection with the ritual and ceremonies used by some of these curanderas they often have a considerable practical knowledge of the properties of medicinal plants, which they often use to advantage. In Binondo Square in Manila there long has been a market for native drugs.

It will be obvious to the reader that, in general, the Filipinos use the American medicinal plants in much the same way, and for much the same purposes, as they are used in Mexico. Not in the reason far to seek. From the writings of Blanco, Delgado, and other friars, it is clear that many of these plants were definitely introduced as medicinal plants and that the properties known in Mexico were taught to the Filipinos.

*Paeonia clombei laminars.* Openly pubescent (full flower, full bloom).

Of this plant in Mexico, Stanley says (11, p. 464): A shrub or tree from 1 to 6 meters high with glossy yellow flowers. It is commonly cultivated in Mexico as a border plant since the branches take root quickly and shoot does not eat it. It is reported that it gives a purple dye. The seeds contain from 22 to 48 per cent of an inodorous oil, easily extracted by pressure. It has been employed in Mexico as an ingredient in soap-making, lubrication, and in medicine. The seeds possess purgative properties.

It is one of the commonest forest plants on the west coast of Mexico, where it is used as a physic (11, p. 229). Hence it is easy to see why it was introduced into the Philippines, with all its uses, since Philippine commercial relations were with the west coast of Mexico.

In the Philippines it is one of the most widely distributed American plants and commonly cultivated as a hedge (11, p. 164). The milky sap of the stem and leaves, as well as the seeds, yield a drastic purgative (11, p. 37) indeed, too drastic for safety. (11, p. 93) The seeds yield 25 to 40 per cent of a yellowish oil, more active than castor oil. Mixed with wax it is used as a
wash for atomic areas. Up to 1800 the oil was exported to
Europe for purposes of illumination and adulterating soaps,
and for candles.(16, p. 276) The roasted seeds are good to eat.
Blanc(3, 186) in 1837 records its use as a hedge, and its
abundant oil extracted for use in lighting, especially in Hawaii,
as it lasts longer than coconut oil. A decoction of the leaves
is used in fixing the red or blue dye in thread.
Blanc gives another interesting use of this plant. The chil-
dren stir up the oil until it is foamy, and then blow bubbles
through small reeds, as youngsters in Europe do with pipes,
soaps, and water. This is a simple, naive, but excellent example
of what the anthropologists mean by "parallel development."

Despite the general distribution, and the past uses and im-
portance of this plant, its nomenclature shows no trace of Amer-
ican influence. Its general name iñapu, which has a wide distri-
bution in the Visayas, and among the Tagalogos, Bicolanos, and
Iloitos, is derived from its property of stoppering fish in ponds
and sluggish streams.

The plant carries a variety of other names. The Tagalogos
use: iñapu(tañ, t. 240) iñañpan, tagchiga-iñañpan, and tu-
kap-babab. In nearby Pumapaga the dialectic term is galen-
bang, which varies to tagasang among the Bicolanos, and
tahusang among the Zamboans. Other Bicolano terms are tagas-
ang apu puso, and tansab. The Bicolano term tan-sab is
reported from the Iloitos, which is not surprising in view of
the contacts we know exist between them. Another term for
Visayan dialects is tahas.

/CAHA ALAHI leaves. 

This is a small shrub with yellow flowers and angular winged
pods. Though cosmopolitan in the Tropics, this plant was
probably introduced from Mexico and is extensively used in the
practice of folk medicine.

Caha alta provides one of the most popular native remedies
and its usefulness is vouched for by physicians. It is a cure for
herpes when the juice of the plant is applied locally to the
affected part.(19, p. 188) It is commonly used for this purpose
and in called panac or bani (remedy for herpes), which is a
common tropical skin disease.(5, p. 177) It also has the virtue,
and is commonly used, to cure itch and ringworm, as Dalup
proved to himself by application of the leaves well crushed.
(19, p. 177)

The American origin of this plant, and even its part of depar-
ture for the Philippines is preserved in a common Philippine
name for this plant: asperillo, or corrupted to leporka. In nearby Panpanga the reference is less correct, pahaywanar, bataka, while farther away in the Visayas the geography is badly off, pahawalna (Chilcino stick); yet both terms show the nomenclature indicating the foreign origin of the plant.

The value of this plant as a folk cure for herpes did not prevent its assuming a local nomenclature in many regions. The Tagalogs call it: hespohio, hilaw-hilaw, as well as gesal-sal (cure for herpes), haboba, pahunokai, and neceling. This term varies in the Visayas to match. In the Buhid region of southern Luzon the term banhata is used.1(1, 1; 193)

In Sulu the term mabilin is reported, although the Spanish albajada was also introduced. The Sultanates of Mindanao say lepo, while the Bugbod say banhata.

The Ilocano term influences the nomenclature of the non-Christian Ilocanos, commerce having made that dialect a sort of lingua franca in that region. Ilocano terms are: sedekito, sedekito-de-dakidaki, and sedekito-de-dakidaki. The Tinguianas who are situated between the Ilocano coast and the mountains use the first words sedekito, while the Ilogos beyond say anfisal.

CRISOSTOMO ANDRES V. HUARAS, M.D. (19) (20)

This is an aromatic herb introduced to the Philippines from Mexico.1(2, 192) where it is called especia (19, 192) from the Nahua, especie, meaning shank; since it has an extremely nauseating odor. This especia del corallo (corallo is the Spanish word for shank, giving this term the meaning "shank of shank") is a folk medicine in general use among the Mexicans, being taken in the form of tea to cure colic, pneumonia, and other ills.

It is an official drug of the United States Pharmacopia for expelling intestinal parasites, and has lately found important use in treating hookworm. The plant is a common weed in many parts of the United States.

Of its use in the Philippines, Padre Mercado (19, p. 206) records:

When the seeds are taken with wine, consumption is so deadly that the debtor may be whipped without feeling the lashes and even when put to the torture does not feel it.

Under the Spanish régime the Filipinos had considerable opportunity for testing this property of the plant which the Spaniards were thoughtful enough to provide.
Illanes (4, 3:12) adds to our knowledge of the use of this plant in
the Philippines and in the Philippines he used the plant to make
the laughing powder. The whole plant was used in the Iligan
and is a variety of a manila paper and banyan tree. The cooked root is
used to make flour when it takes two or three years. It has a very strong
odor that last for a long time. It is said to preserve books from moths—or it
should be made appreciated in these islands.

In the Philippines it is known by various corruptions of its
Spanish name: "hoozite"; "hoozite, hoozite, hoozite;" "powder;" and
"papaw."  It is reported (3, 3:12) for all the Christian peoples.

With historical data lacking this would indicate that this valuable
medicinal plant was actively diffused by the Spanish missionaries
who were especially interested in folk medicines, since they had
but little other available. Such an inference is clearly verified
by the divergent nomenclature among the groups which were
never brought under the bell: Tarsier in Tagalog; "sibah" among
the Igorot; "mao" in Benguet; and "bubba" in Samar (9, 1:139).
All of these groups are in geographic contiguity, but
are peculiarly isolated from cultural contact due to head-hunting
in past times.

EXPLANATION OF PLATE XXI.
An aromatic herbaceous plant, native of Brazil (33, p. 353).

Standley says of its use in Mexico (27, p. 1445):

It is of little economic importance, but some species are used in folk
medicine. At least one species is aromatic and used in flavoring tobacco.

Shortly before 1842 this species was introduced into the Phil-
ippines because of its reputation for medicinal properties in the
characteristics of insects and snakes; according to Illanes:
(2, 3:1)

This grass has been cultivated as much in the last few
years and has narrowly vitiated for a multitude of uses. It is said that
for crooked leave applied to the bites of insects and snakes imme-
diately nor mix. For this they also claim a curative of the leaves to inner
sweet. Over the wound are placed the crooked leaves scurrying all with
a cloth, well wikipedia the description of the plant. This can be drunk
with an embankment of other.

It propertizes rapidly in this climate, and is cultivated by the cultivar.

In 1890 a more competent scientist, the Philippine scholar, Paro
de Tacura, says (33, p. 193):

Its inflorescence has an agreeable, bitter taste and is a good astringent,
dietetic and tonic. It is used internally and locally for the treatment
of venereal diseases and infections. Although its virtues have been greatly
exaggerated, it has in general fallen into accredited neglect.
At present it is planted occasionally for medicinal purposes but is nowhere spontaneous. The plant is known by variants of its Brazilian name, apina or suspense, among the Tagalogs (13, p. 320) and among the Bicolanos (13, p. 320) in its limited use and distribution probably accounts for the paucity of nomenclature.

Antheraea cunapevi (L.)

Numerous herbaceous species of the milkweed occur in Mexico, where the juice is used locally as a drastic purgative, but it is dangerous. Pharrer reports that in Durango, the leaves are applied to the temples to relieve headache.

Merrill (13, p. 314) says that this plant is found "throughout the Philippines in the settled areas, and in open waste places in and about settlements, according to at least 1,500 meters."

The Philippine nomenclature is considerable, and one suspects largely descriptive. Tagalog incorrectly indicates its foreign origin by halab-barita, Spanish cotton (apparently because of the cotton-like appendages to the seeds); while the term in nearby Pangasinan shows a more-confused geography, lupis de francis (lupis or kapok for tree cotton, Calon pusio, of France).

From these terms the local nomenclature varies into a complexity of forms without any American pattern. The Tagalans also use these terms: halab isom; halabang; halab-halab; halab-kabale; halab-kabale; halab-yap; and halab-yap. The Bicolos use halab-sugani; and the nearly non-Christian terms show no relation to it. halab-sugani in Bicol; and in Nipaio halabsh. The Sabanos non-Christians near Zambanga say lausab-sugani. Papagos and daddal are terms reported from the Iloitos, at the other extremity of the Archipelago in the Bicolanos (13, p. 315).

The medicinal uses of this plant were taken up in the Philippines where it was known that the juice that escapes from the slightest abrasion is a drastic purgative. It is also used by local medicine men to cure dysentery. Packed in the cavities of teeth it relieves toothache and is locally applied for skin diseases and syphilis, and is used as a diuretic (13, p. 319).
ZINGIB. American Plants

AMERICAN MEXICAN TRINC.LIPU. ZINGIB. American Plants

This member of the poppy family is an herb with large yellow flowers, spiny leaves, and a yellow sap. It is introduced from Mexico to the Philippines. In Mexico there are several species known by the vernacular names chileo and cebu-hueco. (15, p. 899)

The leaves are narrative by virtue of a principle resembling morphine, and are used by the Filipinos in treating scratched eyes, according to Blanck. (15, p. 899)

About this plant, Merrill says it is found, "in and about towns, a weed in waste places, widely distributed in the Philippines." (14, 2, 199) It is known by its Mexican name chileo; but among the Tagalogs it is called the same name, abacate. (14, 2, 287) because of the similarity of its leaves to Annona glosoria. Among the Bisayas it is named another name, being called jackendood. (14, 2, 287) A sandal wood carried to the Philippines from India by the plant Ceylonnae indica, the leaves of which resemble those of the American plant under discussion. Another name used is abacate. (14, 2, 287) On Panay we find the Vajuyan word kapny-gripeng. (14, 2, 287) In the Balamot Fernando gives this plant the name abacato. (14, 2, 287)

Here we see a common wood of general distribution and some folk-words carrying with it its American name, but soon losing it for descriptive terms. Because of the similarities of the leaves of this plant to other plants, it has usurped their names, one of which is a sandal wood brought from India.

AMERICAN HONEY CROPS IN THE PHILIPPINES

CITRUS. CITRUS. American Plants

Standley gives this account of this plant in America: (48, p. 480)

A shrub occurring nearly throughout Mexico, widely dispersed in central America and advices of the Old World. It is generally known in Spanish America as zanate or Zanate from the Nahuatl zanate. (Jurquirico.) The use of this plant for dye was known to the aboriginal inhabitants of Mexico. In addition, the plant was used in domestic medicine.

It was introduced into the Philippines from Mexico in the eighteenth century and is known there as: tayaco, tayaco (V.); tayaco (T.); and anil. (24, p. 100). In 1781 Delgado records that the women dye cotton and abaca (hemp) cloth. A little fine lime makes it so well that it cannot be washed out. (2, p. 728)
The Philippine Journal of Science

In the next century it became an important plantation product and a considerable native industry was based upon it. In 1837, Blancho (9. 1827) gives us this account of the native industry:

The natives grow the oil trees and plant the seed in November when there is little rain. They harvest at the end of July, taking off the fruit as it ripens. The plants regenerate promptly and reproduce four times without a new planting.

To extract the oil, they prepare a tub or vat of wood about 7 feet high, which is filled with cold water. The plants and leaves are put in in the morning and are left until the following day until the water becomes apple-green. Then they take out the plants.

Then they put in a quantity of lime and stir the water until it takes the desired color, which requires about half an hour. Then it is allowed to rest until it seizes and becomes clear.

Then the oil is tapped and the liquid runs off. The sediment is then taken out and put in a small pit and the water disappears from it immediately. It is then put in clay vessels and each is sold at from three to eight pesos. This is the method that the Indians use to make indigo or tincture. It has good sale in the Islands and China.

With the appearance of coal-tar dyes the industry disappeared here as elsewhere.

Theobroma cacao Linn. Cass. grown

This well-known plant is wild in the forests of southern Mexico and Central America. It was cultivated in the warmer parts of Mexico in preconquest times and is now distributed over all tropical lands. (L. p. 849.)

In Mexico, Cortez was given chocolate by Montezuma, and the beans were used as money among the Aztecs. (10, p. 565.)

The words cacao, coco, and chocolate derive from the Nahautl word chocoahui. The name also is applied to the peanut in Mexico because of an evident resemblance to the same bean; the peanut was a pre-Columbian introduction into Mexico that lost its Brazilian name, seedaa, en route.

Sandon gives an excellent account of the uses in ancient Mexico of this important plant, to which the curious reader should refer, since within the scope of this paper the writer can except only a paragraph. (11, p. 893.)

The original inhabitants of Mexico sometimes ate the seeds either green or dry, but the seeds were used chiefly for the preparation of a drink known as "chocolatl" being the word from which our word chocolate derives. The word signifies "sweet water," the unsweetened drink of the seeds being unpleasantly bitter. The drink as prepared by the Mexicans was different from the chocolate as now usually prepared. It consisted of a strong decoction of the seeds flavored with chocolate, nuts, honey, cocoa seeds, and many other substances, and the beverage was beaten into a froth.
which deserved almost imperceptibly upon the tongue. It was often colored with bula orchidea—the plant was also introduced into the Philippines, but this now is not perpetuated there.)

It was the favorite drink of the Mexican nobility, who consumed immense quantities of it. It was a favorite sin of the encomendero, for whose almost incredible quantities were prepared every day.

A drink still much used in some parts of Mexico is "chocolate," i.e., a mixture of cacao, corks and water. Similar drinks are also prepared by the natives of other abodes.

This plant made a great impression on the excited minds of Renaissance Europe and its use became the fashion. Guide of chocolate mixtures grew up, that often mixed it with pepper.

To the Philippians the Spaniards brought considerable care with the plant. However, the Filipinos joyfully mixed boiling rice or coffee with the cocoa to preparing the beverage.

In the Philippines it is known only as cocoa (35. p. 35). It was introduced into the Islands about 1670, though there are two different accounts for the event. Delano quotes Morillo Valverde who says that it was introduced in 1665 from Mexico by Governor Diego de Salcedo at the instance of the Count of Aranda, (45. p. 144) Blasco cites Gaspar de las Aguilas, who says that it was brought by a pilot from Acapulco in 1670. (53. pp. 401-2)

He says:

The plant was cultivated in Luis, Batangas, in 1674, and in this province the best plants were raised up to 1790 despite the earthquakes and violent storms.

The native plant is grown in a small plot of ground or also in the leaves of trees, shedding each leaf into the form of a framed with a little earth inside, which is warmed from time to time, until it spreads even in the house. Then they transport the plant to the district where a native is located, first planting it in a pot or a basket, later in a basket or a basket, in which they plant also cocoa, peanut, etc., to shade and protect the cocoa. They water the new plants from time to time and in three years they bear fruits. The seeds are planted 6 feet apart and the grove is kept clean of soil.

The fruits are picked before they are ripe.

The natives have already made great use of the cocoa for many of them drink chocolate. For this they use one-third part of toasted rice or more and prepare a chocolate that is very palatable. Others add flavored coffee.

The plant had an extraordinarily wide and rapid diffusion in the Philippines. Writing in 1753, Delano says: (53. p. 99)

The plant has done well in these islands and we no longer have to send it. Almost all the Visayan plant it and at Bisan they grow it in to sell because there is much of it around Lake Balayan (Lanuca). The Buhid (river people who inhabit the shores of
Although the quality produced is good, even at the present time the cultivation is primitive with little or no attention paid to the fungi and insect pests to which the plants are susceptible. In 1918 the cultivation had dwindled to 1,460 hectares. (18, p. 31)

*Cynanchum guainii* (Cynanchaceae) Ind. Medina in nov. 1

This is a tree distributed throughout Mexico where it is called coche in certain states. It is a favorite shade tree for coffee and cacao. (16, p. 442)

It was introduced into the Philippines in the eighteenth century for the same purpose and for which it is still used, being cultivated in many coffee plantations. It has become established in many localities and is of general distribution. (13, p. 31)

In the Philippines this plant bears the same name as the Mexican word for peanut, *huisotes*, an interchange of terms that involves a great deal of history and historical reconstruction. The Philippine nomenclature of this plant, the humble hand-nut, is the "Drink of the Gods," the Mexican *coyote*, embodies much pre-Columbian history in far-away America, which is here briefly recapitulated.

In ancient Indian Mexico *noce* was of such importance as to have firmly patterned its nomenclature about the Aztec word *pixtle* or *nixtle*.(15, p. 391) When that useful plant the peanut arrived in Mexico its resemblance to the cacao caused the Aztecs to call it *pixtle* and, as excellent (Mex.) the peanut is known all over Mexico.

In the conquest of America the Spaniards encountered the peanut elsewhere, obviously at some point where, in its migration from Brazil, it had modified its Brazilian name *mendo* (15, p. 411) to *madu*, which term the Spaniards took up, rather than the Mexican term *noce*.

Upon the introduction of the peanut into the Spaniards it carried its Spanish name *mani* (15, p. 281) which is still the commonest term. However, due to the constant contact with Mexico, the Mexican term *coyote*, could not be kept out. Still it is less common than the Spanish term *mani* in Philippine nomenclature.

When the key plant, the cacao (*Theobroma cacao*), was introduced into the Philippines by the Spaniards, it dropped its
Zigzag: American Plants

The word zigzag is derived from the Latin "semi-circle," and it is believed by some to be the original form of "semi-circle". However, for the handsomely illustrated form "semi-circle" appears as "halves" in the "American" plants, which is also the less common name for the plant.

This explanation of the shaping of the American "halves" is by both the present and the "mother of cacao" in the Philippines illustrate the conservatism of plant nomenclature in times when an introduced plant is culturally important in its native habitat, and shows the utility of plant nomenclature as a tool for historical reconstructions to bridge over gaps where better data are missing.

Let us examine what happened to our Avesta word, "halves", upon introduction into the Philippines and applied to the "mother of cacao" instead of her famous daughter. The plant is commonly called "Halves" in the Spanish "semi-circle", but the Tagalos keep the original Avesta, "halves". They seem possible to have mixed and combined the terms in "barbaris" (15:3:531) (Merio, Mary, and coco Sp.)

This term proves especially conservative, for it carries as far north as isolated "halves" (15:3:531) possibly as an important shade tree for coffee which is common at that altitude. The term carries its coco element as far south as Sulis in Mindanao (15:3:531)

Only once is a local term reported for this plant: among the Tagalos it is called "halves", (15:3:531) a transfer of name from the remotely similar plant "Pongamia pinnata".

BETEL (BETEL) - (HE) (HE) (HE)
Rubber is undoubtedly the most useful raw material vegetable substance in modern civilization. Apparently its use and properties were unknown to white man until the discovery of America brought to their attention its use among the Indians, which is a cultural contribution of capital importance.

So valuable has the substance become that a world-wide search of the Tropics for plants that bear this latex has revealed many kinds of latex-giving vines and trees; but none yields as excellent a product as Hevea brasiliensis, although other American species are also common.

Columbus found that the natives of Haiti possessed among other amusements a game of ball. "The balls were of the gum of a tree, and although large were lighter and bouncier better than the wind balls of Castile," (15:3:1)
The latex-producing tree (Castilla elastica) was described by Juan de Torquemada in Central America where it was called *saludablanca*. It was held in high esteem by the natives, the latex being allowed to coagulate in calabashes or simply smeared over the bodies of the collectors. The rubber so prepared was used in making balls or for shoes for tammers or jester whose ankles it assisted. A medicinal oil was extracted from it. The Spaniards used the latex to waterproof their cloaks.(12, p.3)

The first accurate account of Para rubber (*Hevea brasiliensis*) was given by G. R. de La Condamine, who visited the Amazon country in 1735. He describes various uses of rubber among the Otaguas Indians, including that of making syringes or quirts which had an important place in social gatherings and religious festivals.(10, p.11)

Erland Nordenfalk(11, p.141) gives the classic reference to syringes in South American culture and shows that the aborigines also invented the use of the same, which was adopted by the Portuguese, who carried its use to Europe and Asia. The Indians used the externo-syringes not only as a medicine but also as a mode of taking an opiate poison from the seeds of *Piptadenia*. So taken it produces the blissful intoxication of opium and may have been used as an anesthetic in trepanning.

To the present time the native workers among the wild rubber trees of Brazil are called *capivaros*.

In England, Priestley, the discoverer of oxygen, found that the gum would erase pencil marks, hence its common name, rubber. (10, p.13)

The first English patent was for its use as waterproofing, taken out in 1761. In 1829 an American, Nelson Godfrey, discovered the process of vulcanization by combining rubber with sulphur. Since then it has come to play its important role in modern civilization.

Sharma, in an excellent monograph,(11, p.1) shows that in parts of the Philippines there occur vines (Punica or *Punica* (R.) K. Schum, and others) that produce a good grade of rubber. The people of Tugtalay (southeast of Mindanao) know its commercial value and collect it for sale in Borneo.

In Mindanao the vine is known as *decbbya abbe*, apparently *decbbya abbe*, to eat, and *debby*, a snare; arising from the curious belief that if a snake is cut in two and smeared with the latex, it will recover.

The only so-called rubber trees in the Philippines prior to the American occupation was the beautiful India rubber tree (Ficus
Bixa: American Plants

Bixa orellana

A shrub or small tree, 2 to 6 meters high, having a prickly pod containing numerous seeds with a fluffy, bright orange covering. From its fruit is obtained the essence of orache, for coloring cheeses and butter and silk. It was introduced from America and is now common in the Islands but has no commercial value.

It is indigenous to tropical America, where it is used for coloring cooked rice, and was one of the first plants transplanted to southern Asia and Africa. (3, p. 431)

Sundag gives us this information about the plant: (3, p. 822, 34)

The name Bixa comes from the native name bixa, or bixi in Paraguay, while the specific name orellana was given in honor of Don Francisco Orellana, the delayed but famous captain of Pizarro, who achieved one of the most remarkable explorations in history by the descent of the Amazon from its headwaters.

The plant has had wide usage among primitive peoples. It was used extensively by the Indians of Mexico, Central America and the West Indies for painting their bodies, mostly for ornamental and also for protecting the skin by the dye. It was introduced into the West Indies and thence into the Pacific Islands where the natives soon learned to use the dye in the same way.

In the Philippines a less picturesque and much less primitive use was made of this dye. Padre de la Riva, 194, 420 at the end of the nineteenth century, writes: "Everyone knows the yellow color that Filipinos cook impart to almost all their dishes by this plant." Even this use has largely disappeared.

The Tagalogs still preserve the Mexican word loasa to ochi, (63, 2: 103), but vary it considerably in etymology and spelling. (63, 2: 103) The commonest word in the Archipelago is ochola,
which extends to the Tagalogs, Bicolos, Zamboans, Bucasans, and the Panay Visayans, keeping close to the original name.

In the Visayan islands this general term did not reach Cebu, where cahita (13: 333) represents a new variation from the original. In more isolated Samar and Leyte this becomes chita (13: 301: 303) due to contacts with Cebu, their nearest Visayan neighbor.

In Sulu it is possible that choita is the prototype for the local word choopy, which varies to janajan (15: 2: 182). These words are quite unrecognizable from their Mexican original.

Nearest Manila the Mexican word was carried with little variation to the Tagalogs of the interior of Palaun where it is known as abobos.

This extraordinary variability of nomenclature clustering around the Mexican name abobos, means something interesting to the student of culture. Historic and ethnographic data are quite lacking. What reconstruction may properly be attempted, with the little botanical and comparative material available?

Merrill says of this plant that it occurs "in and about towns throughout the Phillipines, usually planted, but at least persisting after cultivation has been abandoned." (15: 2: 215) This shows that the plant had sufficient folk-use to have been distributed everywhere by man, a usage important enough to cause the plant to keep its American name within great variation.

The only historic material available about the Philippines comes at the end of the nineteenth century, when Pardo de Taboada writes of its use for coloring food. Even this use has largely disappeared.

Plenty of comparative materials have been summed up by Standley in the quotation on the preceding page, and in view of this indirect evidence, the pattern of nomenclature for this plant in the Philippines forces the conclusion that these varied uses once played a part in Philippine culture.

A small tree cultivated for its edible fruits, the seeds of which yield a volatile oil (15: 2: 145) or are eaten roasted (15: 2: 215). De Candolle resolves the opinion that this tree is of American origin and quotes Ernst that it is indigenous to the Amazon basin (15: 2: 215). Although Sturtivant thinks that it is indigenous to the West Indies, Central America, and South America (15: 2: 145), it grows wild generally in dryer parts of Mexico and Central America. The Portuguese introduced it into India and the Malay Peninsula. (15: 2: 215)
Ziziphus: American Plants

In the Philippines it is of wide dissemination, but not extensively cultivated. (p. 313) It has these native names: esnoy (T.); esnoy (I.); baluha (I.); and baluha (T.).

The fruit and receptacle are the most important products of the tree. The enlarged basal part, receptacle, is red or yellow, pear-shaped, and very fleshy and spongy. It is.vertices when green, but when ripe has a pleasantly acid flavor. The pericarp of the fruit contains an oil, cardol, which is acrid and caustic. The roasted kernels are edible, having a pleasant milky flavor.

The gum resin contains 90 per cent of aromatic acid, and 10 per cent cardol. In the Philippines, wood soaked in it is preserved from the ravages of white ants, for which purpose it is also used by bookbinders. (p. 313, n. 9)

The nomenclature for this plant in the Philippines shows considerable local development. The most constant term of widest diffusion is baluha, enough like the English word oxeye to allow us more than a suspicion that both are derived from an unknown American word.

The Tagalogs use the term baluha which is the same as boleto used also in the Ilocanos, but is derived from the Tagalog names of the city of Baluha, among whom a whole cluster of terms are: baluha, baluha, baluha, baluha, baluha. From Sicareyo a wide variation is also reported: boloyo, boloyo, boloyo, and in a variant, see, boloyo. (p. 429)

Thus we see the terminology of this relatively unimportant plant widely differing on the term baluha but also showing a strong tendency to diachronic patterning on local words.

FRAGRANT FLOWERING PLANTS

CHRYSANTHEMUM LINDENII: Jim de noche (Girl of the night).

A shrub with small tubular flowers which fill the air at night with a delightful fragrance. It was early introduced into the Philippines, for we find mention of it by Macedo writing in 1565. (p. 446) It is known everywhere among the Filipinos by its Spanish name, chuma de noche, which indicates a high value or extraordinary esteem on their part and invites the ethnologist’s attention.
The Filipinos from time immemorial have loved fragrant smells and in Philippine culture perfumes have entered deeply. The Spaniards found them using perfumes which they got from the clove-ding (Calamagrostis odorata) and chert cats, as well as perfumes they got in trade with China.

In many dialects a kiss and to smell is the same word, for the old, and still to a greater or less degree prevalent, custom was to kiss by smelling. Jager noted lovers smelling if out their beloved, then some article belonging to the sweetheart, commonly a handkerchief. (121, p. 119) Another formerly, even more convenient with the Filipinos, Foreman, says that they do not kiss, but smell each other, placing the nose and lip on the cheek and drawing a long breath. (6, p. 191)

In Nueva Vizcaya the author learned an interesting origin myth of that region, about the pine tree. The pine tree was an ugly girl who prayed the gods to be changed into a form that everyone would love. She was changed into a pine tree, which all men kiss. This story was quite understandable until it was explained that before the tree is cut down the woodman gathers the tree, and smells it to ascertain if it contains enough pitch for good firewood. Thus, since kissing and smelling were synonymous in their ideology, the girl had had her petition granted.

Jager's footnote reports the identical custom from India. This plant is planted around the houses in every town and barrio in the Philippines. Indeed, one of the charms of night in the Islands is the cool night breeze, strongly scented with its delicate fragrance.

In other countries it is known by similar descriptive names, according to Standley: (5, p. 121)

Hecilla de noche (smells at night) in Pueblo, Cauca, and southern Mexico; pino de noche (smell of evening) in Oaxaca; pino de noche (smell of the night) in Guatemala and Colotlan; rana de noche (queen of the night) in Guatemala.

Though it is poisonous, an extract of the plant is employed as an anti-spasmodic, especially in epilepsy in Mexico.

This use of the plant did not penetrate into Philippine culture.

**Louis (Chittaranjan Hill) writes 1899, 844** anathems of the highest degree. "Die Art so küssen ist abscheulich; nett Lügen an Leute zu präsent, legt die Hand und Nase auf die Wangen, und ziehe den Atem stark ins. In ihrer Sprache bedeutet es nicht: Guck mir einen Kiss, sondern, rieck mich." Beines in den Philippinen (1773) 132.
The temple flower is an American plant very common in Mexico from where it was introduced into the Philippines. It is a tree with very fragrant white or yellowish flowers, and is extensively planted in the Philippines. When in bloom the tree is covered with the blossoms, which children and girls thread on strings to wear, such as the Hawaiian lei, which is often made of the same flower. In the Philippines this use is by no means as important as the Hawaiian use of the lei.

The trees are commonly planted in the plains of Philippine towns, but they are estimated less than the brilliant red-flowered flame tree (Delonix regia) which, though a native of Malagasy, is called caballero or arbol de fuego, indicating Spanish introduction into the Islands.

The temple flower carried its Aztec name balsamalo into all dialects of the Philippines where the Spanish influence was strong. The Tagalogs use balamsalo, balsamalo, bacalado, balsamida, and balado. (p. 301) The first of these names carries the Eibro of southern Luzon.

The Binames of the north say balamboko or balamoko. Among the Bisayans of Panay the term gets varied to balamboko.

SUMMARY

The diffusion of American plants in the ethnography of the Philippines was aided by one of the strongest forms of organized diffusion, missionary zeal. The great missionary establishments that Spain had planted over most of America had their counterpart in the Philippines, where they dominated everything. These missions were great educational establishments that not only Christianized the natives and taught them "right manners and good conduct," but also educated them in the use of domestic animals, improved agricultural techniques, better household arts, etc. New plants were introduced, and their cultivation was taught to the natives. (p. 301; introduction)

Despite the organized aid, some of the American plants—candies and talose—survived in many parts of the Archipelago before the missions were established, while others, especially American fruits, lagged despite the best efforts of the missionaries.

Tohono had the greatest effect on primitive cultures of the Philippines. It first proudly attached itself to the hogo complex, and then like the ungrateful camel in the Arab's tale, largely
displaced ethanol in the ceremonial, social, and everyday life of the people. Smoking tobacco, rather than chewing, is the commonest form of narcotic pleasure in the islands. Tobacco carried its foreign name even to groups isolated from Spanish contact.

No American plant furnished alcoholic beverages. The palo complex was not introduced with the agave, since the native people of the islands had a plentiful supply of liquor from the coco palm (coke, an excellent drink) in Mindanao and Visayas, and beer from sugar cane in the north, as well as rice wine everywhere. All Spanish accounts, even that of sympathetic de Morga, agree that the natives drank a great deal, and to excess at all ceremonial, as most primitive people still do. The friars stamped out this practice almost completely, and nowadays the sight of an intemperate Filipino is rare indeed.

Turning from vines, which in cultural contacts seem to spread faster than other traits, we see that, though the manicure spread with amazing swiftness, it failed to integrate as well as tobacco into the culture, and is still thought of as a food fit only for the poor. Corn has the same status in the psychology of the Filipinos and its spread was slower, as it had to compete with an elaborate rice complex. Corn serves only as a catch-crop, though it is a staple where rice does not grow to advantage. In Cebu and in Guaya Valley it replaced rice for a population in excess of a million. In the utilization of corn, it was taken completely out of its characteristic Mexican complex and fitted into the prevailing rice patterns. Squashes and tomatoes have long been important vegetables in the Philippines because they supplied deficiencies in the local diet. Beans and chiles, like corn, escaped completely from their Mexican contexts, beans being used mostly as a vegetable, string beans.

The prominence of Mexican plants in the American element of the ethnobotany of the Philippines is noteworthy. This resulted from the continuous contacts of the islands and Mexico in the long trade monopoly between Acapulco and Manila from about 1600 to 1820. The South American plants, potatoes, peanuts, and cassava, were common in Mexico before the Spaniards came. Some other South American plants of the Amazon Valley found a diffusion across the Atlantic into Europe and thence into Asia, but these diffusions were on the whole more recent. We have seen how one of these plants, the pineapple, thus travelled from west to east and entered the Philippines from China. For this plant the Filipinos found an extraneous
binary use, in weaving the silk for use in weaving the most highly esteemed fabric, piña cloth. Like silk in China and Japan, piña cloth in the Philippines furnishes the material for clothes of prestige, social ritual, and ceremony.

The American fruits were, in general, slow to spread, except the guava, which soon came to grow wild everywhere from the seeds dropped by birds. The papaya was so useful that its culture became common. Most of the American fruits, however, are even now uncommon around Manila, the center of diffusion, than elsewhere. The reason for this slow diffusion is obvious; the Filipinos are already bountifully supplied with a considerable variety of excellent fruits of pre-hispanic introduction.

The American medicinal plants represent a cultural migration in which the lore and technique as well as the plants were introduced. The early Spanish missionaries were keenly interested in medicinal plants and in folk medicine, and having some knowledge of them on themselves. The first work on Philipino botany is Fr. Mercado's notes on medicinal plants written in 1600. Another friar, some centuries ago, naively informs us of the Indians, "But it is in their superstition that they must show their savagery. They think that disease is caused by the sight of the spirit, whereas all intelligent men know that sickness is caused by fluctuations of the humor." To-day his ideas are as strange to us as he criticized.

Among the American plants were some which became important money crops in trade with China and Mexico, and which were finally given great impetus with the opening of the Suez Canal in the nineteenth century. The first of these plants was tobacco and then cacao. Both immediately became popular, and considerable inter-island trade grew up. The cacao business flourished for two centuries and then died out because of fungous disease and lack of care of the delicate plant. There are a few cacao plants in Liwas, Bulacan, once a great center of this industry, but now these are a curiosity. In spite of the poor farming methods, the tobacco business is still important. A century after the introduction of cacao, indigo was introduced from America and an important business in this dye grew up with China. This lasted until the artificial dye became cheaper. The other great American profit crop, greater in potentialities than cacao, however, is rubber, the spread and development of which is one of the most fascinating chapters of modern industry.
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middle of the back from head to dorsal fin; sometimes there is a blackish line above the anal base; the fins are usually colorless, but all of these may be black or blackish; the caudal often has one or two rows of black spots basally.

Type: No. 41062, Fish and Game Administration collection, 38 mm in length, and 20 embryos from 24 to 30 mm in length, collected by the junior author from a creek and from rice fields at Saldana, Iloco Norte, Ilocos, October, 1933.

Over 500 living specimens collected at the same time were placed in the Manila Aquarium, Fish and Game Administration, and are under observation at the time of writing, December 20, 1933. More than 500 alcoholic specimens, 3 to 50 mm in length, from the same locality, are also in the collection. A few embryos and other specimens are also in the collection of Stanford University, California.

The present new species is very close to Aplocheilus celebensis from which it differs in having a slenderer body, fewer predorsal scales, and a smaller transverse scale count. It is very distant from all other species of the genus in having a truncate caudal fin.

We append a comparison of the number of fin rays and scales in the species of Aplocheilus occurring from India to Japan.

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ILLUSTRATION

PLATE I. Aphodius ferreusum p. 284., from the typis. (Drawing by An- 
nette Verscho.)

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PLATE 1. APLOCELUIS LUCIDUS SP. NOV.: FROM THE TYPE.
NEW AND LITTLE-KNOWN PHILIPPINE COLEOPTERA

By K. H. BEKKER

Entomological Museum, Dresden, Germany

ABSTRACT AND OVERVIEW

In this paper I have given descriptions of some new species, and supplementary and correcting notes on earlier species some of which were based on single specimens. The studies of which this paper is the result were facilitated by material collected by the late C. F. Baker, the late G. Boettcher, the late G. Schlett, Mr. E. C. Hadden, of the Hawaiian Sugar Planters' Association and at one time resident at the Colours of Agriculture, Los Baños, Luzon, and Mr. W. Jars, of Hamburg. Owing to Mr. J. D. Afflitt, curator of the Bremen Museum, and to Mr. H. Gabron, of Hamburg, typical specimens of all species herein described are represented in the Dresden Museum. The museum, moreover, has other important material, obtained through the kindness of the late J. Morfit and, by acquisition, through Steudinger and Bang-Haas.

In the following list only new species have been supplied with numbers; upon the remaining items only supplementary and synonymic remarks are given.

DITRIGIDAE
1. Eupatorus aquilifer, sp. nov.
2. Cephalops quadriscapus, sp. nov.
3. Cerambycidae

CERAMBYCIDAE
1. Cerambyx anthracinus (W. Schlect.)
2. Apatea bicolor, sp. nov.
3. Apalanchus anthracinus, sp. nov.
4. Cerambyx anthracinus, sp. nov.
5. Apatea bicolor, sp. nov.
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Calopterygidae
1. Sigaraea maculifrons sp. nov.

Odonatidae
16. Orthocordulia leucostoma sp. nov.
17. Orthocordulia hirsutula sp. nov.

Scarabaeidae
18. Acronycta hortorum sp. nov.

Cerambycidae
20. Pseudophorius sp. nov.

Cryptophagidae
22. Cryptophagus sp. nov.

Scolytidae
24. Scolytops sp. nov.

Dytiscidae
55. Neopappus affinis sp. nov.

Ellipticus, niger, elytris maculis obscure sarastiola (val la- rida) macula subdorsalis, postmedia, subdorsalis axillaria ornatula; capitis lurid, fronte inter ochracea ante fasciae obli- guata, post alba, sub medios interpectus, a pleurocoeli acutae denticulae, nigro; prothoraco nigro, lateribus luteo-luride-margi- nato, media, media margine, maculae minuta lurida; elytris acedia tesselos (exterioribus vix observandis) parvum puncta- tum, margine laterali, tritele apicali excepto, ut raro brevi; post humilium obliquum refeo, fasciae media, brevi utroque obliqua promota, sarastiola, protracta, eadem suber; striaeque mediae tribus, in marginis basali, haurum media minima, interna, media, cirdaria, exstima vitelliformes, alba luteola, subapica, marginali, oblonga, albae punctiformes, naturali, apiculata. Long. 115, lat. 8,5 mm.

Mindanao, Davao (ex coll. C. F. Baker T251).
CERAMBYCIDAE

Cerambyx membranaceus (M. Bol.)

Pharactis membranaceus W. Schultze must be transferred to the genus Cerambyx. It is closely related to C. varius ssp., from Celebes, and to the following new species from Mindanao.

1. Cerambyx membranaceus W. Schultze

C. membranaceus W. Schultze

Allium spiniger, subtilisine griseo, in stylo albo-nigro marmorato-pilosum; pteracross longissime latitudine fore arcuata, apica transversa interas distans arctimittis; antennae consciderebus nigro, apica, apex, rema punctatissimo; clypeus latitudine humeralis plus digito longissimo, culum modi irregulariter renierisse, posticus segmentus subtilissime, corpus subtilissime, tarsis et alitri demersio marmorato-pilosum. Long. 22; lat. 7 mm.

Mindanao, Davao (sp. coll. C. B. Baker)

Very close to C. membranaceus W. Schultze, but the body and antennae entirely black, and the pubescence, instead of ochraceous, white throughout.

thorax distinctly longer, its subapical and subbasal furrow less impressed, the lateral tooth less acute. Underside delicately, the metepisterna densely, whitish pubescent. The related C. servia m. has a much broader pronotum than other species mentioned, and a double carina in front of it.

Another allied species, which I know only by description, is Cerastus gudahas Boulanger, a new form from Kiana, Bataan, but it differs from all similar species in that the prothorax has two transverse carinae medially, each carina bearing three tubercles.


Nigra, crassocras-tomentosa, corpore laticlavis, fronte, aelytra fasciis obscurum, latum, per summum interrupta parteque apicis parum habituadiffusum, cernino punctulatum inaequali-albida, dispersa, partim verruculoso-concentro, humoris tuberoso-pectinellis ut marcula parva, transversa, utrinque ad suturam, aliae longitun- dinalis, post acuminatis, inter haerent, nigro-glaberis; antennis subae nigro-fimbriatis, articolae, dohbs basalis grisea atque quaeque apices apicolinis excepta, laticlavis, aelytæ versus nigro-apicinibus. Long. 18.5, lat. hum. 8.5 mm. LEZON, TAYABAS, 14. IX. 1890 (ex coll. F. C. Hadding).

According to the synopsis, this species must be placed near basalis m., which likewise has the shoulders produced, but which may easily be distinguished by the different color of the tegmen. Front faintly yellowish, densely and finely punctate, each point circled in black, vertex whitish. Antennae gray with the three basal joints yellowish brown, on the spot blackish, the six apical joints entirely black, the whole antennae fringed with black beneath. Prothorax also white tomentose and black vermicularly punctate, a small transverse dot on either side of the disk impressed. Scutellum rectangulatus, transversus, white. Elytra not quite twice as long as broad, with a shining black humeral corn, basal margin on either side of the scutellum with a small transverse spot; inward from the shoulders with a greater, oblong-triangular, black spot and an indistinct oblique-rectangular band beginning on the base of the elytra and running to the middle of the metepisterna; furthermore, postero- medially a similar, but nearly straight, band, like the apical part, yellowish. Legs and tibias gray, dotted with black, the latter blackish towards the apex. Front legs elongate, tarsi gray.

E. vossii (Baker) similis, sed alae colorata atque signata, prosectione epiptere albo, antennis terminalibus valvis; protneura manica postemembris, obovoideae aurantiacus, seta ornata, in parte contraea et margine, in margine postemembris, in parte contraea et margine, in margine postemembris, in parte contraea et margine, in margine postemembris, in parte contraea et margine, in margin...
abdomine serilia duas, altera submediana, e maculis minoribus, albe, marginali, e maculis melanoidus formata, stramineo-taeniate. Long. 8 ad 11 mm.


Smaller than E. velga New, puncture of the upperside coarser, the underside, except for the yellowish spots, shining smooth, vestiture and elytra black with an intense violet abdomen, the straw-colored spots different in form and arrangement; namely, each elytron has a small oblong spot in the middle near the base, in the first fifth another nearly circular spot, nearly of the size of the middle coin, a point anteromedially near the suture, and a stripe in the apical third, interrupted in the half and its two parts annulate at the end. The straw-yellow tarsus and toes parts of the brownish underwings are also different, and in the anterior half of metasternum consist only of a small stripelike spot at the posterior edge of the metasternum and two rows of spots on the abdomen, one along the sides, the other consisting of smaller spots on either side of the middle line.

I have before me several identical specimens of the typical E. velga New, collected by the late Prof. C. F. Baker and by Mr. Jack (ex Nova. Hamburg) at Baguio, Leonis, and a half dozen of E. minor, collected by Mr. P. C. Heden at Pañil, Laguna Province. As these two localities are separated by a distance of about 350 kilometers and neither form of Euphoria shows any inclination to individual variation, I am convinced of the specific value of E. minor.

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G. sexies Fasc. affinis, sed obscure fuligineus aliterque eufereus-orientatista; antennae articulata duobus basibus nigrit, reliquis ferrugineis; ab ects paalidissimis; vertex itinis duobus eulivoreus, ante convergentibus; prothorace vitta media lata, basi post. dishera, in dimidia parte anteriore paralela; elytra margina densis haud

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*Figured in Locustae, Gen. Oecon., Atlas. p. 100, fig. 1.*
semicircularis, and post acuminata alata por vacuas con zona
cala rhombidali. Naturali, media conjuncta, margina sublateralis
transversa, margines antica convexo-convexi, margines postica
obtusanguste-convexi; inter hanc et praecensor, utraria
aquililaterata, margini punctiforme suffusa; corpore posteriore
dorsocostationis praestans media, mansuetus. Epimeres alatus
excepta, tota, incogniti in parte anteriore abdominisque
ventricle primo stilneque, fuligines; Long. 12. IN. lat. 4.5. mm.
Insula Mabato, Arenor, G. Rodolfo leg. (a Dr. Baetigere
et Baai-Baas aqua).

In 1802 Fr. Tenea[13] described polidclus sp. nov., from Malacca; in 1869[10] he gave a colored drawing, and changed the
type polidclus to ructa; finally, in 1873[12] he gave a more-detailed
description and added the localities Singapore, Sarawak, Melinda,
and Celebes. With the exception of one from the Philip-
ippines, I have no specimens before me from any of these local-
ities, but I believe that the design of the latter is dif-
ferent enough to warrant a new name. Indeed, Passer says:
"One of my specimens has the praeocular patch somewhat in the
form of the letter X with a small spot on either side near the
upper tips of the patch," but he does not say from where this
specimen came. The new Philippine form also has a small superi-
ornecular spot on either side of the elytra, between the nas-
al and subapical natural spot and equidistant from both. The
shape of the nasal vitta on the prothorax and the basal patch
connected along the suture with the nasal patch, moreover,
at least equal to a distinct level from.

Nex, spicer demus, albo-pilea, vertice vitta tenue nigra.
Antennae nigricent, pronotum vitta dusius, discalibus, hastis apic-
erum atrogrisulis, absis tenue atrogrisulis infraeangulari, basi
abreviatis, nigro; scutellum transversum, fove semicircularis,
retro; elytra vitta media nigricant, via tenuissima, apice cum
vitta basali, basari, subpers, conjuncta, margine laterale be-
side nigro-margarite; pubes nigra, fuscous subfusosam-
tibus; tarsus posteriorum articulo primo dusius subcapitullobus
uniti paulo breviora. Long. 13. lat. 3. mm.

[10] Proe. Em. Soc. Londr. (1869) 540, pl. 25, fig. 2.
MENABAL, Davide (ex coll. C. F. Baker).

According to the key of Chr. Aservillius (1936), this species must be placed near cierus Thomson, although it has no black spots on the elytra.

Narrow black, covered all over with a whitish toment, which is very dense on the underside; a fine medial stripe on the vertex; two broader ones on the disk of the pronotum, touching the front and basal margin, and a finer one, abbreviated behind, black, beneath the lateral margin. Elytra with a slightly tomentose blackish discal stripe, jointed before the apex with a fine barred humeral stripe, a fine marginal stripe in the basal third of the elytra, and another, black, along the lateral margin. Legs black, femora more or less dark reddish. First joint of the hind tarsi less than three times longer than broad.

TYPICUS, 1935, Mindanao.

Chr. Aservillius was acquainted with a female specimen only when he published this species and therefore the characters were not quite complete. As usual, the male is much slenderer, and has longer hind femora, than the female; moreover, the black barred mesal strips on the elytra is not dilated in such a manner as the apex as to be confinad with the black subhumeral stripe. After a male and a female specimen from Zambanga, Mindanao (ex coll. C. F. Baker).

The same author has given a key of the Philippine species of *Gnosus* of which there supposedly Philippine species could not be placed, as they still were not interpretable; namely, *locoa*, *stella*, and *varifascia* Thomson.

The following notices on observed additional localities of the occurrence of some species may be useful: *antes* Thomson, Luzon; *palpis* (legit F. C. Hadden); *dorsalis*, Mindanao; *zambanga* (legit C. F. Baker 1717); *reversus* Auriv., Dinagat and Malabo (legit C. F. Baker 3021); *cylindricopunctatus* Thomson; *fasciata* and *tricolor* Auriv., Mindanao, Zambanga (Baker 7895-7896); *comitatus* Auriv., Luzon, Mount Maquiling; *reversus* Auriv., Luzon, Mount Linta; *macrolepos* Renaud-Thomas, Luzon, Mount Maquiling and Palpis (legit F. C. Hadden).

*Phillip. Journ. Sci. 30 (1903) 342.*

*Trees ci. 05-18.*
CURCULIONIIDE

S. CATACRANOSE - carcinus in soc. incolis, orbis.

Niger, aquarellis griseis, plus minusve ellipticas, partim marg.

arctionem-assina micacissibus, in prothorace elongato-argenteis,

pat. densae texturis, costae latitudine vel longiore, dorso ad iniarem

basi angulatis duabus; fronto sub sensu medio, tempi, diametrio

secretori, transverso, distincta latine, occidio medius convexus,

sub-

elongato-ovalis; antennis nigris, funiculis sex-articulatis, articulis

primi inaequalis, latitudine vel longiore, articulis secundo multi

tenementos, primo aequalis, quattuor aequationem transverso, septimo

corpo, eleva agneto, fac crassitum plus aequo longiores

(6-120); prothoraces transverso (9-11); lateribus paulo rotund-

undulatis, lineae mediae pallide; ostiulis punciformibus, viis squamosis;

elicta decumbis seriis-punctatis, punctis elongatis, granulis de-

finitis, post. interomina nigra ante medium, utrique intra striam

secantem et oblongo fascia, obscura, palindrom, m magneto-

mimonti; estera apice (in femina, tuberculis minuscullis).

Long: 6 ad 7, lat. 2 ad 3 mm.

Lilac, Sipilop — Bangalore, Monte Santa Teresa, G. Baseliker leg. (a Steudler et Rangh Haas acquisita).

Dorsum, covered with minute, grey, apple-bark-like (foot hair-

like) tolerably dense scales, glittering more or less, metallic

or pearly, along the middle of the front and of the prothorax

and on one or two sides of the elicta. Antennae black, each

reaching to the middle of the eye, fertile with the first joint

nearly longer but thicker than the second, fifth to seventh

transverse. Prothorax broader than long (11:9), sides slightly

rounded, base not margined. Elicta with ten rows of ablong

punctures, intervals flat, without granules; in the second, some-
times also in the first third, between the sixth and eighth striae

with an indistinct pales, glittering, metallic band. Legs black,

without teeth.


therein the difference between Eupogonius bifidus, (1956) and Ctenobas
des bifidus, (1955) in observation of the substructure, with a transverse

them and without a lateral eggs, densely upon the stam, must be

placed with Ctenobasidae; however, the femoral sertae and the eggs

are in the gonystrop. E. violaceus bifidus. Anterior and longer eggs are

in contradiction to Ctenobasidae. I doubt, therefore, whether Ctenobas-
des can stand as a valid genus.
A species typicus differt: statuta minore, squamulato albido, 
genitaliter vermiculatam discr iptam atque musco expansa, in 
posthumero crurum formata, in elytris, distinctius serico-prata 
tia, fascia basali cum fascia media lata, ad extreman basi 
interrupta ut cum partialis, vere tuto vermiculatam vermi 
culatam superficiallem, per stipitem secundum atque per vientum margi 
nalem plus minuente conjuncta. Leng. 9.8, lat. 4.2 mm.

LUDER, Prov. Alba (ex coll. O. Schütte). Quatuor specimen 
aquae in Mus. Dresden et Boeumann. 

I huius in considerare se hanc ad "species," malum in 
difference in Haliotidae phalldo acutum incoyta. Proba 
h however, there exist still other intermediate forms from other 
localities. The principal mark of sementes is the more-extended 
and vermiculata-scirrhosa whitish scaling which on the pro 
humes untales appears the appearance of a cruciform figure, and 
on the elytra appara as a large median band connected by a lo 
teromarginal stripe and, on the second interspace, by a more 
or less interrupted dorsal stripe, with the basal band and the 
apical part of the elytra.

16. PACHYRHYNCHUS GEBR. MURINUS (Jacq. var. Fig. 5.)

Subulatobrachae nigro, squamulato cinerea ad dorsum obdata; 
posthumerum nigro-gracile ut in P. orbifero, sed in elytris 
mullo reducta; zona inter stratum tertium atque sextum, in primo 
secondo tertio tercio, transversa vera, alte rhombida, basi, 
altera inverso-coroniforme, in secundo tertio, unicolor, ut margin 
limina apical, naturalibus femoralibus ante et post humorem gri 
neo-anastatis. Leng. 12, lat. 5.9 mm.

LUDER, Proov. Hoon Sur, Calango (lat. septentrionali 17° 49'), 
specimen duas aquae, O. Schütte legt (in Mus. Dresden et 
Hamburg). 

W. Schultze illustrated a series of Pachyrobodaphne orbifero 
varieties from Bona Nord. The form given by him on pl. 6, 
fig. 7, seems to close close to species, but the natural area 
of the latter are widely distant from each other and of different 
form, so that a subspecific name seems recommandable.

Eumolopinaeicola Makowsky Holz. et Siles I described 11 this 
species from a single male. I obtained from the Museum at Han 
burg a female, collected by Mr. W. Jack at "Dokud" (certainly 

a. mistaken spelling of "Robus"), near Marar Poi, Hugas Subprovince, Luzon. As was to be expected, the sexes differ considerably. The sylleps of the female slope gently at the posterior end and the apex of the suture is abbreviated, forming a rectangularly truncate apical margin; the lateral margins of the slightly impressed and crenulate shows a tubercle in the middle, and, as usual, the female is larger.

The female of Ex. heananelli may be distinguished, inter alia, by a deep furrow around the free margin of the anal sternite.

In the female of Ex. subpunctatus m. the anal sternite is impressed in the apical half and this impression is prolonged on either side to the base in the form of a furrow, circumnipping a semicircular callosity.

1) Metaphotheurus curranii M. nov. Pl. 1, fig. 10.
Rufo-ascaceus, densus, lato, viridascisque equinacea, prothorace vitta lata, trinita media erecta stipes in elytris usque ad apicem continuata, nitida glabella; retort labellum fertis parte longiore, planiscollo, askugulato-rectato, sulco medio indistincto; antennae, clava nigra omphalata, rufes; fronte convexa, marginis superciliatibus alvado; prothorax lateralis longitudine acutius, lateribus posteri rotundatis, viuta media, glabra, subtiliter punctulato-villosa, striae superciliatibus per aquos costatatem occasi, solum parte vittam subcarinalem, ante distinctam, observanda, apice parce subtiliterque albo-pilosa; corpore ruber nigro, pedibus rufis, femoribus apice nigris. Long. 7, lat. 3 mm.

LUSON, Bulacan. Benguet, Hight's Place, H. M. Curren et O. Schötte lapicata (in Ms. Dresden et Brux.)

This species, by its vittigeria-colored scaling, suggests repub- blicana m. as its elytra are of ordinary form and the large, shingled, smooth, chestnut-brown stripes along the middle of the thorax and the nature makes it easily distinguishable from all other species.

Graes Pseudotettiga, p. nov. absconsa

Rostrum breve, axillo transverso, basali, sulcis, apice abrupte declivi, acrobatis laterales, brevibus, fremitatis. Oculi plena...

This new genus belongs to the aberrant “subgenus cryph- kahale” Cercuncelidae of Lecithidae, which shares the Cret- popus, Elytrodon, and others, a name on the mandibles, a distinct transverse podon in the submentum, but a short, in front abruptly and obliquely truncate, rostrum without a transverse basal furrow, a transverse abdominal furrow, the anterior cone conata, the posterior cone widely distant, touching the lateral margin of the elytra, the corona of the hind three conomera, the claws free, and other characters which indicate its systematic position to be near Coleothrips. It has some superficial resem- blance to Otolitha but is in other respects a very aberrant genus.

Nippon, squamulis permittit, inaeun, plus minusve rosscor- mionibus, oblonga; antennae omnibus rufis, prothoracis- marginem asperae superius, funiculi clava basi convolata, scopo longius, articulo secundo primo foro digo longius, squamulis tribus oblonga, sexis septemque subito- dere, clava nigra, cruciata, funiculo foro digo longius, recto houp- tatis capitis impress, duo late vagoque impress, margine supraquadato emarginata; occuli planissimae, rude granulis; post- thorace longitudine latitudini aquae, in dimidia basi effer- paralleo, in dimidia parte orbitalis paulo rotundato-amplato, rube rugosum-punctato, ante medio miliforme planiforme, glabrum; elytris oblongo-ovatis, margine basali sal lato clarant, fortior posticae-aequalim, sutura, spinae secundae quatuorque costae, hi- prussantes ad declivitatem tuberculata-interrugina, tuberculii squamulis longarius, piliformibus oblongis; femoris posticae
ELYTRAE VIX SEMPERINIMIUS, UT RELIGIOSA INDITAE, DROMO SAGMASITAS, TIBIAE MAGNIFICA INVERTIBUS SUBRIGORUS INHABEBRANTIA. LONG. 4.5 AD 5, LAT. 1.3 AD 2 MM.

LIOBON, BENGUER, MUNDOBANUM TOMAS ET BAGALÁ, G. BOTTCHER LEGIT (A DR. BAVININGE ET RANG-HASS ACQUITTA).

Blackish, covered with dust, mostly reddish, partly glinting, partly ovate, partly subiform, narrow, punctures of prothorax and elytra each boss with a fine bristle, transversely directed in the former. Antennae dark reddish, club fasciform, and nearly as long as the four preceding joints of the fanick, the second joint of the latter distinctly longer than the first, the following

![Image]

FIG. 5. *Peronitissemia submellifica* a, ventral aspect; b, normal aspect.

Prothorax covered with coarse punctures, disk on the front with a minute obsolete callus. Elytra ovate, punctata-orienta, basal margin rather broadly elevated and smoothly acute, the second and fourth intervals elevated and, especially on the disk, forming tubercles, base with long subulate scales. Hind femora unarmed, not extended beyond the elytra. Tibiae densely whitish ochre within.

13. *RUPHIUSIUS MARGINATUS* sp. nov. Male and female.

*R. parva* Fact: submellifica und longior aquis nitidae nigera, prothoraca basi unispeque in medio mangle pura, elytra mas- culina punctiforinalis irregulariter dispersa et femoribus basi apicisque, vitta apicemollin in postero aquis in tubercul re- tangularibus oblongis-sagmasitibus; antennae fasciculato tenuesia, arti- culi tergo duxerque apicibus cristulatis lineis angulatis.
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Nestor arenaptopsalis, dorsalis, robusta rectilinearia determinata; prostheque basi apicosaque fortissimi attenuata et dense duplici-torque punctata, apicis inter punctis haud suspensa; elytris indistincte granulosis, spaltis transverse subrugosis. Long. 13, lat. 5 mm.

LUMA, Monte Maquilina, F. C. Hadden leg. 8. VI. 1921.

_Eucryptus pescadorii_ Pente, without statement of an exact locality; has a dull granules upper side, densely covered between the granules with very minute latious squamules; _E. cemperi_ has nowhere a granulation and the disk of prothorax is impunctate. The new species is more elongate, with a sliding upper side. Prothorax in front and at the base more anteriate, without granules, but with a double punctation, a very fine, a coarser, and, in the middle of the base two oval blue squamous spots; of the same color are the dispersed punctiform spots on the elytra, a stripe above the front cone, the sides of meso- and metasternum, the base, and an apical spot on the legs. Two females from Mount Ranahan, with dispersed punctiform bluish or whitish spots on the elytra, I do not venture to take for females of _necupplegig._

I have also stated that _necupplegig_ is the female of _cemperi_ Pente and extremely variable as is proved by the figure given of a female with an extraordinarily rich, extended, pale design on Plate 1, fig. 2.

_Eupugnax philippinum._

Nigra, ommato squamulis granulis, metallicis, seta dense tectis; elytris creste nigrae-metallicae, muscula laterali, postmedia, nigro-decussata; prostheque longitudine latitudineque aequalis, dorso bicarinato; antennis multis granulatisque quam in _pescadorii_; fasciculus articulo terti, at elest, crepuscularius duplicis longioribus; prothorace longitudine paulo brevior (4 : 4.5), creste nigrae-granulis, disco vitta media, brevi, lev; elytris in spaltis arenato-granulis, granulis in parte anteriori multo majoribus adeque duplantis quam in parte decussi, in spaltis lateralis minus granulis atque ro-mulosis arenatis; femoris minus quam in _pescadorii_.

Long. 14A, lat. 5 mm.

LUMA, Laguna, Paso, W. J. H. legit.

This species is closely related to _pescadorii_ Bob, but of larger size and uniformly covered with moderately dense brown granules scaling; only the elytra on the sides, like _pescadorii_, have a bare, transverse, black patch.

The following key will facilitate ready discrimination among the known species of that genus:
Heller: New Philippine Coleoptera

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1 (4) Prothorax without scaled stripes or spots, elytra behind the middle on the sides with a transverse, bare, black patch.
2 (3) Scalae of body longevus, granules of the elytra not very different in size. (Hawaii) C. granulatus Bak.
3 (2) Scalae of body longevus, granules on the anterior part of the elytra flattened and much larger than in the other half. (Luzon) C. procula sp. nov.
4 (1) Prothorax with pale scaled stripes or spots, elytra without a bare black patch on the sides behind the scutellum.
5 (6) Prothorax between the two scaled dorsal stripes with coarse punctures, elytra on the base and before and behind the scutellum with small bands of along the suture with a stripe of dotted scales.
(Hawaii) C. kiskelii Heller.*
6 (5) Prothorax granulate all over.
7 (8) Prothorax with faceted punctulae intermixed with coarse punctures, on either side of the disk with a whitish scale-stripe, elytra with irregular whitish scale-striae. (Bicol.) C. mimosae Butler.
8 (7) Prothorax with sharp and dense granules without intermixed punctules and scale stripes, but at the front and hind margins with a greenish scale stripe. (Hokkaido) C. olivaceus Heller.*

though it differs from all other species by the absence of remarkable prothoracic crests for a granulate callusity along the base of the second interspace, of the elytra and by the apex which is neither produced nor singly rounded. The punctures of the elytra are coarse, squamiform on the ground, and, on the sides, rectangularly oblong, separated from each other by a small bridge. Legs short, the posterior legs extended but little beyond the third ventral sternite.

A species typica different: prothoracic and ventral tubers antica perfoliias and albo-similis; acetum distinct in transstructure.

Tolimanus, Dura, man (ex coll. C. F. Baker) in Mus. Drec- 
dec; Zambeza, fuscesc. (ex coll. C. F. Baker) in British Mus. 
In the Dresden Museum is a specimen of O. reuleaux Monts., 
from Woodlark, collected by Montreuil, which is extraordinary 
similar in the form from Minanoo, but in the latter the two black dusted gibbosityes are wanting and the white pubes- 
cent setulose is distinctly transverse.

O. gossypium Fairm. affinis and more prothorax breviori, 
siniger, subtiliter luteo-varius, elytra in parte anse media quarta 
que parte apicalis plus minuertis acido-marmentis-apumolosa, 
fascia post media, lira, margine lateralis attingente, striata, 
composita; rostro brevi roundo-punctato, in parte basali ob- 
seque adnervulis; antennis obscuris antennulis, imbo- 
truncato primo procto secondo crassus atque longus, sequenti, 
subtruncato monticellus, clavium versus gradiale crescen- 
tibus, elytra proximale vix dupla longiores; prothoraco longi- 
date nereis parte latius, granulis gibbosi, ochracea duo Curtis, 
duiro margine brevi; stigmis subepiteliale, acutum apice 
multo atro-fracostalibus; tibiae petioli vivat aurea; maris tar-
sis antilia hain longa Sphatricus. Long. 10, lat. 4 mm.

Luzon, Monte Maquiling, et terrae Sibuyan (ex coll. C. F. 
Baker).

The two males before us, one from Luzon, the other from Sibuyan, are similar to small specimens of gossypium Fairm., 
from Vili, but unlike these, both have a short rostrum and un- 
fringed front tarsi; on the other hand they are not quite identi-
with each other. The spiracles from Mount Maquiling show on the prothorax oblong rough glabrous granules and on the dorso a short carina; elytra cylindrical, in the apical fourth and in the basal half the scaling covered with a white exuvia, the former bounded behind by a blackish band, as broad as the combined lengths of the first and second ventrals, and extending to the lateral margin. The one from Silayun is a little larger, its scaling ochreous, the medias band more black marked, the granulation of the prothorax flattened and the short carina on the disk wanting. I do not venture to name this form from a single specimen that perhaps represents a peculiar subspecies.

A. chloromorphus m. affinis, elytra fortilis punctato-striati, costato-nigra, basim nigro apicem viridescens, angulis margine basali crasso microstilo, elytra postmediante, latici subapicali, emarginata; prothorace transverse, viridi-strio, prothoracem basali crasso micrato, dermis fortilis quam in chloromorphus punctatu, in angulis subapicibus postmediantibus, ut in bifo costaturo, maculae griseae tenuissimae; parapodium pedumque obscure viridi-striato, femoris apice costatilis, dentu subdentatulo, arnatico; tibiae anterius margine externo post medio angulatim dilatato. Long. 13. lat. 4.5 mm.


Allied to A. chloromorphus m. affinis black towards the base and the apex changing to metallic green, with three transverse rows of grey-haired oblong-cuneate, confluent spots. First row near the base and the second behind the middle, formed by six, the third row before the apex formed by four spots, the inner spot of the first and the second spot on either side of the second transverse row removed between the first and sixth stripe to the front. Basatum as long as the head and protho-

race costate, in the basal half a distinct dorsal forewings, on the sides costate, on the back fiber and somewhat irregularly punctata. Antennae black, second joint of funicle longer, the third shorter than the first, seventh conical and acuminated to the club, prothorax metallic green, formed and spotted like chloromorphus, but more strongly punctate. Scutellum black, nearly quadrate, larger than in chloromorphus, not increased by the sutures in front. Elytra finely punctato-striato. Legs elevate, the hind leg extend-
ing nearly to the apex of the elytra, its tooth denticulate on the distal edge.

Prasendactylus (alfroni) valdo affinis sed differt; rostro breviore, elytris convolutioribus, striis, praepectris lateribus, subdorsibus, spallis decussatis transversis subrugulatis, maculae aureotrili- dibus, holocorectis, minoresque, aliter formatis se dispositis, nam utrinque una humerali, in marginis basali elytrum intercum continua, una in quinta parte basali, subdorsalis, rotundula, quae praepectis separata, una media, inter striae tertiam et secundam, una postmedia obliqua, inter striae tertiarum et quartarum, duobus marginalibus, in quinta et tertia parte anterioribus, posterioribus rectangulare transverso aliis duobus apicalibus similaribus utin alfroni dispositis, proterea parte basali elytrum aurum mixtum. Long. 11, lat. 5 mm.


This species is so nearly allied to alfroni that at first I was of the opinion that, considering the longer striae of alfroni, this form may be the female of Hadden, but anatomical examination proves that both specimens are males. The shorter striae, the fine transverse rugose interspaces, the four striae, and the different disposition of the spots in Hadden, speak for a distinct species.

A. alfroni Marshall varietas, sed paulo longior, antennis articulis primi funiculari quinque sequentibus simplex aspinulosis, secundis et tertio, crostacies longioribus; pronotum granuloso, maculis confluentis, in dimidia basali solido medio oblongo, lobo acutissimii acutangulis; acutello minore, humerali, striae breves, antecostarum loco, crostacies longitudinale, per totam longitudinem manifeste granulatis; costae anticae reniformes, foveolae antice intermedium deinu, lato, acutius dentis denticulatis, armata, postice dentis minuto, antecostarum abdominale quadratum distantia sequentibus, striae antecostarum dentium, margine internum, in primo trium substitutata, reticula simplicibus; angulorum basali. Long. 9, lat. 5 mm.

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In outline similar to *A. diploporygi* G. A. R. Marshall, but a little longer. First joint of antennae as long as the five following together, second and third longer than thick. Prothorax with acute scutellar hole and an indistinct medial furrow in the basal half, the granulation less dense, the granules larger. Elyttes smaller, not transverse, confined in front by the sutures. Shoulders of the elytra prolonged, interspaces moderately convex, at full length distinctly granulate. Anterior and intermediate femora with a large tooth, destinctive on the distal edge, posterior femora with small teeth and extending beyond the fourth ventral alarline. Front tibiae enlarged in the basal half of their inner edge, without subapical teeth. Claws falcate. *Albosus mariei* m., from Madura, differs from *serico*, inter alia, by the conspicuous anterior cuneus and the conspicuous interspaces of the elytra.


Ex affinitate *A. pedunculifer* Pacc. (—tricostalis Hu-belti), sed prothoracem longitudine distinctae laerores, similiter albo vitatae, sed subito maculam lateralem vitta nigra, in elytrum triaentari basali continuata, utque brevi lacte; antennae sub- tricostalis, stramineo elytris, ut pedunculifer religio, fuematine-fusca, spatium quart ad bicus, apicibus in tergo quarto albo-vitatae, fascia media straminea per suturam intersticem interrupta, subito ductus rectangulati, subtruncata, post subdrama, in spatium primo puncta obtusa, in spatium secundo quattuor vitta nigro-velutinae determinata, femoribus pallide hirsutis, in dimidio parte basali atque puncta, interdum oblonga, in parte truncad, alba; tibiae in margine latera baud subdilatatae, corpora subala approximate fusa, sine squamosid setiferibus albo elyptico. Leng. 6, l. 3.7 mm.


Similar to *A. pedunculifer* Pacc., but the prothorax broader and the general color of the scaling more chrysid-like brown (instead of fuscous); the postmedian whitish band of the elytra


*Est. Deutsch Botschaft (1906) 171, pl. 1, fig. 4.
interrupted by the pale brownish suture; prothorax below the lateral margin, as also the elytra in the first quarter of lateral margin, on the base of fourth, and behind the middle of the seventh interspace, further, behind the white band, on the second and fourth interspaces, with a velvet-black stripe and on the first interspace with a spot of the same color; before the white band, base of the fifth punctate stripe on either side with a nearly square black patch. Legs pale brown, in the basal half whitish, on the elytral part with an often indistinct whitish spot.

*Pachymerus levis* sp. nov. ***MAD.*** P1. 1, fig. 12.

Nigra, prothorace densa, elytra, apices singulis rotundatis, maxima parte pilisata intercostitibus interdita, his infra strium tertium pleno, basali, oblonga, in sutura costitibas atque latitragae vitta, a humeris suturae medio versus curvatae vititique dislium, una laterali, antea abbreviata, alba in distibus parte apicali, subhastata, sed apicem haevam attingente; subcostatae nigrofulvati, prothorace longitudinalibus lateribus (2 : 3: 4), albas media, in impressione oblongo-ovata, uti tipicae antea subcostatala, declivit, basi, striata in medio, vitta pallidiora, in elytris brevis compressa; puncto oblongo-tenuissimae; elytris latitudine plus duplo longitudinalibus, stellis spatulatis, convexusculis, latitudine acqualibus, callo subapicale stulto; corporis suturae pallidissima. Long. 6, lat. 2.4 mm.

**MINDANAO,** Kolumbogan (ex coll. C. F. Baker).

Black, densely interstly pitted, metrum nearly cylindrical, about one-third shorter than the prothorax, at the base higher than broad and wider than in front, moderately densely punctate, vittae in the basal half punctatae-atractis. Antennae dark red, inserted before the middle of the rostrum, club spindle-shaped, longer than the funicle. Prothorax at the base a little broader than long, disk with an oblong-ovate impression. Scutellum oblong-tenuissimae. Elytra more than twice as long as broad, without a subapical callosity, simply rounded on the apex, only the first interspace distinctly convex; at the base, between the third strie, a dark gray spot, prolonged along the suture; farther on either side a stripe running from the shoulders towards the middle of the suture; on the sides, another stripe, abbreviated at the base and a third stripe in the posterior half, near the suture, but not extending to the opaline margin, of the same gray color. Underside densely yellowish pollinosis. This is the first known Philippine species of this widely spread genus.
Helle; New Philippine Coleoptera

H. TRAPONUS (H. MEUENTZA) 440. - Fig. 3. pl. 12.

Niger, sat denso odcrovo-simillimus; rostro prothorace breviore, subpedunculoso, paulo arredato, scrobilosis lateralis; antennis in aerando triangulo rostrli insertis, scopo oculis attingento, fuscicoque oculentato; prothoraco longitudinalis latioris, maxima latitudine ante medianam, basi recto truncato, fortius densoque punctato; elytris latitudine quartae partes longiores, hiem utrinque subcurrantis quam thoraces basi paulo latioribus via angulis posticis anguletundibus, later striam tertium fascia pal- lidibrunneola, dense, necro proca maculis minucis, tribus, nigric, nam una prope axi, alia prope fasciam, tertia ad decurritatem; spatio convexitascula aliqua remote, exterioribus densis fortiusque serratis-gradulatis; femoribus sideribus habitis, posticis ely- tris angulis vix attingentibus; tarsi supra albido pilosis.

Larg. 4.5, lat. 3.5 mm.

MINASAO, Surigao (ex coll. C. F. Baker).

Dorsum black, hidden by moderately dense, dull yellow outer scaling; prothorax on the posterior angles with a triangular spot, elytra between the third striae just before the middle with slightly curved band of pale ochre, three ovoid dots on the third interval, one close before, another behind the pale band, the third, on the beginning of the declivity, black. Rostre dorsose with three embryos, abbreviated in front. Prosternum granulato punctato, with a carina above the eye. Antherae with the falcide asin-jointed. Prothorax transverso, beyond before the middle, lightly scalid, densely and, especially along the bases, very closely punctate, interstices of the punctures minutely granulato. Elytra ovato, narrowed in the sixth fourth, one and one-fourth as long as broad, broadened before the middle, on either side of the base gently sinuate and embracing the hind edges of the prothoraces; stipes fine, remotely and loosely punctato; intervals slightly convex and remotely, the externalae sharper and more densely granulato. Legs stout, femora unarmato, without a furrow beneath, hind pair hardly reaching to the apex of the elytra. Tarsi with pilos pilos above.

I have described this species provisionally as a Traponus, giv- ing an illustration of it which will exclude all doubt as to the validity of that species, though it is certainly as little a Traponus as some other species described.

1. SCYMNOTYRUS 440. - 

2. SCYMNOTYRUS m. valde affinis, sed minor, prothorace plus trans- verse, margines antice haud pro-epiasto, in dimidia parte basilii,
In loco maris, vitta media, interdum fere exannemata, intercutite; cyfris spadix in tritice basili bidentato-quadriantes.
Long. 5 ad 6 mm.

Manusatō, ligens et Kolambagon.

J. Fauve established the genus *Sedaria* upon a species from Peru. Later I published a new species from Cape Enga, northern Luzon. W. Schultze also mentions Calayan, one of the Babuyan Islands, as the locality of its occurrence. I must call attention to this error because the single specimen from both localities mentioned are not quite identical, and under such circumstances it is doubtful that they represent local races. This matter can only be cleared up by means of copious material. The following key will illustrate this best.

1. (2) Prothorax on the elbok with a tectile bristle with black bristles, clytra on the second quarter of the elbok with a black bristles. (Cape Enga.) 2. *E. deflexa* Faut.
   2. (1) Prothorax without a black setae tektiles before the elbok and the clytra without a black bristles on the second quarter of the elbok.
   3. (4) Sedaria circular, alata greyish seme, the alternate intervals and the clytra with more erect, remotely ciliate, short and thick setae, prothorax with a transverse row of four black setae tectiles. (Babuyan.) *E. sedaria* Heller.
   4. (3) Sedaria rectangular or oblong, prothorax without a transverse row of tectiles, clytra as the alternate intervals without short, thick, and remotely setae.
   5. (6) Prothorax in the basal half along the elbok with an ovate yellowish spot, clytra as the alternate intervals of the basal half with remotely ciliate, minute shining granules. (Cape Enga, Luzon.) *E. deflexa* Heller var. (typicus).
   6. (7) Prothorax in the basal half with a square, in frons slightly rounded, yellowish spot; clytra as the alternate intervals with shining granules on the intervals. (Calayan Island, Babuyan.) *E. sedaria* Heller var.
   7. (8) Prothorax more transverse, frons margins less produced than in sedaria, with two black setae apicis, in the basal half with a yellowish line along the elbok, alata without ciliate granules intervals. (Babuyan.) *E. deflexa* Heller var. nov.
   8. (9) Prothorax in the basal half, along the elbok, with a yellowish stripe only twice as long as broad, without a black setae spot on the frons margins. (Calayan Island, Babuyan.) *E. deflexa* Heller var. 7
   9. (5) Prothorax without a pale middle line in the basal half, upper edge of mesepimeron without pale scaling. (Calayan.) *E. deflexa* Heller var. 7

*E. deflexa* Short (1933) 22.
*E. deflexa* Jour. Soc. (1932) 142.
4.2

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II. NAUPHRYS ACHROPLAGIUS (new sp. Male. Par 1, fe. 1.

N. decretus m., affinis, sed aliter signatum; costae latitudinis
fore triipy longiores (1:2.9), creberrime subbilobata, longitudi-
nalisque ramosae; antennae redi, funiculus articulorum subhom-
vomus, elytra quadrangulata; pedunculus valde tenues, vitta
subquadriguttata, lata, elytra recta basali, sagra striata sexta ac
par vittam, in apice primo, cum funicula anterius conjuncta
quartae parte, apicali, at corpore subtilis, estaco-aparensis,
sutura ad basis cella elongata, granulata maioris circiter quin-
quo obulta. Long. 10,5, lat. 6,4 mm.

سام (see coll. C. F. Baker).

I have before me only one female of decretus m.10 and one
male of the new species, and therefore it is possible that a few
of the observed particularities of the latter are sexual dif-
ferences. Superficially speaking, one may say that all the hop-
like figures of decretus appear filled up in alboplatius with
white scaling. For the specific value of it speaks the ovate
and granulate base of the elytra, the transverse of which are
larger than the rest of the elytra; the second interstrial space
is broader at the base than the third, while the contrary is true
in decretus. The sutures in the latter species, at least before the
deptivity, is as broad as the second interspace, in alboplatius
it is much narrower and the tenth stripe is continued to the apex,
whereas in decretus the tenth stripe extends only to the apex
of trapezium.

III. ANALYPYX INNAEICORIS (new sp. Male.

A. colorata Fuss, ex Java, affinis, nigra; pedicel, genaeus al-
grais exceptis, segmentique annulli redi; rostra rubi, seta
remote punctata; antennae funiculi primo incisata, longitudinale istiu-
dini aequali, secunda latitudinis parius longior; pedunculi labi-
tudinis acque longiores, remoluis quam in castore punctato.
lineae basales in vertice stigmo costellate, vitelliformis, heter-
triznalisia; elytra, inter striata sexta, plaga, vitta, alta sepa-
dum trinnasum sexta ac par sumum divisa, redi; pygidio hcro-
protrusi, striato impae carinae dorsalae at basi signis, ad bullae
alterius conjunctae. Long. 9, lat. 1.2 mm.

المك (see coll. Mayling, P. C. Hadley lodged 17. IV. 1931.

Allied to innaeicoris Fuss 11 but easily distinguished by the
much longer proepisternum with three pale lateral stripes and the
labrum pygidial with a black stripe on either side of the middle

11 Ex Brit. rising 9 (1930) 265.
ker confluent to the base. Dorsal patch of the elytra ovate, laterally determined by the sixth stria, halves by the black suture. As this red patch is very variable in extent in *coleopterus Faust*, it may also be so in *lincophorus* of which I have only a single specimen before me.

6. COLEOPTERUS PLEURITIS (DE BELLEAU) sp. nov. (Fig. 14.)

C. (Pheneophorus alin) sordido Germ.45 similislingeri, lineo prunoseae parce longiore, ante minus alepeque exserrata; elytra brevioribus, subovatis, sutora spatuliforme glabrescente, uniseriata punctatis striae punctatis multo latioribus.

Long. 11. lat. 4 mm.

Luzon, Masbila. Legit Dr. O. F. v. Möllendorff; "Philippines" legt W. Jack 1910; Nora Borneo, legit John Waferstraat.

Like *sordido* Germ. black, incertis with a wulstike elevation; prothorax a little longer, on the sides less rounded, less abruptly attenuate in front; elytra shorter, more cordiform, intervals flat, broader than the slightly impressed convex of somewhat remote and corser punctures.

This species may possibly be confined in collections with *C. sordido* Germ., a common and widespread species which also occurs in the Philippine Islands. In the Dresden Museum the following localities are represented by specimens: India or. (ex coll. Delben-Faust); Cambodi, Kampung Toua (Vitalis de Solinsa); Capiz (Dr. W. Herp); Andaman Islands (Mertens); Malacca (Dr. Staallinger); Sumatra, Dali (Deviinet); Java (R. Frischefer); North Borneo (C. Wahlen, coll. W. Müller); Celebes, Makassar (C. Ribbe); Lombok, Sapor (H. Frischefer); Philippines, Mindanao (C. F. Baleit); Arac (C. Ribbe); New Guinea (Dr. P. Sarmolin and Alex. Bau); Madagasso (Sohn, Chr.). (C. Ehr.), Fernando Po (ex coll. Dr. P. Zander); Madura (W. Schmoor) and because *stictus* Fabr. falls under the synonym of *sordido* Germ. also Brasilia (ex coll. forest).

6. XENOPHORUS OCTOMACULATUS (de BELLEAU) sp. nov. Malaya.

Niger, corporis posteri omina cinereo-prunare, prothorax cinctis elytrisque sordidentibus, posthiles atrigirris, punctiformibus, dente adpersis, illis striae in discis, his ad humeros australis atque inter striae currendo et sextam maculam malae, antem...
clara, ut sulcata, elliptica, elliptica, inter striata sternum ut to-
nam, albo-lanata. Long. 10, lat. 3.5 mm.

Intilias Philippine, ex coll. O. Schütze.

Allied to X. albarus m. but larger and the gray toment of the
dark brown underside dispersed in moderately dense round
dots with a very minute center bearing a short, often broken, har-tsi-
ne. Prothorax with an indistinct black stripe along the middle
and a well-marked roundish black spot on each side of the disk.
Elpers with similarly disposed but deep velvety black spots; name-
ly, a small one on the shoulder, a larger one before the middle
between the second and sixth stripes, and an oblong one before
the apex between the fourth and tenth stripes.

Eupitheca bergmani m. var. Mac. Fun. 1, fig. 9.

Niger, prothorax olyriques similiter ut in interregnumico m.,
linea, albo-lanata et pruina, nam in prothorace olyriques
una marginalis, alba submarginalis, una in erathis uque ad se-
mutum spallae secundae extensa, junta spinulis et glandulis puncta
in apicem primo, alba in spatii terrii cripte spinis, cum alba
marginalis, anis abbreviata, in spatii extremae conjuncta; cintillo
nigro, vittiforme, corporis subhilaris clorsens, prothorace
vitae inframarginalis, neopetrae, metopopetrae, metopometa-
pæte vitae margo et albo-lanata; pedo rude cupulata, carina media.
Long. 8.5, lat. 3 mm.

Intilias Philippine (sine loco accurato) ex coll. O. Schütze.

Prothorax and elytra as in interregnumico m. but purer
while striped, the former more alternate in front and the white
stripes, above the anterior cone, equally curved upwards, includ-
ing a black elliptic spot. Scutellum linear, a little broader at
the base, acuminate at the top. The white incised stripes on
the second interspace of the elytra surpassing the middle and
continuing to the apical third part of the third interspace,
that of the sixth interspace abbreviated in front and closely connected
with the former at the apex. Prosternum parallel, as long as
broad, with moderately remote, ringed punctures. Prosternal
white in the middle of the posterior margin, and thence upwards
to the posterior angles of the prothorax.

Eupitheca bilineata m., very closely allied to interregnumico
m. I formerly took to be a female of the genus Ceri-
diceras, but it should be transferred to Eupitheca, because this

* Del. Mitt. Br. (1770) 215, pt. 6, fig. 7 and 10.
* Lec. cit.
vicarious species from Borneo certainly has likewise an un-
clipped club in the male. The same is true of Conocephalus
flavopiscola Holmch., which is at most a local variety of Ep-
ithothrix elypus Kelaart. The former comes from Davao, on
the southern coast of Mindanao, the first from Sibuyan, a prov-
ince in northeastern Mindanao. It differs from the type's species
by the different shape of the pale spots on the elytra; namely,
the subhumeral spot is not pointed toward, but nearly rectangular
transversely, the postmedial band is not pendent, but sharply
delimited behind, and the pale external stripe, in the first third,
extends gradually towards the base to the first and second in-
tervals.

**Conocephalus flavopiscola** (Boh.)

*C. intercalari (Boh.) affinis, sed alba albuscinti; antennae ar-
tieno terete nodosae sequentes, amplissimae; pronotum lati-
nimum lineae albae dorsum sequentes, dorsum articulati, ad latus
varioidea-punctata ut in laterali lineae albo-bistriatae tribus;
elytra post minus attenuata, sutura alba secolium cruciatae,
marginos basali ultra striam quintam, inaequaliter productae,
linea alba subamplissima, in primo terciis radum brevissimum
intus implectum, sutura in primo terciis ut pictura angularis,
comnun, in sutura secondo trientent incipiente albo calvum,
subanthis versus currente albo-bistriatum. Long. 10, l. 4 mm.

Isola Panay (ex coll. C. F. Baker 29295).

This is one of the few species of the genus without a white
crustiform design on the elytra, and the male is without a white
crustiform design on the elytra. Antennae with the third joint shorter than the two following
combined, each barely twice as long as broad. Prothorax as
broad as the middle line in long, coarsely reticulate; the sides
more flattish and smooth-crenulate. Scutellum subangulate,
inclosed by the sutures. Elytra (of the male) with four denticles
on the basal margin, towards the apex less attenuate than in
intercalari Boh.; sutura in the first third narrowly bordered with
white; the white lateral stripe, on the fifth interspace, extends
but a little beyond the first third of the elytra and forms then a
short bruchus, extending inward to the fourth interspace and
then prolonged on the sixth stripe, away over the subapical cul-
tility, to the apex of the first interspace. Sutura in second third
with an angular white band, the branches directed backwards.
and connecting the white lateral stripes. Hind border of the pronotum with sharp rectangular angular edges on the sides.

**SCARABÆIDAE**


This genus was described by J. Moore in 1907 from a single, supposedly male specimen. A specimen before me, doubtless male, with only two anterior tibial teeth, collected by the late G. Schütze on Mount Cebu near Montebello, Rizal Province, Luzon, shows that Moore's statement of the sex is erroneous in that he believed a female to be a male. The illustration (Plate 1, fig. 7) of the male specimen from Mount Cebu, to which I add a text figure of the forewings, proves this, and also that both sexes of this genus have a broad median impression along the abdomen.

**LOCATIONS**

W. Schütze makes no mention of the occurrence of *Podoconeus bivitis* in the following localities: **Luzon**, Ta-yahoa, Bulacan (C. F. Baker leg.); **Mindanao**, Zamboanga (J. C. Hadden leg.).

To other known localities of *Metallithus peronii* Hope I can add **Panay** (C. F. Baker); **Mindanao**, Zamboanga and **Luzon** (J. C. Hadden); **Luzon**, Mount Makiling (C. F. Baker).

Copious material of *Niponius*, collected by Mr. F. C. Hadden and kindly sent me for study, has convinced me that *Niponius suavissimus* McL. is based upon large specimens and is former Bultia var. *—Metallithus* Jeannel (loc. Westw.).**1** and *N. javensis* Jak., *—Metallithus* Westw. *Niponius suavissimus* Buckl. has priority over *suavissimus* Mcl.

**NOTES**


*Ent. Phil. Coleg., (1913) 117.*


*Le Naturaliste 27 (1901) 31.*

*Sci. Nat. 24 (1906) 462.*
ILLUSTRATIONS

PLATE 1

Fig. 1. Serpulae seminariae op. nov., male, Minboldo.
2. Serpulae seminariae op. nov. (= koreanae Ritter), female, Minboldo.
4. Pseudartus artifex varicosa subsp. nov.
5. Pseudartus artifex varicosa subsp. nov., Minboldo.
6. Apohera hemostatica op. nov., Minboldo.
7. Pseudartus harpactus var. nov., Minboldo.
8. Euphyllia artifex var. nov., Minboldo.
10. Euphyllia artifex var. nov., Minboldo.
11. Euphyllia artifex var. nov., Minboldo.
12. Euphyllia artifex var. nov., Minboldo.
15. Euphyllia artifex var. nov., Minboldo.
16. Euphyllia artifex var. nov., Minboldo.
17. Euphyllia artifex var. nov., Minboldo.

TEXT FACING

Fig. 1. Coruja seminariae op. nov., male.
2. Coruja seminariae op. nov., female.
3. Pseudartus artifex varicosa subsp. nov.; a, ventral aspect; b, lateral aspect.
4. Pseudartus artifex varicosa subsp. nov.; a, ventral aspect; b, lateral aspect; c, lateral view from behind.

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NEW OR LITTLE-KNOWN TIPULIDAE FROM EASTERN ASIA (DIPTERA), XII

By Charles P. Alexander

Of Amherst, Massachusetts

TYPICAL GENUS

TIPULA (AERIALIS DESERTA) sp. nov. (Fig. 1, a, b; Fig. 2, a, b, c, d).

Antenna: 13-segmented, unusually short; flagellum bicolorous; terminal two segments more or less fused; mesonotal processus gray with four grayish brown stripes that are narrowly bor- dered by dark brown; spines of tergum of halteres brightened; femora obscure yellow, the tis blackened; wings whitish to pale yellowish skyblue; variegated by dark and pale brown; a large dark brown postcircular darkening; dark area in stigma field interrupted by a pale spot at proximal end of stigma; male hypopygium with hastate sternum with a black spine; cerci of ovipositor slender, with smooth valves.

- Contribution from the entomological laboratory, Massachusetts State College.
Male—Length, about 16 millimeters; wing, 19.
Female—Length, about 18 to 20 millimeters; wing, 16.5 to 18.5.
FrONTAL PROLAPSE of head reddish yellow, darker above; antennae elongated, brownish black; palpi dark brown, paler at junctions. Antennae (male) short, less than the palpi; basal four segments yellow, the succeeding segments brownish, darkened basally; the remainder obscure yellow; only two antennal segments, the small apical one further partly fused with the phallic lamina; venter considerably exceeding the segments in length. Head with front and orbits light yellow, the vertex intensely.
Mesonotum pruinous gray, with four grayish brown stripes that are narrowly bordered by dark brown, the intermediate pair confluent at cephalic ends; each scutal lobe with two dark areas that are unmarginated; median area of notum pale; scutellum and notaulic areas gray; a narrow, continuous, dark brown median line extending from scutum to base of abdomen. Pleurae ochreous pale, the pleurotergita in front golden yellow. Halteres darkened, the apices of halteres narrowly yellow. Legs with the coxae and trochanters yellow; femora obscure yellow, the tips narrowly and conspicuously blackened; tibiae and tarsi brown to dark brown. Wings (Plate 1, fig. 1) with the ground color white, whitish in pale yellowish subapical, the disk chiefly covered by pale brown; pterosternal cells light yellow, cells C and Sc more brownish yellow; darker brown markings, as follows: A large postapical area in bases of cells R and M; origin of Rs; stigma, the last preceded by a conspicuous white spot in the center of a darkened cloud that extends from tip of Sc along outer end of Rs to stigma and thence along the anterior cord; posterior cord; a spot at near midlength of Cu and a spot at end of v. Rs A less distinctly darkened; the ground subhyaline areas include the subbasal portions of cells R and M; most of cell R; before the stigma; a broad fascia beyond the stigma, extending from costa into base of cell M; an area near outer end of cell M; white marginal spots in cells 3r and A (two areas in each cell); basal portions of cells Cu and 1st A variegated with whitish or pale yellow; veins brown. Veins Rs and R4+5 with abundant maculiphore. Venation: Rs4+5 entire but pale yellow, without trichia; Rs long, approximately three times m-cu; the latter somewhat variable in position, from just before to just beyond the fork of M4+5.
Abdominal tergites obscure yellow; the basal segments in male with a very conspicuous brownish black median stripe; in female, the basal and intermediate tergites are reddish yellow, darker sublaterally, the borders narrowly guttulate; terminal segments and genital shield blackened. Male hypopygium with the tergite divided medially by pale membranous or very thin chitin, with a serrulate blackened plate on either side of middle. Basitarsus (Plate 3, fig. 25, 3) with a powerful black spine. Distal tarsus of, as figured. Ovipositor with the central entirely absent for the underside, almost as in the typical subspecies of Tipula, slender, not transverse, the margins without denticulations; hypovalve developed, extending caudal to end of genital shield.

Holotype.—China (Shanghai).


Of the four species of Tipula now known from eastern Asia (including Siberia, Tibet, China, Japan, and Formosa, as well as the Himalayas), the present is the species unquestionably to find its nearest ally in Tipula (Peregrina) voss Alexander (Japan: Honshu), which differs especially in the structure of the male hypopygium. The slender, mesosaccus out of the ovipositor different from those of all species of the subspecies known to me, but unfortunately, the female sex of several species, including this, is still undescribed.

Tipula (Peregrina) vossiana, as new. Plate 3, figs. 25, 26: Plate 4, fig. 26.

Mesonotal pronotum silvery, with four brown stripes that are narrowly bordered by darker brown, the intermediate pair with their anterior ends abruptly pectinate; femora obscure yellow, the tibiae blackened, preceded by a rather yellow ring; wings pale yellow and brown, variegated with darker brown areas, including a conspicuous postocular one; mesonotum in the third the length; male hypopygium with coxal margin of tergite terminating in two widely separated rounded lobes; outer distitarsus elongate, narrow, sinuose; basitarsus unarmed.

Male.—Length, about 15 millimeters; wing, 15-6.

Proximal prolongation of head light yellow above, slightly infra-

median laterally, nasus long and slender, black; palp brownish black. Antennae with coxae and pedicel light yellow, flagellum black; flagellar segments subcylindrical, the basal enlargements fleshy developed; longest verticils subequal in length to the seg-
Head yellow, the center of vertex darkened.

Ground color of mesoventral præcutum silvery on sides, the interspaces more yellowish, the disk with four brown stripes that are very narrowly bordered by darker brown; anterior ends of intermediate stripes abruptly paler, more silver; antecutal lobes yellow posteriorly,each with two dark brown areas; cerci and mediotergite similar; a capitular brown vitta extends from the transverse sutures to the abdomen. Pleura chiefly golden yellow, Halteres with base of alae and apex of knob yellow, the remainder of stem pale brown, the base of knob dark brown. Legs with some light yellow pollinose; trochanters yellow; femora obscure yellow; tibiae obscure yellow, the tips rather narrowly but conspicuously blackened, preceded by a slightly clearer yellow ring; tibiae dark brown, the bases paler; tarsi brownish black. Wings (Plate I, fig. 2) strongly narrowed at base; ground color pale yellow, the coloration chiefly concealed by an extensive grayish brown pattern that covers most of the disk, exposing the ground as follows: Preabdominal region beyond the post-acicular darkening; a very tiny area before origin of Rs; cell R 1 before stigma almost entirely pale; post-stigmatic crossband to cell 1st M 2; near outer end of cell M 2; posterior half of cell 1st M 1; in basal half of cell Cu 2; two spots in outer end of cell 1st A 1; both ends of cell 2nd A 1; cell C chiefly pale; darker brown areas in bases of cells R and M 1; origins of Rs and along vein Cu 2 in alignment with this stigma; entire wing tip unvariegated by pale color; veins dark brown. Venation: macro consisting with M 1, at twice-thirds the length.

Abdominal segment one and basal ring of two light golden yellow, darkened medially; succeeding segments almost uniformly dark brown, the caudal borders of segments two to four faintly paler; basal sternites yellow, the outer segments dark, gray pruinose; outer segnments, with hypopygium, dark brown. Male hypopygium (Plate 2, fig. 36) with the tergite separated from sternites by membranous basipostclypeal complex, with a triangular area partially delimited from sternites dorsum of tergite. Ninth tergite, 97, as viewed from above, with two flattened reddish lateral lobes, widely separated, clothed with delicate pale setae; space between lobes transverse and blunted; dorsum small area of tergite pale but membranous, as is the case in several other species of Ventilpes; viewed laterally, there is seen to be a second lobe ventral of the one described, the margin between the two with abundant pale setae. Basistyle, 6, and eighth sternite, 8, without spines. Outer distal style, 6, unusually long and iden-
der, sinuous at near midpoint, the basal half stouter than the outer half. Inner discal cell, with anal base slender, blackened, separated from the terminal hols only by a linear curved spine.

Habitat—China (Shandong).

Holotype, male, Kwanhsien, altitude 3,000 feet, August 16, 1939 (French).

The slender ally of the present fly is *Typhula* (Wulp), *arisanensis* Edwards (P Farquhar), which differs in the even smaller size, male anal flagellar segments, unmarked penultimate stripes with the median one entire on anterior portion, and the detail of wing pattern, such as the restriction of the yellow ground in bases of rods R and M, before the stigma and in base of cell 2R A, and its increase in amount before the origin of Rs. Both species show the uniformly darkened wing tip and the unusual position of apex before the fork of Rs. Unfortunately the male sex of *arisanensis* is still unknown.

*Typhula* (Ctenophlebia) *hirudinacea* n. sp. from 5, fig. 1; from 5, fig. 4.

Belongs to the *hirudinacea* group; allied to *hirudinacea*; mesocerebral preeurialium, acetum, and scutellum almost uniformly brownish gray; medianscarphus light yellow, the center of the disk dark brown; phara yellow; wings tinged with brown, the costa region and stigmata darker; male hypopygium with the median lobe of tergites wider, depressed, the caudal margin deeply notched, each lobe distinctly set with small black spines; inner discostyle with a powerful curved blade and a slender auxiliary spine, additional to the usual branch.

Male—Length, about 34 millimeters; wing, 27.5. Hind leg: foreleg, 20; hindleg, 20; last, about 20.

Frontal prolongation of head dark reddish brown; meso dark brown, antennae; palpi dark brown. Antennae relatively short; scape brown, pedicel yellow; flagellar segments weakly binaromous, the basal enlargement darkened; the apical portion obscure yellow; longest verticils more than one-half longer than the segments. Hind brown, the posterior orbits narrowly yellowish. Pronotum brownish yellow, the scutellum darker. Mesosternal preeurialium, acetum, and scutellum almost uniformly dark brownish gray, the preeurialium with very indistinct darker stripes, the lateral margin obscure brownish yellow; mediancarphus light yellow, with a large brown apex occupying much of disk. Pleura, including propodeum and dorsoparietal memhranes, uniformly yellow. Halteres darkened, the apices of knobs obscure yellow.
Legs very long; coxae and trochanters yellow; femora light brown, the tips rather narrowly blackened; tibiae and tarsi dark brown. Wings (Plate 1, fig. 3) tinged with brown; cell c and especially cell Sc darker brown; stigma brown; oblique area before cord reduced in size, incipient. Veins: Rs short, suboval to m; petiole of cell Rs subequal to m.

Abdominal tergites brownish yellow; the basal segments narrowly darkened sublaterally, the 9th and succeeding segments, including hypopygium, brownish black. Male hypopygium with the median lobe of tergite (Plate 2, fig. 25, 26) broad, depressed, the caudal margin with a deep U-shaped notch that has about the same general outline as that of the females, the latter densely set with blackened spinous points. Outer distylate, ad, broad on basal half, the spinous portion somewhat narrower. Inner distylate, of, with the outer portion a powerfully flattened curved blade, pliable, terminating in an acute point; in axil between this blade and the usual spinous base of style a slender needle-like rod, its tip subacute; apical base compressed, the margin flattened.

Habitat—China (Takamatsu).

Holotype, male, Mount Omori, altitude 4,500 feet, August 5, 1931 (Pened).

The only other member of the genus that has a hypopygium at all like that of the present fly is Tepesia (Aeschnidae) biculata Alexander, likewise from Fuchinabe. This species has the median lobe of the tergite narrow, only feebly notched, and with the inner distylate of quite different configuration.

*Eosphora* (Eosphora) *platycerus* sp. nov. (Plate 9, fig. 10).

Belongs to the *wenderi* group; allied to *vervivodes*: mesonotal precoxalum, scutalum, and scutellum dark gray; mesostigma declawed medially, bordered by yellow; pleura yellow; oblique areas of wing incipientous; male hypopygium with the median lobe of tergite narrow, the tip simple; inner distyled with a slender blackened base, the outer lobe very broad and flattened, terminating in a small spine, with a second spine on outer margin before apex.

*Male*—Length, about 29 to 35 millimeters; wing, 20.5 to 25.5. 

Preanal prolongation of head yellowish brown, narrowly lined with darker; maxilla elongate, blackened; palpi black. Antenna with scape brownish yellow; pedicel oblong yellow; flagellum weakly blackened, the basal enlargement darkened, the remainder obscure yellow. Head brownish gray, the posterior orbits mar-
rusty pale; anterior vertex relatively narrow, at narrowest point about twice the diameter of eye.

Maennomochlora dark gray; the parasomata yellow; meso-distal tarsus dark medially, broadly margined with yellow. Pleura yellow. Haltere brown, the base of stem narrowly pale. Leg with coxae and trochanters pale yellow; femora obscure yellow, the tibiaa blackened; tibiae brown, the tarsus brownish black; tarsi chiefly brownish yellow; the apices of the segments narrowly darkened. Wings with a strong brown tinge, the prescutellar region, cells C and Sc, and the stigma darker brown; oblique area distinct before stigma but not only slightly evident before the corse, much less than in *Tiphiana*. Venation: Petiole of cell M1 variable, subequal to or shorter than M1; M2 at or just before fork of M3.

Abdomen with basal four segments reddish brown, the tergites narrowly margined laterally with yellow, lined internally with a faint dusky edge; segments five to nine brownish black. Male hypopygium with the median lobe of tergite (Plate 2, fig. 26, 31) unusually slender, narrowed to a single point that is densely set with abundant black spinous points. Outer distityle, 1d, a flattened, long-cylindrical lobe, the apex obtuse. Inner distityle, 1d, with the base unusually slender, blackened; outer lobe of style very broad and flattened, terminating in a small spine, with a second spine at outer margin before apex.

Holotype—China (Szechwan).

Holotype, male, Kwanchel, altitude 4,000 feet, August 17, 1900 (Frances). Paratypes, male, August 19, 1900 (Frances). Paratypes, 2 males, Mount Oomi, altitude 4,000 feet, August 8, 1921 (Frances).

The only near ally, *Tiphana* (Arctipana) evanoe Alexander, is generally similar in appearance to the present fly, but the male hypopygium, especially in the structure of the inner distityle, is quite different.

**TIPHA CEPHEUS** sp. nov. Plate 1, fig. 1; Plate 2, figs. 30 to 31.

Mesosomal pronotum brownish gray, with four darker brown stripes; pleura uniformly light yellow; antennae (male) relatively long; tegument beyond lobe segment black; wings strongly tinged with brown, cells C and Sc conspicuously darker brown; cell 1st M1 small; abdomen orange, the tergites with a median black, villos that is narrowly interspersed; male hypopygium with a single distityle; eighth sternite bearing a large pale lobe that is profoundly divided medially.
Male.—Length, about 15 millimeters; wing, 19; antenna, about 6.

Frontal prolongation of head dark brown, shiny; nasus elongate; palpi brownish black. Antenna (male) relatively elongate; scape and pedicel chiar light yellow, first flagellar segment brownish yellow; remainder of flagellum black. The extensive tips of the individual segments a little brightened; basal enlargements of segments moderately developed; longest verticils sub-equal to the segment. Head chiefly dark brown, the front pale yellow.

Notornal pronotum brownish gray, with four dark brown stripes that are but little conspicuous against the ground, the intermediate pair separated by a more blackish median vitta; posterior portions of notum concealed in the unique type. Pleura uniformly light yellow.

Halters dark brown, the base of stem narrowly pale yellow.

Legs: with the coxae and trochanters pale yellow; femora always yellow; the tips narrowly but conspicuously brownish black; remainder of legs darker brown; clava (male) toothed. Wings (Plate 1, fig. 6) strongly tinged with brown; cells C and M darker brown, the color not involving the radial field, a little darker than the stigma; paler areas in outer ends of cells R1 and R2; oblative areas restricted; veins dark brown. Macrotrichia of venus abundant; squama naked. Venation: R1, entire, with trichina on basal portion; cell 1st M, unusually small, sub-pentagonal; cell M1, about twice its petiole; cell 2nd A relatively narrow.

Abdomen chiefly orange, the tergites with a median black vitrea that is narrowly interrupted at caudal borders of segments; hypopygium chiefly darkened. Male hypopygium (Plate 2, fig. 36) with the tergites, sternite, 9th, and basalium are entirely separate by sutures. Ninth tergite (Plate 2, fig. 34, 35) with caudal border deeply trilobed, the lateral lobes more darkened than the short obsolete median lobe; lateral lobes with very delicate setulae. Ventral end of basal.flagellum protuberant, provided with long setae. A single dististyle (Plate 2, fig. 36), near its base produced into a long erect black spine; outer portion of style produced backward into a diaphanous membrane. Membranae of eighth sternite produced into a depressed pale structure, st., that is split at base, leaving two lobes that in a position of rest hang pendant (Plate 2, fig. 51).

Habitat.—China (Szechwan).
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Holotype, male, Kuanhsien, altitude 2,800 feet, May 27, 1939 (Freisch).

The structure of the male hypopygium readily serves to distinguish the present fly from all other members of the genus known to me. The wing pattern is somewhat like that of Tupola brunneicosta Brunetti (northern India), which is otherwise an entirely different Sp.

LIMOSINAE

LIMOSINI

Limosa (Limosa) hypnorum, sp. n., Plate 6, Fig. 6.

Mesonotal pronotum yellow with two darker intermediate stripes; the lateral borders darkened; antennal flagellum yellow; pronotum dark brown; wings pale yellow, with a restricted pale brown pattern; free tip of Rs lying its own length before R2; supernumerary crossveins in cells Rs and R2; abdominal tergites yellow, with a median brownish black stripe; epiprosternum with small, weak cerci.

Female.—Length, about 10 millimeters; wing, 13 by 3.5.

Nectrum and pale brownish black. Antenna with basal segments dark; flagellum yellow. Head buffy yellow.

Pronotum yellow, dark brown laterally. Mesonotal pronotum with the ground color yellow, with two intermediate darker stripes that are separated only by a capillary pale vein; lateral border of pronotum darkened; scutellum slightly darkened; scutellum pale yellow. Pleura pale yellow, with a conspicuous subcostal longitudinal stripe across the dorsal scutite and pleural membranes; ventral pleuriae not darkened. Abdominal segments, male, the knob dark brown. Legs with the coxae and trochanters pale yellow; femora yellow, with a narrow brown subterminal ring; tibiae and tarsi brownish yellow, the terminal tarsal segments darkened. Wing (Plate 1, Fig. 4) relatively broad, as shown by the measurements; pale yellow, with a restricted pale brown pattern, distributed as spots and arcs along the crossveins and deflections of longitudinal veins, and as longitudinal wavy boundaries on veins Rs, M1, and Cu; auxiliary region and posterior border of wing in medial and caudal limits darkened; veins pale yellow, darker in the divided areas. Venation: free tip of Rs lying distinctly before the level of R2, so that Rs and R2 are subequal; two supernumerary crossveins in outer radial field, one in cell Rs about its own length proximal of R2, the other in cell R3 about its own length beyond the long, acuminated

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in addition to the above, both wings of the type show weak crossveins almost at the wing tip in outer ends of cells R4 and Sd M3; these are variable in length and position in the two wings of the type and are presumably adventitious (not shown in figures); in-us at about one-fifth the length of cell 1st M3.

Abdominal tergites yellow, with a conspicuous median brownish black stripe; sternites more uniformly yellow. Genital segment pale yellow. Ovipositor with very small and weak cerci.

Habibit.—China (Shantung). Insect type, female, Mount Omei, on many cliffs in river gorge, altitude 2,000 feet, July 27, 1932 (French).

The only other described Libellula with two supernumerary crossveins in the wing is Libellula (Libellula) seupe (Edwards) of the higher mountains of Formosa. Compared with the albo-picea females of this latter species in my collection, the present fly differs conspicuously in the diagnostic features listed above. The type is apparently slightly fatter but with the colorational pattern firmly indicated. If the outer adventitious crossveins at the wing tip should prove to be a constant feature, the present fly would be unique in this respect.

Plebeia albo-picea COOTRUMEA et al. Proc. z. 1. 4. 6.

General coloration of body orange; legs chiefly black, the femoral base orange-yellow, tarsal paling to obscure yellow; wings golden yellow with about the outer tenth abruptly dark brown; free tip of S5 about twice distance from the level of R4; inner end of cells 2d M3 and M4 about on a level; axil veins gently convergent at base.

Male.—Length, about 11 millimeters; wing, 15.5.

Female.—Length, about 11 millimeters; wing, 15.5.

Antennae and palpi brown. Antennae brown; flagellar segments short-oval, the outer segments more elongate; terminal segment long, the outer two-fifths narrowed and pointed; verticals uniformly arranged, the longest more than two times the segments. Head obscure fuscous, the front silvery white; anterior vertex of moderate width, subequal to the diameter of eyes.

Thorax almost uniformly orange, the pronotum with indications of four more greenish stripes. Halteres yellow, the knobs infuscated. Legs with the coxae and trochanters obscure orange; femora orange-yellow basally, the tips very broadly blackened, on forelegs including nearly the outer one-third, on posterior legs including a little less than the outer half; ti-
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brownish black; tarsi pale to brownish yellow or obscure yellow. Wings (Plate 1, fig. 6) rich golden yellow, the extreme tip, including about the outer tooth, almost dark brown; stip- 

dal region more saturated golden yellow; veins yellow, brown 
in the apical darkening. Variation: So, ending beyond level of 
rn, S4a close to it; S4a very gently arcuate; free tip of 
S5a some distance beyond R5, the latter nearly curved into R3; 
inner end of cells 2d M3 and M5 about on a level; m-cu at near 
one-third the length of cell 1st M3; and veins gently convergent 
at bases.

Abdomen orangish throughout.

Habitat.—North Cordes (Montana).

Holotype, male, Beargrass, altitude 4,000 feet, April 15, 1931 
(Charl.) Alloptotype, female, April 17, 1931 (Charl.)

This striking crane fly needs no comparison with any other 
described species of the subgenus. The nature of the wing pat- 
tern is like certain species of the tipuline genus Padiophora 
Osten Sacken, such as copernicus (Wiedemann) but in the pres- 
cent the wing tip is even more narrowly darkened. By Ed- 
ward's key to the species of Libellula, the fly runs to complect 
22, disagreeing with all other species in the coloration of the 
body, wings, and legs.

LIMA (ILLUSTRATED INSIGNIA) sp. nov. Plate 1, fig. 3.

Allied to symeon; coloration of entire body black; knobs of 
hallocke blackened; wings narrow, the costal border infuscated; 
free tip of S5a and S2 in transverse alignment; vein 2d A strongly 
alarious.

Male.—Length, about 11 millimeters; wing, 12.5 by 2.5.

Head and palps black. Antennae brownish black, the scape 
more intensely so; flagellar segments oval; vertex relatively 
short; head greyish brown; anterior vertex reduced to a linear 
silvery strip.

Thorax uniformly brownish black or black. Hallocke fuscous, 
the knobs brownish black. Legs with the coxae black; trochan- 
ters brownish black; remainder of legs brownish. Wings (Plate 
1, fig. 7) narrow, weakly tinged with brown; peduncular re- 
gions, cells C and 8c, and the elongate stigma darker brown, form- 
ing a narrow but continuous costal border; veins dark brown. 
Macrotrichia of veins C very small, especially near the wing base.

Variation: Free tip of S5a and R5 in transverse alignment; all

radial and medial veins strongly decurved near margin; m long and arcuate, about one-third the total length of cell 1st M; m-cu at near one-fourth the length of cell; vcu 2d A strongly sinuous.

Abdomen black; hypopygium obscure yellow. Male hypopygium of the typical form of Libanus, with the tubercle of the ventral distastyle, together with its acetab, long and conspicuous; ventral spines long and slender.

Habitat.—North Celebes (Misahara).

Holotype, male, Hoogerwerf, altitudes 4,000 feet, April 11, 1901 (Choppy).

By both Osten Sacken’s 1 and Edwards’s keys to the species of Libanus, the present fly runs directly to Libanus (Libanus) deceptor (Walker), of South Celebes. The latter differs in the ochraceous coloration of the thorax, together with the wings being unmarked except for the stigmal darkening.

**Libanus dubius dubius** REVI, Plate 1, fig. 1; Plate 2, fig. 11.

Mesonotal punctuation obscure yellow with a median brown stripe and with the lateral margins darkened; femora brown, the tips narrowly yellow; wings with a faint grayish tinge; stigma brown, subwhite; male hypopygium with the ventral mesal lobe of hastatyle stout, ending in a slender glabrous lobe; ventral prolongation of distastyle a long yellow blade, with a single small dentate spine on outer margin at near midlength; mesepimera without corrugated ridges.

Male.—Length, about 7 to 8 millimeters; wing, 8.5 to 9.5.

Rostrum and the reduced palpi brownish black. Antenna with the scape black; remainder of organ broken. Head dark gray; eyes contiguous on vertex.

Pronotum obscure yellow above, dark brown laterally. Mesonotal punctuation with the ground color obscure yellow, with a median dark brown stripe and with the extreme lateral portions of the scutellum broadly darkened; scutellum dark brown, the median region more testaceous; scutellum dark brown; mediodiscine more yellowish brown. Pleura almost entirely covered by a broad dark brown stripe, the posterior portion of the sternopleurite and the dorsal portions of the pteropleurite and pleurotergite obscure yellow. Halteres with the stigmas yellow, trokes broken. Legs with the fore cone dark brown, the remaining

1 Osten. Journ. Ent. Soc. 31 (1887) 352-353.
convex and all trochanters obscure yellow; femora brown, the bases narrowly yellow, the tips narrowly but very conspicuously paling to yellow; tibia and tarsal pale brown, the outer segments of the latter darker. Wings (Plate 1, fig. 8) with a faint grayish or sandy tinge, the costal region more brownish yellow; stigma brown, subcircular, conspicuous; wing tip weakly suffused with brown; veins brown. Venation: Sc relatively long, So, ending about opposite five-sixths the length of R3, with S3 at its tip; R3 leaving R at an acute angle, the central portion more arcuated; R3 and free tip of S3 in transverse alignment; m-cu close to fork of M.

Abdomen brownish black, the intermediate segments more bicolorous, their bases broadly obscure yellow. Male hypopygium (Plate 2, fig. 32) with the caudal margin of tegulae, Sc, evenly and convexly rounded. Basistyle, b, elongate, the ventrocaudal lobe stout, its apex narrowed into a slender glabrous lobe. A single dististyle, d, the body of which is in a small oval mass, much smaller than the lobe of basistyle; rostral prolongation a long, pale yellow, gently curved blade, at near midlength on outer margin with small setiform spines. Genaspidyly, g, with the mesal apical lobe long and narrow, the margin of the blade not transversely corrugated, as in members of the pendulus group.

Holotype. Male, Chengtai, altitude 1,890 feet, April 14, 1932 (French). Paratypes. Male, April 20, 1932 (French).

Habitat. China (Shanxi).

General coloration of mesonotum reddish brown, the pronotum with a capillary dark brown median stripe; dorsal half of thoracic pleura darkened, the ventral portions suddenly light yellow; legs brownish black; wings tinged with brown; m-cu about one-third its length beyond fork of M; male hypopygium with the caudal margin of tegulae truncated; basistyle slender, the ventrocaudal lobe basally in penton; ventral dististyle with the rostral prolongation slender, without spines.
Male.—Length, about 3 millimeters; wing, 3.5. Antennae brownish black throughout; flagellus antennae oval. Head dark brown; anterior vertex reduced to a linear strip. Pronotum pale brown. Mesonotum prescutum reddish brown, with a capillary darker-brown stripe extending from the cephalic margin, a little widened behind on posterior third; scutellum reddish-brown, their mesial lobes narrowly darkened; connexulum infuscated; mesosternite reddish-brown. Picus with the dorsal portion darkened, the ventral half suddenly pale yellow. Halteres darkly, the base of stem very narrowly pale. Legs with the coxae and trochanters light yellow; remainder of legs brownish black, only the femoral basis extensively brightened. Wings (Plate 2, fig. 6) rather strongly tinged with brown; stigma oval, slightly darker brown; veins and maculae of frons darker brown. Vena. Se, ending about opposite five-sixths the length of Br, Sc, at its tip; Rs only a little longer than R1+2; free tip of Se, and Rs in transverse alignment; m-cu between one-third and one-half its length beyond the fork of M. Abdominal tergites dark brown, the outer sternites more obscure yellow; hypopygium dark brown. Male hypopygium (Plate 2, fig. 5) with the tergite, 33, narrowed externally, the apex truncate, all setae not far from margin. Basistyle, 33, elongate, the concomitant ventromental lobe on basal half, provided with abundant erect setae. Dorsal dististyle a powerful blade, the tip decurved. Ventral dististyle, ed, with the body of style an oval pale lobe, set with long erect setae that are fully as long as the diameter of the lobe; radial prolongation a long yellow curved end, of blade, without evident spines. Gasteropodous p., with the anal-spiracular lobe ending bluntly but with the tip directed laterally into a point. Holotype.—Sumatra (west coast). Holotype, male, Fort de Kock, altitude 520 meters, 1926 (Johannsen). Linnæusia (Linnæus) quadripennis is one of the smallest species of the subgenus so far made known. It is allied to the larger L. (L.) inornatae Alexander and L. (L.) subornatae Alexander, both of the Philippines, all three forms having the same general structure of the male hypopygium, but with the details different, especially in the tergite. The coloration of the body and position of m-cu further separates the present fly from the two species mentioned. The even smaller L. (L.) inornatae Ed-
warde (Hemero) belongs to a distinct group of the subgenus, the male hypoepipygium having lost the dorsal distityle.

Limenius (Unicordisps) species sp. nov. Plate 1, fig. 10; Plate 2, fig. 9.

Belongs to the punctiferae group; a series of five or six brown clouds in cell C; male hypoepipygium with the ventral distityle relatively small, the median prolongation long and slender, with two small straight spines placed on its lateral face near bases; mesepisternal lobe of genophyseus a simple acute black and mottled point.

**Male.**—Length, about 4 to 4.2 millimeters; wing, 4.8 to 5.

**FEMALE.**—Length, about 5 to 5.5 millimeters; wing, 5.5 to 6.

Rostrum gray; palpi and antennae black. Head dark gray. Mesonotum gray, the pronotum with a median dark brown stripe that is more or less contricted opposite the level of the humeri, in some weakly split by a pale vitta; lateral stripes less distinctly indicated; median region of scutum and the scutellum more testaceous. Pecora dark gray. Haltere pale, the knobs infuscated. Legs with the coxae dark brown; trochanters obscure yellow; femora brownish yellow, the tips broadly blackened; tibiae and tarsi brown, the outer segments of the latter dark brown. Wings (Plate 1, fig. 10) grayish, with a sparse darker brownish gray pattern, arranged as in the punctiferae group; a series of five or six brown clouds in cell C; veins brown. Costal fringe moderately long. Venation: Tip of R; strongly upturned at outer end and bare without trichode.

Abdomen, including hypoepipygium, brownish black. Male hypoepipygium (Plate 2, fig. 34) with the tergites, ft. notched incurvally, the caudal margins of the lobes thinned and provided with numerous setae. Ventral distityle, of small, as compared with subgenitalia; ventral prolongation long and slender, with two small straight spines that are inserted close together near the bases of the phallosclerot and on its lateral aspect; inner spine a trifle longer than the outer; both spines shorter than the apex of the prolongation beyond the outer spine. Genophyseus,  

with the mesepisternal lobe a short simple acute blackened point.

**Habitat.**—China (Shantung), Habitation, male, Mount Orot, altitude 4,200 feet, June 28, 1932 (Pracek). Allotopotypes, female, altitude 4,500 feet, July 4, 1932 (Pracek). Paratypes, several males and females, altitude 3,500 feet, August 16, 1931; 4,200 feet, June 28 to July 2, 1932; 4,500 feet, July 28, 1932 (Pracek). Paratypes, males, Kechuabule, altitude 4,600 feet, August 14, 1932 (Pracek).
Lemisia (Diceronnae) rotundata is most nearly allied to the Formosa L. (D.) sparsiplicata Alexander, in the bipinnate ren-
tral prolongation of the male hypopygium, differing most evident-
ly in the spotted subcostal cell of the wing, and the much smaller
ventral dististyle of the male hypopygium. The status of L. 
(D.) fuscipes (Brundtli) has been discussed by the writer in
another paper.

Lemmisia cristata formosa expansimacula sp. nov. Plate 6, fig. 11.

Male.—Length, about 3.2 to 3.5 millimeters; wing, 4 to 4.5.
Similar to typical formosa (Alexander), differing especially
in the small size and details of the wing pattern.

Legs with the femora pale brown, the tips narrowly whitish,
preceded by a broader subterminal ring. Wings (Plate 7, fig. 11)
with the dark area at origin of Rs and tip of Rs, broadened
broadly, much wider in cell R than in the costal field, not quite
reaching vein M.

Habitat.—China (Kashuwan).

Holotype, male, Mount Ounl, altitude 6,100 feet, July 4, 1902
(Fakelty). Paratypica, male.

Lemisia (Diceronnae) formosa (Alexander), first described as
a variety of rotundata (Edwards), is a valid species, with the
dark area at middle of cell Sc very restricted, not involving
cells C or R, and without darkening at tip of vein 1st A.

Sambucus trilacera formosa Faustulus sp. nov. Plate 6, figs. 10, 11; Plate 7, fig. 10.

Sis small (wing, male, under 4.5 millimeters); mesostial
processum and acumen with orange or brownish orange stripes,
the lateral bocoros and interspaces darker; ven at or close to
fork of Rs; m-cu strongly pointed at inner end; m-cu nearly
its own length before fork of M; dark area in outer end of cell
R in alignment with the m-cu crossvein, not connected with
the broken crossband at middle of cells R and M.

Male.—Length, excluding rostrum, about 4 millimeters; wing,
4 to 4.2; rostrum, alone, about 6.6.

Rostrum black; palp whitish. Antennae with scape and ped-
icular black; first flagellar segment pale, remainder of flagellum
dark brown, somewhat darker outwardly. Head grey, the an-
terior vertex narrower, about equal in width to the diameter of
scape. Pronotum obscure yellow, darkened laterally. Cerotegi
alaris elongate, dark brown. Anterior lateral pretarses whitish.

*Phil. Jour. Sci. 46 (1931) 282.
Monosomal presentum with the disk largely covered by three orange or brownish orange stripes, the interspaces pale brown; lateral borders of scutellum narrowly dark brown; notal lobes extensively orange or brownish orange, margined with brown; acrostichum and dorsocentral dark brown. Flanks traversed by a very broad deep brown stripe, the dorsomarginal region and ventral astomential more yellowish. Halteres pale, the knobby weakly darkened. Legs with the coxa dark brown, the mid-coxa paler basally; trochanters dark brown; femora obscure yellow basally, passing into dark brown, immediately before tip with a very narrow yellow ring; tibiae dark brown, the extreme base and tip pale; tarsi chiefly obscure yellow. Wings (Plate 1, fig. 12) whitish, the preservative region, cells C and B, and the wing tip in cell R. light yellow; a rectangular reticulate brown pattern, including the stigma, two broader areas in cell R, and narrow transverse spots in most of the cells, including two in each of cells Rs, 2d M, and Ml; a spot in cell R above it narrowly brown; a wider, interrupted, brown crossband across cells R and M1, terminating at end of vein 1st A; a brown spot at apex and another in the axillary region of cell 2d A; most of the described brown spots and dots tend to form interrupted brown crossbands that lie more or less parallel with one another; veins pale brown, somewhat darker in the distal areas. Costal fringes long and conspicuous; no macrotrichia on anterior branch of Rs or on anal valves. Vessalies: r.m at or just before base of Rs; anterior branch of Rs diverging very strongly from R.1, cell R. at margin thus being very wide; inner end of cell 1st M strongly pointed; more nearly its own length before base of M? cell 2d A relatively narrow.

Abdomen dark reddish brown, the caudal and lateral portions of the segments somewhat darker brown; hypopygium dark. Male hypopygium (Plate 3, fig. 5) with the outer dististyle, ed, slender, its tip weakly dilated, the surface indistinctly roughened. Inner dististyle, ed, longer, the apical third narrowed, the margin of style with conspicuous setiferous tubercles. Abdomen, in small, Gonopophyses, p. recurved, the tips antra.

Habitat.—New Guinea. New Britain. [Holotype, male, Laut, New Britain (Dr. Heges); Macleay Collection, University of Sydney, through Mr. Francis H. Taylor. Paratypes, male, Friedrich Wilhelm, New Guinea, June, 1895 (Jelich); Hungarian National Museum. Helias (Ehrenbergii) panareae is most nearly allied to the subgenotype, H. (E.) reitersiae (Alexander), of Java, Bur-
ren, Ochao, Mindanao, and Luzon, differing in the diagnostic features listed above, especially the small size, the less heavily retinaloid wing pattern, and the vannusation. The paratype had been recorded earlier by Reed* as Geometria apuncala Hutton, which is now known as Leminia (Euphotia:lochus) hoffei (Edwards).

**Grecanica diaphana Lattirinae** sp. nov. Plate 1, fig. 13; Plate 2, fig. 9.

General coloration dark gray; halteres pale yellow throughout; legs black; wings unusually broad, brownish yellow; costal fringe (male) short; macrotrichia on outer end of vein R; R; R; R; R; only a little short than R; male hypopygium with one pair of gonapophyses yellow, densely set with spinous points.

**Male.** Length, about 7 millimeters; wings, 7.2 by 2.2.

**Female.** Length, about 8 millimeters; wings, 7.3 by 2.2.

Habitat and field black. Antennae black throughout; fugal segments oval, the outer segments gradually smaller. Head dark gray.

Mesonotum and pleura uniformly dark gray. Halteres pale yellow throughout. Legs with the coxae and trochanters dark blackish gray; remainder of legs black, the femoral base somewhat paler. Wings (Plate 1, fig. 13) unusually broad, especially in male, without just opposite or slightly beyond termination of veins 24 A; wings tinged with brownish yellow, cells C and S somewhat paler yellow; stigma region vaguely darker; veins pale. Costal fringe abundant, short. Macrotrecha of veins relatively abundant, there being from ten to twenty on distal third or more of vein R, Venation: R; elongate, only a little shorter than R; free tip of R; very vague, about its own length before R; cell 24 A very wide.

Habitat, including hypopygium, black. Male hypopygium (Plate 2, fig. 9) with the phallicomic armature, p, conchocots, consisting in part of a pair of spinous yellow lobes, united basally by a common stem, the entire outer end densely set with spinous points.

**Habitat.**—China (Szechwan).

Holotype, male, Mount Omei, altitude 3,400 feet, July 27, 1932 (French). Allotypes, female, altitude 3,200 feet, June 23, 1932 (French). Paratypes, male, altitude 4,000 feet, July 4, 1932 (French).

There are now seven species of Orchisera known from China, all of which have been taken at various altitudes on Mount

Omei. The present fly differs from all members of the subgenus known to me by the unusual width of the wing, the increscence in diameter being taken up chiefly by a widening of the anal cells.

Key to the Chinese species of Omeiara.
1. Vents of wing at least twice its own length beyond fork of Rs. 4
   Vents of wing at least twice its own length beyond fork of Rs. (continue) usually fully four times this length. 4
2. Wing venation usually narrow, especially on head third, venal Rs. at end of Rs and in transverse alignment with the head section of Rs. enigmatica Alexander. 4
   Wings of normal width, venal Rs. about its own length beyond fork of Rs. 4
3. Wing veins unusually plump, Rs. without trichrome; male hypopygium with elements of phallicus appendage: sordida Alexander. 4
   Wing veins with abundant trichrome, Rs. having a series over its entire length; male hypopygium with elements of phallicus appendage: cinnabara Alexander. 4
4. General coloration of thorax brownish gray; gular plane with a narrow black longitudinal stripe; mandibles long and compressed at both ends: artemisia Alexander. 4
   General coloration of thorax dark gray; gular plane at least the dorsal pleurites; mandibles short and broad: 4
5. Wing venation unusually wide, especially the anal field; Rs. any only a little shorter than Rs. 4; female black, paler only at base; intersex 4; new Wings of normal width; Rs. approximately the same length as Rs. 4; female brown to yellowish brown: 4
   Wings tinged with purplish; male hypopygium with the outer distal style partly serrated; basistyle unarmed at base: 4
7. General coloration gray, the sternopleurite more reddish yellow; wings with subcostal fringes somewhat; macrotrichia of color similar to that of color of color; male a free tip of Rs. far before Rs. 4; a little more than one-half; shape male hypopygium with the basistyle bearing a large subcostal lobe on each proximal end of median face; outer dististyle with the outer third bent at about a right angle into a long apical spine. 4;
   General coloration gray, the sternopleurite more reddish yellow; wings with subcostal fringes short; macrotrichia of color similar to that of color of color; male a free tip of Rs. far before Rs. 4; a little more than one-half; shape male hypopygium with the basistyle bearing a large subcostal lobe on each proximal end of median face; outer dististyle with the outer third bent at about a right angle into a long apical spine. 4;

Male—Length, about 4 millimeters; wing 4.5. 4;
   Rivets of light brown, gray proximal; palp brownish black. 4
   Antennae black throughout; flagellar segment slender, with a short white paler fore and short vertebral. 4
   Head gray, the exterior vertices all at a narrowed point nearly twice as wide as diameter of scape.
Mesonotum dark brownish gray. Dorsal pleurites dark brown, the sternopleura and mesal region light reddish yellow. Halteres pale, the knob weakly infuscated. Legs with the coxa yellowish testaceous, the fore coxa a little darker; tibiae and tarsi yellow; femora brown, the tibiae darker; remalad of legs dark brown. Wings (Plate 1, fig. 14) with a grayish brown tinge, the prescutal and costal regions pale, more whitish; veins pale brown. Costal fringe short; macrot realistic of veins beyond cord abundant and relatively long, on Sc with about a score. Venation: Sc, ending shortly before fork of Rs; free tip of So, faint, far before Rs, at near mid-distance between the latter vein and tip of So; R1+2 a little more than one-half R2+3, r-m and base of Rs both pale, nearly in transverse alignment; cell 2d A relatively narrow.

Abdomen brownish black; hypopygium a little brighter. Male hypopygium (Plate 2, fig. 17) with the mesal face of hastally, b, at subdiscal end with a large setiferous hole. Outer distitely at near two-thirds the length narrowed and bent at nearly a right angle into a long apical spine. Inner distitely, 16, with a single row of setae along the face, additional to a small group on the inner margin at near midlength. Phalusome, p, with the peduncular short, the gonopophyses appearing as slender, gently curved hooks.

Habitat—China (Szechwan).
Holotype, male, Mount Omei, altitude 4,000 feet, July 14, 1931 (Pychal).

The relations of this distinct species to the other described Chinese species of Ormeura are shown by the key accompanying the preceding species.
brownish yellow, the fore and middle cases more pruneose; remainder of legs yellowish brown, the outer tarsal segments darker. Wings (Plate I, fig. 15) tinged with whitish, the pro-arcular and costal cells slightly more yellowish, the bases of the anal cells a little darkened; vein pa. Macrostria on almost the entire length of the veins beyond cord, there being more than 30 on R,. Venation: S, ending beyond midpoint of R; tip of R,, opposite fork of M,, and before midpoint of distance between end of S, and apex of wing: R, angulated at origin; R, a little shorter than R,, without trichia; R, a little longer than R; curves about opposite one-third to two- thirds the length of R,,

Abdomen brownish black, the genital segment ocherous, the ovipositor horn yellow.

Habitat.—New Caledonia.

Holotype, female, Frons Farn, January, 1929 (Robert).

I take great pleasure in naming this species in honor of the collector, Prof. Jean Robert. The fly is closest to Orius cornutus (Orius cornutus) amorini Haise (New South Wales), differing in the coloration of the thorax and the details of venation, especially the shorter R, and the position of M-.

**HETATOMINT**

**RELATURA ORIOCALCIS MUNDESA** sp. n. Fig. 16, B.

Belongs to the vertebral group; macromerum brownish gray, the prosectorum with three dark brown stripes; vertical tubercles yellow, the summit more polished brown; base of halteres blackened; femora brownish black on outer half; wings strongly tinged with yellowish brown; stigma oval, dark brown; longitudinal veins narrowly and vaguely veined with darker; numerous macrostria on outer radial veins; abdominal tergites black, the shield of ovipositor bright orange.

Female.—Length, about 10 millimeters; wing, 10.

Rostrum short, brownish yellow; palpi black. Antennae with the scape and pedicel yellow, flagellum broken. Head with vertex, including the vertical tubercles, yellow, the latter somewhat polished brown at summit; sides of vertex behind darker and sparsely pruinose.

Macromerum brownish gray, the prosectorum with three dark brown stripes, the middle one entire; acrostichum more heavily dusted with light gray. Halteres dark brown, more or less pruinose. Halteres yellow basally, the knobs and outer ends of stems blackened. Legs with the coxae brown, pruinose; tro-
chapter yellow; femora brown on basal half, the outer half
paling into brownish yellow; tibiae brown, the tarsi a little darker;
tarsi brownish black. Wings (Plate 1, fig. 16) strongly tinge
with yellowish brown; cells C and Sc clearer light brown;
stigma oval, usually small, dark brown; longitudinal veins nar-
rowly and vaguely assumed with darker; veins brown, the outer
radial veins and the cardo darker brown. Costal fringe abundant,
moderately long; abundant macrotrichia on outer radial veins,
those being a series of about twenty-five on R1. Venation: R1,
about one-half R1 to subequal to R1; outer medial veins tend
to become excentric, as common in this genus; dark fold
behind vein 2d A faint and little evident.
Abdominal tergites black; basal sternites a little paler. Ovi-
positor with its shield bright orange; cardo blackened at base,
more reddish on outer half, cerci of moderate length, slender.
Habitat.—China (Szechwan).
Holotype, female, Changtu, along banks of Min River, altitude
1,700 feet, August 26, 1921 (Puteck). Paratypes, female.
Harmonia (Eriocran) minensis is closest to H. (E.) nipporensis
(Alexander), of Japan, differing most conspicuously in the
wing pattern, presence of only three pronotal stripes, and the
yellow vertical tubercles.

Belongs to the sertorius group; nine small (wing, female, un-
der 8 millimeters) mesonotum almost uniformly dark brown,
the pronotum with indications of three more blackish stripes;
femora brownish yellow, the tips narrowly blackened; wings
with a brownish tinge; no macrotichia on outer branches of
R1, excepting a sparse series on R1; cell M, lacking; a chilinox
fold or weak auricular fold immediately behind and parallel
with vein 2d A; valves of ovipositor unusually long and slender.
Female.—Length, about 7.5 to 9 millimeters; wing, 6 to 7.5.
Head remarkably reduced; palpi black. Antennae with scape
and pedicel obscure yellow to brownish yellow;flagellum broken.
Head with vertical tubercle dark brown, entire posterior portion
of head dark gray pruinose.
Mesonotum almost uniformly dark brown, with indications of
three more blackish stripes on pronotum. Pleura dark brown.
Halteres obscure brownish yellow, the kind brownish black.
Legs with the coxae dark brown; trochanters obscure yellow;
femora brownish yellow, the tips narrowly blackened; tibiae and
tarsi brownish black. Wings (Plate 1, fig. 17) with a brownish
tinge; cells C and Sc slightly darker; stigma oval, slightly darker
than the ground color; veins brown. Costal fringe abundant and relatively long; no microtrichiae on other radial veins, excepting a sparse series on vein 3b. Variation: Cell M2 lacking; a second vein 3c originates fold lying immediately behind and parallel to vein 3d A.

Abdomen black. Ovipositor with the valves, especially the cerci, unusually long and slender, nearly straight; hypovalvae extending to just beyond midlength of cerci, very slender.

Habitat—China (Shenchuan).

Hosttype, female, Chengtu, along banks of Min River, altitude 1,700 feet, August 26, 1972 (Franck). Panaopotes, female, Heilongan (Primorski) diplopodium is readily told from H. (C.) diplopleuron (Alexander) and other allied forms, by the diagnostic features listed above. The small size, glabrous outer radial veins, double vein 3d A, together with the unusually long and slender cerci, readily define the species.

Ctenopotes ctenopoteoides nov. prototypa sp. nov. From 6, No. 11; From 6, No. 10.

Belongs to the fumera group; antenna (male) 16-segmented, with nine branched segments, the branches elongate; head and thorax polished black; halteres uniformly blackened; wings whitish, with a restricted dark pattern; abdomen with segments one, seven, eight, and nine black, the remainder yellow, more darkened on their pleural portions; male hypopygium with a single distastyle that is tridentate at apex, the inner tooth a slender curved spine.

Male—Length, about 8 millimeters; wing, 7.

Described from an alcoholic specimen.

Rostrum and palpi dark brown. Antennae with scape and pedicel light yellow; axis of flagellum yellow, the branches and subapical portions of the axis of segments darkened, giving a bluish appearance to the individual segments, the ends being yellow, the central portion fuscous; apical single segment darkened; flagellum with nine long branched segments, the anterior formula being 2:2:2:7:5; first branch a little longer than the last branch, the last about four times the segment; longest branch (about the fifth or sixth flagellar segment) about two-fifths as long as the entire flagellum. Head black.

Thorax polished black, the dorsolateral membrane pale; any pronotally normally present destroyed by immersion. Halteres uniformly blackened. Legs with the femur black, elbowed with very conspicuous elongate artery; trochanters dark brown; remain-
der of legs broken. Wings (Plate 1, fig. 18) with the ground color whitish; cells C and D slightly more yellow; a restricted brown pattern, including small areas at nervules and origin of R4, with a larger triangular area, including the stigma and anterior cord; a paler closed in cells M, Cu, and 1st A at the level of R4; posterior cord and outer end of cell 1st M, very narrowly feathered with brown; wing tip narrowly and very vaguely darkened; veins brown. Variation: R4, ending opposite fork of R4, R5, at its tip; R5+, subequal to R4; R5, a little longer than R4, cell M2 lacking.

Abdomen with basal segment black; segments two to six light yellow, the lateral portions extensively darkened, becoming deeper and more clearly defined on outer segments; terminal segments uniformly blackened. Male hypopygium (Plate 5, fig. 19) with the distal, d, single, tridentate at tip, the inner spine long and slender, curved; surface of style with numerous microscopic punctures. Armes of phallosome, p, appearing as black slender structures, the outer margins microscopically roughened.

Habits.—Central Celebes (Bento Baize).

Holocyla, abdominal male Latimolakong Mountains, altitude 4,600 to 4,600 feet, May 24, 1931 (Clegg).

The present species is most nearly allied to Gynaeodictia (Gynae-
dictia) javanza Osborn Bunker and G. (G.) celo-fasciana Brame-
ti, both of South Celebes.

**Key to the three Cebuano species of the genus Gynaeodictia.**

1. Abdomen uniformly reddish yellow............ javanza Osborn Bunker.

All three members of the javanza group discussed above have cell M2 of the wings lacking and with a rather unusual number of simple terminal antennal segments in male, those being presumably eight in javanza but only five in the present species. Antennal formula of javanza male, 2-3-4-6-1; of cerere-

*Note:* The exact number of antennal segments in female javanza is uncertain, but it is likely to be similar to the male. The six species of *Gynaeodictia* represent several distinct groups of the genus.
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*Grypotomia grypoperita* n. sp. fig. 2

Operophtera brumata, Neumayr, Rev. Linn. Nat. 5 (1861) 157.

Description of a unique female specimen taken at Patumang, South Celebes, January 1896 (Dr. Preitauer). This type, in the Vienna Museum, was kindly loaned me for study by Dr. Heinz Serny in 1921. The following supplementary notes are given.

**Female.**—Length, 9 millimeters; wing, 7.7.

Dorsum of head densely covered with a microscopic appressed gray pubescence to appear like a heavy bloom. Antennae apparently 16-segmented, the formula (female) being 2 + 3 + 4 + 8 or 2 + 6 + 8. Thoracic plura with an appressed gray pubescence. Abdominal tergite one dark brown, tergite two to seven obscure yellow, with the caudal margin broadly, the lateral margins more narrowly dark brown; sternite similar, but the dark pattern more extensive except on segments five and six, on sternites two to four including at least the posterior half of the segment. Genital segment and ovipositor yellowish brown color. Wings yellow, the pattern very much as in the female of *jovunda*; mark at origin of cells R and M distinct; band at level of origin of Rs interrupted in cell M.

The species differs from *jovunda* in the banded abdomen and in the gray coloration of the head.

*Grypotomia* grypoperita nov. sp. fig. 2b, c, d, e, f

General coloration dark brown; pleura with a yellowish white longitudinal stripe; wings grayish, sparsely variegated with bluish submedian areas; foot ending just before origin of the strongly arched to feebly angulated Rs; abdomen, including hypopygium, dark brown; male hypopygium with three distal styles, the outer a long simple rod; phallosome without blackened hooks or spines.

**Male.**—Length, about 2.6 millimeters; wing, 3.

Forelimb and palpi black. Antennae with the scape and ped-

ous black above, more yellowish beneath; flagellum brownish black, with the usual long verticals of this sex. Head pale yellow, the outer of vertex brownish, apparently darkened. Prescutum and anterior loral lappets pale yellow. Metanotum dark brown, the cuferum a very little brighter. Pleura blackish, with a yellowish white longitudinal stripe. Hal-

ter dusky, the extreme apex of the knob obscure yellow. Legs with the coxae and trochanters obscure to fusaceous yellow; hind.
remainder of bean broken. Wings (Plate 1, fig. 19) grayish, with bluish subhyaline areas in cells Cu, 1st M, and M; veins pale. Costal fringes long and conspicuous. Vascular: Rs, ending just before origin of the strongly arcuated or angulated R3; men near fork of M.

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 3, fig. 39) with three dististyles, the outer, od, a simple glabrous rod; second style clavate, its outer surface densely set with recurved black spines; inner style, id, fleshy, with long setae, including a group of three very powerful setae in basal half of style. Phallosome without blackened hooks or spines.

Habitat.—New Guinea.

Holotypes, male, Sinhang, Huon Gulf, July, 1898 (Ros). I take great pleasure in dedicating this fly to the memory of Dr. Solomon Kerkien, former custodian of Digitaria in the Hungarian National Museum, to whom I express my great personal indebtedness for a period of many years. By Eda. S. H. to the Oriental species of Lipoptena, the present species runs to Lipoptena (Lipoptena) diffusa (de Meijere), a very different species. As usual in this group of Tipulidae, the structure of the male hypopygium furnishes the most important specific character. The specimen had earlier been identified as being Lipoptena brevicrissima Skuse by Rosell (No. 22).

Mandibular Apophyses Antilia sp. nov. Pl. 2, fig. 28; Pl. 3, fig. 46.

Mandenom dark brownish gray, the scutellum broadly margined with yellow; pleura striped longitudinally with yellowish white; femora yellow, with a broad black subaxillary ring; wings whitish subhyaline and pale brown, the costal and stigmatal areas darker brown; abdominal segments dark brown, stung caudally with yellow; male hypopygium with the outer dististyle blackened, forked at base into two arms, the outer one longer, glabrous, the inner arm terminating in an acute spine, the distal apical portion with abundant setae; phallosome depressed, each outer lobe angle produced into a blackened conical horn.

Male.—Length, about 3 millimeters; wing, 3.5.

Rostrum and palpi black. Antennae with scape and pedicel dark beneath, yellow above; flagellum brownish black. Head yellow, the outer of vertex with a dark area.

Pronotum and prosternites yellow. Mesonotal prescutum and scutum dark brownish gray, the latter with a small point on caudal-lateral portion; scutellum dark brown, broadly margined behind with yellow; mediocoxal disc dark behind, variegated with
yellow on cephalic-lateral angles, the coloration forming a more or less complete crossband at near midlength of the abdomen. Pleura dark, with a ventral longitudinal yellowish white stripe extending from the fore coxal to base of abdomen. Hairs on yellow, the bases of knots darkened. Legs with fore coxal whitened, remaining coxal yellowish butanous; trochanters yellow; femora yellow, with a broad black subterminal ring that is about two or three times as wide as the pale apex; tibiae and tarsi obscure yellow, the outer tarsal segments darkened; in cases, the femora are more brownish yellow, the black ring preceded and followed by clearer yellow. Wings (Plate 1, fig. 20) relatively broad, the disk variegated with whitish ash-brown and pale brown; darker brown areas at axicilia and stigma; the pale ground areas are arranged as more or less complete crossbands before the cord and at about one-third the length of the wings, in median field and as conspicuous pale areas before and beyond the stigma; ventral pale, darker in the ciliated areas. Venation: 5x short, 5x, ending a short distance before origin of Rs; meso close to fork of M.

Abdomen dark brown, the segments narrowly but conspicuous- ly ringed caudadly with yellow, most distinct on tergites; hypopygium reddish. Male hypopygium (Plate 2, fig. 40) with the outer distal of the ovipositor, somewhat broad, the outer arm slender, sinuous, glabrous; inner arm shorter, the outer half a little dilated, terminating in a long straight black spine, the dilated portion with numerous, long, pale, appressed setae. Inner distal part, terminating in the usual two fasciculate setae, the apex and cephalic margin of style with long normal setae. Phallosome, p. with each outer lateral angle terminating in a strong, curved, blackened horn.

Habitat.—China (Shensi).—Holotype, male, Mount Omel, altitude 4,200 feet, July 2, 1923 (Francke).—Paratypes, 2 males, altitude 4,800 feet, July 4, 1922 (Francke).

The nearest ally of the present fly is Conopina (Lepidoptera) anophylus Alexander, likewise from Mount Omel, where it occurs at higher altitudes on the mountains. The details of the male hypopygia of the two flies are quite distinct.

Conopina (Lepidoptera) Asia, in Part I, fig. 37; Disc. 3, p. 65.

This species belongs to the above group; pleural stripes broad and conspicuous, whitish; knots of halières obscure yellow; legs dark brown; wings with a strong brown stain; male hypopygium with
the dististyle subterminal in position, fleshy; phallosome termi-
nating in two flattened plates.

Male.—Length, about 2.5 millimeters; wing, 3.6.
Female.—Length, about 4 to 4.5 millimeters; wing, 4 to 4.3.

Rostrum and palpi brownish black. Antennae brownish black
throughout. Head with front pair; posterior portion of head
chiefly gray; the cephalic region variegated by yellow.

 Pronotum and anterior lateral protergites light yellow. Me-

cenital pronotum and scutal lobes almost uniformly medium
brown, the former very sparingly pruinose; median region of scu-
tum and posterior borders of scutal lobes obscure yellow; coel-
ulum dark brown; the median region at base more darkened;
meso-tergites darkened. Pleura light brown, with a broad and
continuous whitish longitudinal stripe, extending from the pro-
placa to base of abdomen, involving also much of sternaeromal
and pleurotergites. Halteres darkly, the knobs obscure yellow.
Legs with the coxa brownish testaceous, the femur slightly
darker; trochanters obscure yellow; remainder of legs dark
brown, only the femoral base somewhat paler. Wings (Plate
1, fig. 21) with a strong brown tinge, the stigma scarcely evi-
dent; valva brown. Venation: Sc, ending about opposite one-
third the length of the long Rs, Sq, at near middistance between
tip of Rs and origin of Rs; m-cu shortly before the fork of M.

Abdominal tergites dark brown, paler laterally; sternaeromal
paler; hypopygium brownish yellow. Male hypopygium (Plate
3, fig. 41) with the single dististyle, 4, fleshy, subequal in length
and size to the outer lobe of hastistyle, tipped with the usual
fastigate setae; a long modified seta on outer face beyond mid-
length. Phallosome, p, complex, in slide mounts constructed
about as figured.

Habitat.—Sumatra (West Coast).

Holotypes, male, Fort de Kock, altitude 920 meters, 1924 (J.


This is the first member of the subgenus group of the subgenus
to be described from the Dutch East Indian islands. It is most
nearly allied to a group of three Philippine species, pseudojul-

ous Alexander and pseudojul Alexander, of Mindanao, and imi-
pseudale Alexander, of Luzon. All four species agree in having
a single fleshy dististyle to the male hypopygium, this with a
single specially modified seta on outer margin before apex.

These species differ among themselves chiefly in the construction
of the phallosome. The other species of the group from eastern
Allied to *Gomeosa* (Gomeosa) occidentalis Alexander, likewise from Mount Omel, differing especially in the details of variation, as the longer 5c and more oblique R₈, and in the structure of the male hypopygium, especially of the distatyle and phallosome.

**MEASUREMENTS MONGOLA**

_Plae I, fig. 19._

General coloration light gray, the pronotum with indications of slightly darker stripes; antennae dark brown; halteres pale yellow, the knobs almost white; femora brownish yellow, the tips narrowly infuscated; tibiae and tarsi brown; wings grayish, the stigma slightly darker; no maculelula on veins beyond cede, excepting outer end of R₅ and R₆, vein R₅ subcereet; cell 1st M₄ elongate, with m-cu before midlength; m longer than basal section of M₄.

**Female.** Length, about 4.5 millimeters; wing, 4.0.

Rostrum gray; palpi dark brown. Antennae dark brown throughout, relatively short; flagellar segments oval, with verticle that caused the segments; terminal segments apparently broken; in the unique type it appears that the basal segment of the flagellum is a fused unit of more than a single segment.

Head gray.

Mesosoma almost uniformly light gray, the pronotum with indications of slightly darker stripes; pseudopatriar.Chain varies black.

Flowers and sternum gray. Halteres pale yellow, the knobs almost white. Legs with the coxae gray; trochanters obscure yellow; femora brownish yellow, the tips narrowly infuscated; tibiae and tarsi brown. Wings (Plate I, fig. 23) grayish, the pterocost and costal regions pale yellow; stigma pale brown, only a little darker than the ground; veins brown. No mastephaelia on R₅ or its anterior branch; M and its branches without trichode; a sparse series along outer section of vein R₆. Venation: So, ends just beyond midlength of R₆, Sc₁ not evident; R₅ subcereet, about equal to the distance along costa between R₆ and R₇, R₈ and R₉, subsubequal; m-cu short, before midlength of cell 1st M₄; m about twice as long as the basal section of M₄.

Abdomen dark brown. Ovipositor with the long corn horn club.

_Habitat._ China (Shansi).

_Habitat._ Hespera, female, Chiling, on boat on Min River, May 3, 1933 (Pien.)
Rhodematinae minutulae is very different from Rhodematinae (Palaeodromus) carinata Alexander (Mount Omei, Szechwan), differing especially in the venation and coloration of the legs. Because of the presence of an unique type of the present Rv, I am unable to place it definitely as to species, but believe it will be found to belong to Rhodematinae Alexander, with the antenne short in both sexes.

ERIOPTERA ERIOPTERA (Erioptera) latifrons Alexander, likewise from the mountains of western China, differing in the details of structure of the male hypopygium.

General coloration pale yellow; mesonotum pumetum light reddish brown, somewhat darker medially. Basal four or five antennal segments yellow, the remainder passing into brown. Head of paler blackened. Legs yellow, the tips of femora scarcely darkened. Wings (Plate I, fig. 24) very pale yellowish white; veins pale yellow; macrotrichia light brown. Venation: p-cu long and gently sinuous; vein 1d A strongly sinuous, cell 1st A at midlength nearly three times as wide as at the narrowest point just before outer end. Abdomen dark brown, hypopygium brownish yellow.

Male hypopygium (Plate II, fig. 43) with the outer dististyle, od, simple, darkened, quite glabrous, its outer third narrowed. Inner dististyle, id, a shorter sinuous red, the cutime dusky apex with a number of seraceous punctures; on outer margin just before midlength with a small pale fleshy lobe that is tipped with a single small pale spine. Gonapophysis, p, appearing as nearly straight to gently curved darkened red, the tip coiled; each inner apophysis bearing at tip a small darkened peglike spine.

Habitat. — China (Szechwan).

Holotype, male, Mount Omei, altitude 7,000 feet, July 17, 1931 (French).
diastyle slightly dilated at apex, further produced laterally into a small apical point.

Male.—Length, about 3 millimeters; wing, 6.

Rostrum pale brown; palpi brownish black. Antennae (male) short; basal segments pale, the outer segments a little darker. Head discolored in tym. chiefly dark.

Thoracic dorsum almost uniformly light reddish yellow, the humeral region of pronotum clearer yellow; median stripe somewhat darker. Fleurs with dorsal scutellum reddish brown, the ventral scutellum more yellow. Halteres pale, the knobs broken. Legs with the coxae and trochanters light yellow; remainder of legs slightly more obscured yellow, the terminal tarsal segments darker. Wings light yellow, veins somewhat darker; mura-trichia dark brown. Venation: R3 lying almost in transverse alignment with the basal section of R1; petiole of cell Mx about twice Mx; vein M A ending just before level of metapalar end of Mx.

Abdominal tergites dark brown, the sternites somewhat more brightened; hypopygium light yellow. Male hypopygium (Plate 3, fig. 43) with the dorsal lobe of hastatle, dl, dilated on basal two-thirds, thence suddenly narrowed into a very slender acute spine that is darkened only on outer third; ventral lobe of hastate a similar spine of almost the same length but a little shorter, glabrous to base. Two diastyles, the outer, od, a long, yellow, ribbontike structure, the distal half blunted, narrowed to an acute point at apex, the blackened portion on inner or outer face densely provided with long spinose setae that are arranged in at least two ranks. Inner style, id, nearly as long, yellow, the apex slightly dilated into a darkened head that is further produced laterally into an apicalate point; capitulate portion of style with a series of six to twelve microscopic punctures along inner margin before the point.

Habitat.—Chinha (Kuchwan).

Hodelesys, male, Mount Omol, altitude 4,200 feet, June 18, 1933 (Finch).

*Holocline tetragona* is quite distinct from the other Palearctic species of the genus in the structure of the male hypopygium. The dense brush of setae on the outer diastyle is somewhat suggestive of the condition in *M. tricorne* Denert and (Japan), but all other characters are quite distinct.
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Plate 1

1. *Licaria* (Phanerogamae) ovata sp. nov.; male hypogynous.
2. *Bettia* (Phanerogamae) pascuata sp. nov.; male hypogynous.
3. *Dikarya* (Phanerogamae) bicolor sp. nov.; male hypogynous.
4. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
5. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
6. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
7. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
8. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
9. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
10. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
11. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
12. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
13. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
14. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
15. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
16. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
17. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
18. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
19. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
20. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
21. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
22. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
23. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
24. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
25. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
26. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
27. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
28. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
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31. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
32. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
33. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
34. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
35. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.
36. *Oligomeris* (Phanerogamae) bicolorata sp. nov.; male hypogynous.