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### THE PSYCHOTROPIC *BANISTERIOPSIS* AMONG THE SIBUNDOY OF COLOMBIA

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#### I

THE malpighiaceae psychotropic drugs of northwestern Amazonia have long fascinated numerous native peoples of that region, but it was not until about a century ago that their existence became more widely known. Villavicencio (44) wrote of the Záparo in eastern Ecuador, in 1858, saying, "They take a vine called *Aya huasca* (death or soul vine) from which they make a light decoction and the Indian drinks it . . . and in a few moments it begins to produce the strangest phenomena". Spruce (41) collected botanical specimens in 1852-53 of large forest lianas in the Río Uaupés drainage in Brazil which were used by the Tukano to alter consciousness during festive communal dances. He named the lianas as a new species of the genus *Banisteria* of the Malpighiaceae; Morton (24) transferred them to an allied genus, and today they are known as *Banisteriopsis Caapi* (Spruce ex Griseb.) Mort.

During the century following the early discoveries, many other travellers in the Amazon basin recorded their experiences and observations of the hallucinogens variously known as *caapi* (e.g., *capí*; 10), *yagé*, *ayahuasca*, etc., but the literature that accumulated was extremely

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scattered, often fragmentary, and not always reliable. In 1957, Schultes (38) published a thorough and detailed review of the botanical aspects of this chaotic literature and presented, for the first time, a clear view of our knowledge of the identity of the malpighiaceus psychotropic drugs of the northwest Amazon. Rios (35) has compiled a review of ethnographic, linguistic, botanical and chemical aspects of *ayahuasca*. Today, as our knowledge rapidly increases, many new problems arise.

## II

Schultes (38) concluded that the drugs are, "made basically from the same or closely related plants of the Malpighiaceae", that is, *Banisteriopsis Caapi* (Spruce ex Griseb.) Mort. (syn. : *B. quitensis* (Ndz.) Mort. ; 8), *B. inebrians* Mort., *B. Rusbyana* (Ndz.) Mort. and *Tetrapterys methystica* R. E. Schultes. Several other plants have been reliably reported as occasional admixtures with *Banisteriopsis* (38, 39): *Alternanthera Lehmannii* Hieron. (Amaranthaceae), *Banisteria longialata* Ruiz ex Ndz. (Malpighiaceae), and *Datura* sp. (Solanaceae). Other species which may be involved are *Malouetia Tamaquarina* A. DC. (Apocynaceae) and *Mascagnia psilophylla* (Juss.) Griseb. var. *antifebrilis* (Ruiz & Pav.) Ndz. (Malpighiaceae).

Siqueira-Jaccoud (40) mentions that another malpighiaceus, harmine-containing liana, *Cabi paraensis* Ducke, is used in the same way as its close relative, *Banisteriopsis Caapi*, near the mouth of the Amazon, although Ducke (9) had denied any narcotic use of the plant. Rios (35) believed the *ayahuasca* of the Ucayali River in Peru to be the same species, but did not mention herbarium material to support his belief.

Herbarium collections of *Banisteriopsis muricata* (Cav.) Cuatr. giving the vernacular names *aya-huasca*

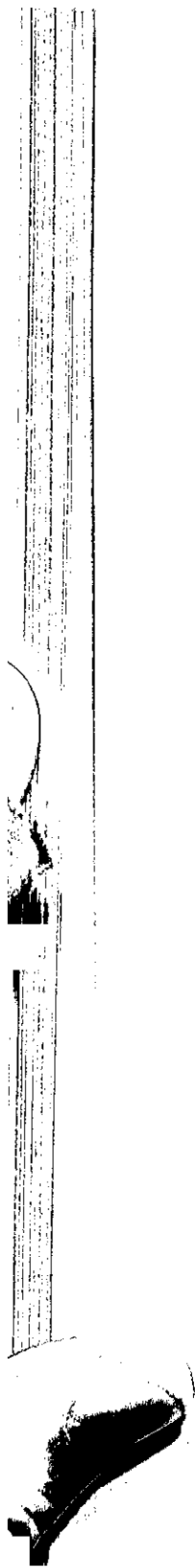
(Herrera 672, Woytkowski 5538) and *agahuasca* (Woytkowski 5332) suggest that this species may one day be shown to be an ingredient of the drug *ayahuasca* in Peru.

### III

Fischer (12) isolated an alkaloid from *yagé* which Elger (11) showed to be harmine, long known from the seeds of a Near Eastern perennial shrub, *Peganum Harmala* L., of the Zygophyllaceae. Chen and Chen (7) confirmed the presence of harmine in *Banisteriopsis Caapi*, and O'Connell and Lynn (26) isolated it from stems of *B. inebrians*. Hochstein and Paradies (16) demonstrated the presence of two other  $\beta$ -carboline derivatives, harmaline and *d*-tetrahydroharmine, as well as harmine, in *B. Caapi* stems. However, O'Connell and Lynn (26) had reported the absence of harmaline in the stems of *B. inebrians*.

Harmine has been found also in the Amazonian malpighiaceous lianas *Cabi paraensis* (23) and *paricá* (3), the latter containing harmaline and tetrahydroharmine as well. *Paricá* is the name employed by the Tukano for the hallucinogenic snuffs that they prepare from myristicaceous trees of the genus *Virola* (37a) and, reportedly, from malpighiaceous lianas as well (3), although herbarium specimens to support this interesting report are apparently lacking. The snuff called *epená* by the Surára, also of northwestern Brazil, contains harmine and tetrahydroharmine (2a). Other harman alkaloids have been found in seven plant genera in six families (4).

Hochstein and Paradies (16) isolated N,N-dimethyltryptamine from leaves said to be employed in Peru along with *B. Caapi* in preparing a narcotic beverage. In the absence of herbarium specimens, the common name had suggested *Prestonia amazonica* as the identity of the leaves, but Schultes and Raffauf (39) have shown this



identification to be in error. On the other hand, the addition of leaves of *Banisteriopsis Rusbyana* to the bark and wood of *B. Caapi* is a well known practice (38), and this species ranges from Colombia to Bolivia, including the region in Peru from which Hochstein and Paradies obtained their materials. It is wholly possible, then, that this indole analogue of serotonin is present in *B. Rusbyana*. Dimethyltryptamine is known to have psychotropic action in man (37).

N,N-dimethyltryptamine has been isolated also from the seeds of the mimosoid legumes *Anadenanthera peregrina* (L.) Speg. (syn. : *Piptadenia peregrina* L. ; 2) and *A. colubrina* var. *Cebil* (Griseb.) v. Reis (syn. : *P. macrocarpa* Benth. ; 2), from which the narcotic snuff *cohoba*, *vilca* or *yopo* is prepared over a wide area in South America (13, 34). Pachter *et al.* (27) recovered the same tryptamine from another related legume, *Mimosa hostilis* Benth., used by the Pancurú of northeastern Brazil to prepare their psychotropic drink, *vinho de Jurumena*. Holmstedt (17) finds this alkaloid, as well as two of its analogues, in *epená*, an intoxicating snuff used by the Waica in northwestern Brazil. The wood anatomy of this drug source indicates a species of *Virola* (Myristicaceae).

#### IV

Recent biochemical and pharmacological studies of the harmala alkaloids bring us toward an understanding of *Banisteriopsis* intoxication. Udenfriend *et al.* (42) showed harmaline to be one of the most potent, but reversible, inhibitors of monoamine oxidase (MAO) activity, and Pletscher *et al.* (31) extended this finding to the other methoxy-harmanes, harmine and tetrahydroharmine, using murine brain *in vivo*. Harmaline's inhibition of MAO in rat brain was seen to last for from twelve to

sixteen hours, while that of harmine disappeared in about eight hours (18). The enzyme MAO functions in the breakdown of serotonin, a biologically highly active substance found in various tissues, including the central nervous system; and in the breakdown of norepinephrine, a possible neurohumor of the central nervous system and known neurotransmitter in the sympathetic nervous system (22). Antidepressant drugs known to inhibit MAO have produced a variety of systemic and psychotomimetic effects, but there is little agreement about the mechanism underlying these actions (15).

Pletscher *et al.* (32) and Zirkle and Kaiser (46) have recently prepared extensive reviews on monoamine oxidase inhibitors. Harmine and harmaline cause hypotension and bradycardia when administered intravenously, but prevent or reverse the hypotensive and sedative effects of reserpine. Small dosages of harmine can slightly increase blood pressure. Although harmine blocks or depresses ganglionic and myoneural transmission, it stimulates intestinal contractions in intact animals. Both harmine and harmaline promote uterine contractions.

Antihelminthic action on parasitic ascarid worms by harmine and harmaline has been observed, and various harman derivatives are also active against Protozoa (trypanosomes, amoebae) *in vitro* (32).

## V

The psychotropic effects of the malpighiaceae drugs are many and varied, and depend upon the species employed, upon the method of preparing the drugs, upon the social and physical environment in which they are taken, and upon the age, health, personality, expectations and mental state of those who take them. I do not intend here to summarize these effects, but attention is called to the report of Pennes and Hoch (29) on the

effects of harmine on thirty-two schizophrenic subjects. They wrote, "Diffuse alterations usually occurred in many realms—autonomic, motor, perceptual, emotional, intellectual, and behavioral." Some of the effects of harmine were:

nausea and vomiting; slow, coarse, spontaneous tremor of the extremities of an 'extrapyramidal' appearance; humming and buzzing noises (no voices); 'waviness' of the environment; 'sinking' sensations of the body; subjective sense of body vibration; and subject numbness, accompanied by objective evidence of reduced sensitivity to light touch and pinprick.

Bradycardia and hypotension were very marked. They observed a "semideliriod or confusional state", with drowsiness and some amnesia, accompanied by a shallow euphoria and visual hallucinations.

Gershon and Lang (14) suggest that "The chief central effects of [harmine] are an anxiety type response in normal man and an activation of psychotic processes in schizophrenic subjects. This distinction is of the utmost theoretical importance in that [harmine] may fall into a very special group of psychotomimetic agents."

Naranjo (25) experimented with harmaline on thirty-two Chilean subjects, nearly all of whom found it hallucinogenic. Visions of serpents, tigers and birds, and of negroes, and experiences of flying, of death, and especially an acute awareness of a human soul separated from its body, were common themes.

Experiments with rats have shown harmaline to nullify a conditioned avoidance-escape behavioral reflex (21).

## VI

The following account presents some of the details concerning the preparation and use of *Banisteriopsis* by Sibundoy medicine-men in diagnosing and treating somatic disease and in discovering therapeutic agents. The

rich variety of hallucinations experienced by natives during intoxication will be reported elsewhere. No attempt is made here to discuss the drug's implications for psychosomatic therapy, for the treatment or investigation of mental disorders or for psychedelic use.

The Sibundoy are one of the few native peoples of highland South America known to employ *Banisteriopsis*. The tribe inhabits the northeast side of a small basin lying at 2200 meters elevation and isolated on the eastern side of the Andean Cordillera in southern Colombia. At present, they share the basin, or the Valle de Sibundoy, with some 8500-4000 Santiagueño Indians and about 9000 *blancos* of predominantly Spanish ancestry. In 1961, the Sibundoy numbered about 2180, having increased very rapidly during the present century. The bilingual Sibundoy have been schooled by Catholic missionaries, but, excepting the exigencies of the new religion, they adhere to their traditional cultural patterns. While their cultural origins remain enigmatic, their agricultural practices exclude them entirely from the cultural context of highland southern Colombia. It is likely that they were once a tropical forest people, but they may have ascended to the Valley of Sibundoy in the remote past (5, 6). Pérez de Quesada found them well established there in 1542 (1).

Apart from Uscátegui's (43) belief that "Yagé, coca and tobacco are doubtlessly present as imported curiosities in the bundles of magic-elements of Sibundoy medicine-men, but none of these narcotics is used widely by the Kamsá people", there has been no mention of the Sibundoy use of *yagé*. (Coca and tobacco—excepting occasional commercial cigarettes—are absent among the Sibundoy.) Rocha's account (36) in a Bogotá newspaper (the original of which I have not seen) erroneously equates the Mocoa and Ingano with the "Sebondoy", and seems

to be confined to the use of *yagé* in the Putumayo lowlands, thus excluding the Sibundoy (cf. 33). Yepes (45) discussed the use of *yagé* by the neighboring, Inga-speaking Santiagueño in his published interview with a travelling medicine-man in Popayan.

## VII

The Sibundoy call the drug *biaxli*\* in their native language Kamsá, but frequently use the widespread *yagé* as well. Table I lists and explains all those words used by the Sibundoy to designate the drug or its compo-

TABLE I

Terms employed by the Sibundoy for the drug and its source plants.

Term	Etymology	Ref.	Application
<i>Amarón wáska</i>	Spanish <i>amarrón</i> 'boa constrictor', from <i>amarrar</i> 'to tie'; and Quechua <i>wáskha</i> 'cord' [hence 'liana'].	(6)	<i>B. Caapi</i>
<i>Ambiwáska</i>	Quechua <i>hánpi</i> 'medicine' and <i>wáskha</i> 'liana'.	(20)	<i>B. Caapi</i> , drug
<i>Ayawáska</i>	Quechua <i>áya</i> 'cadaver' and <i>wáskha</i> 'liana'.	(20)	<i>B. Caapi</i> , drug
<i>Biáxa</i>	Kamsá: sometimes 'climbing plant', but usually restricted to this use. (Related to <i>yaxé</i> ?).	(6)	<i>B. Caapi</i>
<i>Biaxli</i>	Kamsá: from <i>biáxa</i> .	(19)	drug
<i>Bičémia</i>	Kamsá: 'climbing plant'.		<i>B. Caapi</i>
<i>Čagrupõngə</i>	Quechua <i>čáhra</i> 'planted area, garden'; and <i>p'ánkka</i> 'corn shuck', hence 'leaf'.	(20) (28)	<i>B. Rusbyana</i>
<i>Remedio</i> , <i>El remedio</i>	Spanish: 'remedy'.		drug
<i>Sáčawáska</i>	Quechua <i>sácl'a</i> 'shrub, tree' [hence 'woodland']; and <i>wáskha</i> 'liana'.	(20) (28)	<i>B. Caapi</i> , drug
<i>Yaxé</i>	Tukano <i>yahi</i> 'sorcerer, sorcerer's plant'.	(33)	<i>B. Caapi</i> , drug

\*The notation of Kamsá conforms with Juajibioy (19) who follows the Institut d'Ethnologie and the Societé de Linguistique of Paris. An English approximation of *biaxli* is *byah-hee-ee*.

nents. The presence of non-Kamsá names among the Sibundoy is occasioned by their frequent acquisition of plant materials through natives speaking one of the Quechuan languages. Sometimes the drug is accorded a position of preeminence with the Spanish epithet *el remedio* ('the remedy'), a term employed even when speaking Kamsá. The names *sačawáska* 'woodland liana' and *čagrupóngə* 'garden leaf' imply that *B. Caapi* is considered wild, while *B. Rusbyana* is thought of as domesticated, or at least ruderal. As yet, however, we have no botanical evidence to support such an interpretation. A Siona Indian in the nearby lowlands says, "The plant is cultivated and lasts forever." (21a). He seems to refer to the liana the bark of which is employed, *B. Caapi*. The widespread term *ayawáska*, or *ayahuasca*, seems especially pertinent in regard to Naranjo's finding (25) that many of his harmaline-treated subjects in Chile experienced feelings of death and of the separation of soul and body.

### VIII

The botanical identities of the crude drugs *biáwa* and *čagrupóngə*, from which *biawü* is prepared, are based upon seven sterile and three partly fertile specimens from the adjacent eastern lowlands, whence the Sibundoy obtain the plant materials. *Bristol 759* (*biáwa*) from the garden of Salvador Chindoy in the Valley of Sibundoy represents *Banisteriopsis Caapi* (Spruce ex Griseb.) Mort. Chindoy planted it there from a cutting that he obtained near Mocoa about ten years ago, but he will be unable to use it for *biawü* for years to come because it grows slowly in the cool climate of the high valley. *Bristol 325-A7* (*čagrupóngə*) consists of four leaves of *B. Rusbyana* (Ndz.) Mort. brought by the same medicine-man from the same area.

*Bristol 759* is equivalent to the five sterile specimens of *B. Caapi* from the Mocoa-Umbría region of the eastern lowlands, but it likewise resembles *Klug 1964*, the type of *B. inebrians* Mort., also from Umbría. *Bristol 325-A7* is similar to two sterile and two semi-fertile collections of *B. Rusbyana* from the same region.

*Specimens examined from the region where the Sibundoy collect materials for preparing biaxii.*

### *Banisteriopsis Caapi* (*Spruce ex Griseb.*) *Mort.*

COLOMBIA. Comisaría del Putumayo: Valle de Sibundoy, alt. 2200 m., 1.5 km. s. Sibundoy.—Twining, woody, 3 m. "Biaj". Narcotic. Planted as cutting brought from near Mocoa. Bark to be used for hallucinogen, "biajii". Indian garden, very infreq. [sterile]. 13-IV-1963, *Bristol 759* (ECON). Región de Mocoa, alt. 550-800 m., camino viejo Mocoa-Pepino.—[sterile]. 28-VIII-1963, *Chindoy*\* 256a (ECON).—"Bichemia" ('bejuco'), "Amarrón huasca" ('bejuco de boa'). Enredadero 5-6 m.; flor morada. [sterile]. 28-VIII-1963, *Chindoy 279* (ECON, GH, US). Riberas del río Rumiyacu, entre las poblaciones de El Pepino y Mocoa, alt. ca. 600 m.—Nombre vernáculo "Yajé". Bejuco trepador de unos 7 m. Tallos cilíndricos. Cultivado por los indios Inganos en campo abierto y poco sombreado. [sterile]. 28-VII-1960, *Fernández-Pérez & Schultes 5704* (ECON). Umbría, alt. 325 m.—"Yagé" vine. Forest clearing. [sterile]. I/II-1931, *Klug 1934* (A, GH). Alta cuenca del Río Uchupayaco, al suroeste de Puerto Limón.—"Yajé". Narcotic. Liana. [sterile]. 27/28-II-1942, *Schultes 3346* (ECON).

### *Banisteriopsis inebrians* *Mort.*

COLOMBIA. Comisaría del Putumayo: Umbría, alt. 325 m.—"Yagé del monte". Strong narcotic. Indians make a brew of this and have "visions". From root to tip, more than 30 meters long. It takes 6 men to drag the lower half when cut. I estimate that this weighs more than 500 kg. Forest. [fruiting]. I/II-1931, *Klug 1964* (TYRB; A, ECON, GH).

\* Pedro Juajibioy Chindoy, brother of the ethnographer and linguist Alberto Juajibioy Chindoy; not related to the medicine-man Salvador Chindoy.

*Klug 1964* may be the only fertile collection extant of this species (8).

### **Banisteriopsis Rusbyana (Ndz.) Mort.**

COLOMBIA. Comisaría del Putumayo: (Valle de Sibundoy).—Obtained from Salvador Chindoy, a Sibundoy who collected these near Mocoa, alt. 550-800 m. "Chagrupanga". Narcotic. For preparing the hallucinogen "biajii". [4 leaves]. *Bristol 325-A7* (ECON). Región de Mocoa, alt. 550-800 m.—"Amarrón chagrupanga". [sterile]. 28-VIII-1968, *Chindoy 280a* (ECON).—"Chagropanga". 2.5 m. Se dice que no tiene flor. [sterile]. 28-VIII-1968, *Chindoy 281* (ECON, US). Umbría, alt. 325 m.—"Chagropanga" "oco yagé". Vine. Forest. [stem, leaves, 1 perianth]. I/II-1931, *Klug 1971* (A, GH).

### IX

The Sibundoy avail themselves of *biaxii* in two ways. First: they may purchase a bottle of prepared *biaxii* from a Sibundoy or Santiagueño medicine-man in the Valley of Sibundoy. Several natives of the valley who know where to gather the plant materials in the eastern lowlands and how to prepare the drug engage in this commerce. They sell it by the liter for five to ten pesos. Second: in cases of severe or prolonged illness, one of these medicine-men (*tatmbwá*, *biaxii pormayá*) is paid, usually in kind or in labor, to diagnose the disease (*şokán*) while intoxicated with *biaxii*. On these occasions, members of the patient's family and one or more friends of the medicine-man may also take the drink. Thus, while the uses of *biaxii* by medicine-men to diagnose disease and "to study medicine" are considered the more important by the Sibundoy and are the central subject of this report, a majority of the men and many of the women have also taken *biaxii* several times in their lives and for other purposes.

*Biaxii* intoxication is sought for a variety of reasons outside of the medical sphere. A Sibundoy separated from his family while travelling may take it to relieve his loneliness and, as he says, transport himself to their

midst. Or he may be anxious to know who is gossiping about him during his absence. The location of a lost object, he believes, can be revealed by intoxication. It would appear that anxiety states can be better defined, or even resolved, with *biawii*. Of great importance is its use *para conocer*, 'to perceive, to experience, to know through familiarity, to learn', the native's way of expressing in Spanish the drug's ability to "expand consciousness", especially in the visual realm. In this connection, and perhaps in other ways as well, *biawii* helps the Sibundoy 'to learn how to live'.

Therapeutically, the Sibundoy medicine-man employs *biawii* for its unfailing purgative action, perhaps due to harmine's ability to increase intestinal motility (32). As an emetic, the drug is notorious. These secondary actions, while deliberately prescribed at times, also affirm the medicine-man's control over the body, for the drug is taken usually by the patient undergoing diagnosis as well. A strong purge is always assumed to be beneficial, a reasonable assumption in an environment where intestinal parasites are common. The antiparasitic actions of the harmala alkaloids have already been noted (32). Regardless of the ensuing diagnosis, the patient justifiably feels that some improvement has been attained.

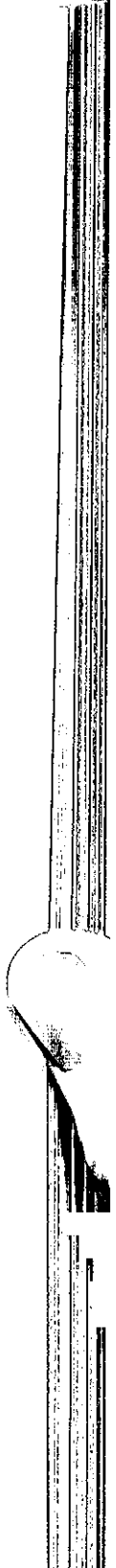
## X

We now proceed to an examination of my observations on the preparation of *biawii* and its use in diagnosing disease and in "studying medicine" by a Sibundoy medicine-man and close friend, Salvador Chindoy. I have been able to discuss the utilization and especially the intoxication from *biawii* with many Sibundoy, but rather than present a composite and generalized picture of its use, it seems preferable to recount a specific instance, the one I observed most fully.

PLATE XVII



The small hut (*biaríi wabranái ámbó*) hidden in a secluded garden area where Salvador Chindoy prepares *biaríi*. A meter stick indicates its size. The roofing is made from fronds of the very common palm, *botsacsá* (*Prestoea* sp.), seen at the upper right and in Plate XVIII. A bunch of dried cornstalks suggests a wall.



On this occasion, Chindoy prepared the drug with the bark of *Banisteriopsis Caapi* (or possibly *B. inebrians*) and the leaves of *B. Rusbyana* that he had recently gathered in the Mocoa region of the adjacent eastern lowlands.

The preparation of *biaxii* is reserved to a small hut, *biaxii wabwandí támbó*, (*biaxii* 'cooking shelter'), which women are expected never to approach (see Plate XVII). It is believed that, should a pregnant woman come too near the hut, thunder and lightning will appear, and both the woman and the medicine-man will be killed instantly. Among other things, this taboo serves to prevent women's learning how to prepare *biaxii* and thus intoxicate themselves when their husbands are travelling. While women can and do take *biaxii*, they must never do so in the absence of their husbands. Furthermore, harmine and harmaline promote uterine contractions (32) and may cause abortion. If the women are aware of this possibility, the taboo discourages their using *biaxii* as an abortifacient without the consent of their husbands. Whether or not pregnant women ever take *biaxii* for any purpose was not ascertained.

The details of preparing *biaxii* vary somewhat, especially between the ideal and the actual practice. Chindoy explained the procedure as follows:

Beginning in the morning, boil forty liters of water, add a pile of bark scrapings to the boiling water, and stuff the pot full of *čagrupóngá* leaves. At noon, throw out both the scrapings and the leaves and add the same amounts of fresh scrapings and leaves, continuing to boil for another three or four hours. Again remove the scrapings and leaves, but this time, add only twelve pairs of *čagrupóngá* (24 leaves), boiling them for two additional hours. When they are taken out, the pot is cooled and the *biaxii* readied for use.

As I had the opportunity to observe the complete preparation of *biaxii* by Chindoy, it seems worthwhile to record his actual procedures here.

Late in the afternoon the *biaxii wabwanayá* (*biaxii* 'cook') started

PLATE XVIII



A Sibundoy medicine-man, Salvador Chindoy, demonstrating the adornments he uses while practicing medicine under the influence of the psychotropic drug *biariri*. (See text.)



a fire in the *biaxli* cooking hut, about fifty meters from the house in a secluded spot. A cauldron with several liters of water was set to boil, and twenty-four *čagrupóngə* leaves were added. This was left and he returned to the house to chat with his family and eat a light supper.

About 7:00 P.M., Chindoy returned to the hut with several enormous leaf blades of *sikse tomakéño* (*Colocasia esculenta* Schott) and two liters of *biaxli* remaining from a previous occasion. Behind the hut, he dug up 'four pairs' (eight sections about  $4 \times 25$  cm.) of the *biáxa* liana. These had been buried for three weeks, to keep them fresher, he said. The sections were carefully scraped to remove all dirt from the bark, an operation which took twenty-five minutes. During this time, the fire subsided, but, when the cleaning was finished, he revived it to continue the boiling for about forty-five minutes.

Now the medicine-man began scraping the bark from the sections of liana with a knife. This tiring process lasted about half an hour, during which time six sections were scraped down to the wood. He decided that it would be too much work to scrape the bark from the remaining two, and further decided against mashing up the wood as he had previously intended. About one and a half liters of scrapings from the liana were accumulated.

A flat stone was placed on the *Colocasia* leaves, and the bark scrapings were pounded on this with a smaller round stone, collected on the leaves and dumped into a large enamel bowl. The scrapings appeared to be reduced to one liter in volume.

The two bottles of previously prepared *biaxli* were then shaken, producing a froth in the bottles. Their contents, about one and a half liters, were emptied into the bowl of fresh bark scrapings, and about one-half of the simmering *čagrupóngə* infusion (one liter) was also added to the bowl. Chindoy washed his hands and proceeded to knead, rub and squeeze the scrapings in the bowl for several minutes. Then the scrapings were thrown into the cauldron of *čagrupóngə* leaves and the cauldron taken off the fire. The liquid in the bowl, consisting of previously prepared *biaxli* (1.5 liters) and an infusion of *čagrupóngə* leaves (1 liter) in which about 1 liter of mashed *biáxa* bark scrapings had been kneaded and squeezed, was ready for consumption as soon as cooled.

In brief, the ingredients of *biaxli* were:

1. 24 leaves of *B. Rusbyana*.
2. Bark from a stem of *B. Caapi* (or possibly *B. inebrians*) about 1.5 meters long and 4 cm. in diameter.
3. 1.5 liters of previously prepared *biaxli*.

The leaves were boiled in several liters of water, but only half of the resulting infusion, or one liter, was used on this occasion. This simmering infusion was added to the cold drink previously prepared, and the sap and small particles from the shredded and pounded bark completed the luke-warm mixture.

The two bottles of *biaxii* left from another occasion could have been taken alone, but Chindoy advised that "it is better to refine the *biaxii*". He said the *čagrupǎngǎ* leaves had to be included, "in order to see pictures", for the *biáwa* bark alone is not hallucinogenic. The remaining liter of *čagrupǎngǎ* infusion, the squeezed bark scrapings, the wood of the six sections already scraped, as well as the two untouched sections, were saved to prepare more *biaxii* at a later date. If all these materials are, in fact, used in making the next *biaxii*, its preparation will conform neither to the stated ideal, nor to the procedure just described. Presumably, some *biaxii* left over from the present batch would serve as the basis for the next.

Although women are never allowed in or near the hut, once the preparation is complete, the *biaxii* can be taken to the house, for "the women can no longer harm it".

## XI

It was then about 8:30 P. M., and Chindoy's wife and the three visitors had gone to bed on reed mats on the floor in the main room. The medicine-man arranged his blankets on the raised wooden bed, and I slept on the floor on a mat. It is common for friends of the medicine-man to spend the night at his house at such opportunities to take *biaxii*, and I was not in an awkward atmosphere. The drink was to be taken around midnight.

The stated purpose of taking *biaxii* on this occasion was twofold. First: a young couple with an ailing infant

wanted to have its disease diagnosed and cured. The child was said to be thirteen months old, but it was obviously stunted. Several native remedies had been tried by the parents to no avail during the past few months. Second: Chindoy wanted to examine some branches of a peculiar *boračera* (*Datura candida* (Pers.) Saff.) closely resembling several of the more important medicinal plants known to him. I had located the small tree in the garden of an older, well known Sibundoy along a much frequented trail, but it had never been seen by Chindoy who rarely had occasion to travel that section of the trail. As he had said that it would be very unwise for him to inspect the other man's tree, I had brought several branches from it. Intoxicated with *biawii*, he would "examine" the branches to determine whether the plant was "poison or remedy, and, if not a poison, what it would be good for and how it should be used".

The medicine-man, the young couple and I awoke at about 1:30 A.M. The medicine-man adorned himself for the ceremonial preparation of the *biawii* with a necklace of large puma canine-teeth, a great many small-beaded necklaces of several colors, two longer necklaces of palm fruit rattles, a chain necklace with a crucifix, two long, tightly wound wrist cords, two red parrot tail feathers in his pierced ear lobes, and a narrow crown with erect, red and blue parrot tail feathers at the rear and a long train of green parrot tail feathers and black-yellow-red toucan tails hanging behind (see Plate XVIII). Excepting for the multicolored porcelain bead necklaces, all these adornments are used by Chindoy exclusively for practicing medicine while influenced by *biawii*. He acquired all but the beads and crucifix in the eastern lowlands among the Mocoa and Ingano who fashioned them from locally available materials and who use them for similar purposes.

Chindoy sat on a stool facing the large enamel bowl of *biaxii* and the wall; the young woman and child remained on their mat on the floor; and the young man and I sat on stools around the now dead fire.

A ceremony was performed over the bowl of *biaxii* before any was taken. The medicine-man alternately chanted, hummed and whistled a tune of three or four staccato notes for about ten minutes. The chanting was solely of the syllables *bia-ai-bia-ai-bia-ai-i-bia-ai-bia-ai-i* . . . . There was no pause in the chanting, humming and whistling. This was accompanied by rattling a brush, *bačnanaišá* (*báčna* 'priest', *wnaišá* ?), made of dried leaves known as *wa-tra-činga* or *pičánga*. This is a "broom to sweep away *bálna bíŋjia* or *malaire*", an airborne disease-causing spirit. The oblong-lanceolate leaves are from a low, unidentified grass of the eastern lowlands.

After the initial ceremony over the large bowl of *biaxii* was complete, Chindoy put some of the drug into a *biaxii futmán kwaštém*, or *medida*, a 'measure' of about 150 cc. This *kwaštém* ('little bowl') is a small, very hard bowl, made probably from a small-fruited variety of the calabash tree, *Crescentia Cujete* L. With the measure of *biaxii* held in the hand, the chanting and humming was repeated. He dipped a crucifix from one of his necklaces into the drink and then crossed himself with it. He completed the ceremony by repeating the sign of the cross over the measure of *biaxii*.

He drank the *biaxii* quickly, spitting and shaking his head because of the disagreeable bitterness. He followed it with half a jigger (20-25 cc.) of *aguardiente* ('whiskey') to wash his mouth, but then he swallowed it, too. With similar ceremony, the medicine-man offered me a measure of *biaxii* which I drank quickly and followed with the more pleasant taste of a few drops of rum which he had advised me to bring for this purpose. A third measure

was given to the young father of the sick infant, and half as much was given also to its mother in a small glass bowl.

After considerable spitting on the dirt floor, Chindoy vomited lightly over the bench next to the wall, beside the head of his sleeping wife. Suddenly, the young man leaped from his stool and vomited lustily across the floor, to everyone's amusement; outside the door, he continued retching for several minutes. About forty-five minutes after taking the drug, no one had noticed any psychic effects, and the three men present each took another half measure. Shortly thereafter, nausea overcame me, and I was obliged to withdraw and vomit up the infusion.

Before long, Chindoy announced, "The *čúma* ('narcosis') has seized me", but instead of sharing any feelings and insights, and perhaps because the drug made him drowsy, he retired quickly to bed. He had seemed to take no notice of either the ailing child or the unknown *boráčéra* branches. With no signs of inebriation, the rest of us soon followed suit.

All of the Sibundoy agree that to "see things" most people must take *biawíi* on several occasions and that neophytes rarely succeed. Chindoy, who takes *biawíi* every few weeks and sometimes more often, invariably has visions and says that he "learns" something each time. My own failure to respond to *biawíi* was not unusual; indeed, it was anticipated by Chindoy. But I remembered also the abbreviated procedures in preparing the drink and wondered if a longer boiling of larger quantities of leaves and bark would have been more likely to produce psychic effects.

Juajibioy (pers. comm.) informs me that sometimes the participants bathe in the nearest stream the following dawn and then are ritually fumigated with *kopál* (resin from *Hymenaea Courbaril* L.; 30) to expel *malaire*.

We arose leisurely at about 6:00 A.M. and rolled up

our sleeping mats. I felt nothing unusual. Presently, I asked the medicine-man, "Did you see anything last night?" and he gave three answers.

First: he had seen that my parents in the United States were disturbed over my long absence (fifteen months) and were anxious for me to return home. They felt that I was being very irresponsible in neglecting them for so long. Second: he informed us that nothing could be done to save the stunted child. Some time ago *microbios* had entered the body between the toes and had crept up through the legs into the torso and now suffused the whole body except for the heart. As soon as they reached the heart—he repeated this—the infant would die. Third: the unusual *Datura* was identified as *salamán boračéra*, a small tree cultivated by Chindoy and used for various medicinal and occasionally narcotic purposes. He would plant the cuttings in his garden, he said, and use the leaves as he does those of the *salamán boračéra*.

Here ends this instance of the use of *biawü* by the Sibundoy, but several comments on its results may be worthwhile.

## XII

The observation of my parents' anxiety over my long absence may imply that Chindoy was disturbed, even during normal consciousness, by what he sensed as careless irresponsibility on my part. Certainly among the Sibundoy, filial responsibilities are greater than in American society. It appears likely that valuable insight on Sibundoy cultural values could be gained from an analysis of the content of natives' psychic experiences during *biawü* intoxication.

Of greater interest is the medicine-man's finding that nothing could save his patient from approaching death,

for ten days later the child died. With this event, the predictive value of *biawii* intoxication was dramatically confirmed for all those Sibundoy involved. Regardless of whether the *biawii* actually contained psychotropic methoxy-harmanes that might somehow facilitate prognosis, several occurrences of this sequence—intoxication, prediction of an event, realization of the event—might be sufficient to establish the general use of the drug for prognostication. We may postulate that such a stimulus-response-reward phenomenon occurred repeatedly among not only the Sibundoy, but especially among tribes of the western Amazon long ago when the use of *Banisteriopsis* was in its initial and experimental stages.

The final observation of the medicine-man on the identity of an unusual plant was as unexpected as it was illuminating. Chindoy's identification of the leaves as those of *salamán boračéra* was manifestly incorrect, as he conceded at a later date when comparing leaves of the two plants. The misidentification is all the more surprising in view of Chindoy's exceptional interest in the medicinal and narcotic uses of the *Datura candida* clones and in the fact that he cultivates all of them in his garden, unlike any other Sibundoy contacted. The plant in question was a variant of the *amarón boračéra* growing beside Chindoy's house, but for which he knows no use.

In this determination through *Banisteriopsis* intoxication of the medicinal uses of a previously unknown plant, we see a most interesting mechanism for the expansion of the Sibundoy *materia medica*. Not only are new plant drugs thus introduced, but there can be little certainty that the use of new drugs will be restricted to situations for which drugs are already available. Through chance, operating within the superstitious nature of Sibundoy beliefs, it is entirely possible that a new drug would become associated with disease symptoms previously un-

treatable. This role of narcosis in expanding the native pharmacopoeia neither leads to the conclusion that most of the Sibundoy drugs were discovered in this way, nor does it suggest that any drugs so discovered are likely to have less therapeutic value than drugs discovered in other ways by other primitive peoples. Nevertheless, it would seem that a substantial increase in the number of medicinal plants available to a culture implies at least a slight increase in that small number which are therapeutically effective. The use of *Banisteriopsis* by Sibundoy medicine-men, not only as an emetic and purge, but even more generally to investigate medicine and disease, may be seen as leading ultimately to an improvement of tribal health.

### XIII

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