

AN ETHNOBOTANICAL ANOMALY:  
THE DEARTH OF BINOMIAL SPECIFICS IN A FOLK TAXONOMY  
OF A NEGRITO HUNTER-GATHERER SOCIETY  
IN THE PHILIPPINES

THOMAS N. HEADLAND  
*Summer Institute of Linguistics*  
*Box 2270, Manila, Philippines*

**ABSTRACT.**—The Agta are a Negrito hunter-gatherer group in the Philippines. After a brief description of their culture, language, natural environment, and folk plant taxonomy, a comparison is made between that taxonomy and the universal model proposed by Brent Berlin. While the Agta data substantiate the Berlin model in most aspects, there is one salient area of conflict. The model proposes that specific biological taxa in any language are composed of binomials. It is argued here that the Agta case is an anomaly, in that their specific plant taxa are monomials. Four hypotheses are proposed as possible explanations for this anomaly.

INTRODUCTION

Certain cognitive anthropologists, particularly Brent Berlin and his associates, argue that in any ethnobiological taxonomy the specific taxa (those found at the third level of a taxonomy) are almost always binomial "secondary" lexemes.<sup>1</sup> The suggestion is that this "binomiality principle" (Berlin 1978:20) may be a human universal. Most of the evidence published to date substantiates this hypothesis.

Data gathered by the present author and his wife in the 1970s, however, provide a startling exception to the hypothesis. An analysis of an ethnobotanical taxonomy of the Agta Negritos found that of the sample of 143 specific taxa elicited from Agta informants, only five were binomials, and none of these were secondary lexemes. Furthermore, to the author's knowledge, no secondary biological lexemes were found to occur in the Agta language, except for the two varietal taxa mentioned in Note 3.

After an introductory description of the Agta sociocultural system, including their natural environment, economy, language, and their relationship with the flora and vegetation, a brief description is presented of their folk plant taxonomy. A comparison will be made between that Agta taxonomy and the Berlin model. Emphasis will be placed on the one area where the Agta data deviate from the model. Four hypotheses will be proposed herein as possible explanations for this Agta anomaly.

THE AGTA CULTURE AND ENVIRONMENT

*The culture.* The Casiguran Agta, or Casiguran Dumagat, are one of approximately 25 different Negrito populations found in the Philippines today. The Casiguran Agta are a hunter-gatherer society which numbered 621 in 1977. Most of these live in one of 13 band areas in or near the Casiguran Valley in Aurora Province, on the eastern coast of Luzon Island. The Agta are seminomadic. Their temporary settlements are typically composed of from three to seven kinship-related nuclear households, located either along watersheds in the foothills of the heavily rain-forested Sierra Madre or along the beaches of the seacoast.

*The environment.* The geographical boundaries of the Casiguran Agta circumscribe an area of 700 km<sup>2</sup>. Elevation ranges from sea level to a maximum of 1100 m. Average annual rainfall is 378 cm. The temperature ranges from an annual normal maximum of 31 C, to an annual normal minimum of 22 C. About half of the area is still covered by primary Dipterocarp rainforest, although most of this has been thinned of the bigger trees by loggers during the past twenty years. The Agta are today greatly outnumbered by a growing population of Filipino immigrant farmers, who now number some 30,000.<sup>2</sup>

*Economic pursuits.* Since at least the early Spanish era the economic activities of the Agta have been, for the men, hunting and fishing and, for the women, shellfishing, gathering wild yams (*Dioscorea* spp.), and extracting starch from a wild palm called *agel* (*Caryota cummingii*). Throughout the same period, a major aspect of their economics has involved the symbiotic relationship between the Agta and their lowland Filipino farming neighbors. This is manifested in heavy trading between the two populations. For at least the last hundred years, if not long before, the Agta have practiced very marginal swidden cultivation. Only about 4% of their starch foods comes from their own gardens (Rai 1982:171). Today, Agta women spend little time in the gathering of wild carbohydrate foods, since rice, secured from the non-Agta framers for which the Agta exchange meat, forest plants, or labor, is now their main staple.

*Linguistic note.* The Casiguran Agta speak their own distinct language, which belongs to the Northern Cordilleran subfamily of Austronesian (Tharp 1974). This language, hereinafter called Casiguran Agta, or simply Agta, is closely related to four sister languages spoken in northeastern Luzon: Palanan Agta, Agta of Southeastern Cagayan, Paranan, and Kasiguranin (Headland and Healey 1974, Headland 1975a). Casiguran Agta shares 46% of its basic vocabulary with Tagalog, and 43% with Ilokano (Headland 1975a). These are the two main trade languages of the area, and of most of Luzon Island.

In this paper, Agta terms are written phonemically. Glottal stop, which is predictable before initial vowel and after final vowels of utterances, and between certain vowel sequences, is not symbolized. The mid close central vowel (the so-called Austronesian 'pepet' vowel) is written as *é*, and the velar nasal is written as *ng*. (For a full description of Agta phonology, see Headland and Headland 1974:xii-xxvii, Headland and Healey 1974: 4-19, and Headland and Wolfenden 1967.)

*Agta culture in relation to the flora.* The Agta, a forest-dwelling group of hunters and gatherers, have an in-depth knowledge of the diverse flora in their environment. Merrill (1967:61) recognizes 8120 species of Philippine plants in 1524 genera. Eighty-six percent of the genera are indigenous (1308/1524), with 3% of these being endemic (35/1308). Ninety-four percent of the species are indigenous (7620/8120), with 77% of these identified as endemic (5832/7620). More recently, Zamora (1977:113) has estimated that there are 12,000 plant species in the Philippines.

The Agta are heavily oriented to the tropical rain forest, with its thousands of plant species. Agta adults can identify and name several hundred of these plants and, as Fox (1953) has demonstrated for another Negrito group, at least a few hundred of these have some cultural use. An Agta dictionary (Headland and Headland 1974) describes the names and some uses of over 200 plants among the Casiguran Agta, with half of these identified with their scientific equivalents.

The plant world is not, therefore, merely of peripheral interest to the Agta, but is a central theme in their culture, comparable to the importance of the buffalo among the Northern Plains Indians in the last century. Every Agta adult uses several species of plants every day of his life for food, medicines, ritual, art, social activities (e.g., exchange of betel ingredients), and practically every part of their material culture. Berlin (1978:9) makes the claim that, in the two nonliterate societies in which he worked, knowledge of the biological world constitutes a greater chunk than all other types of knowledge combined. I suggest here that this may be true for the Agta as well.

Earlier studies on Philippine forest groups indicate that their adult members can identify at least several hundred different plants. Rosaldo, who collected over 800 plants in the Ilongot area, estimates that the Ilongot name well over 1000 plant taxa (1972:95). Frake (1969:36) found 1400 plant taxa among the Eastern Subanon. Fox (1953) describes 600 different plants named by the Negritos in Zambales and Tarlac provinces. McKaughan and Macaraya (1965) present a list of 700 Marahao plant names. Reid and Madulid (1972) list 385 Bontoc plant names. Vanoverbergh (1927) lists 750 plant names for Ilokano, and Pennoyer (1975) lists 915 for Taubuid. Conklin collected more than

1500 plants and plant terms among the Ifugao (1967:208), and more than 1800 plant terms among the Hanunoo (1962:129). Yen and Gutierrez, collected 210 botanical specimens which are recognized by Tasaday informants, and they state that they "consider that the main species of ethnobotanical value have been accounted for" with these 210 specimens (1967:135).

#### AN AGTA ETHNOBOTANICAL TAXONOMY

Employing a folk taxonomic model developed by Conklin (1954) and modified by Berlin and his associates (Berlin 1976, 1977, 1978; Berlin et al. 1968, 1969, 1973, 1974: 25-45; Kay 1971), my wife and I elicited an Agta plant taxonomy, using seven Agta informants. This was done during several periods of field work in the 1970s. While Berlin's model was generally confirmed, two important theoretical issues were encountered. First, in contrast to more general models, intracultural variability in taxonomic assignment was found to be substantial among the Agta. (This issue is described in Headland 1981b.) The second issue, described in the present paper, concerns the apparent lack of secondary binomial lexemes in Agta plant taxa.

*Field methodology.* The procedure we used for eliciting our data combined two methods. The first, described by Werner and Fenton (1973:572), is called "card sorting." Initially, a limited sample of 108 plant taxa were taken from our Agta dictionary and written onto separate three by five cards. Informants were then asked, in separate private sessions, to sort the cards into piles they felt belonged together, for whatever reason. After each informant had categorized the 108 cards into piles, he or she would, at our suggestion, continue to subdivide each pile into smaller piles until the finest subdivision was reached. My wife and I took notes as informants explained to us their reasons for the various categories.

The second elicitation method, described by Black (1969:174), was to ask the same informants two basic questions: "What kinds of X are there?" and "Is Z one kind of Y?" With these two questions one may obtain a folk taxonomy, that is, "elicit sets of terms and . . . determine inclusion and contrast relations among all terms elicited" (Black 1969:188).

The initial sample of 108 taxa was expanded to 203 when informants were questioned with Black's method. The final sample of taxa used, then, was 203 (60 generic taxa and 143 specific taxa). These 203 taxa are listed in Headland 1981b:77-85.

Clearly this small sample of plant taxa was not a random sample of the complete Agta plant world, which would have been ideal had it been possible. Rather, the 108 taxa (later expanded to 203) were a biased sample, taken either from the Agta dictionary (Headland and Headland 1974), or from plants with which we were familiar, as well as additional specific taxa added by informants when they were questioned with Black's method. Because the argument of this paper is derived from a sample, rather than the total of Agta plant taxa, the conclusions, though persuasive, must be recognized as tentative.

We worked in some detail with the three literate informants, at least four hours with each of these, and used both elicitation methods. Sessions with the four nonliterate informants were each about two hours long. The nonliterate informants worked well with Black's method, but could only do the initial categorizing with the card sorting method. In these cases we read the cards to the informants as they placed them into piles.

*The taxonomy.* Our analysis revealed the emic Agta plant kingdom as composed of three primary taxonomic levels, plus three intermediate taxonomic levels, plus a unique beginner level, which we simply labeled 'plant' (since this level is not lexically realized in Agta).<sup>3</sup> Following the Berlin model, we named these seven levels as follows: Unique beginner, life form, intermediate level A, intermediate level B, intermediate level C, generic, and specific.

The term "unique beginner" refers to the most inclusive taxon of a taxonomy. It is the label for the taxonomy, and is the only taxon at the highest level. It does not occur in a contrast set, and it is usually not labeled linguistically (Kay 1971:87; Berlin et al. 1973:215; Conklin 1962:128).

Life form taxa in Agta correspond to the definition proposed by Berlin (1976:384; 1978). Such taxa occur at the first level of the taxonomy, are few in number, are invariably polytypic, are made up of primary lexemes, and are differentiated by stem habit. All Agta informants divided the plant world into three categories: herbs, vines, and trees.<sup>4</sup>

Intermediate level taxa refer to points in a taxonomy where nodes occur, but for which there is no emic plant label (though there are usually generic descriptions, such as 'herbs that bear fruit', or 'hollow trunk trees'). Such intermediate taxa are "covert categories which . . . represent groupings of generic names which are included in mid-level taxa that have not been labeled by . . . plant lexemes" (Berlin et al. 1973:226).<sup>5</sup> Our Agta informants classified a number of plants into covert intermediate categories. Three levels of such categories occurred between the life form and generic taxa. (The details of these are not pertinent to the argument of the present paper, and are thus not described herein. Refer to Headland 1981b for a complete description of the Agta taxonomy.)

Generic taxa in Agta refer to plants which are readily perceived as different by any lay person (which is not the case with specific taxa). Agta generic lexemes are all monomials, and are included in one of the three life form taxa (with a few ambiguously affiliated exceptions). Agta generic taxa also correspond closely with the species in modern biology. Psychologically, generic taxa are the most salient in the taxonomy; they were the first terms our informants gave us in our early ethnobotanical inquiry, and they are the first terms acquired by Agta children as they learn to name plants (Berlin 1978:17; see also Stross 1974).

Specific taxa are those which are immediately included in generic taxa. Whereas generic taxa represent perceptually distinct discontinuities in the biological world, specific taxa are cognitively recognized primarily because of their cultural importance (Berlin 1978:18). As Berlin states it, generic taxa are recognized "because they are there;" specific taxa are recognized "because it is culturally important to do so" (1978:19). Most specific taxa occur in sets of two or three members, although we have found Agta specific sets of up to twenty and thirty members immediately included in some generics of major importance (e.g., the generic *uway* 'rattan' includes 22 specific types of rattan, and the generic *pahay* 'rice' includes 31 specifics).

In most ethnobiological taxonomies, it has been found that most specific taxa are binomial "secondary" lexemes. Conklin reported this to be the case for another Philippine group (1954:117), and Berlin and his colleagues hypothesize that this is a cultural universal (Berlin et al. 1973:218ff). Our data, on the other hand indicate that most Agta specifics are monomial lexemes, with only 4% of the specifics in our data being binomials. Furthermore, there are no secondary lexemes in our data, except for the two varietal taxa in Note 3. Since this phenomenon is so contrary to expectations, we discuss it in detail in the next section which is the heart of the issue and the thesis of this paper.

#### THE DEARTH OF BINOMIAL SPECIFICS IN AGTA

It is a basic hypothesis of Berlin that in any ethnobiological taxonomy the specific taxa found at the specific level number three will be mostly binomial "secondary" lexemes<sup>6</sup> (Berlin et al. 1973:218, 221, 222, 224, 240; 1974:27; Berlin 1976:390, 1977, and 1978:20). Most of the published evidence to date seems to substantiate this hypothesis, including data from the Philippines (Pennoyer 1975:209 and Conklin 1954:117, 128).<sup>7</sup>

This appears not to be the case, however, in Agta. We found 25 generic taxa in our sample of 60 generic plant names that were polytypic. From these 25, we found a total

number of 143 specific plant taxa at level three.<sup>8</sup> Of these 143 specific taxa, only five are binomials. Furthermore, none of these are secondary lexemes, and there are no secondary biological lexemes, to our knowledge, in the Agta language, except for the two varietal taxa discussed in Note 3.

Of the 143 specific taxa, 65% are "simple primary lexemes," 31% are "unproductive complex primary lexemes," and 4% are "productive complex primary lexemes." (For definitions, see Note 1.) Only 4% of the Agta specific taxa in our sample are binomials (5/143).

Berlin et al. state that almost all Tzeltal specific plant names are "composed of an attributive plus a generic name" (1974:41). In contrast, we found only five such binomials among the 143 Agta specific taxa in our sample, with four of these occurring with the same attributive term, **tunay** 'genuine'. These are **tunay a palago** 'genuine *Dillenia*', **tunay a niyog** 'genuine coconut', **tunay a butag** 'genuine areca', and **tunay a maes** 'genuine corn'.

To illustrate with just one example the difference between Tzeltal and Agta specific lexemes, let us compare the form of the specific terms included in the generic taxon for 'banana' in both languages. In Tzeltal there are at least twelve specific classes of bananas, all of which are binomial secondary lexemes (e.g., 'white banana', 'genuine banana', 'wax banana', etc.) (Berlin 1977:84). Agta, on the other hand, has eighteen specific classes of bananas, all of which are marked by primary monomial lexemes. Ten of these are simple lexemes, and eight are unproductive lexemes.

#### FOUR HYPOTHESES FOR EXPLAINING THE ANOMALY

At this point the question is raised, why is the Agta case an anomaly in having so few specific terms which are binomials?<sup>9</sup> While more research is necessary before I will be prepared to give a definitive answer to this question, four possible hypotheses may be considered. These are presented here:

*Hypothesis 1:* Agta speakers tend not to use a lot of adjectives. Elsewhere (Headland 1981a) I have argued that although it is grammatically allowable, it is semantically cumbersome in Agta to use more than one adjective or adverb in a phrase. Some languages actually favor the heavy use of noun modifiers as a rhetorical device for enhancing a speech style. Koine Greek is a classic example of such a language. Banker (1980) also reports that some of the Viet Nam languages string out their sentences with extra modifying words to improve discourse style.

Agta, however, as well as several other Philippine languages, tends to be at the other end of the spectrum in its discourse style. Agta speakers are predisposed not to use a lot of modifiers in their speech. It is rare, in Agta text materials, to find two adjectives in the same phrase. When too many adjectives are inserted into Agta speech, I have argued, there is a resulting "information overload" (Headland 1981a) which causes communication blockage. This may be at least part of the reason for the dearth of binomial taxa in Agta plant names.

*Hypothesis 2:* Agta specific taxa are monomials because the Agta are such skilled specialists on plants that they have long ago coined primary lexemes (rather than secondary lexemes) for even those plants at the specific level. This hypothesis concords with Zipf's law (1949), which maintains that length of word varies inversely with its frequency of usage. That is, words that are used frequently will be shorter than words that are used less frequently.

Cecil Brown (drawing from Berlin 1977:96), has developed a theoretical model to explain the growth (and decline) of certain types of biological terminologies in human societies (Brown 1977:332, 1979:381, and Witkowski et al. 1981). Though Brown does not discuss any reasons as to why a language may have mostly binomial (or monomial) specifics, his model does suggest why some languages may have many specific biological taxa,

while others have very few. To summarize this part of Brown's model, more complex societies tend to have more life form taxa, and fewer specific taxa, while simple societies (like the Agta) would have the opposite tendencies (but cf. Waddy 1982:70).

The reason, then, that more complex societies (with more cultural-technological development) have less specific taxa is they are not as intricately involved and dependent upon the plant world. Berlin (1977:97), for example, points out that English speakers reared in an urban environment have virtually no specific names for kinds of plants. Brown's model thus suggests that specific plant taxa are more highly salient in simple forest societies.

Carrying Brown's direction one step further, I would hypothesize that very simple societies, such as the Agta, which consist of forest dwellers who are intimately involved with and dependent upon their botanical environment, will not only have more specific plant taxa in their vocabulary, but that a majority of those taxa will be primary monomial lexemes. In the case of the Agta, therefore, I see them as skilled botanists, real folk scientists in their own right. One manifestation of this is that they have monomial plant lexemes for most of the named plants in their environment. This includes their plant taxa at the specific level.

It would be interesting to do a semantic study of automobile parts nomenclature as it is used by professional mechanics in an auto repair shop, in contrast to how the same parts might be used by the lay people in the same neighborhood. I would conjecture that the lay people would use proportionately more secondary binomials for the same parts for which the mechanics use primary monomials. James Spradley (1970) has shown the complexity of terminology of certain restricted semantic domains in English, which are known only by those who are specialists or practitioners of those customs to which the domains pertain. Spradley does not discuss the ratio of monomials to binomials in his examples, but his examples do illustrate the extreme argot which can be found in the vocabulary of those who find the items referred to in that domain as important to themselves.

The Agta definitely find the items of the plant world as very important to their lives--so important, I am suggesting, that they have simple monomial lexemes for even many of their specific plant taxa. This fits with Berlin's recent modification of his earlier models that in some languages specific taxa of major cultural importance may be monomial (Berlin 1976:392, 1978:20-21).

*Hypothesis 3:* Here the question is raised as to whether we are dealing here with a phenomenon similar to what Hays asserts for the Ndumba: "Binomialization is culturally permissible for nearly all Ndumba plant names but is uncommon except when used for emphasis" (1976:506, n.7). I would argue that this concept is not true for Agta plant taxa. While any plant taxon may carry a modifier within the phrase within which it is said, such modifying is rare and, in any case, I would not consider the modifier as part of the actual lexeme. Similarly, I do not believe that Agta plant lexemes correspond to what Pennoyer describes for another Philippine group: "In the Taubuid classificatory system most plant names may be potentially modified by the addition of a second attributive word and then applied to a different (but somewhat similar) plant" (1975:209).

*Hypothesis 4:* This hypothesis concords with a characteristic feature of the syntax of Philippine languages in general. It is common in the syntax of Agta, as well as other Philippine languages, to nominalize adjectives simply by using them in the nominal position in a sentence. That is, adjectives may be used as nouns. For example, an Agta speaker may refer to the smaller of two bolos being offered for sale in a market by saying to the vendor,

'Alapen ko tu ketihék a sondang.'

take I the small bolo

'I'll take the small bolo.'

Although this sentence is perfectly grammatical, and would sound natural, the Agta speaker would be more apt to omit the last word, 'bolo', and merely say, "**Alapen ko tu ketihek**," 'I'll take the small (one).' This tendency in Philippine languages, for the speaker to use an adjective as a noun, is especially common when the hearer knows from the context what the speaker is referring to.

Hypothesis Four, then, suggests that originally the monomial specific plant taxa in Agta were binomials consisting of an adjective plus a noun. However, because of the ability of adjectives to serve as nouns in the language, the original generic nouns in the binomial taxa eventually came to be dropped, and the remaining adjectives became nominalized as the formal names for specific plant taxa.

Thus, for example, the specific taxon **binaybay** 'variety of rice', may have originally been called \***binaybay a pahay** (which means literally 'sandy rice'). But later the generic noun, **pahay** 'rice', was dropped, and the adjective **binaybay** became a nominalized plant taxon for referring to this particular specific variety of rice.

There is one minor problem with this hypothesis. It implies that the Agta monomial specific taxa are nominalized forms of known adjectives used elsewhere in the language. But this is the case with only 24 of the 138 specific monomial taxa in our sample. Other specific taxa may be recognized as having been borrowed from another language (usually Tagalog, probably at the same time these cultigens were first introduced into Casiguran). And some of those taxa have adjectival meanings in the languages from which they were borrowed, but not in Agta (as e.g., the variety of cassava called **merakel**, which probably comes from the English word 'miracle'). Other specific plant taxa have no meaning, to our knowledge, in either Agta or any of the major Philippine languages in Luzon, other than as present-day terms for Agta plant names. Hypothesis Four, then, suggests that these latter terms were meaningful adjectives in Agta in the past, but those original meanings are now extinct, and the forms remain today in the language only as terms for plant taxa.

Admittedly, a strong case cannot be made for the apparent near-absence of binomial specifics in Agta without first making collections of the total flora in the Casiguran area, and then eliciting from informants all or most of their plant names, which could number over a thousand. The sample of plant taxa used in the present study is small, and tends to include plants which are of cultural importance to the Agta. Berlin has more recently hypothesized that taxa of "major cultural importance" may have monomial forms at the specific level (1976:392, 1978:20-21). He has, however, also suggested to me (in personal correspondence in 1978) that if I were to elicit more taxa of plants of no cultural utility, that I would find most of the specific level labels of these taxa to be binomials.

While this may be possible, it must remain an open question for the present.<sup>10</sup> My knowledge and experience regarding the Agta language lead me to believe that specific binomials will be just as rare in a complete plant inventory as they are in the present sample. It is rare for Agta speakers to modify nouns with more than one adjective in a single phrase. Though grammatically allowable, it is semantically cumbersome to do so. I would be even more surprised to find any Agta plant lexemes consisting of three, four or five words, as Conklin found for the Hanunoo (1954:128).

### CONCLUSION

This paper has sketched how the Agta Negritos of the Philippines break down their ethnobotanical taxonomy into three main levels—life form, generic, and specific, as well as several covert intermediate levels numbering up to three in some branches of the taxonomy.

The theoretical issue of the paper is concerned with the observation that very few of the plant taxa in the Agta data are composed of binomial lexemes. Agta plant names at the specific level (or at any level, for that matter) are mostly monomials. Only 4% of

the specific taxa in the sample were binomials, and there were no secondary lexemes found in the data. The issue concerns the conflict between the data and a basic hypothesis of certain cognitive anthropologists that specific taxa in any folk taxonomy are made up of mostly binomial secondary lexemes.

Four hypotheses were presented here as possible explanations as to why the Agta case is an anomaly in having so few specific binomial terms. Hypothesis One suggested that Agta has few plant binomials because the language as a whole tends to use adjectives sparsely. Hypothesis Two suggested that the reason for the lack of binomials is because the Agta are such skilled specialists on plants that they have primary monomial lexemes for plants even at the specific level. Hypothesis Three suggested that the Agta specific taxa *are* binomials, but that the second attributive words are only used uncommonly for emphasis. In other words, the binomials are there but the investigators failed to notice them. This author rejects the possibility of Hypothesis Three being correct. Hypothesis Four suggested that originally the monomial specific taxa in Agta were binomials consisting of an adjective plus a noun. But because of the tendency in Agta for adjectives to serve as nouns, the original generic nouns in the binomial taxa came to be dropped, and the remaining adjectives became nominalized as the formal names for specific plant taxa.

There is a theoretical significance to the Agta data, as it has been described here. This involves the discovery of a language group which does not appear to use binomial lexemes for specific plant taxa. The major theoretician in the area of folk biological taxonomies, Brent Berlin, has developed a widely accepted model which proposes that the use of binomial specific taxa is a cultural universal. The present sample of Agta data, however, contradicts that model. The point is, if the Agta lexicon fails to have binomial lexemes for their specific taxa, it seems probable that other languages elsewhere do as well. It would be interesting if future research shows that this phenomenon is limited to languages spoken by so-called hunter-gatherer band-level societies, or is restricted to certain Philippine languages.

#### ACKNOWLEDGEMENTS

The impetus for the present study came originally from a semantics workshop conducted under the auspices of the Philippine Branch of the Summer Institute of Linguistics, in 1974. I am indebted to Kemp Pallesen for his critical comments on my taxonomic analysis during the workshop. A number of individuals have made helpful comments on earlier drafts of the present paper, and I am grateful to them. These include Brent Berlin, Jack Bilmes, Cecil Brown, Michael Forman, Bion Griffin, Richard Lieban, Kemp Pallesen, Navin Rai, Lawrence Reid, Richard Roe, Michael Walrod, Douglas Yen, and the anonymous reviewers for this journal. My wife, Janet Headland, assisted me in all aspects of the data gathering and analysis. The conclusions of this paper, however, remain my own responsibility.

Appreciation is due to Hermes Gutierrez, of the National Museum of the Philippines, for identifying certain plant specimens collected by my wife and I, and to Santiago Peña and Ruben Valencia, of the Pagasa Weather Bureau Station in Casiguran, for patiently supplying me with monthly rainfall measurements from 1962 to 1978.

The author conducted extensive field work among the Agta for most of the years from 1962 to 1979, under the auspices of the Summer Institute of Linguistics and the Philippine Ministry of Education and Culture. The data described in this paper were gathered in the field in November 1974, August 1975, July 1977, and February 1978. I am indebted to the following Agta informants from whom we elicited the data: Didog Aduanan, Eleden Aduanan, Lito Aduanan, Alonso Kukuan, Pedong Maksimino, Erminya Pawisan, and Pompočk Sagunéd. The author is a fluent speaker of the Agta language, and all interviewing was done in that language.

#### LITERATURE CITED

- BANKER, JOHN. 1980. How Can We Improve Our Translation Stylistically? Notes on Translation 78:31-36. ( International Linguistic Center, Dallas.)
- BERLIN, BRENT. 1976. The Concept of Rank in Ethnobiological Classification: Some Evidence from Aguaruna Folk Botany. Amer. Ethnol. 3:381-399.

## LITERATURE CITED (continued)

- \_\_\_\_\_. 1977. Speculations on the Growth of Ethnobotanical Nomenclature. Pp. 63-101 in *Sociocultural Dimensions of Language Change*. Also in *Lang. and Soc.* (1972) 1:51-86.
- \_\_\_\_\_. 1978. Ethnobiological Classification. Pp. 9-26 in *Cognition and Categorization* (Eleanor Rosch and Barbara Lloyd, eds.) Lawrence Erlbaum Associates, Hillsdale, N.J.
- BERLIN, BRENT, DENNIS E. BREEDLOVE, and PETER H. RAVEN. 1968. Covert Categories and Folk Taxonomies. *Amer. Anthr.* 70:290-299.
- \_\_\_\_\_. 1969. Folk Taxonomies and Biological Classification. Pp. 60-66 in *Cognitive Anthropology* (Stephen A. Tyler, ed.) Holt, Rinehart and Winston, New York.
- \_\_\_\_\_. 1973. General Principles of Classification and Nomenclature in Folk Biology. *Amer. Anthropol.* 75:214-242.
- \_\_\_\_\_. 1974. Principles of Tzeltal Plant Classification. Acad. Press, New York.
- BLACK, MARY B. 1969. Eliciting Folk Taxonomy in Ojibwa. Pp. 165-189 in *Cognitive Anthropology* (Stephen A. Tyler, ed.), Holt, Rinehart and Winston, New York.
- BROSIUS, PETER. 1981. After Duwagan: Deforestation, Succession, and Adaptation in Upland Luzon, Philippines. Unpubl. M.A. thesis (Anthr.), Univ. Hawaii.
- BROWN, CECIL H. 1977. Folk Botanical Life-Forms: Their Universality and Growth. *Amer. Anthropol.* 79:317-342.
- \_\_\_\_\_. 1979. Growth and Development of Folk Botanical Life Forms in the Mayan Language Family. *Amer. Ethnol.* 6:366-385.
- CONKLIN, HAROLD C. 1954. The Relation of Hanunoo Culture to the Plant World. Unpubl. Ph.D. dissert. (Anthr.), Yale Univ.
- \_\_\_\_\_. 1957. Hanunoo Agriculture: A Report on an Integral System of Shifting Cultivation in the Philippines. FAO, United Nations, Rome.
- \_\_\_\_\_. 1962. Lexicographical Treatment of Folk Taxonomies. Pp. 119-141 in *Problems in Lexicography* (Fred Householder and Sol Saporta, eds.), *IJAL* vol. 28, no. 2, part IV, Indiana University Research Center in Anthropology, Folklore and Linguistics, Bloomington. Also in *Cognitive Anthropology* (1969), Pp. 41-59, (Stephen A. Tyler, ed.) Holt, Rinehart, and Winston, New York.
- \_\_\_\_\_. 1967. Ifugao Ethnobotany 1905-1965: The 1911 Beyer-Merrill Report in Perspective. Pp. 204-262 in *Studies in Philippine Anthropology* (Mario Zamora, ed.) Alemar Publishers, Quezon City. Also in *Econ. Botany* 21:243-272.
- FOX, ROBERT B. 1953. The Pinatubo Negritos: Their Useful Plants and Material Culture. Bureau of Printing, Manila.
- FRAKE, CHARLES O. 1969. The Ethnographic Study of Cognitive Systems. Pp. 28-41 in *Cognitive Anthropology* (Stephen A. Tyler, ed.) Holt, Rinehart and Winston, New York.
- HAYS, TERENCE E. 1976. An Empirical Method for the Identification of Covert Categories in Ethnobiology. *Amer. Ethnol.* 3:489-507.
- HEADLAND, THOMAS N. 1975a. Report of Eastern Luzon Language Survey. *Philippine J. Ling.* 6:47-54.
- \_\_\_\_\_. 1975b. The Casiguran Dumagats Today and in 1936. *Philippine Q. Cul. and Soc.* 3:245-257.
- \_\_\_\_\_. 1981a. Information Rate, Information Overload, and Communication Problems in the Casiguran Dumagat New Testament. Notes on Translation 83:18-27. (International Linguistics Center, Dallas.)
- \_\_\_\_\_. 1981b. Taxonomic Disagreement in a Culturally Salient Domain: Botany Versus Utility in a Philippine Negrito Taxonomic System. M.A. thesis (Anthr.), Univ. Hawaii. Published by Univ. Microfilms Int., Ann Arbor. Order no. 1318270.
- HEADLAND, THOMAS N. and JANET D. HEADLAND. 1974. A Dumagat (Casiguran) - English Dictionary. Dept. of Linguistics, Research School of Pacific Studies, The Australian National Univ., Canberra.
- HEADLAND, THOMAS N. and ALAN HEALEY. 1974. Grammatical Sketch of Casiguran Dumagat. *Pac. Ling.* A-43:1-54.
- HEADLAND, THOMAS N., and ELMER P. WOLFENDEN. 1967. The Vowels of Casiguran Dumagat. Pp. 592-596 in *Studies in Philippine Anthropology* (Mario D. Zamora, ed.) Alemar-Phoenix, Quezon City.
- KAY, PAUL. 1971. Taxonomy and Semantic Contrast. *Language* 47:866-887.
- MATHIOT, MADELEINE. 1964. Noun Clases and Folk Taxonomy in Papago. Pp. 154-163 in *Language in Culture and Society* (Dell Hymes, ed.) Harper and Row, New York.
- \_\_\_\_\_. 1967. Ifugao Ethnobotany 1905-
- McKAUGHAN, HOWARD P., and BATUA A.

## LITERATURE CITED (continued)

- MACARAYA. 1965. Maranao Plant Names. *Oceanic Ling.* 4:48-112.
- MERRILL, ELMER D. 1967. An Enumeration of Philippine Flowering Plants, Vol. 4 (reprint). A. Ascher and Co., Amsterdam.
- PENNOYER, F. DOUGLAS. 1975. Taubuid Plants and Ritual Complexes. Unpubl. Ph.D. dissert. (Anthr.), Washington State Univ.
- RAI, NAVIN K. 1982. From Forest to Field: A Study of Philippine Negrito Foragers in Transition. Unpubl. Ph.D. dissert. (Anthr.) Univ. Hawaii.
- REID, LAWRENCE A., and DOMINGO MADULID. 1972. Some Comments on Bontoc Ethnobotany. *Philippine J. Ling.* 3:1-24.
- ROSALDO, MICHELLE Z. 1972. Metaphors and Folk Classification. *Southwestern J. Anthr.* 28:83-99.
- SPRADLEY, JAMES P. 1970. You Owe Yourself a Drunk. Little, Brown and Co., Boston.
- STROSS, B. 1974. How Tzeltal Children Learn Botanical Terminology. In *Meaning in Mayan Languages*. (M.S. Edmonson, ed.) Mouton, The Hague.
- THARP, JAMES A. 1974. The Northern Cordilleran Subgroup of Philippine Languages. *Working Papers in Ling.* 6(6):53-114, Univ. Hawaii, Honolulu.
- VANOVERBERGH, MORICE. 1927. Plant Names in Iloko. *J. Amer. Oriental Soc.* 47:133-173.
- WALLACE, BEN J. 1970. Hill and Valley Farmers: Socio-Economic Change Among a Philippine People. Schenkman, Cambridge.
- WADDY, JULIE. 1982. Biological Classification from a Groote Eyelandt Aborigine's Point of View. *J. Ethnobiol.* 2:63-77.
- WALTON, CHARLES. 1979. A Philippine Language Tree. *Anthrop. Ling.* 21(2): 70-98.
- WERNER, OSWALD, and JOANN FENTON. 1973. Method and Theory in Ethnoscience or Ethnoepistemology. Pp. 537-578 in *A Handbook of Method in Cultural Anthropology* (Raoul Naroll and Ronald Cohen, eds.) Columbia Univ. Press, New York.
- WITKOWSKI, STANLEY R., C. BROWN, and P. CHASE. 1981. Where Do Tree Terms Come From? *Man* 16:1-14.
- YEN, D.E., and HERMES G. GUTIERREZ. 1976. The Ethnobotany of the Tasaday: I. The Use Plants. Pp. 97-136. In *Further Studies on the Tasaday* (D. Yen and John Nance, eds.) Panamin Found. Ser. Number 2. Panamin Foundation, Makati, Rizal.
- ZAMORA, PRESCILLANO M. 1977. A Primer on Philippine Plants. *Filipino Heritage* 1:113-119.
- ZIPF, G.K. 1949. *Human Behavior and the Principle of Least Effort*. Addison-Wesley, Cambridge.

## NOTES

1. Berlin defines two main types of lexemes, *primary* and *secondary* (1976:397, 1978; Berlin et al. 1973:217-219, 1974:28). Primary lexemes may be of two types, *simple primary*, or *complex primary*. Complex primary lexemes may in turn be further subdivided as either *unproductive* or *productive*. Since Agta plant taxa consist of each of the three types of primary lexemes, Berlin's definitions are outlined here, with examples from the Agta data, as well as from English.

*Simple primary lexemes* are unique, "single word" expressions which are "linguistically unanalyzable." They are monomorphemic (i.e., unsegmentable). Conklin calls these "unitary simple lexemes" (1962:122). Examples of such lexemes in English folk biology are oak, pine, quail, and bass. Examples in Agta are *biget* 'banana', *buloktot* 'jade vine', *ogsa* 'deer', and *nabneh* 'var. of rattan'. In our sample of 203 plant taxa, 97% of the generics (58/60) and 65% of the specifics (93/143) are labeled with simple primary lexemes.

*Unproductive complex primary lexemes* are polymorphemic (i.e., segmentable) and are linguistically analyzable, but no constituent of the term labels a taxon superordinate to the class in question. Conklin calls these "unitary complex lexemes." Thus, *poison oak* is not a type of oak. Examples in English are *jack-in-the-pulpit*, *pineapple*, and *cat-tail*. There are 45 specific unproductive lexemes in our Agta sample. Most of these, 32, are single words with frozen derivational affixes (e.g., *tumadem* 'var. of rattan', *malagkit* 'var. of rice'). Five more are reduplicated forms of simple lexemes (e.g., *aso-aso* 'var. of rattan', *ipit-ipit* 'var. of banana'). The eight forms are compound nouns (*ipos-nabuhog* 'var. of rattan', *songsong-gabi* 'var. of taro'). Thirty-one percent of the Agta specifics in our sample are unproductive lexemes (45/143). There is one generic which may be classed as an unproductive lexeme: *makahiya* '*Mimosa pudica*', a term borrowed from Tagalog.

## NOTES (continued)

*Productive complex primary lexemes* are also polymorphic and linguistically analyzable; however, in contrast to the unproductive lexemes, one of the constituents always labels a superordinate taxon, such as tree in tulip tree. However, such lexemes contrast directly with other taxa in the set which are simple primary lexemes or complex primary lexemes (which may be productive or unproductive). Examples in English are crabgrass, swordfish, and pipevine. There are only five examples of productive lexemes in our sample, all of which are binomial specifics; and all of the binomial specifics in our sample of Agta are productive lexemes. (These five samples are listed in Headland 1981b:90.)

*Secondary lexemes* are also polymorphic and linguistically analyzable. They are, like productive primary forms, identifiable in that one of the constituents of such expressions is the same as the category superordinate to the form in question. In this case, however, in contrast to productive lexemes, secondary lexemes occur in contrast sets all of whose members are labeled by other secondary lexemes which share the same superordinate constituent. An example of such a contrast set in English is the set filled by the terms jack oak, post oak, scrub oak, blue oak, etc.

To our knowledge there are no secondary lexemes in Agta botanical taxa, except for the two varietal taxa in Note 3. This phenomenon does not fit the Berlin model, which states that "specific and varietal classes are labeled, with predictable exceptions, by binomial secondary lexemes" (Berlin 1976:390).

It should be noted that Conklin does not differentiate between productive complex primary lexemes and secondary lexemes in his model, but refers to both types as "composite lexemes" (1962:122).

2. The traumatic culture change of the Agta since WWII has been described elsewhere (Headland and Headland 1974:xlvi; Headland 1975b; 1981b:2-13).

3. Berlin et al. describe a fourth level universal ethnobiological taxonomic category, called varietal, which is a further division of specific taxa. They state that this level is "rare in most folk biological taxonomies" (1973:215, 216). We discovered only one set of taxa at this varietal level, two subvarieties of the species of taro called sampernando. These are melatak a sampernando 'white sampernando taro', and mengiteta a sampernando, 'dark sampernando taro'.

4. We hypothesize here that this three-part division of plants is universal for all Philippine groups. It has been documented for the following Philippine groups: Subanun, Hanunoo, Taubuid, and Gaddang (Conklin 1957:44; Frake 1969:36-37; Wallace 1970:10; Pennoyer 1975:210), and several colleagues of the Summer Institute of Linguistics have verified to us that this same 'herb-vine-tree' trichotomy exists in other groups in the Philippines. This contrasts with a two-part division at the life form level for the Aborigines on Groote Eylandt, Australia (Waddy 1982:70), a four-part division for the Tzeltal and the Aguaruna (Berlin et al. 1973:219; Berlin 1976:385), and a five-part division for the Papago (Mathiot 1964:156, 158) and the Ndumba of New Guinea (Hays 1976:506, n.4). For a possible exception to this hypothesized universal, see Reid and Madulid (1972:2), and Headland (1981b:96, n.17).

5. Not every researcher handles the covert nodes in folk taxonomical studies. Conklin, for example, found intermediate levels in a Hanunoo plant taxonomy, but did not include them as levels in the taxonomy, because these midgrouping of plants were not made "according to a structured terminologically-identifiable system" (1954:97). Berlin et al., however, argue that these unlabeled covert categories are of crucial taxonomic significance, and that "the understanding . . . of a . . . domain is actually obscured if one focuses solely on lexically labeled units" (1968:290).

6. For a definition of "secondary lexemes," see Note 1. A *binomial* is defined in this paper as a native biological name consisting of two terms, one of which is the same as the superordinate taxon to the name in question, and the other of which is an attributive. This is synonymous with what Conklin calls "*composite lexemes* . . . one or more segments of which . . . designate categories superordinate to those designated by the forms in question" (1962:122). In Berlin's model, all *secondary lexemes* and *productive primary lexemes* are binomials. There were only five binomials discovered in Agta.

7. For the Hanunoo, Conklin states, "Of the total inventory of 1625 Hanunoo plant type names, 1054, or nearly two-thirds, consist of an initial basic name followed by one or more attributive

## NOTES (continued)

units (961 types have only one such attribute, 87 have two, eight have three, and only two have four)" (1954:128). For the Taubuid, Pennoyer states, "Most plant names may be potentially modified by the addition of a second attributive word and then applied to a different (but somewhat similar) plant" (1975:209).

8. There are, of course, more than 143 specific plant taxa in Agta. These 143 extend only from our original sample of 108 plant lexemes. (This sample was later expanded to 203 lexemes when informants, being questioned with Black's elicitation method, added lexemes to the original sample.)

9. The Zambales Negritos of western Luzon also appear to have very few binomial plant taxa. Peter Brosius elicited approximately 300 plant terms in 1980, during his study of the responses of this population to deforestation (Brosius 1981). His sample includes specific terms for 34 varieties of banana, 16 of sweet potato, 16 of rattan, 15 of rice, 9 of taro, 8 of yam, 8 of corn, and 4 of wild banana. Of these 110 specific terms, only 5 are binomials (Brosius, personal communication).

This Negrito group lives to the immediate southwest of the population studied by Fox (1953). It should be noted that the Zambales Negritos are geographically isolated from the Casiguran Agta. They have no social interaction, and their languages, though both Austronesian, are not closely related. The shared vocabulary between Casiguran Agta and Botolan Sambal, which is spoken both by the lowland Filipinos and the Negritos in the municipality of Botolan, is 46% (Walton 1979).

10. A final answer to this question may be soon forthcoming. Melinda S. Allen, an ethnobotanist from the University of Hawaii, conducted a seven month field study of Agta ethnobotany in Cagayan Province in 1981. Allen is a co-investigator of an NSF project titled "Women Hunters in a Tropical Foraging Society," Grant No. BNS-8014308. The investigators studied an Agta group 200 km north of Casiguran, who speak a language which is 70% cognate with Casiguran Agta (Headland 1975a:50).

Allen's work was aimed at a botanical collection of all plants in fruit or flower, with an emphasis on those of economic importance. Regarding the frequency of binomials in this area, she wrote me on June 29, 1981 saying, "To date 293 folknames have been elicited for an unspecified number of Latin equivalents. Of these, 11 are compound nouns, and only five are true binomials."