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## Eipo plant nomenclature and classification compared with other folk taxonomic systems

### Abstract

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Ethnobotanical data collected among the Eipo people in the Central Highlands of West New Guinea are compared with the theoretical model of ethnotaxonomic systems developed by Berlin and co-workers based on ethnobotanical studies in Central and South America. The Eipo plant nomenclature appears to fit well in Berlin's general principles and corroborates the existence of universals in folk classification systems.

Key words: ethnobotany, ethnotaxonomy, linguistics, New Guinea, Indonesia, Eipomek valley.

### Introduction

The Eipo are a people of small stature (less than 150 cm tall) living in several villages in the Eipomek valley (c. 4°26'S and 140°00'E) in the Central Highlands of Irian Jaya at an altitude of about 1500-2000 m. From their material possessions their culture could be classified as "neolithic". Their language has been linguistic terra incognita until 1974.

During botanical field work in the Eipomek valley in 1976 about 400 Eipo plant names were recorded and vouchers collected (Hiepko & Schultze-Motel 1981). W. Schiefenhövel collected a large amount of additional ethnobotanical data during his extensive ethnomedicinal field work among the Eipo between 1974 and 1976 (Hiepko & Schiefenhövel 1987). The botanical research in the Eipomek valley was part of an interdisciplinary research project on the Eipo, the local people of this area, their culture, and their environment, sponsored by the Deutsche Forschungsgemeinschaft (German Research Foundation).

At about the same time Berlin, Breedlove & Raven (Raven & al. 1971, Berlin 1973, Berlin & al. 1973, 1974) elaborated their general principles of folk taxonomy based on ethnobotanical studies in Central and South America and drew convincing parallels with the taxonomic thinking among European people, which became the basis of taxonomy in Western science. In the following years several authors of ethnological papers used Berlin's principles as the best available system to present ethnotaxonomic data (e.g., Hays 1979, Kocher Schmid 1991). But there were also

critics of Berlin's ideas. Especially Sillitoe (1983) questioned the whole comparative enterprise because of the variable naming results obtained in his research in Papua New Guinea, e.g., when he asked 26 men and 26 women to identify 21 sweet potato vines. In my opinion it is not astonishing that only some of the cultivars were 'correctly' named by most informants. The main reason for Sillitoe's fundamental doubt about Berlin's ideas may be the fact that he studied the naming of crops only. Moreover he was botanically not trained when starting his studies: "I had no idea of the difference between a sweet potato and a yam" (Sillitoe 1983: 4).

In 1992 Berlin published an extensive review of the principles of ethnobiological classification and in this context he discussed also the variation in ethnobiological knowledge. Martin (1995: 215ff.) stressed the importance of exploring folk classification in the context of ethnobotanical studies and recommended to use for this purpose the generally accepted scheme of folk taxonomy devised by Berlin. In a recent publication the folk classification of African rattans was described and discussed within this framework (Sunderland 2004).

## Material and methods

Most plant names were recorded during field work around the villages Malingdam and Talim in the Eipomek valley. Normally several (five to ten) young Eipo boys at an age of about eight to 14 assisted us. The children were astonishingly skilled in identifying plants, also such of no apparent value. When the specimens were pressed and field notes were made they named the plants in most cases. At least for the more frequent species the names were cross-checked several times. The collection of P. Hiepko & W. Schultze-Motel is deposited in the herbarium at Berlin (B) and in Bogor (BO); more or less complete sets are in Leiden (L), Kew (K), and New York (NY). Other collaborators of the interdisciplinary research project (e.g., the ethnologists K. Helfrich and G. Koch) gave us lists of Eipo plant names, especially of cultivated plants. Many of these were brought to us when we asked for them – mostly by young women. Another lot of plant names with vouchers was collected by W. Schiefenhövel, who was fluent in Eipo (vouchers at B). These Eipo ethnobotanical data were primarily recorded to facilitate communication with the non-botanical colleagues working in the same multidisciplinary project. Our recording was done without any influence of the ideas of Berlin.

The recorded Eipo plant names are listed in Hiepko & Schultze-Motel (1981) and were evaluated in cooperation with the two authorities on the Eipo language belonging to the project group, V. Heeschen and W. Schiefenhövel (Heeschen & Schiefenhövel 1983).

## Results and discussion

### Taxonomic categories

When we studied the plant material collected in the Eipomek valley I discovered that the Eipo are very good 'botanists': they are able to correctly group phenotypically very different plants into one genus, i.e. in several cases they use the same name for two obviously different species of one botanical genus. Impressed by this fact (which was helpful in the determination of several plants) I started to compare our ethnobotanical data with the general principles of Berlin & al. (1973, 1974). Since most authors working on this subject state that the names provide the only valid key to folk taxonomy it is worthwhile to think about the Eipo plant taxonomy on the basis of their plant names (complete list of these names in Hiepko & Schultze-Motel 1981).

The nomenclatural situation is somewhat complicated due to an extensive name taboo system causing a double naming of many plants (and other things or persons as well, see Koch (1984: 126) and Heeschen (1998: 26). Hays (1979: 256) mentioned a similar name taboo system for the Ndumba, another New Guinea Highland people. Only the true plant names (*dibe si*) of the Eipo can be used for a comparison with other systems. However, the synonymous second names or 'soul' names (*furume si*) are also of interest because they are often linguistically analysable sec-

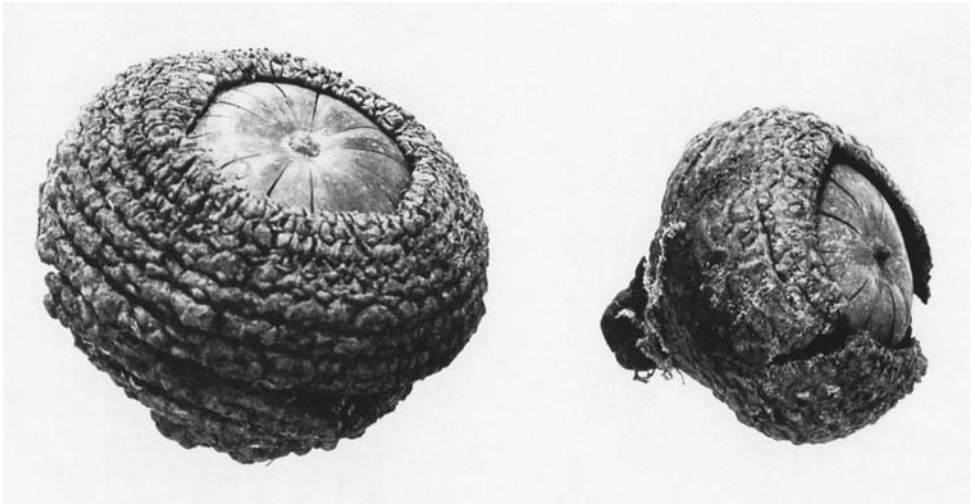


Fig. 1. Fruit of *Lithocarpus schlechteri* Markgraf (*Hiepko & Schultze-Motel 1331*), Eipo name: *den kisok* (lit. penis head). – Diameter of the fruit c. 5 cm.

ondary lexems in contrast to the true names which usually are monomial and linguistically not analysable. Some of the more descriptive *furume si* are:

*den kisok* (lit. penis head = glans penis): *Lithocarpus schlechteri* (*Fagaceae*), related to European oaks and with a similar acorn-like fruit (in German also the same word for acorn and glans penis is used: Eichel!) (*dibe si: barje*). – Fig. 1.

*kam amwe* (lit. dog tail): *Setaria montana* (*Poaceae*), a grass with brownish hairy spikes.

*molu farekne* (lit. light fibre (plant)): *Polygonum chinense* (*Polygonaceae*), a light coloured climbing herb used for tying (*dibe si: bosal*).

*yaltapenang sanyum* (lit. penis-gourd of a mythical ancestor): *Nepenthes maxima* (*Nepenthaceae*), the tubular part of the leaves looks like a penis-gourd.

The c. 200 recorded true plant names (*dibe si*) of the Eipo fit well into the general principles of folk taxonomy of Berlin & al. (1973, 1974) mentioned above. Eipo plant taxa are of several distinguishable types, the so-called ethnobiological ranks. We were able to find five ranks. These ranks are (in the terminology of Berlin & al. 1973, 1974):

1. *Plant kingdom* (or unique beginner): Similar to most other folk plant classifications this group is unnamed but obviously distinguished by the Eipo. Rapidly they understood that we were interested in plants only. They brought many plants to us but never animals, nor fungi, which are not plants in the Eipo's opinion.

Sillitoe (1983) wrote in his highly interesting book on crops of the Wola in the Highlands of Papua New Guinea about the "worrysome absence throughout the world of so-called 'unique beginners' ..., that is words equivalent to the English kingdom category of plant and animal." He obviously overlooked that also in the English (and German) language there were no indigenous words for these kingdom categories (plant and Pflanze are derived from the Latin *planta*).

2. *Life form rank*: The Eipo distinguish four taxa at this level, namely:

*yo* (trees and shrubs)

*tape* (climbing plants)

*maning* (grasses and grass-like plants)

*notuma* (bryophytes and similar plants).

Other folk systematics have 5-10 named life-form taxa. The Ndumba of Papua New Guinea distinguish, according to Hays (1979), only one additional life-form: they have a name for broad-leaved herbs which is lacking in the Eipo language. Interestingly the word for grasses (*maning*) is also used for the grass species most common in the grassland of the Eipomek valley.

3. *Intermediate rank*: Named or unnamed groups of plants (covert taxa) ranking between level 2 and 4. The Eipo obviously see relationships between plant species and use metaphors to describe this, e.g. “The grass B is the uncle (or brother) of grass A”. A named group of this rank is e.g. *fontong yo* (lit. hair- or needle-leaved trees). In this group the Eipo unite gymnospermous trees with the similar looking angiospermous she-oak (*Casuarina*) – a mistake often made by botanically not trained Europeans also.

4. *Generic rank*: The folk ‘genera’ or (according to Berlin) generics form the core of the Eipo plant taxonomy, a fact typical for all folk systematics. The names of the generics are usually monomial and linguistically not analysable. Most generic taxa are monotypic (c. 90 %). Only 22 generics are polytypic and c. 65 % of these represent sets of more than two members. The majority of the polytypic generics refers to economically important plants (staple crops, vegetables, fruits etc.). But we found also several bitypic generics and even those with three or four specifics of wild plants with no apparent use or value.

5. *Specific rank*: The subdivisions of generics of wild plants are distinguishable through their binomial nomenclature (e.g. *table*, *table kara*, *table nyana* for three different species of *Saurauia*). As mentioned by Berlin et al. the ‘type specifics’, i.e. the most common specifics of many folk generics are labelled with the monomial name of the generic only.

The highest degree of polytypy is found among the most important diet crops. In the following list the number of cultivars named with ‘specific names’ in the sense of Berlin found in Malingdam (Koch 1984) is listed (in brackets):

1. Taro, *Colocasia esculenta*, *am* (56)
2. Sweet potato, *Ipomoea batatas*, *kwaning* (34)
3. Banana, *Musa* sp., *kwalje* (21)
4. Sugarcane, *Saccharum officinarum*, *kuye* (17)
5. Pit pit, *Saccharum edule*, *bace* (13)
6. Hibiscus spinach, *Abelmoschus manihot*, *touwa* (13)
7. *Setaria palmifolia*, *teyang* (10)
8. Acanth spinach, *Rungia klossii*, *mula* (5)

In contrast to Berlin’s conclusion that the names of folk specifics besides the above mentioned ‘type specifics’ are always labelled with secondary lexemes, the Eipo mostly use only the ‘specific’ name of the cultivar without adding the name of the superordinate generic category. The same optional binomialisation was reported by Hays (1979) from the Ndumba and by Silitoe (1983) from the Wola. The Wola clearly state in this connection that their cultivar names (‘specifics’) belong to a hierarchically subordinate category (‘family-small names’) in contrast to the names of the crop plants (‘generic’) which they call ‘family-big names’. I am sure that European farmers do the same and when talking about different cultivars of e.g. potatoes use only the names of the cultivars because they know what plant species they are talking about.

The list of crop plants given above shows an exception to the rule that the number of ‘specifics’ depends on the economic importance of the species. Taro holds the highest rank, but it constitutes only c. 2 % of the total diet, whereas the sweet potato with much less named cultivars makes up about 90 % of the Eipo diet (Koch 1984). The probable explanation is that taro is an ancient, indigenous crop and used to be considerably more important prior to the arrival of the sweet potato in this area. Today it has a purely cultural (or better: mythical) importance which extends the prominent position of taro.



Fig. 2. Eipo name *mena* for two very different species – A: *Pittosporum ramiflorum* (Zoll. & Moritzi) Miq. (Hiepko & Schultze-Motel 1446); B: *Pittosporum pullifolium* Burkill (Hiepko & Schultze-Motel 1216).

6. *Varietal rank*: This category is rare in folk taxonomies. We found only one example of uncertain status at this level (Hiepko & Schultze-Motel 1981).

### The correspondence with the scientific classification

The comparison of the ethnotaxonomic system of the Eipo with the scientific botanical classification shows that – as shown by Berlin (1973) – all three logical types of correspondence, namely, one-to-one correspondence, overdifferentiation and underdifferentiation can be found. One-to-one correspondence means that one named Eipo generic corresponds to one species in scientific botany; in some rare cases of polytypic generics of wild plants even the binomial Eipo specifics correspond to botanical species! Overdifferentiation is typical for crop plants in using binomial specific names for cultivars, a rank much lower in the hierarchy of botanical nomenclature. Underdifferentiation, on the other hand, is typical for wild plants of no apparent value. Here fit some of the impressive examples where the Eipo use the same name for two or more morphologically very different species belonging to one (botanical) genus:

*bensukwe* – name for two extremely different species of *Polyosma* (*Saxifragaceae*)

*kerikna* – name for two very different species of *Rubus* (*Rosaceae*)

*kolkola* – name for different species of *Levieria* (*Monimiaceae*)

*mena* – name for two extremely different species of *Pittosporum* (*Pittosporaceae*) – Fig. 2.

*tirik* – name for two very different species of *Macaranga* (*Euphorbiaceae*)

These examples illustrate the highly developed ability of the Eipo to recognize similarities and discontinuities in nature. According to our observations in the field, morphological characters of the whole plant – the ‘Gestalt’ –, the leaves, and the fruits are the most important taxonomic clues for the Eipo. Smell is not important for identifying plants.

One last example may support our high opinion of the Eipo’s ability to recognize relationships among plants: the classification of the Irish potato which only recently was introduced in the Eipomek valley. In Europe we use several names for this crop plant, which illustrate two different ways of coping with exotic plants in folk taxonomies (Barrau 1979). The names of such introduced plants are often derived from familiar names. Apple (or Apfel) was used in former times for fruits in general and therefore the names ‘Erdapfel’ (ground apple) and ‘pomme de terre’ were formed. The Italians named the potato by reference to the fungus truffle ‘tartuffoli’ which was corrupted in Germany into ‘Kartoffel’. The second possibility is to use the aboriginal name of the introduced plant. In Spain the Indian name of the sweet potato ‘batate’ was erroneously used for the Irish potato (*Solanum tuberosum*) as ‘patata’ which became in England in a bowdlerized form: ‘potato’. No European people created a name for *Solanum tuberosum* referring to the common, indigenous weed ‘black nightshade’ (*Solanum nigrum*) which belongs to the same genus as the potato. The Eipo, however, recognized the similarity between their weedy species *S. nodiflorum*, very similar to the European *S. nigrum*, and the potato: they combined the name of the indigenous weed (*kenkene*) with the name for sweet potato (*kwaning*) forming the name *kenkene kwaning*.

Our study of the Eipo folk botany confirms the existence of universals in folk classification systems as elaborated by Berlin et al. These general anthropological aspects of the study of folk taxonomy were clearly formulated by Raven & al. (1971): “Man is by nature a classifying animal. His continued existence depends on his ability to recognize similarities and differences between objects and events in his physical universe and to make known these similarities and differences linguistically. Indeed, the very development of the human mind seems to have been closely related to the perception of discontinuities in nature. In view of this, the study of folk taxonomic systems ... has a high significance in interpreting the logical processes going on in our own minds, as well as in understanding the application and utility of the taxonomic systems themselves.”

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