Ethnotaxonomy of food plants in Gayo People: a case study in the Jabodetabek community

S Hidayati¹, A Sunkar¹, N I Suansa², A S Fuadah¹, A P P Hartoyo³

¹Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry and Environment, IPB University, PO Box 168, Bogor 16001, Indonesia
²Jaga Rimba Nusantara Foundation, Indonesia
³Department of Silviculture, Faculty of Forestry and Environment, IPB University, PO Box 168, Bogor 16001, Indonesia
E-mail: syafitrihidayati@apps.ipb.ac.id

Abstract. Traditional knowledge (TK) of indigenous people is of utmost importance for the conservation of many plant species at the grassroots level, in particular food plants, as the main resource for human survival. For the past two decades, a novel path of research has emerged justifying the focus of linguistic ethnobiology on ethnotaxonomy, used by the local communities to symbolize biodiversity. The co-occurrence of linguistic, cultural, and biological diversities at a global level, are recognizable as evidence for a mutually dependent relationship known as biocultural diversity. Traditional knowledge and language come together to provide an ethnotaxonomical system of biodiversity. This study focuses on the ethnotaxonomy of food plants to document the TK of the Gayo ethnic group residing in Jabodetabek. Using Focus Group Discussion and in-depth interviews, this study found 218 species of food plants encoding TK related to morphology (80), ecology (35), utility (11), and quality (9) of the taxa. Our study indicated that ethnotaxonomy showed a remarkable ability to encode TK of multiple taxa. However, 83 documented taxa were unanalysable, suggesting the possibility of TK erosion within the community. Anyone wanting to conserve biocultural diversity should take into account the potentials of folk names as condensed biocultural knowledge.

1. Introduction
Ethnotaxonomy simply means the naming system embedded in traditional culture [1,2,3,4]. This indigenous knowledge is sourced from the empirical experience of local people for a long period of time. Two things can be reflected in ethnotaxonomical knowledge. On one hand, it may reveal how an organism can be described by the local people. On the other hand, it also may uncover how the organism relates to the local culture [5]. Hence, this TK is important at least for two stages of ethnobiological research. At the beginning stage, researchers usually record the native names of plants from the local people that contain biocultural expression [6]. Here, the ethnotaxonomical knowledge acts as a gate to segregate the plant's diversity through local recognition and symbolism that has been proven as the historical backbone of systematic biology [7]. Then, it can be used for multidisciplinary subjects at the succeeding stage, extending from basic to applied sciences [8]. For example, Brown [5] had presented that folk taxonomy is highly correlated with social and botanical aspects. He stated that the amount of folk botanical life-form vocabularies is positively correlated with societal complexity and species diversity. The other studies have expanded the subject at a more specific concern, such as folk taxonomy for assessing intraspecific variation and for revealing the status of cryptic species supported by DNA barcoding, phylogenetic, and metabolomic analyses [9,10,11].
Unfortunately, the studies relating to the ethnotaxonomy subjects in Indonesia are still lacking. During the last two decades, the number of international publications (indexed by Web of Science and Scopus) related to this subject was only 4 articles [12]. Several good results had been reported in Tobelo [13] dan Baduy [4]. Whereas the number of ethnic groups in this country is more than 600 groups [14]. Therefore, a lot of efforts will be needed in documenting at least for some major ethnic groups, before they may lose their TK. As researchers have revealed and as mentioned in The Declaration of Bélém, that any loss of TK is inextricably linked to loss of biological diversity and vice versa [15,16,17]. Consequently, this cultural diversity must be recognized and protected as valuable resources for further giving benefits for biodiversity conservation.

Gayo ethnic is one of the local communities in Indonesia who are living in the Gayo Highland. The Gayonese are territorially concentrated in the central highlands of Nanggroe Aceh Darussalam, particularly Gayo Luks, Bener Meriah, Aceh Tengah, and Aceh Timur. These regencies are home to the Gayonese subgroups, *i.e.* Gayo Luks, Gayo Lot, Gayo Lokop Serbajadi, and Gayo Linge [18]. Their presence around the Leuser Area, historically, had been intertwined for thousands of years. Formally, they have an important role in establishing the Leuser Protected Area through the Declaration of Tapaktuan (1934), which was the forerunner of the Mount Leuser National Park as the first five national parks in Indonesia [19,20]. However, the status of their local language, one of the cultural diversity components, is categorized as endangered by Ethnologue [21]. This status might be triggered by the pressure from other languages, globalization, destruction of land and livelihoods, economic activities, formal schooling, and so on, which at a certain level leads to a decline in the number of local people who are speaking their local language [22,23]. Hence, we can assume that some of their biodiversity may be lost due to the loss of cultural diversity [15,16,17]. Such conditions are already reported elsewhere. In Zapotec communities, the engagement of heads of family in economic and services activities resulted in the less competent of the people to identify the plant name and uses [22]. At the global level, shifting towards a monoculture system (mind, people, and land) leads to a rapid jeopardization of the local system [24].

Considering the aforementioned facts, this study was aimed to collect the ethnotaxonomy of food plants in the Gayo people. Food plants are the basic knowledge that is generally owned by every individual in a community. Thus, it is used as a focus of the present study. However, due to the Covid-19 pandemic, the setting of the study was restricted only to the Gayo community residing in Jabodetabek. With an intention as a preliminary study for next to be applied in the local site.

2. Methods
The study was applied by using both qualitative and quantitative methods; such methodology can answer the weaknesses of using a single method alone [25,26,27]. The mixed-method approach also becomes more relevant when multiple disciplines such as linguistics, traditional knowledge, and conservation are involved. The data was collected through literature review, Focus Group Discussion (FGD), and an in-depth interview. A literature review was used to generate the baseline data of Gayo food plants. There were five key publications that mentioned the Gayo food plants were used as the sources:
1. “Tumbuhan Obat dan Pemanfaatannya oleh Masyarakat Sekitar Hutan Hujan Tropis Kedah Kabupaten Gayo Luks” [28].
2. “Pengobatan Tradisional Gayo Untuk Ibu Nifas” [29].
3. “Cintronella agroforestry in Gayo Luks Regency of Indonesia” [30].
4. “Analysis of taste quality of Coffea arabica in several altitudes at Gayo Luks District” [31].
5. “Pemanfaatan tumbuhan dalam kehidupan komunitas Gayo dan Hubungannya dengan kelestarian keanekaragaman hayati” In Bintang and Gayo Linge (Central of Aceh) [32].

Constructed on the baseline information collected, the ethnotaxonomic system of the Gayo food plant was drafted through Focus Group Discussion (FGD) and in-depth interview. FGD is a form of interview that was able to construct a wealth of data [33]. The FGD was conducted in August 2020 collaborated with 11 Gayo people residing in Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek). A series of in-depth interviews were conducted with Mr. Hamid Hakim to interpret and generate the ethnotaxonomical system in Gayo Food Plants. Then, the generated data was compared with the general
template proposed by Berlin [34]. According to the model, there are nine general principles of classification and nomenclature in folk biology. The mechanism of naming was also compared with Kakudidi [35] and guided by Newmaster [36] which are in a particular case could not be general. The data was gathered then analysed by using statistical description to pronounce patterns and relationships that describe the key concepts of the phenomenon.

3. Results and discussion

Table 1 shows that the Gayo Community who are residing in Jabodetabek can recall about 218 food plants that used to utilize for their daily needs. In this initial study, there were about 135 (62%) taxa had been identified, while about 83 (38%) taxa still unanalysable. However, in further analysis, the number of unanalysable primary lexemes is calculated about 78% (figure 2).

Tabel 1. List and Meaning of Food Plants in Gayo Community Residing in Jabodetabek.

| No. | Name | Description | Mechanism |
|-----|------|-------------|-----------|
| 1.  | Agor (Solamum sp.) | (Unidentified) | Unidentified |
| 2.  | Anar (Rubus cuneifolius Pursh) | (Unidentified) | Unidentified |
| 3.  | Anar buyung (Unidentified) | (Unidentified) | Unidentified |
| 4.  | Anggur uten (Causonis trifolia (L.) Mabb. & J.Wen) | The plant found in the forest | Ekologi |
| 5.  | Asam Bali (Citrus sp.) | Balinese orange | Ekologi |
| 6.  | Asam Genensa (Citrus sp.) | Good quality orange | Quality |
| 7.  | Asam gerah giri (Citrus sp.) | Could be fresher when consumed | Utility |
| 8.  | Asam jantar (Citrus sp.) | The orange is used for cooking | Utility |
| 9.  | Asam jering (Citrus sp.) | The orange has liquid on its skin | Morfologi |
| 10. | Asam jewe (Citrus sp.) | Javanese orange | Ekologi |
| 11. | Asam Kelele (Citrus sp.) | The orange has a round shape | Morfologi |
| 12. | Asam kelele Gayo (Citrus sp.) | The orange fruit is round and could be rolled over | Morfologi |
| 13. | Asam kenyaran (Citrus sp.) | Orange from Kenyaran village | Ekologi |
| 14. | Asam keprok (Citrus sp.) | Beat softly to peel the orange | Utility |
| 15. | Asam kincit (Citrus sp.) | The small orange-like small feces | Morfologi |
| 16. | Asam kuyun (Citrus sp.) | Orange from Kuyun village | Ekologi |
| 17. | Asam leda (Citrus sp.) | (Unidentified) | Morfologi |
| 18. | Asam pepok (Citrus sp.) | The orange is used as a toy or children’s game | Utility |
| 19. | Asam perege (Citrus sp.) | The species can be used as roof | Ekologi |
| 20. | Asam tai kurik (Citrus sp.) | Fruit with the smell of chicken shit | Morfologi |
| 21. | Asam weh (Citrus sp.) | Juicer | Morfologi |
| 22. | Awal (Pisang) Abu (Musa × paradisiaca L.) | The banana that has a darker color than other bananas | Morfologi |
| 23. | Awal (Pisang) beret (Musa × paradisiaca L.) | Banana with a long and much fruit, so the one who picked it up was reluctant | Morfologi |
| 24. | Awal (pisang) cangang (Musa × paradisiaca L.) | a long and crooked banana | Morfologi |
| 25. | Awal (pisang) kapal (Musa × paradisiaca L.) | Banana carried in a boat and shape like a boat | Morfologi |
| 26. | Awal (Pisang) keken (Musa × paradisiaca L.) | (Unidentified) | Unidentified |
| 27. | Awal (Pisang) keris (Musa × paradisiaca L.) | This banana shape like a ceremonial knife (Keris) | Morfologi |
| 28. | Awal (pisang) mas (Musa × paradisiaca L.) | Golden banana | Morfologi |
| 29. | Awal (pisang) nut (Musa × paradisiaca L.) | Shiny banana | Morfologi |
| 30. | Awal (pisang) oak (Musa balbisiana Colla) | The Banana from Oak village | Ekologi |
| No. | Name                                                                 | Description                                                                 | Mechanism |
|-----|----------------------------------------------------------------------|----------------------------------------------------------------------------|-----------|
| 31  | Awal (pisang) reje (Musa × paradisiaca L.)                           | King (delicious) banana                                                     | Quality   |
| 32  | Bako (Nicotiana tabacum Linn.)                                       | (Unidentified)                                                             | Unidentified |
| 33  | Banitan (Mitrephora maingayi Hook.f. & Thomson)                      | (Unidentified)                                                             | Unidentified |
| 34  | Beke (Melastoma malabathricum L.)                                    | (Unidentified)                                                             | Unidentified |
| 35  | Belo pedeh (Piper betle L.)                                          | The real Piper sp.                                                         | Ekologi   |
| 36  | Benalu kupi (Scurrula ferruginea (Roxb. ex Jack) Danser)             | (Unidentified)                                                             | Unidentified |
| 37  | Bernol (Unidentified)                                                | (Unidentified)                                                             | Unidentified |
| 38  | Beuing gajah (Zingiber sp.)                                          | Elephant (big) ginger                                                      | Morfologi |
| 39  | Beuing ilang (Zingiber zerumbet Sm.)                                 | Red ginger                                                                 | Morfologi |
| 40  | Beuing/ging (Zingiber officinale Roscoe)                              | The real ginger                                                            | Ekologi   |
| 41  | Beyem (Amaranthus hybridus Linn.)                                     | (Unidentified)                                                             | Unidentified |
| 42  | Biwa (Eriobotrya japonica (Thunb.) Lindl)                             | (Unidentified)                                                             | Unidentified |
| 43  | Bunge Lawang (Myrcianthes fragrans (Sw.) McVaugh)                     | A species introduced by Indian                                             | Ekologi   |
| 44  | Bunge Lawang Kling (Illicium verum Hook.f.)                          | (Unidentified)                                                             | Unidentified |
| 45  | Cempedak (Artocarpus integer (Thumb.) Merr.)                          | (Unidentified)                                                             | Unidentified |
| 46  | Cerme (Phyllanthus acidus (L.) Skeels)                                | (Unidentified)                                                             | Unidentified |
| 47  | Dededok (Phyllanthus angulata Linn.)                                  | (Unidentified)                                                             | Unidentified |
| 48  | Deren (Phyllanthus angulata Linn.)                                    | (Unidentified)                                                             | Unidentified |
| 49  | Duku (Lansium domesticum Corr.)                                      | (Unidentified)                                                             | Unidentified |
| 50  | Durin (Durio zibethinus L)                                           | Thorny fruit                                                               | Morfologi |
| 51  | Empan (Zanthoxylum acaanthopodium DC)                                 | Release more saliva                                                       | Utility   |
| 52  | Gadung (Manihot esculenta Crantz)                                     | (Unidentified)                                                             | Unidentified |
| 53  | Gadung karet (Manihot carthagenensis subsp. glaziovii (Müll.Arg.) Allem) | Planted with Hevea brasiliensis                                            | Ekologi   |
| 54  | Gadung ugu (Ipomoea batatas (L.) Lam.)                               | Purple tuber                                                               | Morfologi |
| 55  | Gadung uten (Dioscorea hispida Dennst)                                | Found in forest                                                            | Ekologi   |
| 56  | Gantang (Solanum tuberosum Linn.)                                    | (Unidentified)                                                             | Unidentified |
| 57  | Gantang granola (Solanum tuberosum Linn.)                            | Big potato                                                                 | Morfologi |
| 58  | Gantang mentega (Solanum tuberosum Linn.)                            | Smooth and butter potato                                                   | Morfologi |
| 59  | Gantang sayur (Solanum tuberosum Linn.)                              | The potato is used for cooking                                             | Utility   |
| 60  | Ganyong (Canna indica L.)                                             | (Unidentified)                                                             | Unidentified |
| 61  | Gegarang (Mentha x villosa Huds.)                                    | (Unidentified)                                                             | Unidentified |
| 62  | Gele (Unidentified)                                                   | The species found in Gele                                                  | Ekologi   |
| 63  | Gelime (Psidium guajava Linn.)                                       | (Unidentified)                                                             | Unidentified |
| 64  | Gelime ilang (Psidium guajava Linn.)                                 | Red guava                                                                  | Morfologi |
| 65  | Gelime kapas (Citrus sp.)                                             | Soft Orange                                                                | Morfologi |
| 66  | Gelime Mekah (Punica granatum Linn.)                                  | a species introduced from Mecca                                            | Ekologi   |
| 67  | Gelime tai (Psidium guajava Linn.)                                   | A species with many seeds and freckles                                     | Morfologi |
| 68  | Genye (Cannabis sativa L.)                                           | (Unidentified)                                                             | Unidentified |
| 69  | Genyer (Limmocharis flava (L.) Buchenau)                             | (Unidentified)                                                             | Unidentified |
| 70  | Geseng tanduk (Lithocarpus walllichianus (Lindl. ex Hance) Rehder)    | (Unidentified)                                                             | Unidentified |
| 71  | Gunur (Benincasa hispida (Thunb.) Cogn.)                             | (Unidentified)                                                             | Unidentified |
| 72  | Jagong (Zea mays Linn.)                                              | (Unidentified)                                                             | Unidentified |
| 73  | Jagong lungi (Zea mays Linn.)                                        | Sweet corn                                                                 | Quality   |
| 74  | Jagong pulut (Zea mays Linn.)                                        | Sticky corn                                                                | Morfologi |


| No. | Name | Description | Mechanism |
|-----|------|-------------|-----------|
| 75. | Jamu bol (Syzygium malaccense (L.) Merr. & L.M. Perry) | (Unidentified) | Unidentified |
| 76. | Jamu ijo (Syzygium aqueum (Burm.f.) Alston) | Green guava | Morfologi |
| 77. | Jamu ilang (Syzygium aqueum (Burm.f.) Alston) | Juicy guava | Morfologi |
| 78. | Jamu kecek (Syzygium aqueum (Burm.f.) Alston) | Small guava | Morfologi |
| 79. | Jamu keling (Syzygium aqueum (Burm.f.) Alston) | Black guava | Morfologi |
| 80. | Jeh (Imperata cylindrica (L.) P.Beauv.) | (Unidentified) | Unidentified |
| 81. | Jepang (Syzygium aqueum (Burm.f.) Alston) | Green guava | Morfologi |
| 82. | Jire alus (Unidentified) | Smooth cumin | Morfologi |
| 83. | Jire Item (Nigella sativa Linn.) | Black cumin | Morfologi |
| 84. | Jire kul (Unidentified) | Big cumin | Morfologi |
| 85. | Jire Putih (Cuminum cyminum Linn.) | White cumin | Morfologi |
| 86. | Jombang (Nasturtium officinale W.T.Aiton) | (Unidentified) | Unidentified |
| 87. | Kacang bogor (Vigna subterranea (L.) Verdc.) | Peanut from Bogor | Ekologi |
| 88. | Kacang gelise (Psophocarpus tetragonolobus (L.) DC.) | An obscure fruit like a nervous person | Morfologi |
| 89. | Kacang jio (Vigna radiata (L.) R.Wilczek) | Green bean | Morfologi |
| 90. | Kacang Ilang (Vigna unguiculata (L.) Walp.) | Red bean | Morfologi |
| 91. | Kacang kapri (Foeniculum vulgare Mill.) | (Unidentified) | Unidentified |
| 92. | Kacang Koro (Canavalia ensiformis (L.) DC.) | The seed is larger than others | Morfologi |
| 93. | Kacang kuning (Glycine max (L.) Merr.) | Yellow bean | Morfologi |
| 94. | Kacang Ranting (Vigna unguiculata (L.) Walp.) | Long bean | Morfologi |
| 95. | Kacang Tanah (Arachis hypogaea L.) | Bean collected by digging the ground | Ekologi |
| 96. | Kanis (Garcinia parvifolia Miq.) | (Unidentified) | Unidentified |
| 97. | Kasemah (Diospyros kaki L.f.) | (Unidentified) | Unidentified |
| 98. | Kedondong biasa (Spondias dulcis (L.) Parkinson) | Abundant Spondias dulcis | Ekologi |
| 99. | Kedondong uten (Spondias dulcis (L.) Parkinson) | Found in the forest | Ekologi |
| 100. | Keloang (Diplazium esculentum Swartz.) | (Unidentified) | Unidentified |
| 101. | Keloang gajah (Unidentified) | Elephant (big) fern | Morfologi |
| 102. | Keloang jantan (Unidentified) | (Unidentified) | Unidentified |
| 103. | Kemili (Aleurites moluccanus (L.) Wild.) | (Unidentified) | Unidentified |
| 104. | Kepile (Ipomoea batatas (L.) Lam.) | (Unidentified) | Unidentified |
| 105. | Kepile koneng (Ipomoea batatas (L.) Lam.) | Yellow yam | Morfologi |
| 106. | Kepile padang (Ipomoea batatas (L.) Lam.) | Shiny yam | Morfologi |
| 107. | Kepile rujak (Unidentified) | This species is used as rujak | Utility |
| 108. | Kepile ungu (Ipomoea batatas (L.) Lam.) | Purple yam | Morfologi |
| 109. | Keramil (Cocos nucifera Linn.) | (Unidentified) | Unidentified |
| 110. | Keramil gading (Cocos nucifera Linn.) | The coconut has a white-yellowish color like a horn | Morfologi |
| 111. | Keramil hibrida (Cocos nucifera Linn.) | The big coconut | Morfologi |
| 112. | Keramil ijo (Cocos nucifera Linn.) | Green coconut | Morfologi |
| 113. | Kerto (Morus alba Linn.) | (Unidentified) | Unidentified |
| 114. | Murbei gunung | The plant found in the forest | Ekologi |
| No.  | Name                                                                 | Description                                    | Mechanism       |
|------|----------------------------------------------------------------------|-----------------------------------------------|-----------------|
| 115  | Ketuner (Coriandrum sativum Linn.)                                    | (Unidentified)                                | Unidentified    |
| 116  | Kincit Manuk (Unidentified)                                           | The leaf smells like a bird shit              | Morfologi       |
| 117  | Kulit manis (Cinnamomum burmanni (Nees & T.Nees) Blume)               | The bark has a sweet taste                    | Quality         |
| 118  | Kuning (Carcuma longa L.)                                             | Yellow                                        | Morfologi       |
| 119  | Kupi (Coffeea sp.)                                                    | (Unidentified)                                | Unidentified    |
| 120  | Labu kekal (Unidentified)                                            | Tough squash                                  | Morfologi       |
| 121  | Labu manis (Unidentified)                                            | Sweet squash                                  | Quality         |
| 122  | Labu pit (Unidentified)                                               | Bitter squash                                 | Quality         |
| 123  | Langsat (Lansium domesticum Corr.)                                    | (Unidentified)                                | Unidentified    |
| 124  | Lansat (Diocxyllum parasiticum (Osbeck) Kosterm.)                     | (Unidentified)                                | Unidentified    |
| 125  | Lasun Ilang (Allium cepa Linn.)                                       | Red onion                                     | Morfologi       |
| 126  | Lasun Potih (Allium sativum Linn.)                                     | White onion                                   | Morfologi       |
| 127  | Lasun prei (Allium tuberosum Rottler ex Spreng.)                      | (Unidentified)                                | Unidentified    |
| 128  | Lasun ulung (Allium fistulosum L.)                                     | Leaf onion                                    | Utility         |
| 129  | Lekap (Syzygium cumini (L.) Skeels)                                    | Rough                                         | Quality         |
| 130  | Lengkueus (Alpinia galanga (L.) Willd.)                               | (Unidentified)                                | Unidentified    |
| 131  | Lentoro (Leucaena glauca)                                             | (Unidentified)                                | Unidentified    |
| 132  | Lentoro gung (Unidentified)                                           | Big Leucaena glauca                          | Morfologi       |
| 133  | Leude ijo (Capsicum sp.)                                              | Green chili                                   | Morfologi       |
| 134  | Leude ilang (Capsicum sp.)                                            | Red chili                                     | Morfologi       |
| 135  | Leude keriting (Capsicum sp.)                                         | Curly chili                                   | Morfologi       |
| 136  | Leude kul (Capsicum annuum Lin)                                       | Big chili                                     | Morfologi       |
| 137  | Leude pedeh (Piper nigrum Linn.)                                      | The real lede                                 | Ekologi         |
| 138  | Leude pentek (Capsinum frustescens Linn.)                             | Small chili                                   | Morfologi       |
| 139  | Lukup (Unidentified)                                                  | (Unidentified)                                | Unidentified    |
| 140  | Lukup cange (Unidentified)                                            | Lukup from Cange village                      | Ekologi         |
| 141  | Lukup sabun (Unidentified)                                            | (Unidentified)                                | Unidentified    |
| 142  | Lumu (Colocasia esculenta (L.) Schott)                                | (Unidentified)                                | Unidentified    |
| 143  | Lumu birah (Colocasia sp.)                                            | The Colocasia sp. has a reddish color         | Morfologi       |
| 144  | Lumu ijo (Colocasia sp.)                                              | Green yam                                     | Morfologi       |
| 145  | Lumu payah (Colocasia sp.)                                            | It grows in the brackish region               | Ekologi         |
| 146  | Mancang (Mangifera foetida Lour.)                                     | (Unidentified)                                | Unidentified    |
| 147  | Manggis (Garcinia mangostana Linn.)                                   | (Unidentified)                                | Unidentified    |
| 148  | Manggis hutan (Garcinia bancana Miq.)                                 | Plant found in the forest                     | Ekologi         |
| 149  | Manggis hutan 2 (Garcinia celebica L.)                                | Plant found in the forest                     | Ekologi         |
| 150  | Nangka (Artocarpus integer (Thunb.) Merr.)                            | (Unidentified)                                | Unidentified    |
| 151  | Nas (Ananas comusus (L.) Merr.)                                       | (Unidentified)                                | Unidentified    |
| 152  | Nenggeri (Passiflora quadrangularis Linn.)                            | (Unidentified)                                | Unidentified    |
| 153  | Nenggeri uten (Passiflora foetida L.)                                 | Plant found in the forest                     | Ekologi         |
| 154  | Pala (Myristica argentea Warb.)                                       | (Unidentified)                                | Unidentified    |
| 155  | Pangoh (Arenga pinnata (Wurmb) Merr.)                                 | (Unidentified)                                | Unidentified    |
| 156  | Peking (Dalbergia pinnata (Lour.) Prain)                              | (Unidentified)                                | Unidentified    |
| 157  | Periye (Momordica charantia Linn.)                                    | (Unidentified)                                | Unidentified    |
| 158  | Pertik (Carica papaya Linn.)                                          | (Unidentified)                                | Unidentified    |
| 159  | Pertik banan (Carica papaya Linn.)                                    | Female carica (round)                         | Morfologi       |
| 160  | Pertik rawan (Carica papaya Linn.)                                    | Male carica (ovale)                           | Morfologi       |
| 161  | Peterle (Luffa acutangtula (L.) Roxb.)                               | (Unidentified)                                | Unidentified    |
| 162  | Peterle halus (Luffa aegyptiaca Mill.)                               | Smooth Luffa                                  | Morfologi       |
| 163  | Petukel (Cucurbita moschata Duch.)                                    | (Unidentified)                                | Unidentified    |
| 164  | Petukel halus (Cucurbita moschata Duch.)                              | Smooth pumpkin                                | Morfologi       |
| 165  | Petukel kasar (Cucurbita moschata Duch.)                              | Fibrous pumpkin                               | Morfologi       |
| No.  | Name                                      | Description                                           | Mechanism            |
|------|-------------------------------------------|------------------------------------------------------|----------------------|
| 166. | Pokat (Persea americana Mill.)            | (Unidentified)                                       | Unidentified         |
| 167. | Pokat dedamar (Persea americana Mill.)   | Plant found in Dedamar village                       | Ekologi              |
| 168. | Pokat mentega (Persea americana Mill.)   | Buttery avocado                                      | Morfologi            |
| 169. | Pokol (Ellingera sp.)                    | Beater                                               | Morfologi            |
| 170. | Rambai (Baccaurea motleyana (Müll.Arg.) | (Unidentified)                                       | Unidentified         |
| 171. | Rampelam (Mangifera laurina Blume)       | (Unidentified)                                       | Unidentified         |
| 172. | Rempelam gadung (Mangifera sp.)          | The fruit shape like gadung                          | Morfologi            |
| 173. | Rempelam golek (Mangifera sp.)           | This mango fruit is curved such lying down           | Morfologi            |
| 174. | Rempelam kuwini (Mangifera odorata Griff.) | (Unidentified)                                      | Unidentified         |
| 175. | Rengkernil (Unidentified)                | (Unidentified)                                       | Unidentified         |
| 176. | Rom alas (Oryza sativa Linn.)            | The paddy grows in the open fields                   | Ekologi              |
| 177. | Rom bontok (Oryza sativa Linn.)          | This paddy is big resembling the                     | Morfologi            |
|       |                                           | Xiphophorus spp.                                     |                     |
| 178. | Rom ilang (Oryza sativa Linn.)           | Red paddy                                            | Morfologi            |
| 179. | Rom kuring (Oryza sativa Linn.)          | The dark and brown paddy                            | Morfologi            |
| 180. | Rom lambu (Oryza sativa Linn.)           | Not native paddy                                     | Ekologi              |
| 181. | Rom padang (Oryza sativa Linn.)          | The paddy can grow in the open land                  | Ekologi              |
| 182. | Rom pedeh/Rom alas (Oryza sativa Linn.)  | The real paddy                                       | Ekologi              |
| 183. | Rom pulut (Oryza sativa Linn.)           | Sticky paddy                                         | Morfologi            |
| 184. | Rom rempak (Oryza sativa Linn.)          | This species is planted and harvested at its cycle   | Ekologi              |
| 185. | Rom tajuk (Oryza sativa Linn.)           | Paddy smells like flowers                            | Quality              |
| 186. | Rukut (Solanum nigrum Linn.)             | The fruit has a small black rounded shape            | Morfologi            |
|       |                                           | and is packed in a bunch                            |                     |
| 187. | Rukut Cipluk (Physalis angulata L.)      | The grass small and rounded                          | Morfologi            |
| 188. | Rukut Leunca (Physalis sp.)              | The fruit has a small black rounded shape            | Morfologi            |
|       |                                           | and is packed in a bunch                            |                     |
| 189. | Salam (Syzygium polyanthum.Wight.)       | (Unidentified)                                       | Unidentified         |
| 190. | Sarami (Unidentified)                    | (Unidentified)                                       | Unidentified         |
| 191. | Sawi (Brassica rugosa Prain.)            | (Unidentified)                                       | Unidentified         |
| 192. | Sawi asin (Brassica sp.)                 | (Unidentified)                                       | Utility              |
| 193. | Sawi cina (Brassica sp.)                 | This plant comes from China                         | Ekologi              |
| 194. | Sawi potih (Brassica sp.)                | White Brassica sp.                                   | Morfologi            |
| 195. | Seliming (Averrhoa bilimbi Linn.)        | Stimulant to release more saliva                     | Utility              |
| 196. | Seliming segi (Averrhoa carambola L.)    | Stimulant to release more saliva                     | Utility              |
| 197. | Sepang (Biancaea sappan (L.) Tod.)       | (Unidentified)                                       | Unidentified         |
| 198. | Sere (Cymbopogon cytratus Stapf.)        | (Unidentified)                                       | Unidentified         |
| 199. | Serule (Unidentified)                    | (Unidentified)                                       | Unidentified         |
| 200. | Tamok (Amaranthus sp.)                   | Harvesting species is easy                           | Morfologi            |
| 201. | Tangi (Unidentified)                     | (Unidentified)                                       | Unidentified         |
| 202. | Teh (Camellia sinensis (L.) Kuntze)      | (Unidentified)                                       | Unidentified         |
| 203. | Tempil (Unidentified)                    | (Unidentified)                                       | Unidentified         |
| 204. | Terong (Solanum melongena L.)            | (Unidentified)                                       | Unidentified         |
| 205. | Terong Padol (Solanum sp.)               | (Unidentified)                                       | Unidentified         |
| 206. | Terpuk (Ellingera elatior (Jack) R.M.Sm.)| (Unidentified)                                       | Unidentified         |
| 207. | Terujak (Unidentified)                   | (Unidentified)                                       | Unidentified         |
| 208. | Timun kul (Cucumis sp.)                  | Big cucumber                                         | Morfologi            |
| 209. | Timun bireun (Cucumis sativus Linn.)     | The cucumber comes from Bireun district              | Ekologi              |
| 210. | Timun dike (Cucumis sp.)                 | (Unidentified)                                       | Unidentified         |
| 211. | Timun karo (Cucumis sp.)                 | The cucumber comes from Karo district                | Ekologi              |
| 212. | Timun taiwan (Cucumis sp.)               | Cucumber from Taiwan                                  | Ekologi              |
| 213. | Timun tikus (Cucumis sp.)                | Small (Mouse) cucumber                                | Morfologi            |
| 214. | Tomat (Solanum lycopersicum Linn.)       | (Unidentified)                                       | Unidentified         |
Results showed that the traditional knowledge of the Gayo Indigenous Peoples in identifying plant taxa can be categorized into 4 mechanisms, namely morphology (37%), ecology (16%), utility (5%), and quality (4%) (figure 1). This classification group is in line with various studies that have been conducted by researchers [1,10,37,38]. For example, [10] stated that ethnotaxonomy includes several mechanisms such as morphology, sensory perception, ecology, and utility. The high number of taxa identified by local people through morphological mechanisms shows that this method is indeed the fastest and easiest mechanism that can be captured by the human senses. Stated that morphology such as the form of growth/habitus, fruit, flowers, or leaves is the most important criterion for classifying plants [39]. Besides, shape and colour can also be parameters of morphological identification [40].

The Gayo community distinguishes the morphology of plant forms into big/fat (kul, gong), small (kecek, kincit, pentek), hollow (utung), curly (keriting). There are also taxa identified based on textures such as fine (halus), soft (kapas), and fibrous (kasar). Other groups are also identified based on colour differences, there are at least six basic colour terms in their food plants viz. ilang (red), potih (white), koneng (yellow), item (black), ijo (green), and ungu (purple). The people also use kul (big), kecek/kucak (small), and resemble with six of another thing such as kincit (small feces). The people also denote the texture of the fruit or particular area of the plant by using the term kasar (rough/fibrous). The example of morphological character embedded in Gayo food plants could be seen in lasun ilang (Allium cepa), lasun potih (Allium sativum), lede kul (Capsicum annum), asam kincit (Citrus sp), petukel kasar (Luffa acutangula).

| No. | Name                          | Description                  | Mechanism  |
|-----|-------------------------------|------------------------------|------------|
| 215 | Uluh (Bamboo sp.)            | Long and cylindrical         | Morphologi |
| 216 | Uluh utung (Bamboo sp.)      | Big bamboo                   | Morphologi |
| 217 | Ungke pit (Solanum sp.)      | Bitter Solanum sp.           | Quality    |
| 218 | Ungke rimang (Solanum stramonifolium Jacq.) | Medicinal Solanum sp. | Utility    |

![Figure 1. Ethnotaxonomical systems of food plants in the Gayo people.](image)

In ecological mechanisms, the Gayo community uses several identification groups, including plant origin, habitat, and place-names [41]. Some documented sources of plant origin are Java, Bali, Bogor, Japan, Mecca, Taiwan, Keling / India. The habitat which is the place where people commonly find the plants in question is forest (uten), field / large area (alas), brackish (payah), land (tanoh). Other groups identified based on place names around the Gayo Plain are Dedamar, Kenyaran, Cange, Kuyun, Gele, Oak. The example of ecological character embedded in Gayo food plants could be seen in gelime mekah (Punica granatum), asam kuyun (Citrus sp.), asam kenyaran (Citrus sp.), rom alas (Oryza sativa), kedondong uten (Spondias dulcis), nenggeri uten (Passiflora foetida L.). The ecological or habitat
category plays an important role in whether the biotic category will be culturally recognized by the local people or not [36].

Furthermore, utility mechanisms that indicate the identification of plants can be grouped by use, method of use, and parts used. Food plants are understood as a utilization group of food plant diversity, however utilitarian characteristics might diverse and in many cases could reflect the importance of the species into the community [42,43]. Based on its use, some plants are given the name *jantar* because it is an ingredient for vegetables, given the name *rajak* because it’s used to make a salad, they are given the name *empan* to increase appetite, and *seliming* which means a way to stimulate the release of more saliva. There are also groups of plants that are given names related to the parts used, such as *ulang* which means leaf. Furthermore, several ways of use can also be identified from the names given, such as *pepok* which means to be hit, and *tangerine* which means how to strip the skin of plants by beating them. The example of utility character embedded in Gayo food plants could be seen in *asam jantar* (*Citrus* sp.), *kepile rujak* (*Pachyrhizus erosus*), *rom tajuk* (*Oryza sativa*), *lasun ulang* (*Allium fistulosum*). Gayo people also use *empan* (*Zanthoxylum acanthopodium*) and *seliming* (*Averrhoa bilimbi*) to gain more appetite. *Empan* means a condition that releases more saliva when one’s appetite increases, whereas *seliming* means a way to stimulate the release of more saliva. *Empan* is endemic and culturally important for people in Aceh and North Sumatera, it is known by *andaliman* which have a great number of phytochemicals as potential bioprospecting commodity [44].

The last mechanism is the classification of plants based on quality. The Gayo community attaches the term *genensa* to something that has premium quality, the most superior, the tastiest, the sweetest, for example, *asam ganensa* (*Citrus* sp.). Genensa is normally used to denote the great/premium quality, the duck flesh with premium quality comes from *bebek genensa*. Genensa is also used to denote people with praiseworthy behavior. Human influence to name the biodiversity to reveal and indicate constricted human-environment interactions [3,4,41]. Besides, there are also groupings based on taste, such as the taste of sepat (*lekap*) and sweet (*manis*).

These complex examples in the ethnotaxonomical system of Gayo food plants consist of generic, specific, and varietal taxa. Based on Table 1 not all of the lexemes could be analysed by the Gayo people residing in Jabodetabek. A total of 170 out of 218 primary lexemes given as names were of an un-analysable nature (78%), referring only to the generic taxa. Only 10 specific taxa could not be analysed out of 139 (7%) and only 2 varietal taxa could not be analysed out of 14 (14%).

![Figure 2. Un-analysable lexeme on each taxa.](image-url)

In this condition, we could realize that there is a loss of traditional knowledge among the Gayo People, especially the Gayo People residing in Jabodetabek. A similar result found in the Tsimane’ community, where the adults experienced a net decrease in the report of plant uses ranging from 9% (for the female subsample) to 26% (for the subsample of people living close to towns), equivalent to a 1 to 3 % per year.
Changes were more acute for men than women and informants living in villages close to market towns than informants settled in remote villages [45]. However, considering these situations there will be an opportunity to revitalize the language as well as traditional knowledge by documenting and sharing this research with the younger generation.

4. Conclusion

Results showed that the traditional knowledge of the Gayo indigenous peoples in identifying plant taxa can be categorized into 4 mechanisms, namely morphology (37%), ecology (14%), utility (5%), and quality (3%) out of the number of taxa. As much as 47.3% of unidentified and unanalysable lexemes of Gayo food plants indicate loss of traditional knowledge among Gayonese residing in Jabodetabek. Future research might answer the gap of this study by collaborating with Gayo people in their origin ecosystem.

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Acknowledgement

We would like to thank Ikatan Musara Gayo Jabodetabek for your valuable knowledge sharing and facilitate the FGD. The key person from Gayo Lut (Takengon) Pak Hamid Hakim for his kindness and patient on my never-ending questions. Kementerian Riset dan Teknologi-BRIN, the Republic of Indonesia for your support through Penelitian Dasar Unggulan Perguruan Tinggi (PDUPT) scheme.