



Ethnomedicinal plants of the *Dumagat* community of Paraiso, Culat, Casiguran, Aurora, Philippines

Madel L. Canceran, Paul Henric P. Gojo Cruz, Evaristo A. Abella, Diana C. Castillo, Emmanuel E. Gandalera, Khristina G. Judan Cruz*

Department of Biological Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines

Key words: *Dumagats*, ethnobotanicals, indigenous knowledge.

<http://dx.doi.org/10.12692/ijb/18.3.261-267>

Article published on March 30, 2021

Abstract

Of the Philippines' 130 distinct and diverse ethnic groups, the *Dumagats* of Casiguran, Aurora hosts a rich culture of traditional medicine that utilizes taxonomically diverse ethnobotanicals. This paper highlights the *Dumagats*' utilization of ethnobotanicals as medicine. *Dumagat* families served as informants and were interviewed for their use of the ethnobotanicals. The data collected were quantified by calculating the use value and informant consensus factor. A total of 58 ethnobotanicals used for medicinal purposes were listed and classified under 34 families. Leaves are the commonly used plant part. Ethnomedicinal plants were often decocted and taken orally. *Centella asiatica* L., *Pinanga* sp., *Mikania cordata* (Burm.f.) B.L. Rob., *Pterocarpus indicus* Willd., *Psidium guajava* L., *Phyllanthus urinaria* L., and *Imperata cylindrica* (L.) Raeusch are the most used medicinal plants in the community with a use value of 1. The disease category with the highest FIC value was injury and poisons of external causes and diseases of the respiratory system with a value of 0.85. High FIC values were observed which suggests further research to validate the medicinal uses of these plants.

* **Corresponding Author:** Khristina G. Judan Cruz ✉ kjcruz@clsu.edu.ph

Introduction

The Philippines is characterized by a rich diversity both in cultural, indigenous communities and natural resources. The country hosts more than 16,223 species of plants of which a third is considered endemic. A number of these plant species are used by diverse indigenous communities for medicinal purposes entailing a broader scope for healing. The knowledge and traditional use of plants as medicine by the indigenous people are conventionally inherited from ancestors through oral tradition (Olowa *et al.*, 2012). Among these are the *Dumagats*. The *Dumagat* is a Philippine indigenous group that inhabits the coast of Pacific Ocean and the hinterlands of the Sierra Madre Mountains in the eastern part of Luzon Island, Philippines (Sia *et al.*, 1998). In earlier times, they were semi-nomadic people, searching for food and build temporary houses until the natural resources around them are already consumed. The *Dumagats* resemble other Negrito groups such as the *Aetas* of Pinatubo, *Ati* of Panay Island and the *Manobos* of Davao and North Cotabato provinces. However, the *Dumagats* have bigger built and are taller than the *Ati* and *Aeta* groups (Blumentritt, 1980; Eranista, 1994). The *Dumagats* are divided into three subgroups based on language: *Tagibulos*, *Kabulowan*, and *Idemala*. Most of the *Dumagats* belongs to the *Tagibulos* subgroup found along the shores of Aurora, Quezon and mountains of Bulacan and Rizal.

Ethnobotanical surveys in the Philippines are often conducted on mountainous areas as this serves a home for both the indigenous people and diverse group of plants that they utilize as traditional medicine. This utilization is an ideal example of the traditional use of plant resources by local communities for treatments of various diseases and considered significant in paving the development of present medicines. However, the use of traditional medicine is in danger of extinction as many traditional healers do not keep written notes and fail to pass the knowledge orally to the succeeding generations. Throughout the ages and in different parts of the world, plants have notably played a major role in treating human diseases (Thirumalai *et al.*,

2009) and the use of herbal medicine as an alternative to conventional medicine is also becoming popular all over the world. Albeit, modernization brought by western practices in the medical field has also resulted to the continuous replacement of traditional practices (Ong *et al.*, 2011). Also, as modernization progresses, medicinal plants have become threatened because of habitat destruction due to industrialization and climate change. This presents a crucial role for ethnobotanical surveys to bring about discovery of untapped ethnobotanicals for scientific validation and drug development. Thus, this paper highlights the ethnobotanical diversity, preserved knowledge and the rich culture of traditional medicine of the *Dumagats* of Paraiso, Casiguran, Aurora.

Materials and methods

The ethnobotanical survey was conducted in Sitio Paraiso, Barangay Culat, Casiguran, Aurora. The area was surveyed for the presence of ethnobotanicals and the data was collected through a semi-structured interview of 9 *Dumagat* informant-families who are knowledgeable on medicinal plants. Key informants were identified through the tribal chieftain. The semi-structured interview was composed of questions on medicinal plants, its utilization as a traditional medicine, the diseases treated by the plants, the parts that are used, how the parts are prepared and the frequency and direction of use of these plants. Samples of plants with mature parts (leaves, stems, flowers, roots, and fruits) were collected for taxonomic identification. Two samples of the plant were immersed in alcohol and were placed in a collection bag with a unique collection number. The plant was placed in newspapers, pressed on a plant presser until it has dried out and was placed in herbarium sheets (30 × 42 cm). The herbarium was labeled with the following information: date of collection, collector's name, place of collection, scientific name, common name, and description. The habitat and specimen were photographed in-situ. Voucher specimens were verified and authenticated by a taxonomist and deposited at the Department of Biological Sciences, College of Science, Central Luzon State University, Philippines.

The information on the medicinal plants based on the interview was tabulated.

The Informant Consensus Factor (ICF) was computed using the formula: $ICF = (Nur - Nt) / Nur - 1$: where Nur is the number of use reports in each category and Nt is the number of species used for a particular category by all informants (Ragragio *et al.*, 2013). The maximum value attained using this Formula, 1, means that the informants completely agree that the

particular species cited could cure a particular ailment.

Results and discussion

Nine family respondents, composed of the chieftain, knowledgeable elders and members of the community who are utilizing the ethnobotanicals, participated in the conduct of the survey. A total of fifty-eight (58) plants were recorded and collected from various areas in the mountain and within the *Dumagats'* residence.

Table 1. List of Ethnomedicinal Plants used by the *Dumagat* Community of Paraiso, Culat, Casiguran, Aurora.

| Family | Scientific name | Local name | Usage of plant | Plant parts used | Mode of preparation and administration |
|------------------|---|----------------------------|---|------------------|---|
| Amaryllidaceae | <i>Allium cepa</i> var. <i>aggregatum</i> G. Don | Sibuyas Tagalog | Fever, cough | Leaves and Stem | Decoction; taken orally |
| Annonaceae | <i>Polyalthia longifolia</i> (Sonn.) Benth. & Hook. f. | Uya | Charm | Roots | Skinned and used as charm |
| | <i>Anaxagorea luzonensis</i> A. Gray | Apsot | Relapse after giving birth | Leaves | Decoction; taken orally |
| Apiaceae | <i>Centella asiatica</i> L. | Mahabanwaw/ Takip-Kuhol | Cough, colds, stomach ache, diarrhea, urinary tract infection (UTI) | Leaves | Decoction; taken orally |
| Apocynaceae | <i>Alstonia scholaris</i> (L.) R. Br. | Manakit | Fever, headache, malaria | Bark | Decoction; taken orally |
| Araceae | <i>Aglaonema simplex</i> (Blume) Blume | Tagabalid | Sprain, inflammation | Leaves | Leaves are applied with oil and heated directly on flame; Poultice |
| | <i>Philodendron giganteum</i> Schott | Salangubang/Payaw Payaw | Stomach gas | Stem | Decoction (mixed with abutra/labtang and kamote roots); taken orally |
| | <i>Rhaphidophora korthalsii</i> Schott. | Takup-Takup | Boils, muscle spasm | Leaves | Heated directly on flame and used as poultice |
| Araliaceae | <i>Schefflera heptaphylla</i> (L.) Frodin | Bagnet | Relapse after giving birth | Leaves | Decoction; taken orally |
| Arecaceae | <i>Calamus manillensis</i> (Mart.) H.A. Wendl. | Bisal | Toothache, stomach gas | Roots | Roots are covered with leaves, directly heated on flame, mixed with salt; inserted in the tooth holes |
| | <i>Pinanga</i> sp. | Butag | Wound, stomach ache, fever | Fruit | Chewed and is mixed with lime; dermal application |
| Asteraceae | <i>Ageratum conyzoides</i> L. | Payokpok | <i>Taon</i> , wound, cough, fever | Leaves | Leaves are extracted by hand; dermal application |
| | <i>Artemisia vulgaris</i> L. | Damong Maria | Dysmenorrhea, amenorrhea, stomach ache | Leaves | Decoction; taken orally first in the morning |
| | <i>Blumea balsamifera</i> (L.) DC. | Sambong | <i>Pasma</i> , muscle spasm, body pain | Leaves, Roots | Leaves: decoction; taken orally or smoked, Roots: Decoction; smoked |
| | <i>Chrysanthemum indicum</i> var. <i>edule</i> (Kitam) Kitam. | Mansanilla | Fever, cough, stomach gas | Leaves | Decoction; taken orally |
| | <i>Elephantopus mollis</i> Kunth. | Tabatabako | <i>Taon</i> , wound | Leaves | Pounded and rolled in a leaf, heated directly on flame, mixed with salt and used as poultice |
| | <i>Mikania cordata</i> (Burm.f.) B.L.Rob. | Bercrop | Wound, cough | Leaves | Heated directly on flame to extract; dermal application |
| | <i>Tagetes erecta</i> L. | Amarillo | <i>Taon</i> , stomach gas | Leaves | Heated directly on flame; extract is taken orally |
| Bromeliaceae | <i>Ananas comosus</i> (L.) Merr. | Pinya | Boils | Leaves (young) | Pounded and heated directly on flame, wrapped in leaves and used as poultice |
| Cannaceae | <i>Canna indica</i> L. | Kuneg | Skin redness | Roots | Pounded; Poultice |
| Commelinaceae | <i>Tradescantia spathacea</i> Sw. | Atsibar | Vomiting of blood | Leaves | Decoction; taken orally |
| Cyperaceae | <i>Cyperus</i> sp. | Mutha | Stomach gas | Roots | Chewed; poultice |
| Dipterocarpaceae | <i>Hopea</i> sp. | Butnol | Wound | Leaves | Pounded and applied dermally |
| | <i>Parashorea malaanonan</i> (Blanco) Merr. | Pampabait | Charm | Roots | Skinned and used as a charm |
| Euphorbiaceae | <i>Codiaeum luzonicum</i> Merr. | Putat | Relapse after giving birth | Bark | Decoction/ soak in alcoholic drink for three days; taken orally |
| | <i>Euphorbia hirta</i> L. | Tawa –Tawa | Fever, asthma | Leaves | Leaves are sundried, rolled in a paper and is smoked on the affected part |
| | <i>Macaranga tanarius</i> (L.) Müell.Arg. | Bilante | Relapse after giving birth, hip pain | Bark | Decoction; taken orally |
| | <i>Pedilanthus tithymaloides</i> L. | - | Snake bite | Whole plant | Pounded and mixed with salt, heated |

| | | | | | |
|--|--|--------------------------|---|------------------------------|--|
| Fabaceae | <i>Arachis hypogaea</i> L. | Mani-manian | Mouth ulcer, toothache | Leaves | directly on flame and used as poultice Pounded, mixed with salt and covered by banana leaves. Heated directly on flame and extract is gargled. |
| | <i>Mimosa pudica</i> L. | Makahiya | Amenorrhoea | Roots | Decoction; taken orally |
| | <i>Pterocarpus indicus</i> Willd. | Narra | Dysentery, mouth ulcer, stomach ache | Leaves, Bark | Leaves: Poultice. Bark: decoction; taken orally, Sap; applied dermally |
| Lamiaceae | <i>Origanum vulgare</i> L. | Oregano | Malaria | Leaves | Decoction; taken orally |
| Lauraceae | <i>Beilschmiedia</i> sp. | Bantigi | Strengthening of bones, disinfection of a newly cut navel in babies | Leaves, Bark | Leaves are heated directly on flame and used as poultice; Bark is mixed with chewed leaves and applied externally |
| Lythraceae | <i>Lagerstroemia speciosa</i> (L.) Pers. | Banaba | Kidney disease | Leaves | Decoction; taken orally |
| Malvaceae | <i>Hibiscus rosasinensis</i> L. | Gumamela | Boils | Flower | Pounded and applied to the outer area of the boil |
| Melastomataceae | <i>Astronia</i> sp. | Tulang | Stomach ache, cough | Roots | Decoction; taken orally |
| Menispermaceae | <i>Anamirta cocculus</i> (L.) Wight and Arn. | Abutra/ Labtang | Stomach ache | Roots | Decoction; taken orally (can be mixed with alcohol) |
| Moringaceae | <i>Moringa oleifera</i> Lam. | Malunggay | Toothache, wound | Bark | Mixed with lime; gargled |
| Myrtaceae | <i>Psidium guajava</i> L. | Bayabas | Stomach ache, wound, diarrhea | Leaves, bark, roots | Leaves: decoction; taken orally or used for bathing. Bark: decoction; taken orally Roots: Pounded; extract is taken orally with kalamansi root extract |
| Phyllanthaceae | <i>Phyllanthus urinaria</i> L. | Taltalikod | <i>Taonor subi-subi</i> , possessed by ghosts | Leaves | Pounded leaves; taken orally |
| Piperaceae | <i>Piper betle</i> L. | Ngayabngab | Fever, influenza | Roots, leaves | Decoction; mixed with bath water |
| | <i>Piper cordatilumbum</i> Quisimb. | Litlit | Cough, colds, fever, stomach ache | Leaves | Leaves are mixed with coconut oil; dermal application |
| | <i>Piper nigrum</i> L. | Diwat/ Sikday | Athlete's foot | Leaves | Heated directly on flame to extract; dermal application |
| Poaceae | <i>Cymbopogon citratus</i> (DC.) Stapf | Tanglad | <i>Pasma</i> , measles | Whole plant | Decoction; taken orally, used as bath and smoked |
| | <i>Imperata cylindrica</i> (L.) Raeusch | Cogon | UTI, skin itchiness | Roots | Decoction; taken orally |
| | <i>Paspalum conjugatum</i> P.J. Bergius. | Carabao grass | Diabetes, miscarriages | Whole plant | Decoction; taken orally |
| Rubiaceae | <i>Morinda citrifolia</i> L. | Bungaw Bungaw/ Lewlew | Body pain, hernia, headache | Leaves, roots | The leaves are oiled and heated directly on flame; used dermally as poultice. Roots were pounded and mixed with salt; used as poultice |
| Rutaceae | <i>Citrus microcarpa</i> Bunge | Kalamansi | Cough, colds, stomach ache | Leaves(young), fruits, roots | Leaves: decoction; taken orally. Fruit extract is taken orally as juice and is applied dermally |
| Selaginellaceae | <i>Selaginella cupressina</i> Spring | Pako-Pako | Diarrhea | Leaves | Poultice |
| Simaroubaceae | <i>Manungala pendula</i> Blanco | Manunggal | Stomach ache, vomiting, diarrhea | Fruit | Decoction; taken orally |
| Solanaceae | <i>Capsicum annuum</i> var. <i>annuum</i> L. | Siling Labuyo | Stomach ache | Leaves | Pounded and extract is taken orally |
| Urticaceae | <i>Prochris laevigata</i> Miq. | Pangloko | Charm | Roots | Skinned and used as charm |
| Zingiberaceae | <i>Curcuma longa</i> L. | Kamahilan | Gastritis | Stem | Chewed and released on the affected part |
| | <i>Zingiber officinale</i> Roscoe | Luya | Stomach ache, Rheumatoid arthritis, muscle spasm | Stem | Decoction; taken orally |
| | <i>Kaempferia galanga</i> L. | Dusol | Boils | Leaves (young) | Pounded; applied dermally |
| Other scientifically unidentified plants | Species 1 | Anggo | Muscle spasm | Bark | Decoction; taken orally |
| | Species 2 | Atikahang | Cough | Leaves | Pounded and extract is taken orally |
| | Species 3 | - | toothache | Roots | Decoction; gargled |

The recorded taxa were classified under 34 families representing 53 genera and 55 species. Fifty-three of the fifty-eight ethnobotanicals were documented *in-situ*, five ethnobotanicals were not documented because of the unavailability of the plant in the study area and three of the plants were not identified due to insufficient parts when collected and which are only known through their local *Dumagats* name. The dominant family was Asteraceae having the highest number of representative species followed by Euphorbiaceae. Leaves are the most utilized plant

part (56.90%), followed by the roots (27.57%), bark (13.79 %), stem (6.90%), and fruits (5.17%).

There are certain diseases that are treated using the whole plant and this accounts for 5.17% of the total plant species identified in this study. Decoction was the most cited ethnobotanical preparation followed by pounding, flaming, other mode of preparation such as soaking the plant part in a hot water, extracting by hand, oiling the plant part, sun drying and mixing with salt, and chewing.

Table 2. Ethnomedicinal plants used in different diseases.

| Category | Plants |
|---|---|
| Respiratory | <i>Allium cepa</i> var. <i>aggregatum</i> G. Don, <i>Centella asiatica</i> L., <i>Ageratum conyzoides</i> L., <i>Chrysanthemum indicum</i> var. <i>edule</i> (Kitam.) Kitam., <i>Mikania cordata</i> (Burm.f.) B.L.Rob., <i>Euphorbia hirta</i> L., <i>Astronia</i> sp., <i>Piper betle</i> L., <i>Piper cordatilumbum</i> Quisimb., <i>Citrus microcarpa</i> Bunge, "Atikahang" |
| Wounds and bites | <i>Alstonia scholaris</i> (L.) R. Br., <i>Aglaonema simplex</i> (Blume) Blume, <i>Blumea balsamifera</i> (L.) DC., <i>Macaranga tanarius</i> (L.) Müell.Arg., <i>Morinda citrifolia</i> L., <i>Curcuma longa</i> L., <i>Zingiber officinale</i> Roscoe, <i>Pedilanthus tithymaloides</i> L., <i>Rhaphidophora korthalsii</i> Schott., <i>Pinanga</i> sp., <i>Ageratum conyzoides</i> L., <i>Elephantopus mollis</i> Kunth., <i>Mikania cordata</i> (Burm.f.) B.L.Rob., <i>Ananas comosus</i> (L.) Merr., <i>Hopea</i> sp., <i>Beilschmiedia</i> sp., <i>Hibiscus rosasinensis</i> L., <i>Moringa oleifera</i> Lam., <i>Psidium guajava</i> L., <i>Piper nigrum</i> L., <i>Kaempferia galanga</i> L. |
| Gastro-intestinal | <i>Centella asiatica</i> L., <i>Philodendron giganteum</i> Schott., <i>Calamus manillensis</i> (Mart.) H.A. Wendl., <i>Pinanga</i> sp., <i>Artemisia vulgaris</i> L., <i>Chrysanthemum indicum</i> var. <i>edule</i> (Kitam.) Kitam., <i>Tagetes erecta</i> L., <i>Cyperus</i> sp., <i>Pterocarpus indicus</i> Willd., <i>Astronia</i> sp., <i>Anamirta cocculus</i> (L.) Wight and Arn., <i>Psidium guajava</i> L., <i>Piper cordatilumbum</i> Quisimb., <i>Citrus microcarpa</i> Bunge, <i>Selaginella cupressina</i> Spring, <i>Manungala pendula</i> Blanco, <i>Capsicum annum</i> var. <i>annuum</i> L., <i>Curcuma longa</i> L., <i>Zingiber officinale</i> Roscoe, <i>Calamus manillensis</i> (Mart.) H.A. Wendl., <i>Arachis hypogaea</i> L., <i>Pterocarpus indicus</i> Willd., <i>Moringa oleifera</i> Lam. |
| Obstetrics-gynecology | <i>Anaxagorea luzonensis</i> A. Gray, <i>Schefflera heptaphylla</i> (L.) Frodin, <i>Artemisia vulgaris</i> L., <i>Codiaeum luzonicum</i> Merr., <i>Macaranga tanarius</i> (L.) Müell.Arg., <i>Mimosa pudica</i> L., <i>Paspalum conjugatum</i> P.J. Bergius., <i>Morinda citrifolia</i> L., <i>Centella asiatica</i> L., <i>Lagerstroemia speciosa</i> (L.) Pers., <i>Imperata cylindrica</i> (L.) Raeusch |
| Musculo-skeletal | <i>Aglaonema simplex</i> (Blume) Blume, <i>Rhaphidophora korthalsii</i> Schott., <i>Blumea balsamifera</i> (L.) DC., <i>Beilschmiedia</i> sp., <i>Alstonia scholaris</i> (L.) R. Br., <i>Macaranga tanarius</i> (L.) Müell.Arg., <i>Morinda citrifolia</i> L., <i>Curcuma longa</i> L., <i>Zingiber officinale</i> Roscoe, "Anggo" |
| Nervous | <i>Alstonia scholaris</i> (L.) R. Br., <i>Pinanga</i> sp., <i>Ageratum conyzoides</i> L., <i>Chrysanthemum indicum</i> var. <i>edule</i> (Kitam.) Kitam., <i>Euphorbia hirta</i> L., <i>Piper betle</i> L., <i>Piper cordatilumbum</i> Quisimb. |
| Dermatological | <i>Canna indica</i> L., <i>Imperata cylindrica</i> (L.) Raeusch |
| Infectious and parasitic disease | <i>Alstonia scholaris</i> (L.) R. Br. (malaria), <i>Origanum vulgare</i> L. (malaria), <i>Cymbopogon citratus</i> (DC.) Stapf (measles) |
| Endocrine, nutritional and metabolic diseases | <i>Paspalum conjugatum</i> P.J. Bergius. |

The plants are grouped under disease categories (Table 2). The diseases and ailments treated using these ethnomedicinal plants are categorized into different areas: respiratory, wounds and bites, gastro-intestinal, obstetrics-gynecology, musculo-skeletal, nervous, dermatological, infectious and parasitic diseases, and endocrine, nutritional and metabolic diseases. Majority of these plants are taken orally or applied externally (Table 1).

Medicinal plants are mostly used for gastro-intestinal diseases (23 plants), treatment of wounds and bites (21), obstetrics-gynecology (11), and respiratory problems (10).

Informed Consensus Factor (ICF)

The ICF value (0 – 1.0) determines the agreement between informants over which plants should be used for each category of disease (Raterta *et al.*, 2014; Uddini and Hasan, 2014). The ICF values are presented in Table 3. The highest value of 0.85 was obtained for two categories: respiratory and wounds and bites. *C. asiatica* and *Pinanga* sp. are the most commonly used plants for each category. The study showed that plants are valued by the community for their medicinal properties. Most of the plants used are easily accessible with a few species collected from the forest. Most of the plants recorded in the study are already known as plants with medicinal values

especially in areas with limited access to healthcare and medicine (Valle Jr. *et al.*, 2015, Balberona *et al.*, 2018). Among the recorded plants, *C. asiatica*, *Pinanga* sp., *M. cordata*, *P. indicus*, *P. guajava*, *P. urinaria*, and *I. cylindrica* are the most used plants, none of which had been extensively studied for their phytochemical properties. Ethnobotanicals in the area are taxonomically diverse. Most of the plants

utilized by the *Dumagats* are accessible as most of these plants are common weeds or are already planted as ornamentals around the community.

A few of the plants are found in the forest. High ICF values were observed on majority of the plants which suggests further research to validate the medicinal uses of these plants.

Table 3. Disease categories with Informant Consensus Factor.

| Category | Disease | Use citation | Plant taxa used | ICF | Plant most used |
|---|--|--------------|-----------------|------|----------------------|
| Respiratory | Common colds, asthma, cough, influenza | 60 | 10 | 0.85 | <i>C. asiatica</i> |
| Wounds and bites | Wound, sprain, bites | 53 | 9 | 0.85 | <i>Pinanga</i> sp. |
| Gastro-intestinal | Stomach ache, diarrhea, stomach gas, gastritis, toothache, mouth ulcer | 112 | 22 | 0.81 | <i>P. guajava</i> |
| | | | | | <i>P. indicus</i> |
| | | | | | <i>Astronia</i> sp. |
| Obstetrics-gynecology | Kidney problems, Urinary Tract Infection (UTI) | 12 | 3 | 0.81 | <i>I. cylindrica</i> |
| Musculo-skeletal | Rheumatoid arthritis, body pain, inflammation, <i>pasma</i> , muscle spasm, hip pain, hernia | 36 | 8 | 0.8 | <i>A. simplex</i> |
| Nervous | Headache, Fever | 40 | 9 | 0.79 | <i>Pinanga</i> sp. |
| Dermatological | Skin redness, boils, itchiness | 23 | 6 | 0.77 | <i>I. cylindrica</i> |
| Infectious and parasitic disease | Measles, Athlete's foot, malaria, | 12 | 4 | 0.73 | <i>P. nigrum</i> |
| Endocrine, nutritional and metabolic diseases | Diabetes | 1 | 1 | 0 | <i>P. conjugatum</i> |

These plants should be prioritized for further bioassay and toxicity studies as it could help in the discovery of new compounds that is potential in treating diseases with no known cure.

Conclusion

This paper documented the medicinal plants utilized by the *Dumagats* of Sitio Paraiso, Barangay Culat, Casiguran, Aurora, Philippines. The survey revealed a rich diversity of traditional medicinal plants utilized for a variety of ailments. The ethnomedicinal plants are readily available within the area. This paper emphasized the rich traditional medicinal knowledge of the ethnic community. Further scientific evaluations are recommended to validate their medicinal uses and to screen their pharmacological potential.

Acknowledgements

The authors are grateful for the warm accommodation of by the following: the *Dumagats* of Sitio Paraiso, Barangay Culat, Casiguran, Aurora, Philippines; Municipal Environment and Natural

Resource Office of Casiguran, Aurora, Philippines and the Department of Biological Sciences, College of Science, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines.

This study would not be possible without their consent, cooperation and assistance. This study was funded by the Commission on Higher Education (CHED), Philippines.

References

- Balberona AN, Noveno JJ, Angeles MGB, Santos RI, Cachin EJDJ, Cruz KGJ.** 2018. Ethnomedicinal plants utilized by the Ilongot-Egongot community of Bayanihan, Maria Aurora, Aurora, Philippines. *International Journal of Agricultural Technology* **14(2)**, 145-159.
- Blumentrit F.** 1980. An attempt writing a Philippine ethnography in: the Negrito Filipino heritage. *The Making of a Nation*. **1**.
- Eranista JA.** 1994. *The Agta situationer*. Manila:

ECTF.

Olowa LF, Torres MA, Aranico EC, Demayo CG. 2012. Medicinal plants used by the Higaonon tribe of Rogongon, Iligan City, Mindanao, Philippines. *Advances in Environmental Biology* **6**, 1442-1449.

Ong HC, Chua S, Millow P. 2011. Ethno-medicinal plants used by Temuan villagers in Kampung Jeram Kedah, Negeri Sembilan, Malaysia. *Studies on Ethno-Medicine* **5(2)**, 95-100.

Ragragio EM, Zayas CN, Obico JJA. 2013. Useful plants of selected Ayta communities from Porac, Pampanga, twenty years after the eruption of Mt. Pinatubo. *Philippine Journal of Science* **142(3)**, 169-82.

Raterta R, de Guzman G, Alejandro GJ. 2014. Assessment, inventory and ethnobotanical survey of medicinal plants in Batan and Sabtang Island (Batanes Group of Islands, Philippines). *International Journal of Pure Applied Bioscience* **2**, 147-154.

Sia IC, Sur ALD, Co L, Gaerlan FJM, Naynes RS, Galang RM, Estabillo VB. 1998. Ethnopharmacological study of the Philippine ethnolinguistic groups: the *Dumagat* people of the provinces of Aurora, Bulacan, Nueva Ecija, and Quezon in Luzon Island. *University of the Philippines Manila Journal* **4(1)**.

Thirumalai T, Kelumalai E, Senthilkumar B, David E. 2009. Ethnobotanical study of medicinal plants used by the local people in Vellore District, Tamilnadu, India. *Ethnobotanical Leaflets* **13**, 1302-131.

Uddini MZ, Hassan MDA. 2014. Determination of informant consensus factor of ethnomedicinal plants used in kalenga forest, Bangladesh. *Bangladesh Journal of Plant Taxonomy* **21**, 83-91.

Valle DL Jr, Andrade JI, Puzon JJ, Cabrera E, Rivera WL. 2015. Antibacterial activities of ethanol extracts of Philippine medicinal plants against multidrug-resistant bacteria. *Asian Pacific Journal of Tropical Biomedicine* **5**, 532-540.

<https://doi.org/10.1016/j.apitb.2015.04.005>