

Utilization of Asteraceae family as medicinal plant by local community of hutan pinus Jantho nature reserve, Aceh Besar

LIZA FADHILLAH¹, SAIDA RASNOVI^{1*}, ZAIRIN THOMY¹

¹Magister Program of Biology, Biology Department, Faculty of Mathematics and Natural Sciences Syiah Kuala University, Banda Aceh, Indonesia

Abstract. The use of medicinal plants by local communities is an ethnobotanical study that links the culture of a community with the resources of plants that are around it. A study on the utilization of medicinal plants in the Hutan Pinus Jantho Nature Reserve was conducted to obtain information about the types of medicinal plants used by local communities from the reserve. This study applied the Participatory Rural Appraisal (PRA) methods for interviews conducted by Purposive Sampling. The parameters observed in this study are; parts of medicinal plants used, method of processing, method of use, and location of the collection. According to interview, 10 species of Asteraceae are found to have medical potential, and 3 of them are used by the local community of CAHPJ, these are *Blumea balsamifera* L., *Chromolaena odorata* L., and *Tagetes erecta* L. These species are used to cure wounds, treat colds, reduce fever, and soothe stomachaches.

Keywords: Ethnobotany; Hutan Pinus Jantho Nature Reserve; Medicinal plant

INTRODUCTION

Hutan Pinus Jantho Nature Reserve (CAHPJ) is known as a conservation area that has a high diversity of plants, including many medicinal species. CAHPJ has been appointed as a natural reserve with an area of 15.356,49 Ha [1]. this area was initially designated as a Nature Reserve for natural forests of *Pinus merkusii*, which acts as a protection area for plants and wildlife around it. Furthermore, its location is adjacent to residential areas, namely the villages of Aweek, Data Cut, Jantho, Weu and Bueng, as a result, many villagers travel to the reserve in search of medicinal plants [2].

Plants are a vital biological resource that have been widely used by humans around the world for centuries. The use of plants as traditional medicine has been known by the community for a very long time, and this knowledge has been passed down from generation to generation [3]. The use of plants as medicines by local communities is an ethnobotany study that links the culture of local communities with the plant resources that are in their vicinity [4].

So far, many of the villagers use forest products to meet their daily needs, including the need for basic medicinal ingredients. The family known as Asteraceae is one of the groups of medicinal plants used by the community around CAHPJ.

The Asteraceae family is the second largest family member in the kingdom Plantae system. Morphologically, members of the Asteraceae family have the appearance of single, scattered or opposite leaves. Flowers in small humps with bandage leaves, often in the same head there are two kinds of flowers: tubular disc flowers and ribbon-shaped border flowers. This family also includes broad-leaved weeds, they grown terrestrially. and are also categorized as dicotyledonous as they reproduce perennially. The protective leaves of individual flowers are sometimes like straw scales. The flower could be irregular or single flower with generally very indistinct petals. The crowns of the flowers are surrounded with loose leaves and stamens are in the crown tube, ovary sinks with one ovule, one pistil, mostly with two pistils. In hard one-seeded fruit, the seeds generally grow together with the skin of the fruit [5].

The Asteraceae family dominates the whole plant vegetation on earth with more than 24,000 - 30,000 species and 1600 - 1700

*Corresponding Author:
saida_rasnovi@unsyiah.ac.id

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genera spreading over almost all the globe and inhabiting almost all of the world's ecosystems [6]. Some members of the Asteraceae family have economic value, including Aster (*Callistephus chinensis* L.), Dahlias (*Dahlia variabilis*), Krisan (*Chrysanthemum inicum*), Gerbera (*Garbera jamesonii*), Tagetes (*Tagetes erecta*), Zinnia *elegans*, *Helianthus annuus*, and *Lactuca sativa*. These species are used as ornamental plants, insecticides and food ingredients [7]. Several other types of plants in the Asteraceae family can be used as traditional medicine because the Asteraceae family contains many bioactive compounds, such as: sesquiterpenes, lactones, pentacyclic triterpenes, alcohols, alkaloids, tannins, polyphenols, saponins, and sterols [8]. In addition to the pharmacological benefits that can be obtained, many plants contain metabolite compounds that are toxic to humans. However, the toxicity content of many medicinal plants used today is still unknown [9].

The use of plants as medicine may be carried out within certain limits, so as not to cause damage and extinction of the medicinal plant species [10]. Ethnobotany is a science that can be used to document the knowledge of traditional communities who have used various kinds of properties and benefits of plants to support life such as medical, food, building materials, traditional ceremonies, cultural events, and coloring materials [11]. Ethnobotany studies emphasize the relationship, either directly or indirectly, between community culture and plant resources. Documentation of local knowledge of the community in utilizing plant resources will be very helpful in preserving biodiversity and the domestication of high-value medicinal plants [12]. This activity can reduce the rate of exploitation of plants excessively which causes greater damage such as disruption of forest functions and the ecological status of these plants.

This study is aimed at recording the types of plants from the Asteraceae family that are used as medicine by the community around the

CAHPJ, Aceh Besar. In addition, this research can provide information and knowledge about the diversity of medicinal plants from the Asteraceae family in CAHPJ. This research data can also be used as an effort to utilize and preserve medicinal plants in the CAHPJ area.

METHODOLOGY

Material and Method

This research was conducted in villages that are directly adjacent to CAHPJ, the villages are Aweek, Data Cut, Jantho, Weu dan Bueng district Jantho, Aceh Besar regency. The tools used in the research were a notebook, permanent marker, pencil, pen and digital camera.

Data Collection

This research applied the Participatory Rural Appraisal (PRA) method with purposive sampling data collection. The age of respondents selected is over 30 years old and they all have an understanding of the use of medical plants [13]. The respondent groups are:

Table 1 Respondent group-based role in community

Group	Role in Community
1.	Traditional Leaders (headman)
2.	Housewives

RESULTS AND DISCUSSION

Based on the research that has been conducted at CAHPJ, it is found that at least 10 species of Asteraceae family have potential as medicine, they are *Blumea balsamifera*, *Elephantopus scaber*, *Tridax procumbens*, *Chromolaena odorata*, *Ageratum conyzoides*, *Eleutheranthera ruderalis*, *Crassocephalum crepidioides*, *Micania micrantha*, *Acmella paniculata*, *Vernonia cinerea*, and 1 species that was found in the house yard, *Tagetes erecta* L.. Among the 10 members of the Asteraceae family found, only three species are used by communities of CAHPJ, they are *Blumea balsamifera* L., *Chromolaena odorata* L., and *Tagetes erecta* L. The benefits, the

Table 2. Benefits, share used and how to use medicinal plants from the Asteraceae group by the community around CAHPJ

No.	Scientific name	Local name	Benefits	Used part	How to use
1	<i>Blumea balsamifera</i> L.	Daun Capa	Malaria, fever	leave	Squeezed, drunk
2	<i>Chromolaena odorata</i> L.	Daun serapuh	Wound healing	leave	Squeezed, rub
3	<i>Tagetes erecta</i> L.	Daun tahi ayam	Stomachache	leave	Squeezed, sticked

parts used, and the methods of use by the community for the three plants can be seen in Table 2.

***Blumea balsamifera* L.**

Blumea balsamifera L. or sembung (Indonesian name) bak capa (local name) (figure 1A) is a plant originating from Asia and in Indonesia *B. balsamifera* L. is found throughout its archipelago. This plant habitus is shrubs with a height of more than 4 m, with single oval leaves and dark green erect stems with a diameter of 3-5 cm. *B. balsamifera* L. Generally-grows on roadsides, in soil full of grass or shrubs [14]. This plant grows in areas with adequate lighting which are not too dry and usually lives in the lowlands to an altitude of 2000 MASL. The characteristics of *B. balsamifera* L. are as follows; trees with a height of 2 meters, erect stems, fuzz, and are green in color. Leaf structures typically include: a single leaf scattered with an oval leaf blade where the base and a tip of the leaf taper, a serrated edge, and is covered in fine hairs. Inflorescences in the form of bunches grow in the axillary leaves and stem tips, and the flower crown is yellowish-white. The fruit is cylindrical, hairy, and brownish white. The seeds are flat and white [15]. Typically, in the CAHPJ ecosystem, this plant is found in shrubs vegetation.

Based on the results, the *B. balsamifera* L. is used as a medicine for malaria and fever by the community around the CAHPJ area. The part used are the leaves, which are processed by kneading and drinking the water. This plant is known to be spicy, slightly bitter, warm and has a smell like spices. The community around CAHPJ uses the *B. balsamifera* L. to treat symptoms of fever and malaria. According to Nursamsu et al., (2017) *B. balsamifera* L. can be used to cure various ailments such as headaches, colds, fever, diarrhea, diabetes, rheumatism, flatulence, menstrual pain and can also be used to increase appetite. Other properties of *B. balsamifera* L. are as antibacterial treatments, as well as blood circulation and cough medicines. The content of secondary metabolites of *B. balsamifera* L. used as essential oils are believed to be a medicinal source. It also contains other compounds, such as saponins, tannins, glycosides, and flavonoids [16].

***Chromolaena odorata* L.**

Chromolaena odorata L. (Figure 1B) is another member of Asteraceae used by the local community of CAHPJ that has medicinal potential. In Indonesia this plant known as Minjangan or Seurapoh (Acehnese language). *C. odorata* L. has oval-shaped leaves, and serrated leaf edges tapering to the tip. It also has an upright fuzzy trunk, with a height of 100-200 cm, many branches and in an opposite

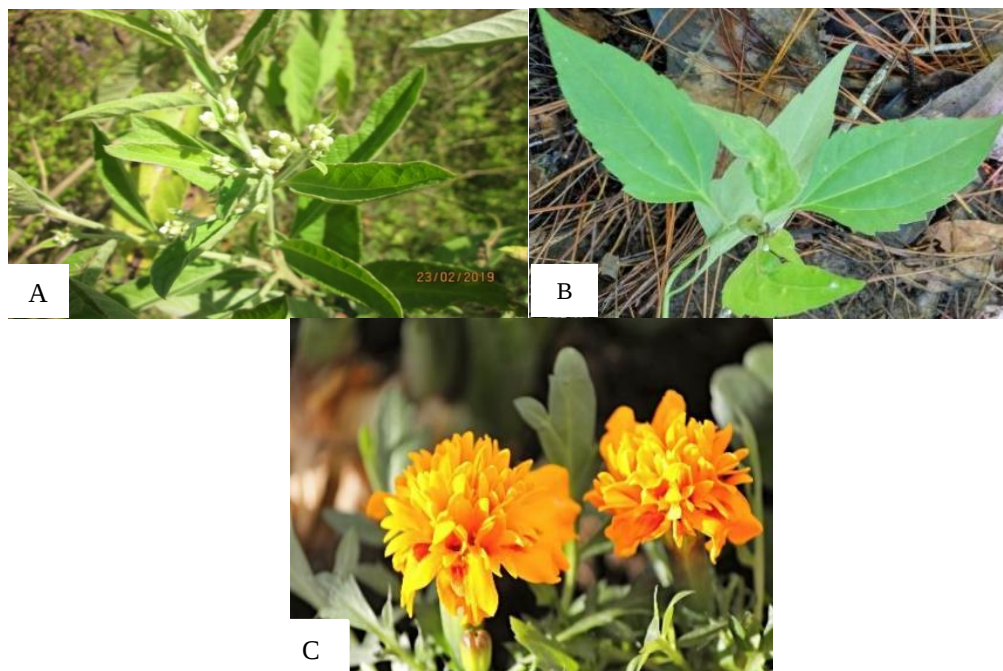


Figure 1. Asteraceae family as medicinal plant by local community of hutan pinus Jantho nature reserve, Aceh Besar. (A). *Blumea balsamifera* L., (B). *Chromolaena odorata* L., (C). *Tagetes erecta* L.

leaf arrangement. *C. odorata* L. originates from Central America and has been distributed to many other tropical and subtropical areas [16].

C. odorata L. was found at three different vegetation forests, as well as in shrubs and meadows. The local community of CAHPJ uses the *C. odorata* L. mainly to treat wounds. The leaf is the main part of the plant used in this treatment, where it is squeezed and then applied to the wound. *C. odorata* L. contains chemical compounds like tannins, phenols, flavonoids, saponins and steroids. The essential oil that is produced from the leaves contains α -pinene, cadinene, camphora, limonene, β -caryophyllene and isomer candinol [18]

***Tagetes erecta* L.**

Tagetes erecta L./Bunga tahi ayam (Indonesian name)/Bak seurunee (local name) (Figure 1C) is one of the Asteraceae family used as a medicinal plant by the local community of CAHPJ and often found around the yards of local houses. *T. erecta* L. contains very useful chemical compounds such as alkaloids, flavonoid, saponin and tanin. Other than for medicine, *T. erecta* L. is also grown as a living fence and decorative plant by the community [19][20]. *T. erecta* L. is a seasonal herbaceous plant with a height up to 1 m, it is characterized by a compound flower that contains 2 flowers; namely ribbon flowers and tube flowers which have various crown colours (red, pink, yellow or green). Like other characteristics of the Asteraceae family, the *T. erecta* L. flower is located at the end of the flower stalk [21].

Hutan Pinus Jantho Nature Reserve is a natural ecosystem that is home to many beneficial plant species. Although only three species are used by the community, the species of Asteraceae that are found in CAHPJ are proof of the high diversity of plants in CAHPJ. In order to maintain the sustainability of CAHPJ, especially the forest vegetation, it is necessary to provide outreach and knowledge to the community by related parties about the impact of forest exploitation, as well as educate the community about medicinal plant management in their own back yards.

CONCLUSION

Hutan Pinus Jantho Nature Reserve is a natural ecosystem that houses many beneficial plant species that are used as medicine. Although only three species are used by the community, the species of Asteraceae that are found in CAHPJ are proof of the high diversity of plants in CAHPJ. In order to preserve the

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