Identification of medicinal plants used by the community for indigenous poultry health management

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Abstract. Research has been carried out to inventory and identify medicinal plants in the Lama and the Namorih Village, Pancur Batu District. The purpose of this research to find out the types of medicinal plants. The use of natural ingredients as traditional medicines tends to increase because human awareness to back to nature and the prolonged crisis has reduced the purchasing power of modern medicines, which are relatively more expensive. Natural medicine is also considered to have almost no adverse side effects. The research was conducted by exploring the village and holding discussions with breeders who use medicinal plants. The plants that have been obtained are identified and identified. The results obtained 14 species of medicinal plants.

1. Introduction

Indonesia is known as a place where medicinal plants grow so it got the nickname live laboratory. About 30,000 kinds medicinal plants owned by Indonesia. With this rich flora, of course Indonesia has potential to develop products herbs of equal quality with modern medicine. However, these natural resources yet optimally utilized for public interest. Just about 1200 species of medicinal plants utilized and researched as traditional medicine. Our ancestors have used traditional medicine from natural plants for generations to maintain stamina and treat several diseases.

Traditional herbal medicine is commonly known as an herbal medicine [1]. The use of herbal medicine is not only used for humans, but herbal medicine has begun to be widely used known among poultry breeders. Middle and lower scale farmers generally use this plant as traditional medicine for their livestock. They rarely use factory drugs because they are considered expensive. Research on the use of herbal medicine in various test animals has been carried out on broilers, ducks, quail in rabbits, and cows. The higher the cost drugs and drug prices chemicals, and lots of side effects the results of using chemical drugs, now is people's time make use of medicinal plants [2, 3].

Large land and yards encourage people to inspire and beautify the environment by planting plants around the house. So that with the many plants in Lais Village, it is estimated that they have various types of medicinal plants. The efficacy of each part of the plant may not be known to everyone, even though these types of plants are commonly known. Therefore, it is necessary to carry out an inventory and identification of the types of medicinal plants found in Lama Village and Namorih Village, North District.
2. Research Methods
The ethnobotany survey was carried out in the small-scale commercial farming area of the Lama and Namorih village of Pancur Batu sub-district - Deli Serdang District in July 2020. The state lies between 3° 39' N and 3° 52' N latitudes and 98° 54' E and 98° 62' E longitudes. The average annual rainfall varies from 269 mm/day.

To identify the medicinal plants used by farmers, the following steps are carried out: (i) an ethnobotany survey to obtain information. Indigenous knowledge (ITK) about medicinal plants and trees used for poultry health management. (ii) collect, articles, e-books, national and international journals obtained from Proquest, YouTube, Pdf drive, Google Scholar Database (GS), Google Playbook (iii) documenting the results of interviews, observations and group discussions with herbalists, farmers and other stakeholders and review some literature.

This checklist is used to gather information on indigenous technical knowledge about common diseases or selection of symptoms of local livestock, diseases and pests, herbal plants (local names and parts of medicinal plants used.) in poultry management.

3. Results and discussion
3.1. Socio-Economic Condition of the community

Figure 1. Characteristics of community according to sex

Figure 1 shows that Lama village consist of higher population than Namorih village. They have slightly more female than male in both villages. According to a previous study, the imbalance of sex ratio stimulates economic growth by stimulating more entrepreneurship and hard work. These include, the development of new domestic private firms, which is an important engine of growth, and also the willingness of parents to have an entrepreneur son [4]. These indicate, the number of farmers can be increased as well. In addition, there are some differences between these two genders in terms of biological and behavioral characteristics. Subsequently, these affect manifestation of many widespread diseases and the approach to health care [5]. These indicate, the sex differences might affect availability of nutritional food to support poultry health management.
Figure 2. Characteristics of community according to age.

Based on Figure 2 shows that the age of the majority of people are in the age group of 15-64 both in the Lama Village and Namorih Village. While the smallest number of respondents is in the group over 65 years. This shows that the village community is in the productive age category which indicates that in theory all respondents have greater productivity when compared to those who are not in the productive age category.

According to [6] stated that the productive age for working in developing countries is generally 15-55 years. According to [16] the age of the farmer has a positive effect on the income of the farmer, i.e. if the age increases by one unit it will increase the income of one unit.

Figure 3. Characteristics of community according to profession

Figure 3. illustrates the livelihoods of the Lama Village people are farmers (8%), civil servants (9%), drivers (18%) and traders (65%), while the people of Namorih Village are the civil servants (7%), drivers (8%) %) and farmers (85%). It can be seen that the majority of people work as farmers and traders. This is related to the location of the two villages which are still quite close to the downtown of Pancurbatu Sub district, which is a crossing lane and includes the buffer zone of Medan City [8].
In the Namorih Village, the largest population of poultry is broilers with a population of about 1500 tails (Figure 4) while in the Lama Village there is not available broiler chicken population but there are about 200 kampong chicken. Other livestock commodities that are abundant in the Lama Village and Namorih Village are beef cattle, goats and pigs, for the largest population in the Namorih Village is 1300 pigs while in the Lama Village the population is the largest number of beef cattle as many as 230 cows (Figure 5).

Broiler chicken commodities are one of the most important sources of protein for the community because of maintenance are relatively shorter than kampong chicken or other livestock commodities such as beef cattle, goats and pigs. Broiler chickens as meat producers are reared to the age 6-7 weeks, with a weight of 1.5-2 kg and feed conversion 1.9-2.25. Weakness broilers are susceptible to diseases that needed vaccine as maintenance. The disease often affects broilers between other CRD (Chronic Respiratory Disease), ND (Newcastle Disease), Colibacillosis, Gumboro, Coccidiosis and others. Therefore to improve the immunity and performance of broiler chickens in Namorih Village usually use herbal plants.
3.2 Traditional herbal for indigenous poultry

Throughout his civilization, humans have used medicinal plants for various purposes. Many properties obtained from plants as a source of chemicals to cure various diseases. Utilization of medicinal plants is one of the ancestral heritage that needs to be preserved. Raw materials for traditional medicine come from plants that are spread almost throughout Indonesia. Indonesia's tropical forests have around 30,000 types of plants, there are only 9,600 known types of medicinal plants, and 200 types that have been used as raw materials for traditional medicines [9].

The medical plants used by village community at Namorih and Lama - Pancur Batu for Animal Feed and drink water can be seen in table 1.

| No | Scientific name | vernacular name | ingredient | parts of medicinal plants | the benefits |
|----|-----------------|-----------------|------------|---------------------------|--------------|
| 1  | Curcuma domestic (Turmeric) | essential oils from the monoterpenes and sesquiterpenes, yellow dyes called curcuminoids, proteins, phosphorus, potassium, iron and vitamin C. | rhizome | increase weight, lower fat, and cholesterol. antioxidant, antimicrobial and anti-inflammatory. |
| 2  | Kaempferia galanga L | Kaempferia galanga | essential oils and alkaloids | Rhizome, leaf | increase weight, lower fat, and cholesterol. |
| 3  | Curcuma xanthorrhiza | curcuma xanthorrhiza | curcumin, curcuminoid, minerals, volatile, fatty oils, carbohydrates and protein | rhizome | increase weight, lower fat, and cholesterol. increase appetite, antioxidants, antimicrobials, anticholesterol and anemia. |
| 4  | Curcuma heyna B. Piperine, A. curcuma | piperazine citrate, saponia, curcumin | rhizome | Anthelmintic |
| 5  | Curcuma aeruginosa rhizome | Black turmeric | essential oils, tannins and curcuminoinds. | rhizome | anthelmintic and increase appetite. |
| 6  | Carice papaya, Linn | Papaya | proteolytic enzymes, like papain and chymopapain | Leaf, fruit | amoeba killer drug and as a worm medicine and helps increase (appetite. antiviral, antifungal antibacterial properties |
| 7  | Aloe vera | Aloe vera | emodin and scutellarin, acetylated, anthraquinone glycoside and anthraquinone compounds | leaf | antiviral substances, able to destroy the enzymes found in the bird flu virus, daily body weight gain and |
| No. | Plant Name | Part Used | Bioactive Substances | Effect |
|-----|------------|-----------|----------------------|--------|
| 8   | Moringa centifolia | Noni fruit | kalium, vitamin C, Alizarin, L-ampeloside, and pyroxenite | lower fat, increase the protein content of meat [13] |
| 9   | Curcuma Zedoaries Rosch | White rhizome | essential oil and rhizome curcuminoid component | helps digestion by stimulating the nervous system's secretions [3] |
| 10  | Allium sativum L. | Garlic | alliin, allicin and allyl sulphide | increased body weight and carcass [14] |
| 11  | Piper beetle | Leaf | butylphenols, sesquiterpene, diastase, chavicol | increased metabolizable energy and nitrogen retention [15] |
| 12  | Cymbopogon nardus L. | Citronella grass | geraniol, leaf citronello sesquiterpene | increased body weight [16] |
| 13  | Diplazium esculentum | Fern | omega-3 dan omega-6 leaf Flavonoid, vitamin A, C, kalium B complex | antibacterial activity [17] |
| 14  | Dendrocalamus asper | Bamboo | flavonoid, polysaccharide, chlorophyll, vitamin | anthelmintic dysentery, diarrhea, pile [18] |

Medicinal plants include turmeric and ginger have been widely used by broiler breeders. The bioactive substances in curcumin and essential oils of these plants can increase body weight, reduce fat and cholesterol [2]. According [10] One of the functions of medicinal plants is as an immunomodulator. Experiments were carried out to study the effect of ginger extract on the number of leukocytes in broiler chickens. The research report shows that ginger extract has activity as an immunostimulant for non-specific immune responses.

The feed given to male broilers containing aloe vera with levels of 2% and 0.75% was the best treatment based on daily body weight gain, carcass percentage, and feed conversion ratio (FCR) [12]. There was significant effect of the juice up to 75 ml in water on reducing the fat content of the meat to 66.52%; and increasing the protein content of the meat by 14.86% but had no significant effect on the percentage of carcass weight. Curcuma heyneana, it self-based on IPB journal notes contains piperazine citrate, a type of phytochemical compound that works as a toxin against the worm's nervous system, worms will die and be wasted through the digestive system [19].

According [20] said that liquid garlic extract at 2.25 ml kg causes a significant increase in carcass and body weight broiler chickens’ parameters, while a significant reduction in bird mortality for GFA is supported group observed during rearing period. Papaya has many benefits due to its high content of proteolytic enzymes such as papain and chymopapain which are antiviral and anti-fungal as well as high levels of vitamins A, B and C [21]. According to [11] it was said that giving water extract of Carice papaya fruit (CPF) induced in mice could improve their oxidative stress.

Betel leaf extract which is added to in drinking water significantly (P <0.05) increased metabolic energy and retention nitrogen. Highest energy value Metabolic and nitrogen retention were indicated at a solution concentration of 10 ml / L. Thus, the leaf betel can replace the use of Zn-Bacitracin in broiler rations [15]. According [16] said that provision of citronella waste from oil distillation to a level of 40
% is able to improve the appearance of Balinese cows with daily body weight gain of 0.20-0.24 kg/head/day. Bamboo leaves have been widely used as an alternative feed for livestock ruminants. The tannin content in bamboo leaves provides potential bamboo leaves as an antiemetic agent. The leaves of bamboo (*Dendrocalamus asper*) have been used as traditional medicine to treat diarrhea in animals [18].

Herbal plants that can be used to increase the body's resistance and performance of broiler chickens include turmeric, ginger, galanga, ginger, garlic, betel leaves and others. Many research results show positive results with the use of herbal plants, such as the results of research [3, 10, 19, 22] reported that the provision of herbal ingredients consisting of a mixture of galanga, finger root, galangal, ginger, turmeric, red onion, garlic, yam bean, betel leaf, lemongrass, star fruit, and basil can inhibit the growth of disease-causing bacteria, reduce the number of broiler mortality and improve the performance of broiler chickens. Other studies report that the use of herbal ingredients consisting of garlic, ginger, betel leaves, turmeric and galangal can improve the performance of broiler chickens. Therefore, efforts to provide herbal herbs in the village Namorih and Lama an appropriate way in the poultry health management so as to increase the community’s incomes from livestock performance maximum.

4. Conclusion

Based on the results of research that has been carried out in the Lama and Namorih Village there are species found medicinal plants from 14 species which are commonly used for livestock. They are *Curcuma domestica*, *Kaempferia galanga* L, *Curcuma xanthorrhiza*, *Curcuma heyneana*, *Curcuma aeruginosarhizome*, *Curcuma aeruginosarhizome*, *Carica papaya*, *Aloe vera*, *Morinda citrifolia*, *Curcuma Zedoria Rosc*, *Allium sativum* L, *Piper betle*, *Cymbopogon nardus*, *Diplazium esculentum*, *Dendrocalamus asper*.

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References

[1] Marni 2014 Efficacy of Herbal Healing-feeding Against Diarrhea in Children. *Proceeding of the National Seminar and Call For Papers UNIBA* pp. 25–31.

[2] Meha G N, Santoso E P and Sumarno 2018 Analisis Ekonomi Penggunaan Puyer Herbal Pada Ayam Pedaging. (Economic Analysis Of The Use Of Herbal Puyer In Broilers.) Publication of Student Scientific Articles, Agricuktuire Faculty, Universitas Tribhuwana Tunggadewi 6(1).

[3] Bayoa DL, Sarayar C L K, Najoan M and Utiah W 2014 The addition effectiveness of *Curcuma Xanthorrhiza roxb* and *CurcumaZedoaria rox* flours in Commercial Ration on Performances of Broilers. *Journal zootek* 34 85-94.

[4] Zagrosek V 2012 Sex and gender differences in health. *European Molecular Biology Organization. 13*(7) 596–603.

[5] Trisakti B, Lubis J, Husaini T and Irvan 2017 Effect of turning frequency on composting of empty fruit bunches mixed with activated liquid organic fertilizer. *IOP Conf. Ser.: Mater. Sci. Eng.* 180(1) 012150

[6] Wisiarso F A 2005 Economic Value of Agroforestry Land Use in Ciliwung Watershed Area, West Java (Case Study of Kuta Village and Sukagalih Village, Megamendung District, Bogor Regency). Bogor. Department of Forest Management, Faculty of Forestry IPB

[7] Nugraha, I S and Aprizal Alam syah 2019 Factors Affecting the Income Level of Rubber Farmers in Sako Suban Village, Batang Hari Leko District, South Sumatra Indonesian Journal of Agricultural Sciences (JIPI), Vol. 24 (2) 93-100.
[8] Imran U 2017 Factors Affecting the Productivity of Small Industry Workforce in Palopo City Journal Of Islamic Education Management. 2(2) 2548 – 4052.
[9] Haniarti, Munir M A, Akib A, Ambar A D, and Rusman P 2019 Herbal for increasing immunity and weight of poultry. IOP Conf. Series: Earth and Env. Sci 247 012056.
[10] Falahudin I, Pane E R and Sugiati 2016 Efektifitas Larutan Temulawak (Curcuma Xanthorrhiza Roxb.) Terhadap Peningkatan Jumlah Leukosit Ayam Broiler (Gallus gallus Domestic sp.). Effectiveness of Curcuma Solution (Curcuma Xanthorrhiza Roxb.) Against the Increased Number of Leukocytes Broiler Chicken (Gallus gallus Domestica sp.) Jurnal Biota 2 (1).
[11] Sadek K M 2012 Antioxidant and Immunostimulant Effect Of Carica Papaya Linn. Aqueous Extract In Acrylamide Intoxicated Rats. Acta Inform Med. 20(3) 180–185.
[12] Sunu P Z, Abdurrahman H 2019 Performance and Carcass Yield Effect of Aloe vera-Based Diet in Male broiler Chickens Jurnal Sains Peternakan Vol. 17 (1) 12-16
[13] Fenita Y, Warnoto and Nofis A 2012 The effect of Nengkudu juice (Morinda citrifolia) on the quality broiler carcass Jurnal Sains Peternakan Indonesia Vol 6(2).
[14] Brzóska F, Sliwinski B, Rutkowska O M and Sliwa J 2015 The effect of garlic (Allium sativum l.) on growth performance, mortality rate, meat and blood Franciszek Brzóska parameters in broilers Ann. Anim. Sci., 15(4) 961–975
[15] Sudrajat D D, Kardaya B, Abas M 2015 The Effect of inclusion Of Piper Betle (Piper Betlelinn) Leaf Solution In The Drink Water As An Alternative Substitute For Feed Antibiotic On Nitrogen Retention And Metabolizable Energy Of Ration. Jurnal Peternakan Nusantara 1 (1).
[16] Nurhayu A dan Warda 2018 The Effect of Giving Fragrant Lemongrass Waste from Essential Oil Distillation as Animal Feed on the Appearance of Bali Cows Biocelebes, 12(3) 30-40.
[17] Dewasasri M and Wardani 2018 Vegetable Ferns, Wild Plants Rich in Antioxidants Pakis Sayur, Tumbuhan Liar Kaya Antioksidan. http://www.satuharapan.com/read-detail/read/pakis-sayur-tumbuhan-liar-kaya-antioksidan.
[18] Mulyono N, Widyana B L, Noryawati S, Mulyono, Bibiana W, Rahayu L S, Yaprianti I 2012 Antibacterial Activity of Petung Bamboo (Dendrocalamus Asper) Leaf Extract Against Pathogenic Escherichia coli and Their Chemical Identification. International Journal of Pharmaceutical & Biological Archives 3(4) 770-778.
[19] Irvan, Husaini T, Trisakti B, Batubara F and Daimon H 2018 Composting of empty fruit bunches in the tower composter – effect of air intake holes IOP Conf. Ser: Mater. Sci. Eng. 309(1) 012066
[20] Trisakti B, Mhardela P, Husaini T, Irvan and Daimon H 2018 Effect of pieces size of empty fruit bunches (EFB) on composting of EFB mixed with activated liquid organic fertilizer IOP Conf. Ser: Mater. Sci. Eng. 309(1) 012093.
[21] Vij T and Prashar Y 2015 A review on medicinal properties of Carica papaya Linn Asian Pacific Journal of Tropical Disease Vol 5(1) 1-6.
[22] Trisakti B, Mhardela P, Husaini T, Irvan and Daimon H 2018 Production of oil palm empty fruit bunch compost for ornamental plant cultivation IOP Conf. Ser: Mater. Sci. Eng. 309(1) 012094.