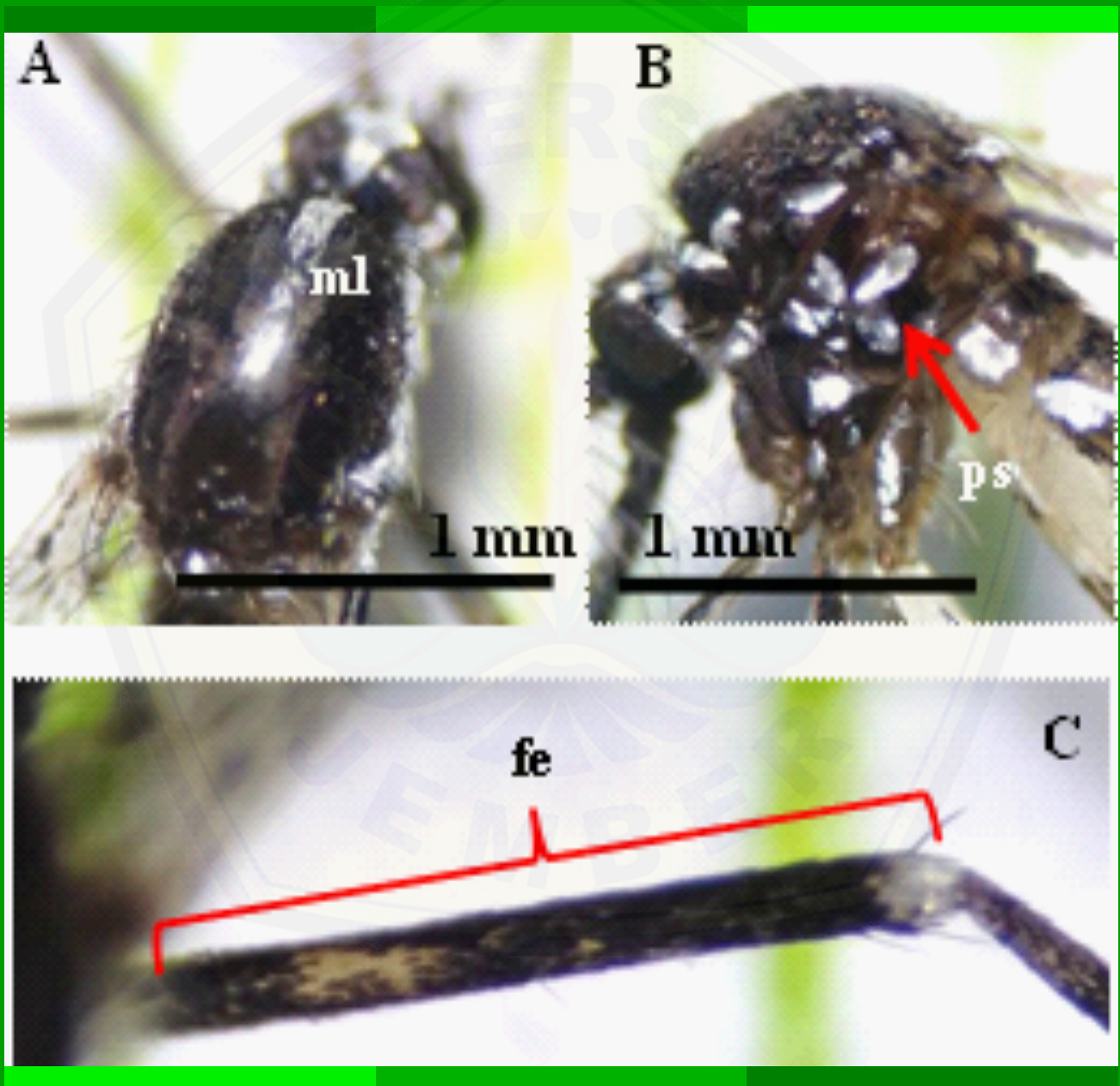




# BIOEDUKASI

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## UTILIZATION OF TRADITIONAL ANIMAL PLANTS FOR ANIMAL HUSBANDRY BY MADURASE TRIBE COMMUNITIES IN GRUJUGAN DISTRICT, BONDOWOSO DISTRICT

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### Abstract

The people of Bondowoso Regency are dominated by Madurase, which is 90%. The majority of Madurase in Bondowoso Regency own cattle. The Madurase community in Grujugan Subdistrict, Bondowoso Regency still maintains ancestral traditions for the care and treatment of cattle, so there is a need for scientific studies on the use of plants for traditional livestock so it will not be extinct. The purpose of this study was to determine the plants used for the care and treatment of cattle, how to process them, the presence of a mixture of other non-plant material in the feed making or traditional medicine of cattle, the types of diseases commonly experienced by cattle, and the types of plants used for cattle feed. This type of research is descriptive exploratory, with a survey method that uses semi-structured interview techniques. The study was conducted in two villages, named Sumber Pandan Village and Wanisodo Village using 18 respondents. The results of the study are inventorying 20 plant species and 14 families that are used for traditional treatment and care of livestock and 9 types of additives used for blending in the manufacture of livestock medicine. In addition there are also 16 species of plants and belong to 8 families that are used for cattle feed by the Madurase Tribe Society in Grujugan District, Bondowoso Regency.

**Keywords:** Treatment, Medicine, Livestock, Traditional

### 1. INTRODUCTION

Indonesia is a country known for its rich biodiversity and cultural diversity. Every tribe in Indonesia has traditional customs which were inherited from their ancestors. One of the traditional knowledges possessed by the Indonesian people is about the use of plants for daily life. Plants found in Indonesia are used as raw materials for traditional medicines, food ingredients, preservatives and natural dyes, natural pesticides, textile materials, can also be used for treatment, care and feed ingredients for farm animals [1].

Livestock business in Indonesia is one of the natural resources that can be developed so that it can improve the quality and productivity of economic growth. One of the fast-growing livestock businesses is cattle farming. Cattle farms in Indonesia have expanded widely in all regions and regions because of their excellence, including in Bondowoso Regency. The people of Bondowoso Regency are

dominated by Madurese, which is 90%. The majority of Madurese in Bondowoso Regency have cattle, this is because the Madurese community cannot be separated from livestock, especially cattle. For the Madurese community, cows have their own symbol that has the meaning of welfare for cattle owners. In addition, cows are also considered part of their family members [2]. Bondowoso Regency also received the nickname "Cow Barn" because many of its people own cattle farms, especially beef cattle.

In general, there are still many Madurese people who use traditional medicine for the care of cows such as the use of herbal remedies [3]. As part of the Madura tribe, the Madurese community in the Bondowoso region, especially in the Grujugan District still uses traditional knowledge in raising cattle.

Care of livestock is not just like caring for livestock, but breeders must also ensure that they can live well. Care can also be in

the form of feed that can help the growth and development of cattle. Livestock feed from the perspective of nutrition is one of the most important elements to support animal health, development and growth, and reproduction of livestock. A good feed will make livestock able to carry out normal bodily functions in the body [4]. At present forage is the main source of food for livestock. But sometimes the availability of forage feed for livestock is not proportional to the nutritional needs of livestock and livestock populations.

Bondowoso Regency has a fairly good availability of feed for cattle breeders because Bondowoso has a very good climate and regional conditions so that animal feed crops can grow well. Besides that, the position of Bondowoso Regency which is in the middle of the ex-residency area of Besuki makes it easy for farmers to market their livestock. Breeding activities have also become the culture of the Bondowoso community [5]. The enthusiasm of the people of Bondowoso Regency is also very high towards the livestock sub-sector, especially beef cattle farming. Bondowoso Regency also has good agricultural and plantation potential, so it is very suitable to implement an integrated beef cattle breeding system [6]. According to the Livestock Service Office of East Java Province in Bondowoso Regency in 2018 the number of cattle increased by 224,917 head of beef cattle compared to the previous year which was in 2017 amounted to 219,013 head of cattle.

## 2. RESEARCH METHODS

This research was conducted in Grujugan Subdistrict, Bondowoso Regency, East Java Province, using a sample of Madurese in the Wanisodo Village and Sumber Pandan, Grujugan District. The study was conducted from March to April 2020. This type of research is descriptive exploratory, with a survey method that uses semi-structured interview techniques.

Determination of Key Informants for Desa Wanisodo and Desa Sumberpandan is one of the village communities who are domiciled as Village Heads. The sampling technique used in this study was Purposive

Sampling and Snowball Sampling. Purposive Sampling is a technique used in research to determine samples based on certain criteria or based on a consideration [7]. In this case the sample must have the following criteria: 1) have cattle, 2) utilize medicinal plants for the treatment of farm animals, 3) Madurese, 4) indigenous people from the area, and 5) get knowledge about the treatment of farm animals descending downward.

Snowball Sampling is a technique used to determine samples through a rolling process from one respondent to another respondent. Determination of respondents is done by asking the previous respondent. Sampling is stopped if the data is saturated or the respondent has appointed the previous respondent.

The technique used for data collection is to use direct observation techniques and conduct semi-structured interviews using the type of open-ended questions. The technique is used so that researchers can easily obtain the desired information and interviews conducted also flow like chat in general but keep pace with the interview guidelines that have been available. Observation technique used is participant observation technique in which the researcher is involved with the daily activities of people being observed / interviewed while making observations.

## 3. RESULTS AND DISCUSSION

Based on the results of research conducted in the District of Grujugan, Bondowoso Regency, East Java, precisely the research was conducted in two villages namely Wanisodo Village and Sumber Pandan. The majority of people in the two villages are Madurese and have cattle. Researchers got 18 informants namely 7 people from Sumber Pandan Village and 11 people from Wanisodo Village. The majority of informants were male with a percentage of 72% and women by 28%, each of the informants living as farmers. The age range of the informant is between 33-75 years. Based on education level, informant have varying degrees of not going to school having a percentage of 11%, completing elementary school / equivalent by 67%, graduating junior high school / equivalent by

11% and graduating high school / equivalent by 11%. Based on the results of the study also showed the informants have knowledge about traditional medicine and care for cattle through their ancestors and parents. The information they have about the use of plants for the traditional treatment and care of cattle over a span of between 20-50 years, even the majority of informants still use plant-based ingredients for traditional treatment and care. Based on the results of the identification of the scientific names of plants and their families, there are 20 species of plants from 14 families used by the Madura Tribe Society in Grujugan District, Bondowoso Regency as traditional livestock medicine and treatment materials. The following is an explanation of Local, Scientific and Family Names for the care and treatment of cattle in the Grujugan District, Bondowoso Regency, which can be seen in Table 1.

Based on the results of interviews conducted if their cattle are sick with fever, they usually have symptoms such as the body of the livestock looks weak and

lethargic, accompanied by high body temperature, then it can also be seen from the hollow of the cow's eye that looks more concave, decreased appetite so that it can causing its movements to be also weak and limited.

Then if there are also symptoms such as dirt looks softer, runny, dirt looks darker in color and smells foul, also accompanied by appetite begins to decline means that the cattle have a stomach problem that is diarrhea.

In addition, there are also symptoms of ringworm, based on interviews with cattle ranchers in Wanisodo Village, Grujugan Subdistrict, Bondowoso District, mentioned a number of symptoms, including an open wound on the surface of a cow's skin, usually accompanied by hair loss around the wound. Then in the wound there are pus, crust and stiffness that can eventually cause flies. If their livestock have constipation, cattle ranchers also mention a number of symptoms, including the texture of the stool that is harder and drier and usually their cattle does not defecate for several days.

Table 1. List of Plants Used for the Care and Treatment of Cattle in Bondowoso District.

No	Plant Names			Family	Parts Used	Use for livestock
	Local	Indonesia	Scientific			
1.	Jembuh	Jambu Biji	<i>Psidium guajava L.</i>	Euphorbiaceae	Leaf	Treating diarrhea
2.	Lompong	Talas	<i>Colocasia esculenta L.</i>	Araceae	Leaf	Wound healing, treat diarrhea, increase appetite
3.	Accem	Asam	<i>Tamarindus indica L.</i>	Caecalpiniaceae	Fruit	Postpartum care, helps fertilize the womb
4.	Beng Pote	Bawang Putih	<i>Allium sativum L.</i>	Liliaceae	Rhizome	Increase appetite
5.	Nyior	Kelapa	<i>Cocos nucifera L.</i>	Arecaceae	Fruit	Increase appetite
6.	Kates	Pepaya	<i>Carica papaya L.</i>	Caricaceae	Fruit	Increase appetite, launch bowel movements, treat fevers
7.	Temulambeh	Temulawak	<i>Curcuma xanthorrhiz</i>	Zingiberaceae	Rhizome	Increased appetite, fever
8.	Soro	Sirih	<i>Piper betle L.</i>	Piperaceae	Leaf	Postpartum care, stamina enhancer for bulls
9.	Konye'	Kunyit	<i>Curcuma domestica Val.</i>	Zingiberaceae	Rhizome	Cool the stomach after diarrhea, increase appetite,



						treat fever, postpartum care, help fertilize the womb
10.	Koncheh	Temu Kunci	<i>Boesenbergia pandurata</i>	Zingiberaceae	Rhizome	Postpartum care, stamina booster, fever
11.	Bhakoh	Tembakau	<i>Nicotiana tabacum L.</i>	Solanaceae	Leaf	Treat wounds on the skin
12.	Gheddhang bai'	Pisang	<i>Musa paradisiaca</i>	Musaceae	Fruit and Buds	Treat diarrhea, increase appetite
13.	Kalenteng	Kelor	<i>Moringa oleifera Lam.</i>	Moringaceae	Leaf	Postpartum care
14.	Koddu'	Mengkudu	<i>Morinda citrifolia L.</i>	Rubiaceae	Fruit	Increase appetite, postpartum care
15.	Rabbet derre	Sirih Merah	<i>Piper crocatum Ruiz &amp; Pav.</i>	Piperaceae	Leaf	Postpartum care, smooth delivery after childbirth
16.	Perreng	Bambu	<i>Bambusa sp.</i>	Poaceae	Leaf	Postpartum care
17.	Temu ireng	Temu Hitam	<i>Curcuma aeruginosa</i>	Zingiberaceae	Rhizome	Treat skin wounds
18.	Labu cina	Labu putih/labu air	<i>Lagenaria siceraria</i>	Cucurbitaceae	Fruit	Treat fever
19.	Kencor	Kencur	<i>Kaempferia galanga L.</i>	Zingiberaceae	Rhizome	Helps fertilize the womb
20.	Chabbih	Cabai	<i>Capsicum annum L.</i>	Solanaceae	Fruit	Treat itching on the skin

There are other additional ingredients used in the treatment and treatment of livestock, including chicken eggs, sugar, soy sauce, duck eggs, shrimp paste, lime, brown sugar, salt, and rice washing water. These additives are used as a mixture and as a flavor enhancer in the manufacture of drugs for the treatment and care of traditional cattle. the highest part of plants which is used as medicine and care for cattle is 33%, 33% for leaves, 27% for rhizomes, and 5% for shoots. The processing method consists of pounding, boiling, grated, mixed and kneaded. The results showed that the processing of traditional medicine was the most widely used, namely by pounding 32%.

Cattle breeders in Grujugan Subdistrict, Bondowoso Regency, in obtaining plants as ingredients for traditional medicine and treatment of cattle are by cultivation by 61%, buying by 11% and wild plants by 28%. Based on the results of the study found several types of diseases that are often experienced by community cattle in the District of Grujugan, Bondowoso Regency.

The type of care used for cattle in Grujugan District, Bondowoso Regency also utilizes plants and is traditionally processed. Based on the results of research shows that care that is often done by the public is pre and postnatal care and launch milk. In addition, other treatments carried out by breeders are increasing stamina and also to increase the appetite of cattle. One example of pre and postnatal care is to assist in fertilizing the womb for female cows, this is done so that after cows remain healthy.

In addition to care for the body of the cow, cage care is also carried out by cattle farmers in Grujugan District, Bondowoso Regency. Maintenance of the cage is usually done every morning and evening. This is done so that the cow pen is kept clean and their cattle are not susceptible to disease. By local people in cleaning cowsheds, they use tools made of bamboo and the surrounding community usually call it "Serok".

The most widely used plants by farmers in Grujugan Subdistrict, Bondowoso Regency, are those from the Zingiberaceae group such as curcuma, chinese ginger, and

galangal. The types of plants most widely used by farmers as cattle feed can be seen in Table 2.

Based on Table 2 it is known that 16 types of plants used as animal feed are classified into 8 plant families, namely Araceae, Caricaceae, Portulacaceae, Cyperaceae, Zingiberaceae, Lamiaceae, Asteraceae and Poaceae. Plant families that are most widely used by the community are from the family Poaceae. These forage plants are widely used by cattle breeders because they are easy to find.

Based on the results of the study there are some people who believe not to look for animal feed after it rains, because the rain drops that are found in the plants, they take will cause cattle to get worms. In addition, according to the surrounding community, the best time to look for cattle feed is in the morning, especially when there is still morning dew. In addition to using plants, people also often use tofu waste to supplement cattle feed.

Table 2. Types of Plants Used as Feed for Cattle by Madurese Communities in Grujungan District, Bondowoso Regency

No.	Local Name/Indonesia	Scientific Name	Family
1.	Rumput Gajah/Rumput gajah	<i>Pennisetum purpureum</i>	Poaceae
2.	Jhegung/Jagung	<i>Zea mays</i>	Poaceae
3.	Damen/Padi	<i>Oryza sativa</i>	Poaceae
4.	Kemondelan/Gletang	<i>Tridax procumbens</i>	Asteraceae
5.	Lalang/Ilalang	<i>Imperata cylindrica</i>	Poaceae
6.	Wedhus-wedhusan/Bandotan	<i>Ageratum conyzoides</i>	Asteraceae
7.	Krajep/Krokot	<i>Portulaca oleraceae</i>	Portulacaceae
8.	Grinteng/Rumput grinting	<i>Cynodon dactylon</i>	Poaceae
9.	Rebbhe/Rumput teki	<i>Cyperus rotundus</i>	Cyperaceae
10.	Manggalah/Rumput benggala	<i>Megathyrsus maximus</i>	Poaceae
11.	Rebbhe/Rumput lempuyangan	<i>Zingiber zerumbet</i>	Zingiberaceae
12.	Kamelina/Jati putih	<i>Gmelina arborea</i>	Lamiaceae
13.	Pahitan/Paitan	<i>Tithonia diversifolia</i>	Asteraceae
14.	Sengon/Sengon	<i>Albizia chinensis</i>	Fabaceae
15.	Lompong/Talas	<i>Colocasia esculenta L.</i>	Araceae
16.	Kates/Pepaya	<i>Carica papaya L</i>	Caricaceae

Adding salt to tofu pulp is only used as a flavor enhancer. Additional tofu pulp feed is only given to bulls, because if given to cows it will be difficult to conceive or when the cows are pregnant it can cause miscarriages. According to the community around the provision of tofu pulp for bulls will gain weight or can fatten bulls. However, because the price is quite expensive, only a few people use tofu waste as an additional ingredient for cattle feed.

Elephant grass is the main feed that is often used by cattle farmers. Elephant grass is generally easier to obtain compared to other types of grass. The part that is often used for feed is the leaves and breeders usually feed elephant grass 2-3 times a day. Elephant grass plants are most widely used

for cattle feed, but are easily found also contain good nutritional value for cattle. The composition of the nutritional content of elephant grass that has a water content of (82.79%) and crude protein content of (8.86%) is high compared to the content of crude fat of (4.46%) and crude fiber of (33.20%) [8].

The second crop that is most widely used for animal feed is corn. Corn plants are plants that are found in the tropics. Besides being useful as a staple food for humans, corn plants are also often used by farmers to feed cattle. Parts of corn plants that are often used to feed cattle are the leaves and stems. Other names for corn plants are *jagong* (Sunda), *jhaghung* (Madurase) and Eastern Indonesia used to call them *milu*. Corn has



crude protein content of 3.64%, crude fat of 0.64% and crude fiber 29.05% [9].

The 3rd crop is rice or *Damen*. Rice is one of the most widely planted plants in Indonesia because it has benefits as a staple food, namely rice. Besides being beneficial to humans, rice can also be used as feed for livestock, especially cattle. One of the feeds made from processed rice and has high nutritional value for cattle is bran or other names can also be called *Damen*. Bran is cattle feed derived from the impact or the process of rice milling. The main components of rice bran are oil, protein, carbohydrates and minerals. The oil contained in rice bran has a high nutritional content and contains oryzanol which is a source of natural antioxidants [10].

The 4th plant is *Kemondelan* or *Glacier*. *Glaciers*, also known as *kemondelan*, are wild herbaceous plants. The habitat of this plant is an area that is exposed to the sun's heat, for example in pastures, road sides, sandy beaches, and on the edge of cliffs. Other names for this plant are *katumpangan* (Sundanese), *glacial*, *bondelan*, *gobesan*, *sidawala*, *orang-arang* (Javanese), and *tar-sentaran* or *taroto* (Madurase). Plant parts used for animal feed are leaves, stems and flowers.

The 5th plant is *Lalang* or *Ilalang*. Reeds are grass plants that have a long life (perennial) and also often become weeds on agricultural land. Other names for this plant are *eurih* (Sunda), *alang-alang* (Javanese), *lalang* (Malay and Madurase). Part of the plant that is used for cattle feed is the leaves only. Reeds have a crude protein content of 7.46% and minerals [11].

The 6th *Wedhus-Wedhusan* or *Bandotan* plant. *Bandotan* plants in other names are *wedusan* (Javanese), *dus-bedusan* or *wedhus-wedhusan* (Madurase), *babandotan* (Sunda) and are called *balam grass* (Malay). Parts of plants that are often used to feed cattle are leaves, stems, and flowers. Based on the results of phytochemical analysis of *bandotan* leaves contain chemical compounds flavonoids and saponins that are useful for reducing cholesterol levels in livestock [12].

*Purslane* plants are plants that can grow in drought conditions and also have hot

weather. Other names of *purslane* plants include *gelang* (Indonesian), *krokot* (Java), *krejep* (Madurase) and *gelang pasir* (Malay). Parts that are often used to feed cattle are leaves to stems. *Purslane* plant is one of the plants that contains high antioxidants and has the highest concentration of omega-3 fatty acids to increase endurance. Besides *purslane* has other important ingredients including carbohydrates, fructose, vitamin A, vitamin B1, and vitamin B2 [13].

*Grinting grass* is a plant that lives wild and can grow at an altitude of 2100 m above sea level. Types of grass that can survive on barren land and even in the dry season. His life as a weed in agricultural land, so many of the farmers who use it to feed cattle. Other names for this grass include *bermuda grass*, *suket grintangan* (Javanese), *kakawat* (Sundanese) and *grinteng* (Madurase). [14] *Grinting grass* has a crude protein content of 10.59%, crude fiber of 21.21% and minerals. The results of the analysis showed that crude protein content is safe if it has a value ranging from 8.02-23.66% and crude fiber ranges from 19.87-39-36%, therefore *grinting grass* has crude protein and crude fiber which is good enough for livestock cow.

*Puzzle grass* is a plant that lives wild in the open and a little sun for example, such as in agricultural areas, fields, gardens and also fields. This grass is often used for animal feed because it is easy to find and is also a plant that still exists despite the dry season. Other names for this grass are *puzzle* (Javanese) and *motta* (Madura).

*Bengal grass* is one of the plants that live wild, grows in the fields and is included in chronic plants. Another name for this plant is *king grass* or *manggalah* (Madura). All parts of *Bengal grass* can be used as cattle feed. [15] *Bengal grass* has low nutritional value, containing 0.1% crude fat, 6.1% crude fiber and 2.6% crude protein. So there is need for additional concentrates to meet the nutritional needs of farm animals, the concentrate is used as a supplement or supplementary feed.

*Lempuyangan* plant is one of the plants used for cattle feed because it has properties for supplements for the health of cattle. The

benefits of this plant are as supplements to increase appetite and maintain the health of cattle. Another name for this plant in Javanese is *Lempuyang*, in Sundanese called *lampuyang* and in Madurase called *rebbhe*.

White teak plant also called *gmelina* plant is a plant that is used as a greening plant because this plant can grow on critical land and is also fire resistant. In addition, maintenance of white teak plants is also easier and faster to grow so that many plants are planted on city streets. Parts of plants that are often used for animal feed are the leaves. [16] The tannin content of white teak or *gmelina* plants can be beneficial for livestock because the microbes in the rumen will suppress protein breakdown so that it can increase the availability of protein to be absorbed directly by the animal's body.

Suture or so-called moon flower is a plant that grows in the tropics and sub-tropics. This plant grows well on infertile soils, on the roadside as bushes, cliff slopes and can also become weeds in agricultural areas. This plant is referred to as *paitan* in the Madurese language or the bitter grass. The part used for cattle feed is fresh leaves. [17] Suturing plants have a crude protein content of 22.98% and crude fiber of 18.17%. High crude protein content in a feed ingredient has a high sulfur content. Sulfur is one of the important elements that is useful for synthesizing amino acids.

Sengon is one type of forage that thrives in mountainous or highland areas, the part that is often used as cattle feed is the leaves. Sengon leaf is widely used for cattle feed because it has a high protein content for cattle so it is very good for cattle health. Other names for the sengon plant include *singon* or *sengon* (Javanese), *jeungjing* (Sundanese), and *sengghung* (Madura). [18] Sengon leaves used for animal feed contain 21.32% crude protein nutrients, 10.09% crude fat, 14.72% crude fiber, and 3056 Kcal / kg of metabolic energy. Although the sengon leaves are crude protein and metabolic energy is quite high so their use must be limited because of the presence of tannins and HCN which are toxic to livestock.

#### 4. CONCLUSION

Based on the results of the identification of the scientific names of plants and their families, there are 20 species of plants from 14 families used by the Madura Tribe Society in Grujugan District, Bondowoso Regency as traditional livestock medicine and treatment materials. Plants can also be used to feed cattle. There are 17 species of 8 plant families that are widely used by the people of the area to feed cattle.

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