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Use of Medicinal Plants in the Treatment of Respiratory Diseases in Tanahun District of Nepal

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Abstract- Background: The diverse soil and climatic conditions make Nepal suitable for the growth of several medicinal plants. Medicinal plants play vital roles in the Nepalese livelihood and the use of medicinal plants is common in all parts of the country. This study aims to assess the traditional knowledge of medicinal plants used by local people in Tanahun district of Nepal in the treatment of respiratory system related diseases.
Methods: Data were collected in January and February, 2020 from four villages of Myagde rural municipality in Tanahun district by using semi-structured interviews and guided field works.
Results: A total of 21 medicinal plants, belonging to 15 families were documented. Commonly used plant parts were leaves (33.33%), fruits (23.81%) and underground portions/ rhizome (19.04%). The most popular medicinal preparation is decoction, infusion, powder, paste and juice.
Conclusions: The study area was found to be rich in plant resources so the uses of medicinal plants in this area need to be explored and documented before it lost forever. We believed that further pharmacological and clinical studies on these plants may provide effective herbal medicines for various respiratory disorders.

Keywords- Medicinal plants, Ethno botany, Respiratory disease, Traditional medicine, Traditional healers, Nepal.

I. INTRODUCTION

Traditional medicine is commonly used in large parts of Asia, Africa and Latin America. In developing countries, traditional medicine is often the only accessible and affordable treatment available [i]. In many Asian countries traditional medicine is widely used, even though western medicine is often readily available [ii]. Nepal is blessed with varied and diverse soil and climatic conditions suitable for the growth of various plant species [iii]. Medicinal plants play vital roles in the Nepalese livelihood and it's use is common in many parts of the country. In Nepal, many researches are carried regarding the indigenous use and ethno medicinal potential of medicinal plants [,] however, very little is known about the use of medicinal plants in the treatment of respiratory related diseases.

The plant parts used, preparation and administration of drugs depend on several factors. People in this area have a strong belief that some plants are very effective in the treatment of respiratory diseases and they have used medicinal plants since ancient times to treat these diseases. The knowledge level differed heavily with respect to generation. Traditional beliefs and practices are deeply rooted in their culture so that the ideas of using these plants have been transferred from one generation to another through oral communication. In this survey study, we have observed that elderly people have the deep knowledge about the medicinal plants and their use compared to young people. Thus, such knowledge on the use of locally available plant parts in the diseases management has to be scientifically and systematically documented before it is lost due to rapid change in the lifestyle.

II. MATERIALS AND METHODS

Geographical details of the study sites:
Tanahun district lies in the Western region of Nepal. It is located between 27° 55' 0 N to 84° 15' 0 E and occupies an area of 1,546 square kilometers (597 sq mi) []. The district consists of ten municipalities. The present survey was undertaken in four villages of the Myagde rural municipality. The selected villages are Gunadi, Manung, Dirbhu and Barchyang. At the time of the 2011 Nepal census, Myagde Rural municipality had 5628 households with 22,502 population, out of them 12616 were female and 9886 were male.

Weather details:
Tanahun has moderate climate with average annual rainfall of about 1377 mm. Most rainfall occurs in summer season and winter is mostly dry. .The district has an average humidity of 61% and the average annual temperature is 21° Cwith the highest average temperature of 30°C during summer and the lowest is 11°C during the winter season.

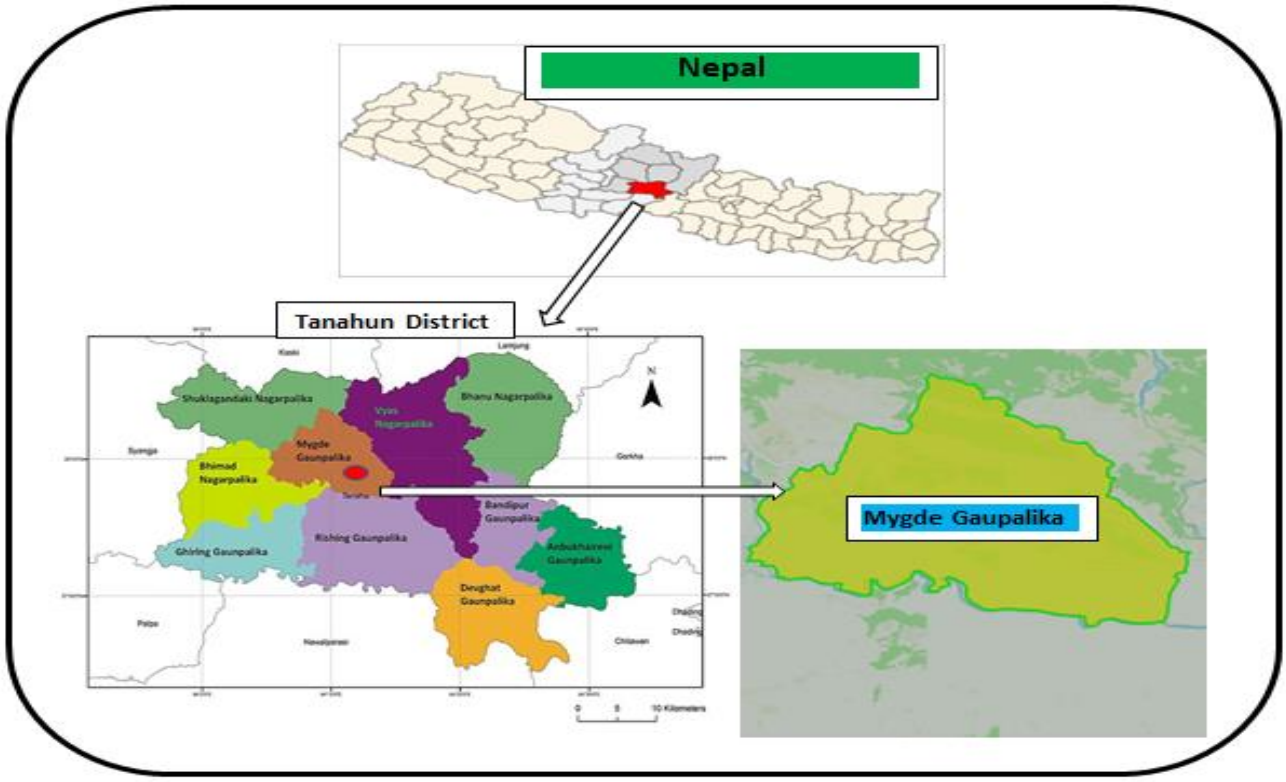

Figure 1. Map of the study area

Survey interview:

The survey was carried out from January to February, 2020. The information on plants used as traditional medicine against respiratory diseases were collected through interactions with local traditional healers, village leaders and old aged people who had strong links with traditional medicinal practices. A total of 18 individuals were interviewed. Interviews were conducted in Nepali language and the data were transformed into English. The data were gathered through semi-structured interview schedule. We have selected Myagde rural municipality of Tanahun district as a study site because the principal investigator of this study is originally from the respective area so that it is easier to contact the potential respondents of the study.

III. RESULTS AND DISCUSSION

A total of 18 informants comprising of 13 male (72.22%) and 5 female (27.77%) were interviewed to explore the knowledge of medicinal plants used in the treatment of respiratory diseases in their surroundings. Among them, 8 respondents were from Gunadi, 5 from Dirbhu, 3from Barchyang and 2from Manung village. All the respondents were grouped into four age groups viz., 30– 40 years, 41–50 years, 51-60 years and above 60 years and most of them (44.44%) were in the category of 51–60 years. 66.66% of the respondents were educated whereas 33.33% have no formal education (Table 1).

Table 1: Demographic details of respondents

Characteristics	Number (Distribution percent)		
	Male	Female	Total
Gender	13 (72.22%)	5 (27.77%)	18 (100%)
Name of village			
Gunadi	6 (46.2%)	2 (40.0%)	8 (44.4%)
Dirbhu	3(23.07%)	2 (40.0%)	5 (27.7%)
Barchyang	3 (23.07%)	0 (0.0%)	3 (16.6%)
Manung	1 (7.69%)	1 (20.0%)	2 (11.1%)
Age			
30-40 years	1 (7.69%)	0 (0.0%)	1 (5.5%)
41-50 years	3 (23.07%)	2 (40.0%)	5 (27.7%)
51-60 years	7 (53.8%)	1 (20.0%)	8 (44.4%)
Above 60 years	2 (15.4%)	2 (40.0%)	4 (22.2%)
Education Status			
Literate	11 (84.6%)	1 (20.0%)	12 (66.6%)
Illiterate	2 (15.4%)	4 (80.0%)	6 (33.3%)

Table 2: Traditional medicinal plants used for respiratory diseases in Myagde rural municipality.

S.N.	Latin Name	Family Name	Local Name	Habit	Parts used	Disease
1.	Acacia catechu Willd.	Leguminosae	Khayer	Tree	Heartwood	Cough, Throat Irritation.
2.	Achyranthes aspera Linn.	Amaranthaceae	Datiwon	Herb	Leaf	Common cold and Cough
3.	Acorus calamus Linn.	Araceae	Bojho	Herb	Rhizome	Cough
4.	Adhatoda vasica Nees.	Acanthaceae	Asuro	Shrub	Leaf	Bronchial Asthma, Cough,
5.	Allium sativum Linn.	Liliaceae	Lasun	Herb	Rhizome	Common cold
6.	Citrus Pseudolimon Tan.	Rutaceae	Nibuwa	Shrub	Leaf	Common Cold, Sinusitis
7.	Cleistocalyx operculata (Roxb.) Merr. And Perry.	Myrtaceae	Kyamuno	Tree	Bark	Sinusitis, Chronic common cold
8.	Curcuma longa Lin	Zingiberaceae	Besar	Herb	Rhizome	Cough, Common Cold, Sinusitis
9.	Elettaria cardamomum Maton.	Zingiberaceae	Allaichi	Herb	Fruits and Seeds	Cough
10.	Mussaenda macrophylla Wall.	Rubiaceae	Dhobini	Shrub	Root	Cough with Fever
11.	Nyctanthes arbortristis Linn.	Oleaceae	Parijaat	Tree	Bark, Leaf	Pneumonia
12.	Ocimum basilicum L.	Lamiaceae	Babari	Herb	Leaf	Common Cold, Asthma
13.	Ocimun sanctum Linn.	Labiateae	Tulasi	Herb	Leaf	Cough, Pneumonia
14.	Phyllanthus emblica L.	Euphorbiaceae	Amala	Tree	Fruit	Cough
15.	Piper attenuatum Buch.	Piperaceae	Chabo	Climbers	Steam	Cough, Bronchial Asthma
16.	Piper longum Linn.	Piperaceae	Pipla	Climbers	Fruits	Cough, Pneumonia, Bronchial Asthma
17.	Pogostemon benghalensis Kuntze.	Lamiaceae	Rudilo	Herb	Leaf	Cough, Pneumonia
18.	Psidium gaujava L.	Myrtaceae	Belauti	Tree	Leaf	Sinusitis, Common Cold
19.	Terminalia chebula Retz.	Combretaceae	Haroo	Tree	Fruit	Cough
20.	Terminalia bellirica Roxb.	Combretaceae	Baroo	Tree	Fruit	Cough
21.	Zingiber officinale Rosc.	Zingiberaceae	Aduwa	Shrub	Rhizome	Cough, Common Cold,

A total of 21 medicinal plant species used for the treatment of six different respiratory diseases were recorded in the survey (Table 2). These disorders include common cold, cough, bronchial asthma, pneumonia, sinusitis and throat irritation/pain. The 21 medicinal plant species belong to 15 families, with Zingiberaceae (3 species) being the most represented family, followed by combretaceae, myrtaceae, piperaceae and lamiaceae (2 species each) and the remaining 10 families were reported with one species each (Fig 1). In case of habits of the plants recorded, majority were herbs 8 nos. (38.09%) followed by trees 7 nos. (33.33%), shrubs 4 nos. (19.04%), and climbers (2 nos., 9.52%) (Fig 2).

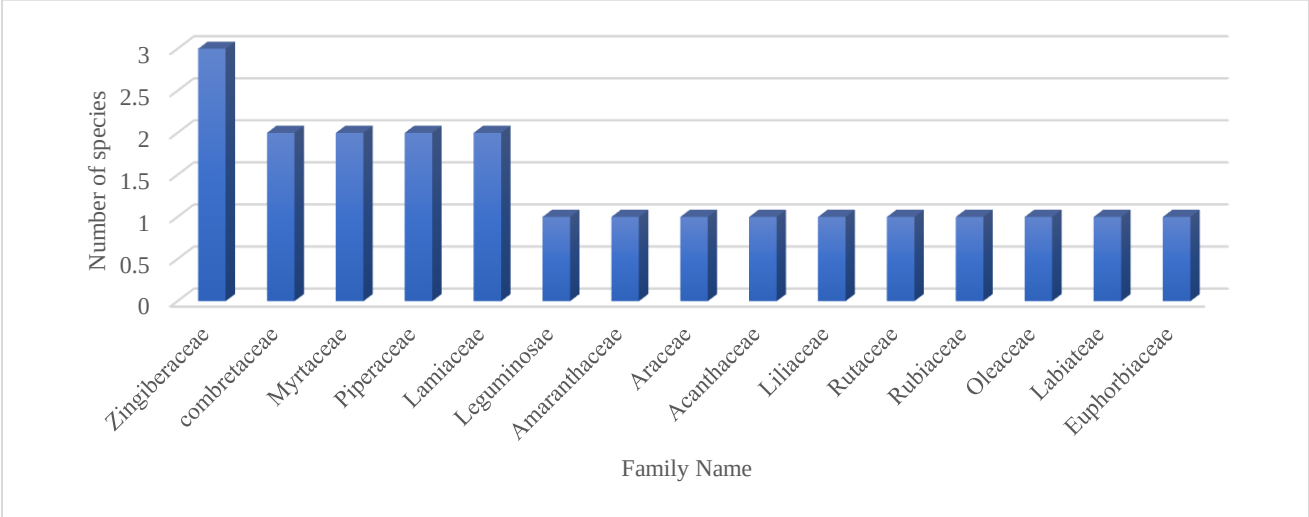

Figure.2 Families with no. of species

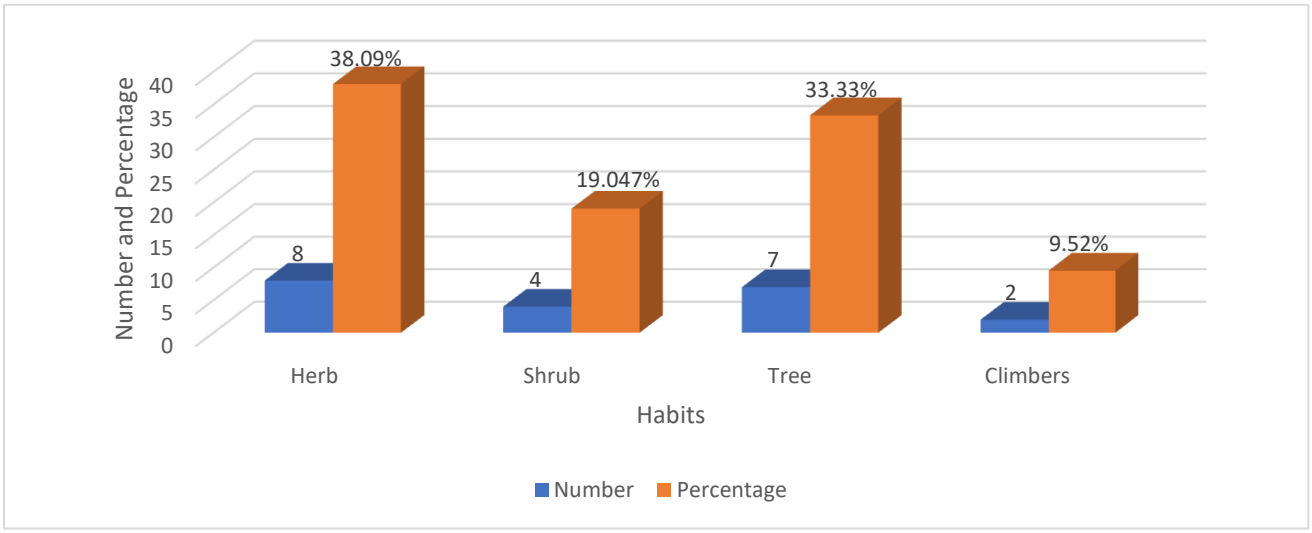

Figure. 3 Number and percentage of plants in various habits

The result shows that the plant part predominantly used was the leaves (33.33%) followed by fruit (23.81%) and rhizome (19.04%) (Fig 3). It was also noted that the most popular medicinal preparation is infusion, decoction, powder, paste and juice. The informants generally preferred fresh plants because they found them more effective.

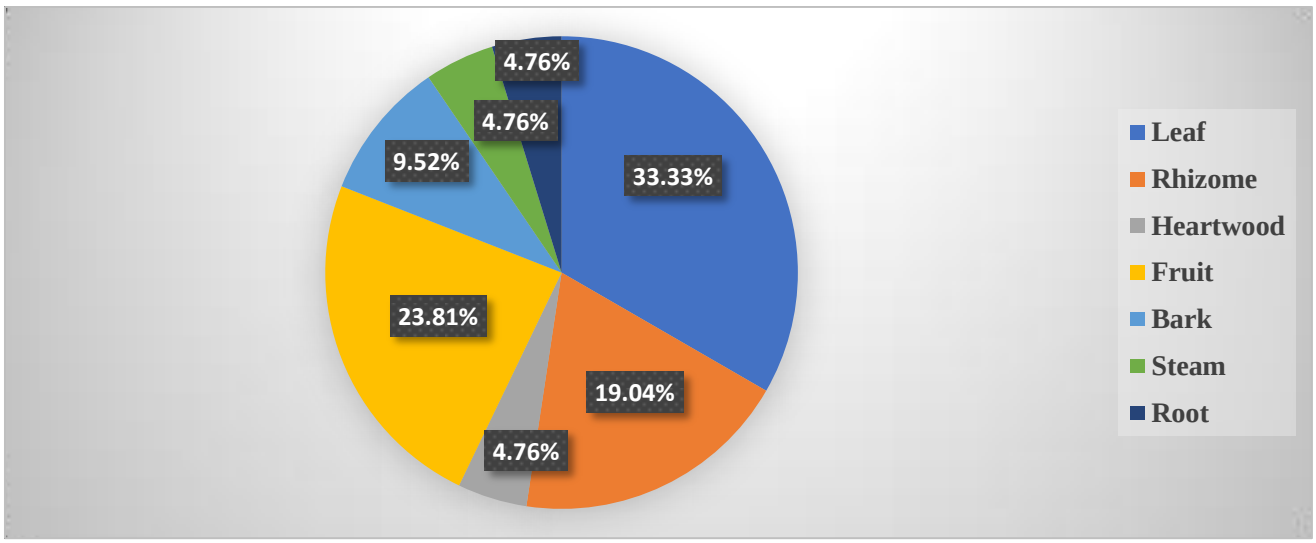

Figure: 4. Percentage of plants part used

Table: 3. Cultivation, effectiveness and availability status of the medicinal plants

S.N.	Latin Name	Cultivation Status	Effectiveness of the plant parts in diseases treatment (* = little effective, ** = moderate effective, *** = Very effective	Current extent of use compared to ten years ago	Availability status	Availability trend compared to ten years ago
1.	Acacia catechu Willd.	Wild	**	Increased	Scarce	Same
2.	Achyranthes aspera Linn.	Wild	*	Decreased	Abundant	Decreased
3.	Acorus calamus Linn.	Cultivated	***	Increased	Abundant	Increased
4.	Adhatoda vasica Nees.	Wild	***	Same	Abundant	Same
5.	Allium sativum Linn.	Cultivated	**	Same	Abundant	Increased
6.	Citrus Pseudolimon Tan.	Cultivated	*	Decreased	Abundant	Decreased
7.	Cleistocalyx operculata (Roxb.)	Wild	***	Same	Abundant	Same

	Merr. And Perry.					
8.	Curcuma longa Lin	Cultivated	***	Increased	Abundant	Same
9.	Elettaria cardamomum Maton.	Cultivated	**	Increased	Scarce	Same
10.	Mussaenda macrophylla Wall.	Wild	*	Decreased	Scarce	Decreased
11.	Nyctanthes arbortristis Linn.	Wild	**	Same	Scarce	Increased
12.	Ocimum basilicum L.	Cultivated	**	Same	Abundant	Same
13.	Ocimun sanctum Linn.	Cultivated	***	Increased	Abundant	Same
14.	Phyllanthus emblica L.	Cultivated	**	Increased	Abundant	Decreased
15.	Piper attenuatum Buch.	Wild	***	Decreased	Scarce	Decreased
16.	Piper longum Linn.	Wild	***	Increased	Abundant	Decreased
17.	Pogostemon benghalensis Kuntze.	Wild	*	Decreased	Scarce	Decreased
18.	Psidium gaujava L.	Cultivated	**	Decreased	Abundant	Increased
19.	Terminalia chebula Retz.	Wild	***	Increased	Scarce	Same
20.	Terminalia bellirica Roxb.	Wild	*	Same	Scarce	Same
21.	Zingiber officinale Rosc.	Cultivated	**	Same	Abundant	Decreased

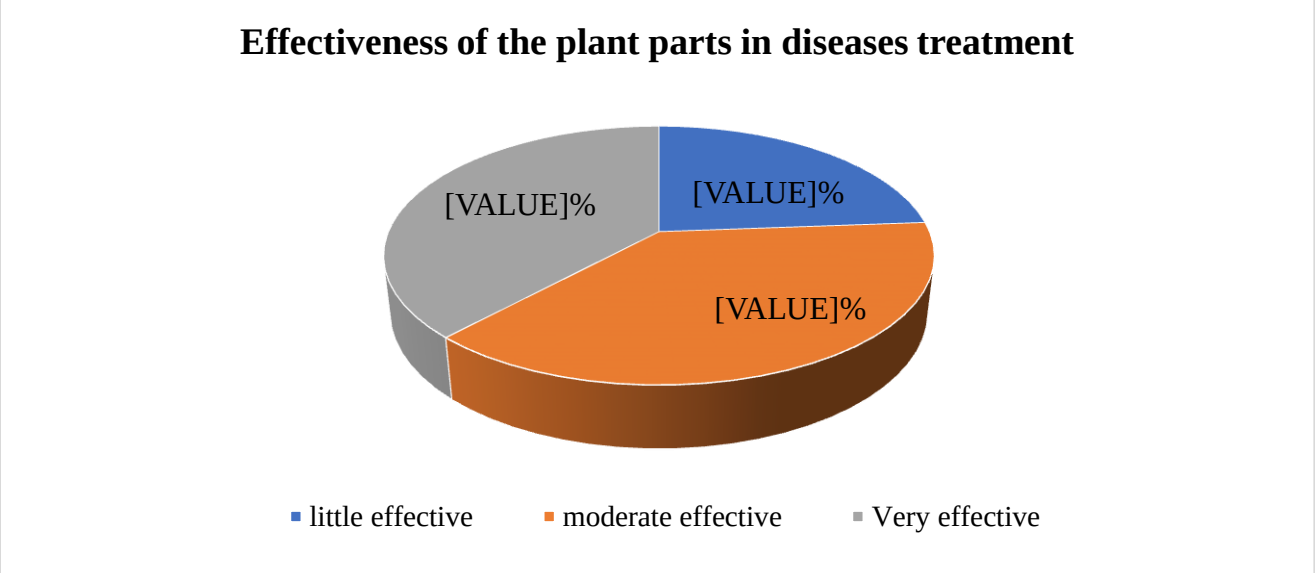

Figure 5. Effectiveness of the plant parts in diseases treatment

The result shows that among the used plant for the treatment of respiratory system related diseases, more than 50% of plants are significantly effective while 23.81% plants are little effective.

The local people use these plants and their parts for the treatment of various respiratory disease following traditional practice. A previous survey study done in the Tamang tribe of Kabhrepalanchok district of Nepal revealed that 95 plant species are used exclusively to treat various diseases including respiratory disorders [7].

It was reported that two common respiratory disease in the present study area were Cough and bronchial asthma. This may be due to the use of firewood as fuel for cooking in most of the households in the study area. A cross-sectional study done in rural and urban area of Nepal has shown that people exposed to biomass smoke had more respiratory symptoms compared to those exposed to clean fuel [8].

We have also found that except for highly communicable diseases and in emergency cases, people of these areas are depending on traditional medicines. In some cases, people are seeking help from traditional healers when their illness was not cured by modern medicine.

IV. CONCLUSION

The findings of the present study mainly shows that the old age people living in this areas still have a rich traditional knowledge of medicinal plants. Young people are generally attracted to urban and Western lifestyles and did not know the value of traditional medicine. Therefore, the uses of medicinal plants in this area need to be explored and documented before it lost forever. We believed that further pharmacological and clinical studies on these plants may provide effective herbal medicines for various respiratory disorders.

ACKNOWLEDGMENT

Special thanks to all informants, who generously shared their knowledge regarding local medicinal plants and their uses in respiratory diseases.

CONFLICT OF INTEREST

The author declared that there is no conflict of interest.

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