



# Ethnomedicine in the high lands of Chiapas, Mexico

Eduardo Alberto Lara Reimers<sup>1</sup>, Yamen Homaidan Shmeit<sup>1</sup>, Eloy Fernández Cusimamani<sup>1</sup>, Juan Manuel Zepeda del Valle<sup>2</sup>, David Jonathan Lara Reimers<sup>3</sup>

<sup>1</sup>Czech University of Life Sciences Prague, Fac. Trop. Agrisci., Dept. of Crop Sci. and Agroforestry, Czech Republic

<sup>2</sup>Chapingo Autonomous University, Regional Centers, Mexico

<sup>3</sup>Chapingo Autonomous University, Dept. of Forestry Engineering, Mexico



## Introduction

Traditional medicine is considered as the first health care system resource in the world, about 80% of people depend on it (1).

The diversity of medicinal plants is very high in Mexico. There are about 30 000 plant species in the country, many of which are not explored in their totality and a high number are endemic species (2).

The health panorama presented in Mexico is inscribed in a social reality characterized by poverty, migration, social and environmental fragmentation. Chiapas has 11 different ethnic groups and hosts a great number of practitioners of the traditional medicine.

## Objectives

The main objective of the research was:

- to register the current popular therapeutic use of medicinal plants in the Tzotzil indigenous population in the highlands of Chiapas, Mexico

The specific objectives were:

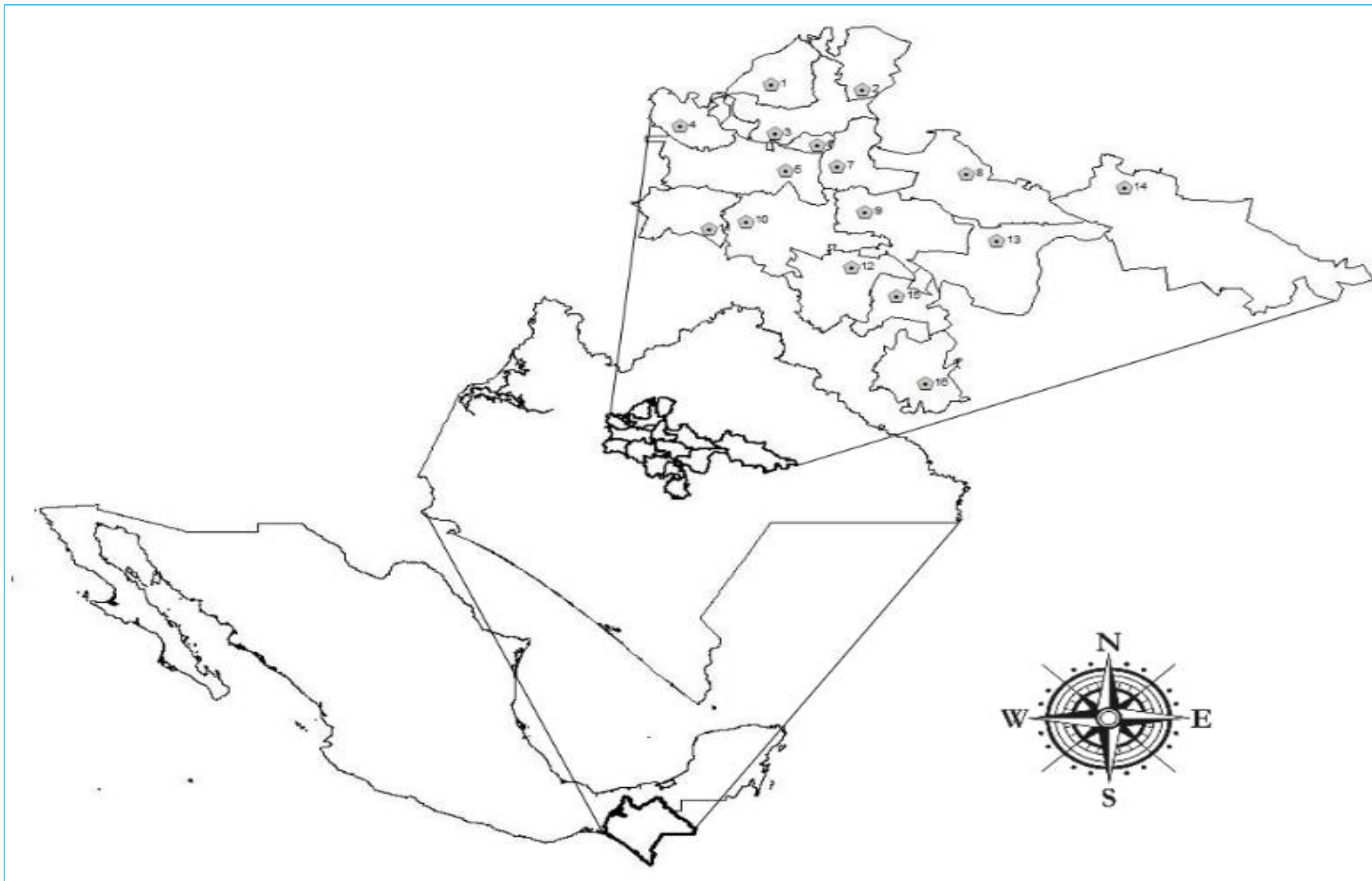
- to create an inventory of the medicinal plants used by the Indigenous group “Tsotsil” in the high lands of Chiapas and
- to analyze the most important cultural species used in each area.

## Data Analysis

Data was analyzed and tabulated using standard quantitative indices such as Use reports (UR), Informant consensus factor (ICF) and Use value index (UVI) (3).

In this study the level of homogeneity among information collected from diverse informants for plant species in treating a particular disease was calculated by the Informants’ Consensus Factor (ICF) (4).

## Study Area



**Figure 1.** Map of the study area: The high lands of Chiapas Region V (“Los Altos de Chiapas”)

## Results

A total of 59 species of medicinal plants, belonging to 55 genera and 37 botanical families were registered for the treatment of 13 disease categories (Tab.1).

The families Asteraceae (with 6 species and UR = 51), Lamiaceae (4, UR = 37) and Lauraceae (4, UR = 21), are the most representative in the study area (Tab. 2).

The highest use value index (UVI) was reported for *Matricaria chamomilla* (UVI = 0.42), *Mentha sativa* (UVI = 0.36) and *Ruta graveolens* (UVI = 0.31).

The main pathological categories treated are for diseases of the reproductive system (ICF = 0.80), respiratory system (ICF = 0.75) and of the digestive system (ICF = 0.70) (Tab. 2).

Informants mostly collected medicinal plants in wild and flat areas 46%. The most used parts of the plant are the leaves (51%) and the most common way to prepare traditional remedies is through infusion (71%) (Fig. 2).

## Materials and Methods

The field work was carried out in Chiapas, in the region "Alto Tsotsil-Tseltal", Mexico from March to October 2016 (Fig.1).

Data was collected from local inhabitants by using semi-structured questionnaires in the Tzotzil language. A total of 59 informants (39% men, 61% women) between 20 and 86 years old were selected by random sampling.

Plant material was collected, pressed then taxonomically identified using The Plant List (2013).

Voucher specimens were deposited in the Herbarium at the Chapingo Autonomous University.

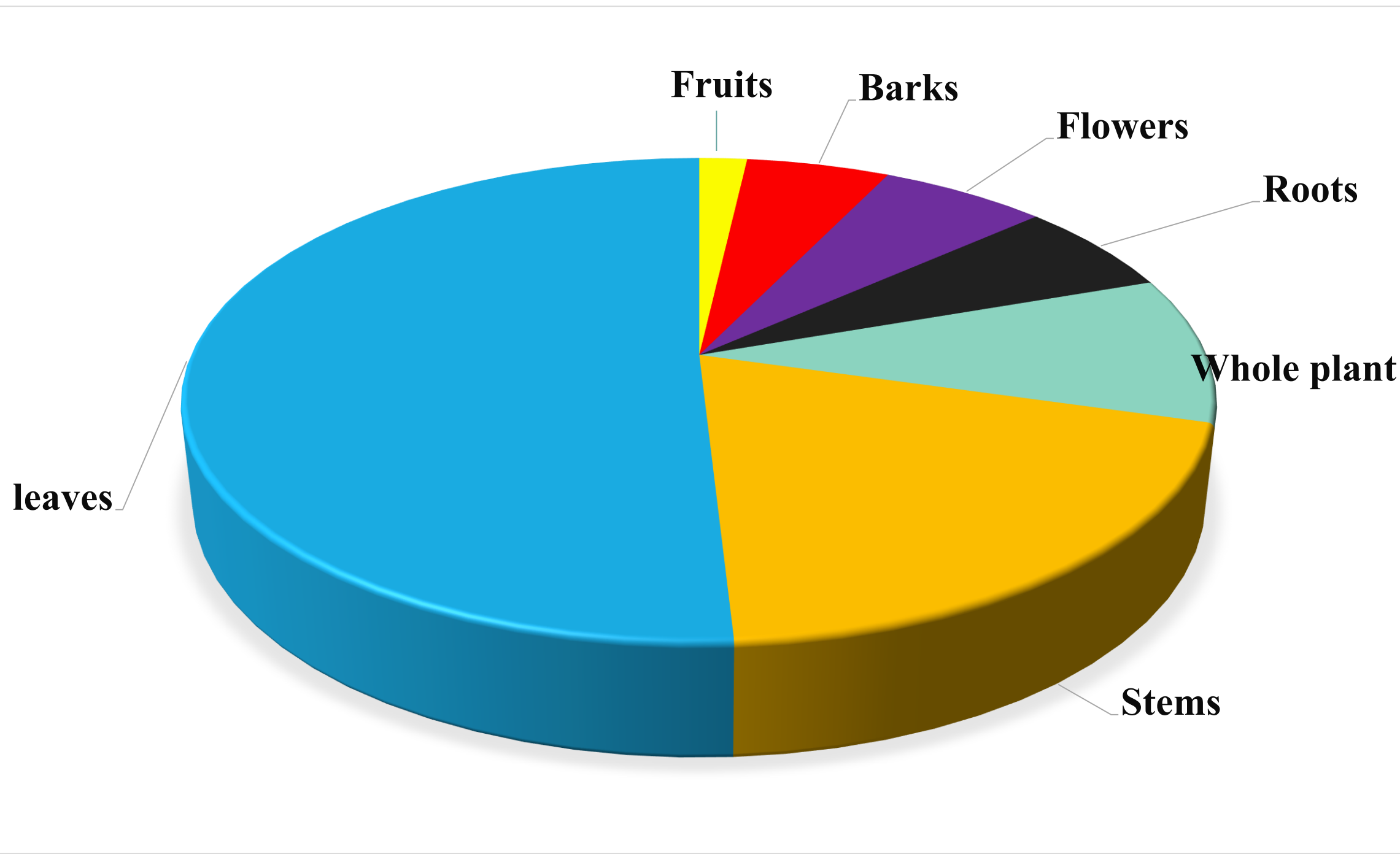


**Table 1.** Socio- demographic characteristics of the 59 informants

Demographic variables	Demographic category	No. informants	%
Gender	Woman	36	61
	Man	23	39
Age	20-30	21	34
	31-40	11	18
	41-50	13	21
	51-60	6	10
	+61	11	18
Residence	Rural	39	63
	Sub-urban	23	37
Activity	House wife	15	24
	farmer	24	39
	Public workers	5	8
	Merchants	5	8
	Students and profesors	3	5
	Others	10	17

**Table 2.** Disease Category and its Informant Consensus Factor (ICF)

No.	Ailment category	No. of species	No. of UR	% of UR	ICF
1	Diseases of the reproductive system	3	11	3,94	0,80
2	Diseases of the respiratory system	15	56	20,07	0,75
3	Diseases of the digestive and gastrointestinal system	30	98	35,13	0,70
4	Diseases of the cardiovascular system.	9	27	9,68	0,69
5	Diseases chronic–Degenerative	4	10	3,58	0,67
6	Autoimmune diseases	2	4	1,43	0,67
7	Diseases of the musculoskeletal system	6	15	5,38	0,64
8	General symptoms and problems	13	34	12,19	0,64
9	Diseases of the nervous system	2	3	1,08	0,50
10	Diseases of the urinary tract system	4	7	2,51	0,50
11	Diseases of the skin	8	11	3,94	0,30
12	Antidotes	2	2	0,72	0,00
13	Rituals	1	1	0,36	0



**Figure 2.** Used parts of the plants for the elaboration of traditional remedies in Chiapas



## Conclusion

The species reported and their diversity of use satisfy the basic medical needs of families with socioeconomic deficiencies.

A greater number of references to the treated conditions corresponds to gastrointestinal and digestive diseases, which occupies the first place as a cause of mortality in the region.

## Acknowledgement

We would like to thank the support of local inhabitants of Chiapas Mexico, for sharing their traditional medicinal plant knowledge. We also thank CULS grant IGA 20195001 for supporting this project.

## REFERENCES

- 1.Yabesh, J. M., Prabhu, S., & Vijayakumar, S., 2014. An ethnobotanical study of medicinal plants used by traditional healers in silent valley of Kerala, India. *Journal of ethnopharmacology*, 154(3), 774-789.
- 2.Bye, R., Linares, E., Estrada, E., 1995. Biological diversity of medicinal plants in Mexico, *Phytochemistry of medicinal plants*, Springer, pp. 65-82.
- 3.Kufer, J., Förther, H., Pöhl, E. and Heinrich, M. 2005. Historical and Modern Medicinal Plant Uses The Example of the Ch'orti' Maya and Ladinos in Eastern Guatemala. *Journal of Pharmacy and Pharmacology* 57(9):1127–1152.
- 4.Ferreira, F.S., Brito, S.V., Ribeiro, S.C., Saraiva, A.A., Almeida, W.O., Alves, R.R., 2009. Animal-based folk remedies sold in public markets in Crato and Juazeiro do Norte, Ceará, Brazil. *BMC complementary and alternative medicine* 9(1), 17.