An ethnobotanical study of medicinal plants used in Papantla, Veracruz, Mexico

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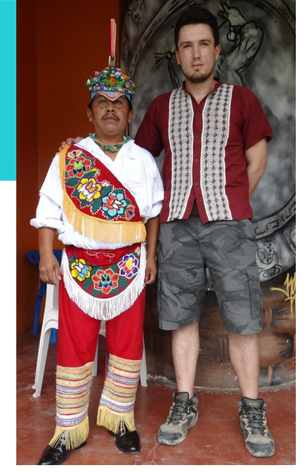

Introduction

•Traditional medicine is the first health care system resource in the world. According to the World Health Organization (WHO), approximately 80% of the world population depends on traditional medicine (1,2).
•The diversity of medicinal plants is very high in Mexico. Mexico has about 30 000 species of plants, however, there are many plants which are not explored in their totality and a high number of endemic species (3,4).
•Veracruz is one of the richest states with regard to biological and cultural diversity in Mexico. The medicinal flora of Veracruz is used as a remedy to treat several diseases, and different ailments(5).
•In Veracruz, there are indigenous groups who are consumers and practitioners of traditional medicine (6).
•In the study area as in other regions, the recording of traditional knowledge is not widely promoted. Moreover, the preservation of knowledge is still carried out in oral form from generation to generation (7).

Objectives

-To identify, to document and to create a botanical inventory of plants used with medicinal purposes.

-To register the epidemiological diseases affecting the Totonacapan region

-To analyze quantitavely the medicinal uses and to determine the most used plants in the communities.

Study Area

Figure 1.- Location of studied communities

Humid–warm climate.

Precip. 1000 - 1500mm

Temperature 22-26 ºC.

Materials and Methods

- Totonacapan has a population of 622 846 inhabitants, of which 204 934 people form the economically active population (32.9%). Nevertheless, it should be noted that 32.5% of Totonac population works in the primary sector (agriculture, fisheries, and forestry).
- 77 out of 212 municipalities in the state have moderate poverty (8).

Data Collection

- Fieldwork was carried out from January to June of 2017 in 16 communities in Papantla, Veracruz, Mexico **(Fig. 1).**

-Ethnobotanical information was collected from local inhabitants by using semi-structured questionnaires. A total of 85 informants were selected by random sampling. The informants were asked to provide knowledge about plant uses.

-The plant material was collected, pressed and taxonomically identified. The botanical names of the species were verified with The Plant List (2013)(http://www.theplantlist.org) and voucher specimens were deposited in the Herbarium at the Chapingo Autonomous University.

Data Analysis

-The information was structured and analysed with Use-Reports (UR) and Informants Consensus Factor (ICF) (9,10)

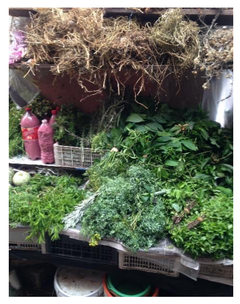

Table 1.- Socio-demographic characteristics of 85 informants.

Background characteristic		Number	%
Residence	Rural	26	31
	Urban	59	69
Gender	Female	40	47
	Male	45	53
Age	>20	2	2
	21–30	13	15
	31–40	12	14
	41–50	16	19
	51–60	20	24
	61–70	14	17
	71–85	8	9
Occupation	Farmer	9	11
	Housewife	21	25
	Seller	4	5
	Teacher	2	2
	Worker	40	47
	Other	9	10

Results

Seventy eight informants (92%) are actively using medicinal plants in their daily life, and 70 of the informants (82%) utilize plants as their option to treat ailments. The informants obtain the plants mostly from wild gathering (37%), market (35%), and familiar gardens (28%).

A total of 77 ailments were grouped into 17use-categories(**Table 2**) Informants recognized 101 ethnobotanical plants belonging to 51 families and distributed in 95 genera ; they were commonly used by the majority of indigenous people for the treatment of 77 ailments.

Table 2.-Ailment categories, informant consensus Factor(ICF) and use report (UR)

No	AILMENT CATEGORIES	n° SPECIES	n° of UR	% UR	ICF
1	Respiratory system disorders	17	100	7.89	0.84
2	Blood-cardiovascular disorders	21	112	8.83	0.82
3	Kidney disorders	17	119	9.38	0.86
4	Genitourinary disorders and childcare	17	118	9.31	0.86
5	Skeleton-muscular system disorders	8	34	2.68	0.79
6	Nervous system disorders	5	28	2.21	0.85
7	Gastro-intestinal disorders	29	247	19.48	0.89
8	Endocrinal disorders	23	137	10.80	0.84
9	Oncology	5	44	3.47	0.91
10	Dental care	9	27	2.13	0.69
11	Poisonous bites	2	14	1.10	0.92
12	Liver disorders	3	3	0.24	0.00
13	Skin disorders	17	83	6.55	0.80
14	Fever and infective diseases	13	93	7.33	0.87
15	Ear-eye disorders	7	39	3.08	0.84
16	Veterinary uses	4	14	1.10	0.77
17	Different uses	11	56	4.42	0.82

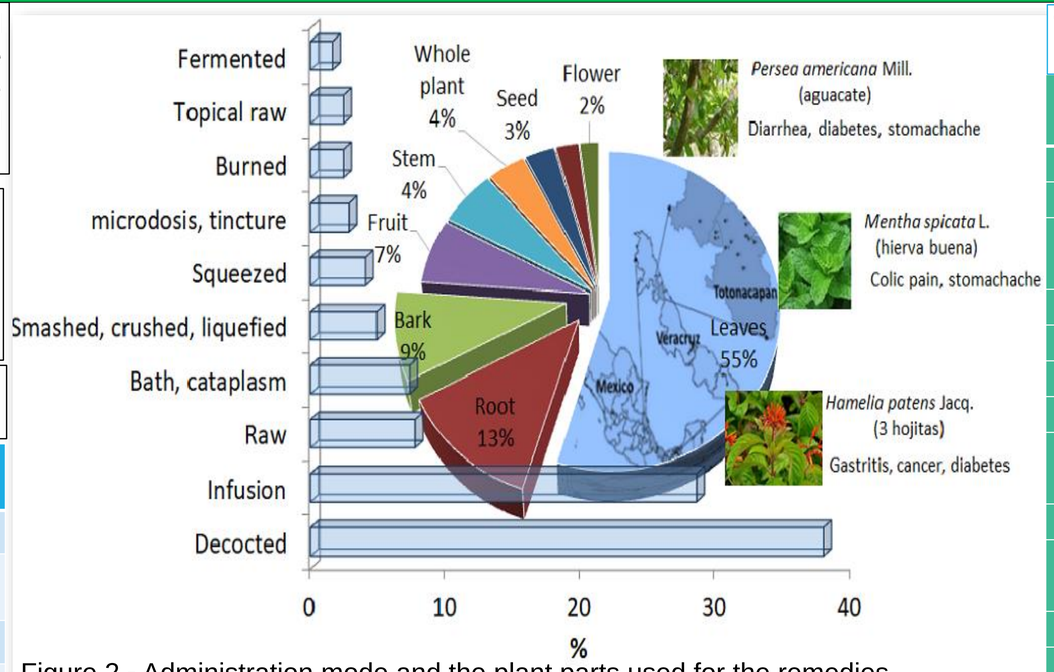

Figure 2.- Administration mode and the plant parts used for the remedies

-The most represented family were Asteraceae and Rutaceae with both having 8 species, followed by Fabaceae (6 species), Myrtaceae, Malvaceae and Apocynaceae (4 species), and Euphorbiaceae, Lamiaceae, Meliaceae and Poaceae with 3 species.

-The current study showed that the plant parts are usually consumed fresh (83%) and leaves represent the most commonly used plant part to prepare the medicinal remedies.

-Two main routes of administration of herbal remedies were reported: oral (72%) and topical (28%) .

-The forms used are decoction (38%), infusion (29%) and raw plant material (11%)(**Figure 2**).

-Oncological issues showed an ICF of 0.91 with 5 species and 44 UR, followed by gastro-intestinal disorders (ICF = 0.89) with 29 species and 247 URs, infective diseases and fever reported an ICF of 0.87 with 13 species and 93 URs, kidney disorders and genitourinary disorders reported the similar ICF, with 17 species each one. (**Table 2**)

Table 3.-Ranking of 12 most culturally important medicinal species according to the quantitative measures

Scientific name	Common name	Total use reports (UR)
Hamelia patens Jacq.	3 hojitas	77
Persea americana Mill.	Aguacate	58
Bursera simaruba(L.) Sarg.	Chaca	45
Matricariachamomilla L.	Manzanilla	34
Mentha spicata	Hierva buena	33
***Aloe vera* (L.) Burm.f.**	Sábila	33
***Apium graveolens* L.**	Guanábana	32
***Peperomia granulosa* Trel.**	Gordonzillo	32
***Ruta graveolens* L.**	Ruda	32
***Tradescantia spathacea* Sw.**	Barquilla	31
***Psidium guajava* L.**	Guayaba	30
***Asclepias curassavica* L.**	Hierva del	27

Acknowledgement
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Conclusion

The collected information indicates that the study area is rich in medicinal plants and the results contribute to spread their uses. The social importance of the medicinal plants in the community is quite important for the public health and the conservation of traditional knowledge and a good management is required. In Papantla (Veracruz, Mexico), indigenous population still depends on medicinal plants to treat several ailments.

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