

# Some Traditional Medicinal Plants of North Region from Puebla, Mexico: Uses and Potential Pharmacological Activity of *Rumex* spp.

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## Abstract

This paper, based on the traditional knowledge and research, aims to provide an overview of the current state of local and traditional medical uses, pharmacological potential activities, toxicity and safety of some medicinal plants from north region of Puebla State, Mexico. The information about use medicinal plants was obtained by a poll the therapists from Traditional Medicinal Hospitals from Ayototxo, Xalacapan and local market of Teziutlán. The information obtained of the empiric knowledge from therapists of Traditional Medicine about of extracts, whole and parts of some plants, like are used on the treatment of several health disorders common in the north region of state Puebla, such as pains, infections, fever, constipation, diahorrea and periodontals disorders is discusses. *Rumex* spp widely distributed as wild plant in the northern region of Puebla, consumed in salad, presents a variety of applications to treat oral diseases and antipyretic as a poultice, has aroused great interest to be studied by our research group. Despite its historical and cultural importance, the "traditional" use of plants has decreased.

**Keywords:** *Rumex* spp.; Traditional herbal medicine; Medicinal plants; Extracts; Antipyretic; Anti-inflammatory; Therapists

## Introduction

The plant kingdom has been the main source of medicine of humanity for hundreds of years and there is a vast accumulation of knowledge inherited for centuries. Scientific interest in medicinal plants in the past 40 years has led to the discovery of new molecules and active ingredients derived therefrom that give answers to very serious health disorders. Many plants and parts thereof, usually dry, still used worldwide as home remedies or as ingredients in herbicides, spiritual therapies, fermented drinks, poultices, ointments by therapists of the Traditional Herbal Medicine (THM) by their medicinal properties [1-5]. Not surprisingly, that these products are first or second option in treatment of important diseases [1]. Examples, soy isoflavones (*Glycine max*), [6] for menopause and climacteric; silymarin of milk thistle (*Silybus marianus*) as hepatoprotective [7,8] taxol from yew (*Taxus baccata*), for different types of cancer; [9,10] galantamine the Galanto (*Galanthus nivalis*) for Alzheimer's disease; [11] extracts of ivy (*Hedera helix*), as antitussive and expectorant [12]; the partenólids of migranella (*Tanacetum parthenium*), in cases of headaches and migraines; [13] flavonoids ginkgo (*Ginkgo biloba*) in cognitive disorders [14]. In Mexico 7,000 species are used as medicinal plants. Traditional Herbal Medicine of the State of Puebla is still unfinished and information scattered on few works, papers, magazines, etc., both local, national and international not just give us a general idea of what this treasure is supposed of the nature [15,16]. This paper is not intended to address all Mexican medicinal flora, if not devoted to the north region of State Puebla and especially the flora Teziutlán. We hypothesize that the exploration of research approaches over time proven traditional herbal medicine could lead to new areas of research of medicinal plants. Our perspectives include a research of the practice of the same Herbal Medicine in the north region of Teziutlán Puebla. Though this discussion must include some examples of herbs from Teziutlán, Puebla, Mexico only, the focus of our discussion underscores traditional herbal medicine strategies that can be used for the community and the Family and Community Medicine program,

School Medicine, and Stomatology program, School Estomatology, Complejo Universitario de la Salud (CUS), Benemerita Universidad Autónoma de Puebla (BUAP). We have listed some traditional medicinal plants, with general approach about traditional practice of herbal therapy, and pharmacological potential, and how to use, mainly *Rumex* spp (Lengua de Vaca).

## Materials and Methods

### Study area

Teziutlan is located north of the State of Puebla, in the northern part of Neovolcanic, almost bordering the state of Veracruz, between parallels 19°46' and 19°58' north latitude; meridians 97°19' and 97°25' west longitude; altitude between 700 and 2400 m (Figure 1). Teziutlán bordered on the north by the municipalities of Hueyapan and Hueytamalco; east with the municipalities of Hueytamalco and Xiutetelco; south with the municipalities of Xiutetelco and Chignautla; west with the municipalities of Chignautla and Hueyapan. It occupies 0.3% of the state's area 92 518 km<sup>2</sup>. It has 33 locations and a total population of 92,246 inhabitants, with Nahuatl and Totonac main dialects [17]. Within this area we find the Cuenca called "La Gran Caldera de Teziutlán" [18]. The predominant soil types in this area are

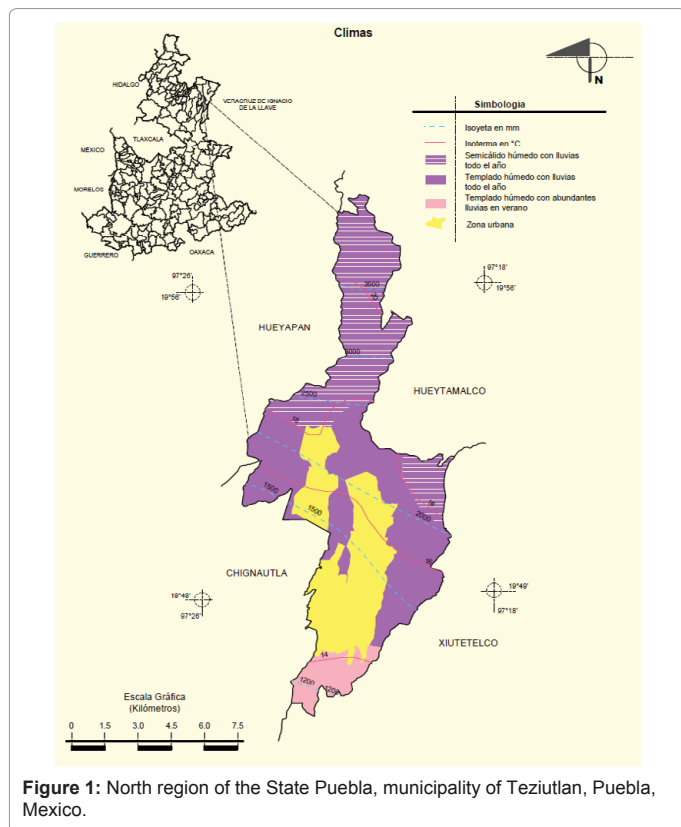
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the andosols and regosols, which have a dark gray color on yellowish brown layer surface and in the deeper layers are rich in organic matter and have a high nutrient content.

### Weather

Temperature range 12 to 22°C, precipitation range 1 100-3600 mm, generally mild and humid with rains all year (60%), semi wet with rain all year (31%) and temperate humid with abundant rainfall summer (9%). Its main locations are Teziutlán, Atoluca, San Juan Acateno, San Sebastian, Xoloateno, San Diego, Mexcalcuautla, Ixticpan, Cuaxoxpan [17].

### Medicinal plants (Traditional knowledge)

Since the early days of discovery of the American continent, the way to cure the natives was praised, and sent to Spain remedies and therapeutic elements. In 1571, Felipe II sent to Francisco Hernandez make scientific expeditions, to carry out a well-documented in medicine and medicinal plants in the states of Mexico, Morelos, Puebla, Tlaxcala and Hidalgo. He collected all the information written in his work called History of the Plants, resulting in sixteen volumes of natural history of this land (1571-1576), containing a wealth of information about Mexican plants, and the description and drawings, giving special interest to medicinal plants [15].

The term of “healers” or “therapists traditional herbal medicine” originated in 2002 with the Program of Hospitals Integrals with Traditional Medicine (PHITM) in the State Puebla, whose main objective is to provide mixed health services and spaces where traditional medicine and allopathic medicine is developed in an intercultural framework. This mixed model of health care was applied at that time in five regions with high marginalization of the State of Puebla: Cuetzalan del Progreso, Ayototco, Huehuetla, Coxcatlán y

Tulcingo de Valle. Traditional medicine modules operate from then with hospital where traditional therapists provide care, recognized by their communities in different specialties such as are midwives, healers, bone setters, herbalists, etc., [19]. Therapists are recovering the knowledge of medicinal plants communities. Plants are grown and gather and then the therapists offer to people their knowledge and treatments at affordable prices.

### Results and Discussion

During the period 2014-2015, interviews were conducted with different therapists around the northern region of the state of Puebla, such as the Hospitals of Traditional Medicine Herbal of Ayototco, Xalacapan and local markets Teziutlán. Healers or therapists are a group mostly women, urban and middle-aged-advanced, which have become in medicinal plants specialists with the explicit mission of “cure people with the use of medicinal plants.” The information collected is presented in Table 1. The therapist uses the plants or preparation cold for a hot disease and plant or preparation warm for a cold disease.

The information obtained in Table 1 shows that *Rumex* spp. is used (one or two fresh leaves) as an antipyretic in the treatment of fever in children as poultice with animal fat, until get the dry leaves, suggesting that the nonpolar components are typically absorbed through the dermis, generating its antipyretic activity. Few reports of the use of *Rumex* as antipyretic agent, as in the case of traditional medicine in Turkey (*Rumex patientia*) [20]. There are some papers about the antipyretic properties of metabolites or hexane extracts compared with the form of use in the northern region of Puebla, this has aroused great interest to be studied by our research group. Farre et al. has reported anti-inflammatory properties of aqueous extracts from *Rumex patientia* [21], EtOAc extracts, anthraquinones and naphthalenes isolated from the root of *Rumex nepalensis*, show inhibitory effects, moderate to strong on COX-1 (compared with indomethacin as positive control) and COX-2 (compared with celecoxib) [22]. Analgesic activity is observed at high doses of methanolic extract of *Rumex abyssinicus* which has up to 70% protection in mice induced pain compared with aspirin and morphine as positive controls [23]. There are studies of antiviral activity of some molecules isolated from *Rumex acetosa*, [24,25] potential pharmacological activity to recurrent epidemics of influenza in Mexico.

*Rumex* spp. “Lengua de vaca” (*Rumex* spp) common in the region Teziutlán, belonging to the *Polygonaceae* family, is native to Europe, where it grows in almost any kind of soil, but prefers soils rich in iron and nearby courses water, ponds and wetlands and shady forest areas in general [26]

### Description taxonomy

The plant is 50 cm tall, with perennials and woody roots some things that grow deep into the soil moist, and with an erect striated and single stem. The leaves are edible, oblong; 5 to 10 cm long, arrow-shaped at its base, with wide and long lower leaves without petiole upper leaves, and often has a scarlet dye (Figure 2).

The flowers are delicious, reddish green male and female redder (such as *R. acetosella*), and appear especially in the months of June and July. As the flowers mature, they become purple. Mature seeds are bright and brown [26,27] Taxonomy. There are numerous species; the most remarkable are *Rumex patientia*, *Rumex acetosa*, *Rumex scutatus*, *Rumex crispus*, *Rumex japonicus*, *Rumex dentatus*, *Rumex vesicarius*, *Rumex hymenosepalus*, among other [27]. The Table 2 shows some reports on the traditional use of *Rumex* spp. and parts used.

Medicinal Plant	Scientific Name	How To Use	Traditional Use
Albahaca	<i>Ocimum basilicum</i> L.(a)	Make corsages and "ramear" all over the body as sweep. Boil some leaves in water and take. Boil a bunch and rinse after bathing.	Clean spiritual. Stomachache. Postpartum bath
Alelía	<i>Matthiola incana</i> (a)	Boil and let it sit in the water, use water to rinse the end of the bath	Frightened children to bathe
Árnica	<i>Tithonia diversifolia</i> (Hemsley) A. Gray (a)	Alcoholic infusions of leaves to "rub". Poultices of crushed leaves	Anti-inflammatory treatment
Azomiate	<i>Barkleyanthus salicifolius</i> (a)	Tea leaves taken	Stomach ache
Cancerina o hierba de angel	<i>Hippocratea excelsa</i> Kunth (a)	The whole plant is boiled in 1 liter of water and when no longer so hot wash affected area	Wounds
Clavel criollo	<i>Dianthus caryophyllus</i> (a)	Prepares tea with flowers	Calms the cough
Coquillo, Estropajillo	<i>Cuscuta corymbosa</i> Ruiz & Pavón (a)	Boil the plant and let stand, use the water for bathing babies and children. Boiled plant is used as a scourer to carve children.	Cure the "shock" and "algorre" in children
Dedo de niño	<i>Sedum rubrotinctum</i> (Crassulaceae) (a)	Cut leaves and squeeze out the liquid until it contains and apply a few drops in the ear or eye if it is the case.	Eye and ear infection
Espinosilla	<i>Loeselia mexicana</i> (Lam.) Brandege (Ujwitz) (a)	It cut 3 to 4 sprigs for ½ liter of water, taken in the morning for 3 days.	Bile
Espuela de caballero	<i>Delphinium</i> (b)	Boil the branches and let stand, water used as "rinse" during bath.	Postpartum bath
Floripondio	<i>Brugmansia candida</i> Pers. (a)	Fresh flower is crushed and puts a little alcohol, smeared on the back.	Back pain
Hierba del sol	<i>Crusea longiflora</i> (a)	Boil two leaves in 1/2 liter of water and drink it. Note: when the plant is freshly cut green but after boiling turns a deep red color.	Fever
Hierba dulce	<i>Lippia dulcis</i> Trev. (a)	The leaves are boiled, allowed to cool a little and take a little sweetened with honey. The leaves are boiled and douches are made after childbirth or abortion.	Cough, postpartum or post treatment abortions.
Hierba Maestra (ajenjo)	<i>Artemisia absinthium</i> L. (a)	Aqueous infusion of leaves, take as water.	Bitter and to treat shock, bile, courage, diabetes taste, and stomach pain.
Huichin	<i>Verbesina persicifolia</i> DC. (a)	Whole plant is boiled and washed the infected part.	Wounds
Ixtanzokpikxiuitl		A twig it is used in 1 liter of water, boiled and taken as the pain persists.	Stomach ache
Lengua de vaca	<i>Rumex</i> spp (a)	3 leaves are boiled in ½ liter of water and taken for 3 days. Two leaves as a poultice with lard and paper in the abdomen. Boil two to three leaves of the plant dry and mouthwashes are made.	Diarrhea, courage, wounds, bile, rheumatism. Reduce fever in children. Oral diseases. Treatment of viral diseases.
Malva	<i>Malva parviflora</i> L. (a)	The whole plant is boiled and washed the infected part.	Wounds. Infections
Marrubio	<i>Marrubium vulgare</i> L. (a)	The whole plant is boiled and washed the infected part.	Wounds. Infections
Matahuacal		Whole plant is boiled in 1 liter of water, let cool slightly and put in place affected.	Acne
Mazote	<i>Bidens pilosa</i> (a)	The leaves are boiled and taken as water.	stomach ailments
Mejorana	<i>Origanum majorana</i> L. (a)	Two or three twigs are cut into 250 ml, to make them in tea is taken warm.	Stomach ache
Mirto	<i>Salvia</i> spp. (a)	Boil leaves and use as a mouthwash after bathing. Make corsages with sheets for "ramear" whole body.	In "cold" diseases and oral diseases. To scare
Nogal	<i>Juglans regia</i> L. (a)	Infusion of leaves. Mouthwash. Rinses the scalp.	Treatment of retracting the gingiva. Natural dye for darkening hair.
Poleo	<i>Mentha pulegium</i> L. (a)	2 stripes are placed in 250 ml of warm water and taken	Indigestion. Stomach ache.
Romero	<i>Rosmarinus officinalis</i> L. (a)		Treatment of "cold" diseases. Postpartum bath. Hair Treatment (prevents hair loss).
Sauco	<i>Sambucus bipinnata</i> (xomet) (a)	4 to 6 leaves are boiled in 1 liter of water; it is taken as hot as possible.	Threw up. Dizziness
Toloache	<i>Datura stramonium</i> L. (a)	Whole plant is boiled, allowed to cool a little and make washes uterus.	Wash uterus when you have cervical cancer.
Toronjil	<i>Agastache mexicana</i> (a)	Macerated in alcohol and take after meals	Aids digestion and stomach ailments
Vara milagrosa. Palito de siete corazones	<i>Haematoxylum brasiletto</i> Karst. (a)	The bark is boiled and taken in tea or water weather	Depression

Table 1: Traditional uses and local names of Medicinal Plants from north region of Puebla.



Figure 2: *Rumex* spp. Teziutlán Puebla.

Scientific name	Part of the plant	Traditional use	Reference
<i>Rumex patientia</i> <i>Rumex scutatus</i>	Leaves	Antipyretic in traditional medicine Turkish, anti-inflammatory and analgesic.	[20,28]
<i>Rumex acetosa</i> ( <i>Herba Rumicis acetosa concis</i> )	Whole	Tx. viral, rheumatism.	[25,29]
<i>Rumex scutatus</i> L. <i>Rumex japonicus</i>	Root	Hemorrhage, wounds.	[30]
<i>Rumex acetosella</i> , <i>acetosa</i> , <i>crispus</i> , <i>vesicarius</i>	Leaves	Food (soups, sauces and salads).	[31-33]
<i>Rumex hymenosepalus</i> , <i>Rumex vesicarius</i>	Stems, leaf and roots	Antioxidant, Antimycobacterial in skin problems, gastrointestinal disturbances sore.	[34-36]
<i>Rumex dentatus</i>	Whole	Antimicrobial.	[37]

Table 2: Traditional medicinal use parts of *Rumex* species.

### Traditional medicinal in north region of Puebla

In the mountains north of Puebla, community commonly use *Rumex* spp as an astringent in treating diarrhea (indigestion) and externally to control bleeding and rashes, sores in the mouth. Mainly used THM in Teziutlán as an antipyretic in febrile episodes like poultices (confortativos), based on lard with paper in the abdomen of infants. They are also used in the treatment of rheumatism, jaundice and cooked the roots are used as a tonic. In infusions, dry leaf as antiseptic in mouthwashes for periodontal diseases (inflammatory processes of the gingiva) and bleeding. It has been used as a dietary supplement useful in the treatment of influenza and viral infections such as herpes repeated.

**Food:** The cooked “lengua de vaca” is used in most of the region as a companion to meat dishes (mole verde, eggs) or broth. Edible in salad, the leaves have a pleasant sour taste. Oxalic intoxication has at times been reported, mainly in children, due to the high oxalic acid content of the plants [21]. The edible variety is known as the language of elongated or pointed Cow (*Rumex crispus*) and is native to tropical America [27]. The genus *Rumex* is characterized by the accumulation

of anthraquinones, naphthalens, flavonoids, stilbenoids, carotenoids, fenols, trans-resveratrol y rumexoid [35,38,39]. Table 3 shows the structures of some compounds isolated from *Rumex* species [38,39].

**Collects:** Plants can be harvested from wild or cultivated plants. *Rumex* collection was conducted in a scientific manner of wild plants. In this first stage plant breeding is not controlled. Wild plant is where their demands are met shadow and light. Research has shown that light is a contributing factor to determine the amount of plant components as in the case of alkaloids in *Datura* spp light for training is not required [40]. It is also considered the altitude and climate (tempering with rains all year) from the northern region of the state of Puebla, which have a great influence on the population of plants. For *Rumex* spp, it grows adequately in Teziutlán and San Juan Xiutetelco, it shows that in Ayotoxco, which is another different altitude and amount of rain, is not *Rumex* spp. Soils differ from one another both in their physical and chemical properties. The soil is composed of mineral material, formed by the action of weathering of rocks, decaying organic matter or humus. In the case of the northern region of the state of Puebla soil type is andosol predominantly volcanic soil dark and very porous. The time when each plant is collected generally has considerable importance, since the amount, and sometimes the nature of the active ingredients, are not constant throughout the year. Betts and Fairbair showed that the content of C-heterosides, O-heterosides and free anthraquinones in the developing leaves of *Rhamnus purshiana* it fluctuates markedly throughout the year [41]. An investigation of changes in the consituyentes in the collected plants *Rumex* spp in different locations and periods of vegetation revealed that the total amount of phenolic compounds are increased through the cycle of the plant, but decreases in samples of greenhouses (controlled) compared with those observed in the field samples (wild) [42]. Aerial parts of *Rumex* spp, free fresh leaves dew or attacked by insects, were collected.

**Dryng:** The drying process can be slow or fast. When it is necessary to stimulate the enzymatic action, drying should be slow, at moderate temperatures. If it is necessary to avoid enzymatic action, drying should be started as soon as possible after collection, as in the case of essences [40]. With the leaves of *Rumex* spp., the drying was performed outdoors without artificial heat for weeks to ensure maximum enzymatic action.

**Trituración:** The dried leaves of *Rumex* spp were grinded in food processor Braun Multi quick to a fine powder.

**Exhaustive extraction:** Maceration process was chosen for the collection of the active ingredients (prolonged infusion) with solvents of different polarities followed by percolation (addition of fresh solvent to replace the solvent has passed up through the ground powder) [43]. Initially the medicinal plant was extracted with a nonpolar solvent (hexanes), followed by exhaustive extraction with AcOEt and EtOH. Excess solvents was removed under reduced pressure to obtained dark solid (Hexanoic extract) and dark oil (AcOEt and EtOH extract), the yields show in Table 4.

### Conclusion

Summarizing these information, the use of medicinal plant comprising highly complex mixtures of up to several hundred compounds in Traditional Herbal Medicinal (THM). The medicinal plants are very economical to production and has pharmacological activity potential. THM, in full, is considered as “primary medicine” with botanical qualities to “help” or “protect.” Therapists use medicinal plants, depending on the disease (cold or hot) in the case that the plants are used alone or in combination with other herbs to prepare plasters, poultices, medicinal teas. Despite its historical and cultural

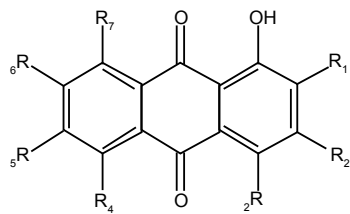
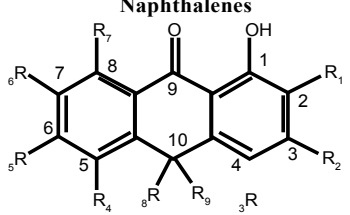
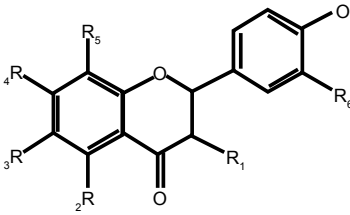
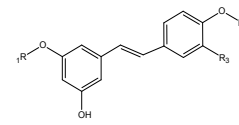
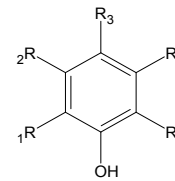
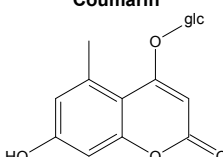
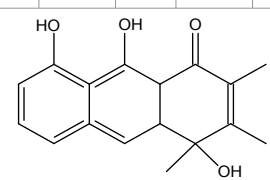
Structure	Substituents									Name
	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	R <sub>8</sub>	R <sub>9</sub>	
<b>Anthraquinones</b> 	H	CH <sub>2</sub> OH	H	H	H	H	OH	—	—	Aloeemodin
	H	CH <sub>2</sub> OH	H	H	OH	H	OH	—	—	Citreosin
	H	CH <sub>3</sub>	H	H	H	H	OH	—	—	Chrysophanol
	H	CH <sub>3</sub>	H	H	OH	H	OH	—	—	Emodin
	H	CH <sub>3</sub>	H	H	OCH <sub>3</sub>	H	OH	—	—	Physcion
	H	H	H	H	CH <sub>3</sub>	H	Oglc	—	—	Pulmatin
	H	COOH	H	H	H	H	OH	—	—	Rhein
	H	CH <sub>3</sub>	H	OH	H	H	H	—	—	Ziganein
	H	OCH <sub>3</sub>	H	H	H	CH <sub>3</sub>	H	—	—	Przewalsquinone
	<b>Naphthalenes</b> 	H	CH <sub>2</sub> OH	H	H	H	H	OH	H	glc
H		CH <sub>3</sub>	H	H	H	H	OH	OH	glc	Cassialoin
H		CH <sub>3</sub>	H	H	OCH <sub>3</sub>	H	OH	glc	OH	patientoside A (10S)
H		CH <sub>3</sub>	H	H	OCH <sub>3</sub>	H	OH	OH	glc	patientoside B (10R)
COOH		CH <sub>3</sub>	H	H	H	H	OH	glc	OH	rumejaposide A (10S)
COOH		CH <sub>3</sub>	H	H	H	H	OH	OH	glc	rumejaposide B (10R)
COOH		CH <sub>3</sub>	H	H	OH	H	OH	glc	OH	rumejaposide C (10S)
COOH		CH <sub>3</sub>	H	H	OH	H	OH	OH	glc	rumejaposide D (10R)
H		CH <sub>3</sub>	H	H	OH	H	OH	glc	OH	rumejaposide E
H		OH	H	OH	H	H	—	—	—	apigenin
<b>Flavonoids</b> 	H	OH	H	OH	H	H	—	—	—	vitexin
	H	OH	H	OH	H	H	—	—	—	isovitexin
	H	OH	H	OH	H	OH	—	—	—	leteolin
	H	OH	H	OH	glc	OH	—	—	—	orientin
	H	OH	Glc	OH	H	OH	—	—	—	isoorientin
	OH	OH	H	OH	H	OH	—	—	—	quercetin
	Oglc	OH	H	OH	H	H	—	—	—	astragaln
	Ogal	OH	H	OH	H	H	—	—	—	hyperoside
	Orha	OH	H	OH	H	OH	—	—	—	quercitrin
	Oglc	OH	H	OH	H	OH	—	—	—	isoquercitrin
	H	OH	H	Oglc	H	OH	—	—	—	quercimeritrin
	rha-glc	OH	H	OH	H	OH	—	—	—	rutin
	<b>Stilbenoids</b> 	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	R <sub>8</sub>	R <sub>9</sub>
H		H	H	—	—	—	—	—	—	<i>trans</i> -resveratrol
CH <sub>3</sub>		H	H	—	—	—	—	—	—	pinostilbene
H		CH <sub>3</sub>	H	—	—	—	—	—	—	deoxyrhapontigenin
glc		H	H	—	—	—	—	—	—	piceid
ara		H	H	—	—	—	—	—	—	rumexoid
<b>Phenols</b> 	H	OH	H	CH <sub>3</sub>	H	—	—	—	—	orcinol
	H	Oglc	H	CH <sub>3</sub>	H	—	—	—	—	sakakin
	Oglc	CH <sub>3</sub>	H	COCH <sub>3</sub>	H	—	—	—	—	rumexin
	H	H	COOH	H	H	—	—	—	—	paraben-acid
	OCH <sub>3</sub>	H	COOH	H	H	—	—	—	—	vanillic acid
	OH	H	CHCHCO <sub>2</sub> H	H	H	—	—	—	—	caffeic acid
OCH <sub>3</sub>	H	CHCHCO <sub>2</sub> H	H	OCH <sub>3</sub>	—	—	—	—	sinapic acid	
<b>Coumarin</b> 	hastatuside A									 rumexone

Table 3: Structures of some compounds isolated from *Rumex* species.

Rumex Leaf Extract	Yield <sup>a</sup>
Hex (dark solid)	0.48
AcOEt (dark oil)	2.16
EtOH (dark oil)	0.40

<sup>a</sup>The yield is given in percentage (%).

**Table 4:** Yields of Hex, AcOEt and EtOH extracts of leaves from *Rumex* spp the region Teziutlán, Puebla.

importance, the “traditional” use of plants has decreased. Further preclinical and clinical studies and investigations are needed to clarify the potential antipyretic action of extracts from *Rumex* spp, safety and efficacy therapeutic in the community practice as well as purification, isolation and elucidation of the components from extracts obtained.

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