Actividad analgésica y antiinflamatoria de la *Artemisia copa*

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Abstract

Artemisia copa Phil. (Compositae) is a small shrub native of the northwestern of our country, commonly known as "copa-copa" and traditionally used for cold, pneumonia, hypertension, stomachaches and as digestive. Also alcohol macerated leaves are topically applied by rubbing for rheumatism. Analgesic activity of *A. copa* was analyzed by means of writhing, formalin and hot-plate tests in mice. A dose-related antinociceptive response was obtained in the writhing test at doses of 0.5 and 1g/kg p.o. (% inhibition 23.3 and 52.70%). This effect was not antagonized by pre-treatment with naloxone 5 mg/kg i.p. Also an inhibition on the second phase of the formalin test (38.81%) was observed. No significant effect was obtained in the hot-plate test. The anti-inflammatory activity was analyzed with the carrageenan-induced paw edema in rats and the ear edema induced by TPA and arachidonic acid in mice. *A. copa* showed antiinflammatory activity in the TPA (88%) and arachidonic acid (37%) tests but no effects were seen at doses between 75-600 mg/kg in the carrageenan test. The results obtained indicate that *Artemisia copa* has analgesic and topical anti-inflammatory activities and these facts would corroborate the traditional use of the infusion in folk medicine. In order to characterize the compounds responsible for the analgesic and antiinflammatory activities for this species, three flavonoids were isolated and identified from the ethanolic extract: luteolin (previuosly reported), luteolin 7-methyl ether and luteolin 3'-methyl ether (crisoeriol), not reported previously for the specie.

Introducción

Artemisia copa Phil. (Compositae) de nombre vulgar "copa-copa", es un arbusto pequeño, de 30- 60 cm de altura, que crece en las montañas y punas del Noroeste de Argentina, desde Jujuy hasta San Juan, y en el Norte de Chile. La infusión de esta planta es utilizada en medicina popular para el resfrío, las neumonías, para disminuir la presión arterial, el dolor de estómago y como digestiva. Sus hojas se usan maceradas en alcohol, en fricciones, para los dolores reumáticos.

Del extracto etanólico de *Artemisia copa* se aislaron tres flavonoides: luteolina (ya descripta para esta especie), luteolina-7-metil éter y luteolina-3-metil éter (crisoeriol), no reportados previamente. La luteolina y sus derivados tienen varias actividades farmacológicas interesantes ya descriptas: antitumoral, antiinflamatoria, antioxidante, etc.

Objetivo

El objetivo del presente trabajo fue la evaluación de las actividades analgésicas y antiinflamatorias de diferentes extractos de *Artemisia copa* a través de distintos modelos experimentales en los cuales el común denominador es el dolor producido mediante estímulos químicos y térmicos y la inflamación, con el fin de corroborar el uso de la infusión de *Artemisia copa* en medicina popular como antirreumática.

Materiales y métodos

Material vegetal

Se utilizaron partes aéreas de *A. copa* recolectadas en Antofagasta de la Sierra (Catamarca). La clasificación del material fue realizada por el Ing. G. Giberti del Museo de Farmacobotánica de la Facultad de Farmacia y Bioquímica de la Universidad de Buenos Aires. Se obtuvieron los extractos acuoso, CH_2Cl_2 y ETOH.

Animales

Ratones Swiss de 25-30 g y ratas Sprague-Dawley de 180-200 g hembras.

Ensayos de actividad analgésica

1. Ensayo de las contracciones inducidas por ácido acético (writhing test) en ratón.

Se usó el método de Collier *et al* (1968). Los tratamientos fueron: 1. Control (Solución fisiológica + AcH); 2. *A. copa* (infusión) 250, 500 y 1000 mg/kg p.o. + AcH. 3. Indometacina 10 mg/kg i.p. 4. Naloxone + A. copa. En todos los grupos se cuenta el número de contracciones cada 5 min durante 20 min. Se calcula para cada grupo el porcentaje de inhibición.

2. Ensayo de nocicepcion inducida por formalina en ratón.

Se utilizó el método de Hunskaar and Hole (1987). En el ensayo se distinguen dos fases: Fase 1, indicativa de dolor neurogénico y en la cual se mide el tiempo de lamidas (en segundos) en los primeros 5 minutos posteriores a la administración de la formalina. Fase 2, indicativa de dolor inflamatorio; se cuenta el tiempo de lamidas en los últimos 15 min. Tiempo total de la experiencia: 30 min. Tratamientos: 1. Control (solución fisiológica p.o. + formalina.); 2. Infusión de *Artemisia copa*: 500 y 1000 mg / kg p.o. + formalina.

3. Ensayo de la platina caliente (hot plate) en ratón

Se basa en la inducción de sacudidas o lamidas de las patas delanteras o salto por efecto de la temperatura (56 ± 1° C). Se mide la latencia de respuesta en segundos.

Los tratamientos fueron: 1. Control (solución fisiológica); 2. morfina 10 mg/kg s.c. 30 min antes de la prueba. 3. Infusión de *Artemisia copa* 500 mg/kg p.o. 60 min antes de la prueba.

Actividad antiinflamatoria

1. Edema de oreja en ratón por (TPA) y por (AA).

Se aplicaron los métodos de De Young (1989) y Carlson (1985). Inmediatamente después de la administración de 12-O-tetradecanoylphorbol-13 acetate (TPA) o ácido araquidónico (AA) se aplicaron tópicamente extractos de A. copa disueltos en acetona, en la oreja derecha (1mg / oreja / 20µl). La oreja izquierda (control) recibió el vehículo. La Indometacina fue usada como droga de referencia (0.5 y 2 mg / oreja / 20 µl para TPA y AA respectivamente). Luego de 4h post TPA y 1h post AA, se sacrifican los animales, se cortan discos de 6 mm de diámetro del pabellón de la oreja y se pesan. La inflamación se mide como la diferencia de peso entre los discos provenientes de orejas derechas e izquierdas, y se expresa como % de inhibición del edema.

2. Edema de pata de rata inducido por carrageninaa.

Se aplicó el método de Winter *et al.* por administración de carragenina al 2% en la aponeurosis de la pata trasera derecha en animales pretratados con la infusión de los extractos acuoso, CH_2Cl_2 o ETOH de *A. copa* (100 mg/kg). La inflamación fue cuantificada midiendo el volumen desplazado por las patas (pletismómetro Ugo Basile) a tiempos 0 y 1, 3 y 5 h luego de la administración de carragenina.

Resultados y discusión

Los resultados se muestran en las tablas 1 y 2 y en la figura 1. En lo que respecta al test del hot plate, *A. copa* no muestra diferencias significativas comparados con los controles. En el test de la carragenina la inflamación sigue un curso temporal similar al de los controles. En el test del edema de oreja, el extracto CH_2Cl_2 muestra mayor actividad antiinflamatoria. Con los resultados obtenidos se validaron las actividades analgésicas y antiinflamatorias, justificando su uso en medicina popular en el reumatismo. El hecho de que *A. copa* sea inefectiva en la primera fase del test de la formalina y en el test del hot plate, señala que en el mecanismo de la acción antinociceptiva no está involucrada la participación de receptores opioides.

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Grupo	Dosis (mg/kg)	Número de contorsiones	Inhibición%
Control	----	29.43 ± 1.61	----
A. copa	250	25.61 ± 1.45	----
	500	22.58 ± 1.72 *	23.28
	1000	13.92 ± 2.03 **	52.70
Indometacina	10	12.58 ± 3.67 **	57.26
Naloxone + *A. copa*	5 + 1000	12.23 ± 1.80 **	58.44

Cada grupo representa la media ± SEM (n=10). *p0.05; **p0.01 comparado con el control.

(ANOVA - Dunnett's test).

TABLA 1. Efecto analgésico de la infusión de *Artemisia copa* en writhing test.

Grupo	Lamidas (s)		Inhibición %
	0 – 5min	15-30 min	
Control	87.36 ± 6.03	106.29 ± 8.06	-----
A. copa (0.5 g/kg)	82.44 ± 4.56	68.82 ± 5.54*	35.25
A. copa (1 g/kg)	79.13 ± 6.20	41.25 ± 6.97 **	61.19

Cada grupo representa la media ± SEM (n=10). *p0.05; ** p0.01 comparado con el control.

(ANOVA - Dunnett's test).

TABLA 2. Efecto analgésico de la infusión de *A. Copa* en el test de la formalina.

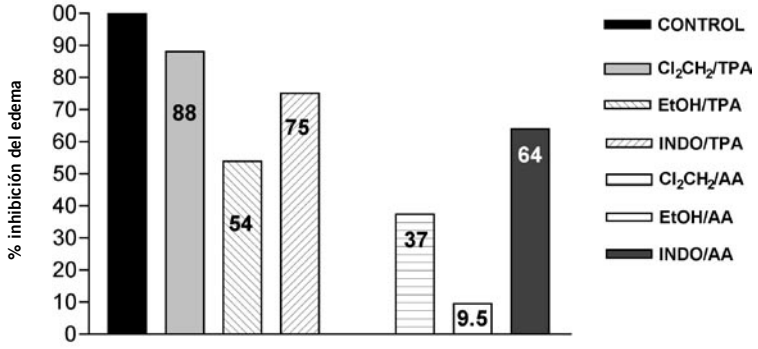

FIGURA 1. Efecto de extractos Cl_2CH_2 y ETOH de *A. copa* sobre el edema de oreja por TPA y AA en ratón.

Active Components of Avicenna's Drugs from *Haplophyllum perforatum*

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Key Words: Avicenna's Drugs, active components, alkaloids, lignan, structure, pharmacological activity.

Introduction

Plants of the genus *Haplophyllum* (Rutaceae) were widely applied in folk medicine of Central Asia. Avicenna (980–1037) called the plants as sadab-ruta and used them as a sedative, antiinflammatory drug, and antidote as well for treating paralysis, ulcer, herpes, edema, mumps, warts, tumors, and other diseases (Ibn Sina 1985).

We have studied active components of the aerial parts of *H. perforatum* Kar. et Kir. collected in Dzhungaricum mountains during the flowering. In the communication, we summarize and generalize our results on isolation and chemical and biological properties of alkaloids and lignan from the plant.

Experimental

In a typical isolation, air-dried and powdered aerial parts of the plant were exhaustively extracted with CH_3OH. The concentrated extract was partitioned between $CHCl_3$ (A) and 10% H_2SO_4. The acid solution was alkalized by con. NH_3 in a bath with ice and exhaustively extracted with ether and then with $CHCl_3$ (etheric and $CHCl_3$ totals of alkaloids). Solution A was treated with 4% aqueous KOH, washed with H_2O, dried under Na_2SO_4, filtrated, and concentrated (a fraction of neutral compounds). The alkali solution was saturated with NH_4Cl and successively extracted with ether and $CHCl_3$ (phenols, soluble in ether and $CHCl_3$), then neutralized to pH 7 with conc. HCl and extracted with ether and further with $CHCl_3$ (etheric and $CHCl_3$ parts of an acid fraction).

The etheric total of alkaloids was treated with acetone, and glycoperine was separated, mp 224-225°C (methanol). Crystals of evoxine were obtained from the concentrated acetone solution, mp 155-156°C (acetone). The solution was evaporated and chromatographed on a Si gel column, using gradient elution. Etheric eluates gave 7-isopentenyloxy-γ-faragine, mp 105-106°C (EtOAc), evodine, mp 152-153°C (acetone), and evoxoidine, mp 135-136°C (acetone); chloroformic eluates, methylevoxine, mp 122-123°C (ether); chloroform-methanolic eluates, evoxine; and methanolic eluates, glycoperine. The neutral fraction was treated with acetone. The acetonic solution, containing alkaloids, was dried and treated further with ether. Crystals of eudesmin, mp 107-108°C (acetone), were obtained from the cooled etheric solution, which further was evaporated to dryness and treated with petroleum ether. Concentration of the petroleum etheric solution provided the crystals of haplamine, mp 201-212°C (deg., ethanol). Petroleum etheric solution was further evaporated and chromatographed on a Si gel column. Eudesmin, flindersine, mp 185-186°C (deg., ethanol), perfamine, mp 164-165°C (ether-acetone), and haplamine were successively isolated from etheric eluates. Insoluble in petroleum ether part gave haplamine after treating with ether. The residue after purification of haplamine was chromatographed on a Si gel column, and dihydrohaplamine, mp 231-232°C (acetone), was obtained from etheric eluates.

The total of alkaloids and some pure components were tested on mice as an emulsion with the apricot gum.

Results and discussion

The total of alkaloids is low toxical. LD_{50} amounts 700 mg/kg after 24h of administration. It shows expressed sedative action with a short period of preceding excitement. We have isolated 10 alkaloids from the total and neutral fraction, including new haplamine (**1**), β,γ-dihydrohaplamine, glycoperine (**2**), and methylevoxine (**3**) as well as known flindersine (**4**), evoxine (**5**), 7-isopentenyloxy-γ-fagarine (**6**), evodine (**7**), evoxoidine (**8**), and perfamine (**9**). In addition, known lignan eudesmin (10) has been obtained from the neutral fraction.

The structure determination of new alkaloids and identification of known compounds were carried out on the basis of spectral data, chemical transformations, and partial syntheses (Akhmedjanova 1999). All the alkaloids obtained are derivatives of quinoline and belong to 4 groups of the class: pyrano-2-quinolones (**1** and **4**), dihydropyrano-2-quinolones (β,γ-dihydrohaplamine), furano-quinolines (**2**, **3**, **5**-**8**), and modified furanoquinolines (**9**). Glycoperine (**2**) is the first glycoalkaloid among quinoline alkaloids. Perfamine (9) is the first representative of modified furanoquinolines with gem-substituted cyclohexadienone ring A.

Haplamine (**1**), glycoperine (**2**), and evoxine are low toxic and possess sedative (100-200 mg/kg) action (Sadritdinov 1980). Lignan (**10**) (1.5-10 mg/kg) possesses estrogenic activity of short time action (Akhmedkhodjaeva 1975).

Conclusion

Ten quinoline alkaloids and lignan eudesmin were isolated from the aerial parts of *H. perforatum*. Experiments have shown that the sedative action of Avicenna's drugs from *H. perforatum* is due to its total alkaloids (main components, glycoperine and evoxine), haplamine, and lignan eudesmin. The lignan positively differs from another existing estrogenic preparations by combination of sedative and estrogenic activities. The aerial parts of *H. perforatum* can be served as a source for obtaining eudesmin and haplamine.

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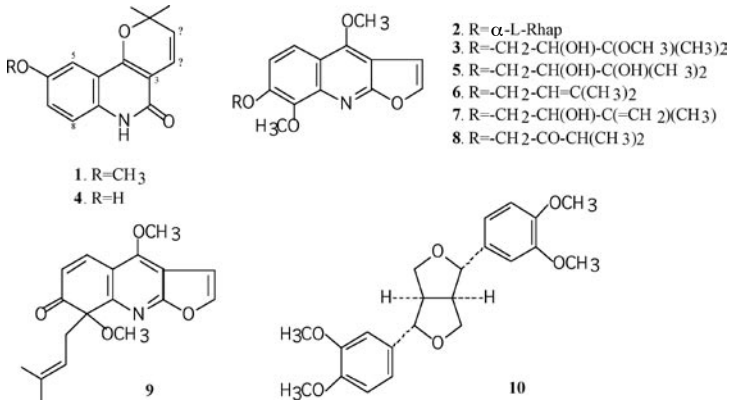

Structures of the isolated compounds.

Alkaloids and flavonoids of two *Oxytropis* species used in folk medicine

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Key Words: *Oxytropis muricata, O. trichophysa,* alkaloids, flavonoids, structure, pharmacological activity.

Introduction

The species *Oxytropis muricata* (Pall.) DC. and O. *trichophysa* Bunge (Fabaceae Leguminosae) are perennial herbaceous plants distributed on the territory of Mongolia and East Siberia. They are widely used in folk medicine (Blinova *et al*. 1986) for the treatment of intoxications and liver and kidney diseases. In Tibetan medicine *O. muricata,* named dag-sha nag-bo, is used as a diuretic, wound-healing, vasodilator, sedative, cholagogue, and helminthic. In chemical respect, however, the plants were almost unstudied before our investigations. In the report, we generalized some literary and our data, including unpublished, on alkaloids and flavonoids from the aerial parts of *O. muricata* and *O. trichophysa*, growing in Mongolia.

Experimental

In the process of a typical isolation, the dried and powdered aerial parts of these plants were extracted with ethanol. The concentrated extract was partitioned between $CHCl_3$ and 10% H_2SO_4. Total alkaloids were obtained from the acid solution by the usual way. For the isolation of flavonoids, the extract was divided into fractions according to its solubility in organic solvents. Pure alkaloids and flavonoids were separated from the totals and fractions, respectively, by repeated column chromatography, using Si gel and gradient elution, and further recrystallization of the components. The structures of new alkaloids were elucidated on the basis of spectral data, chemical transformations, and partial syntheses. Known flavonoids were identified according to their physicochemical and spectral data and by direct comparison with authentic samples.

Results and discussion

From the plant *O. muricata,* we have isolated 4 new alkaloids: N-benzoyl-2-hydroxy-2-phenylethylamine (**1**) (Batsuren *et al.* 1992), N-nicotinoyl-2-hydroxy-2-phenylethylamine (**2**) (Batsuren *et al*. 1992), muricatide (**3**) (Akhmedjanova *et al*. 1997), and muricatisine (**4**) (Demeuov *et al*. 1998) and 2 known flavonoids (Tsetsegmaa *et al*. 1992): robinin and kaempferol. Five new alkaloids: **1** (Batsuren *et al*. 1992), N-benzoyl-2-phenylethylamine (**5**) (Batsuren *et al*. 1992), trichophysine (**6**) (Akhmedjanova 1996), trichophydine (**7**) (Akhmedjanova 1994), and oxytriphyne (8) (Akhmedjanova *et al*. 1993) and 4 known flavonoids (Tsetsegmaa *et al*. 1992): kaempferol, liquiritigenin, 7,4'-dihydroxyflavone, and pratol have been obtained from *O. trichophysa.*

Alkaloids of the plants belong to 2 different groups: 2-phenylethylamine (**1-7**) and 2-oxazoline (**8**). The first numerous group of alkaloids consists of N-, O-, or N,O-acylated derivatives of 2-phenylethylamine. Their common property is the capable of hydrolysis. Oxytriphyne (**8**) is the first representative of the new 2-oxazoline group of plant alkaloids unknown earlier. Compound **1** is the main alkaloid of both plants. Its content in *O. muricata* can reach 1% of the dried raw material. Biological properties of 1 are studied now. Among flavonoids, robinin dominates in *O. muricata* and kaempferol, in *O. trichophysa*. According to the literature (Khalmatov 1979), both flavonoids possess diuretic properties. Robinin in the dosage of 1 mg/kg body mass increased the diuresis of dogs up to 30–40% and kaempferol in the dose of 3 mg/kg, to 30%.

Conclusion

The plants *O. muricata* and *O. trichophysa,* growing in Mongolia and used in folk medicine, produce alkaloids and flavonoids. Alkaloids of *O. muricata* (**1-4**) belong to the group of 2-phenylethylamine and its flavonoids (robinin and kaempferol), of flavonol. In addition to 2-phenylethylamine alkaloids (**1**, **5-7**), *O. trichophysa* contains the 2-oxazoline alkaloid oxytriphyne (**8**). Flavonoids of the plant are more diverse and belong to 3 groups: flavones (pratol and 7,4'-dihydroxyflavone), flavonols (kaempferol), and flavanones (liquiritigenin).

Diuretic properties of the plants were determined to be caused by the presence of robinin and kaempferol in *O. muricata* and kaempferol, in *O. trichophysa.*

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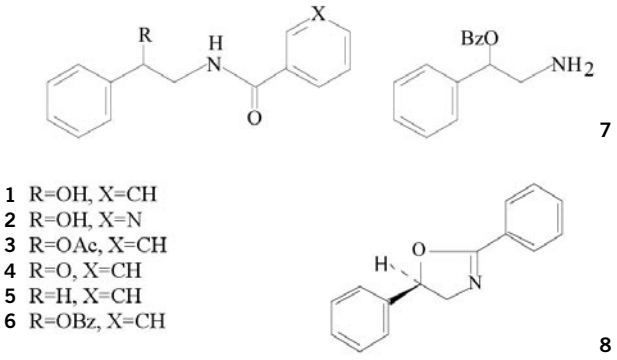

Structures of the isolated compounds.

Sorprendente coincidencia entre medicina popular y ortodoxa Laguna de Cospeito (Galicia /España)

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Abstract

"Quien no conoce su historia, corre el riesgo de repetirla". A la luz de esta frase, se comenzo un estudio etnobotánico en la comarca de "Terra Cha" (Lugo/Galicia/España). Se eligió esta zona, por tratarse de un "espacio natural de interés" (forma parte de uno de los LIC propuestos por la Xunta de Galicia para su inclusión en en la Red Natura 2000, LIC Parga-Ladra-Támoga) y por contar con una antigua tradición agrícola y ganadera.

Se hizo una prospección inicial que abarcaba únicamente el entorno de la "Laguna de Cospeito", la más grande del conjunto de lagunas y zonas húmedas que caracterizan a esta meseta. Para su ejecución se entrevistó a los habitantes del lugar con el fin de conocer el papel que desempeñaban las plantas en en la medicina popular. Se realizaron 61 entrevistas, de las que se obtubo información relativa a 65 especies de plantas diferentes de las cuales se identificaron 44. A estas 44 especies la medicina tradicional les atribuyó un total de 95 usos terapéuticos.

De los resultados obtenidos, en esta exploración, nos sorprendió la gran cincidencia existente entre los usos populares y los ortodoxos de las plantas medicinales (84 de 95). Este hecho aumento nuestra confianza en la etnofarmacología como fuente de información para la investigación de nuevos medicamentos y nos animó a continuar en nuestro estudio, con la dedicación que requiere un enclave de interés etnobotánico. Confiamos en que este trabajo contribuya a salvaguardar la diversidadcultural y fomentar el desarrollo sostenible de la comarca.

Introduction

The Terra Chá region of Galicia in the northwest Iberian Peninsula constitutes the northern part of the Lugo meseta. It lies at an altitude of 400 - 500 m, and covers an area of about 1730 km^2. It comprises 10 municipalities, including Cospeito. The climate of the Terra Chá region is Cold Subcontinental, within the Oceanic macroclimate of Galicia. The region's flat topography, high rainfall, numerous rivers and very high water table mean that the soil is often waterlogged. Accordingly, the region contains various lagoons and marshy areas, including the Laguna de Cospeito Nature Reserve (part of a larger area denominated "Ladra-Pargas-Támoga" and proposed by the Galician Regional Government for inclusion in the Natura 2000 network). Hydrophilous plants like mosses and reeds are therefore common, together with Atlantic-type deciduous tree species, such as oaks, birches and alders. Sweet chestnut and commercially planted pine are also present. The scrub vegetation includes heaths, broom scrubs, gorse scrubs, and *Rubus* communities.

As of January 2001, the censused population of the Terra Chá was 53,017 inhabitants. The population of the municipality of Cospeito was 5,842 inhabitants, of whom 39% were aged over 60 years. This, together with the region's agricultural socioeconomic tradition and botanical richness, suggested that it may be of interest as a source of information about traditional botanical remedies, whether for human disorders or livestock. It is worth noting that most Spanish people aged over 60 years spent their youth in a society with very limited access to scientific medicine.

Aims

1) To assess whether the Terra Chá region is of ethnobotanical interest.

2) To create a database containing the local and scientific names of medicinal plants in the Terra Chá region, together with information on the traditional uses of these plants.

3) To evaluate whether these traditional uses coincide with established medicinal uses of these plants.

Methods

A total of 61 interviews were administered to adults resident in Cospeito; 42 of the respondents (31 women, 11 men) reported medicinal plants. Interviews were conducted in Galician, the first language of most respondents. All replies were recorded and? transcribed verbatim for subsequent analysis. Respondents were asked if they knew any medicinal plants, and if so what properties they attributed to each, what part of the plant is used, how the plant is prepared for use, its mode of application or administration, and its perceived efficacy. In the analysis we focused on respondents aged over 60 years (23 of the 31 women, 10 of the 11 men), though it should be stressed that most such respondents no longer use traditional medicines, and often had difficulty remembering plants and procedures used in their youth.

Results

A total of 61 medicinal plants were cited by the 42 respondents. Of these 44 (72%) were readily identifiable to species level; the remainder were not readily identifiable.

The 44 identifiable plants belonged to a total of 32 families, namely Labiatae (5 species), Compositae (4 species), Gramineae (3 species), Liliaceae, Papaveraceae, Moraceae and Umbelliferaceae (2 species each), and Malvaceae, Betulaceae, Boraginaceae, Cruciferae, Rutaceae, Clavicipitaceae, Myrtaceae, Junglandaceae, Lauraceae, Liriaceae, Verbenaceae, Papilonaceae, Pinaceae, Fagaceae, Rosacae, Rutaceae, Caprifoliaceae, Solanaceae, Tilaceae, Leguminosae, Crassulaceae, Valerianaceae, Urticaceae, and Vitaceae.

The 44 identifiable plants were associated with a total of 95 medicinal uses, of which the most common were treatment of common cold, influenza, sore throat, bruising and "pains", constipation, diarrhoea, boils, colic, and "urinary irritations", as well as diuresis, improving circulation, helping digestion, stopping bleeding, healing wounds and burns, eliminating warts, and even stimulating hair growth. Of the 95 uses cited, 14 were veterinary.

Of the 95 medicinal uses cited, 84 (89%) correspond to established medicinal uses of these 44 plant species.

Four of the 44 plants were identified by at least one respondent as potentially toxic. Perceived efficacies of the 44 plants are summarized in the figure.

Conclusions

The results of the present study allow us to conclude:

1) that the Terra Chá is certainly an area of ethnobotanical interest, clearly meriting further study;

2) that reported traditional uses of medicinal plants in this area coincide in most cases with established uses, supporting the utility of the information obtained.

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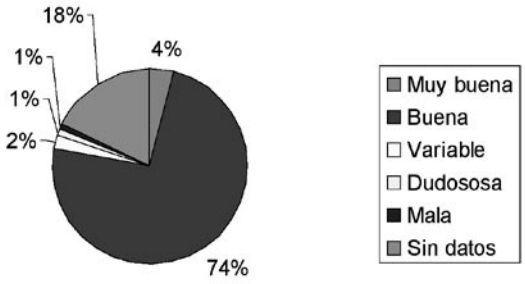
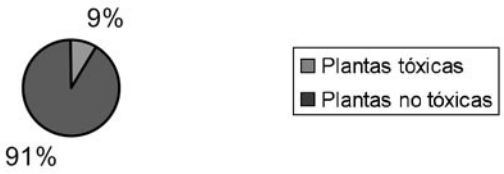


Eficacia atribuída por los informantes al tratamiento popular con plantas citadas e identificadas.



En 4 de las 44 plantas citadas e identificadas, los informantes avisaban de su posible toxicidad.

Ethnobotanique et patrimoine historique de la flore médicinale au Maroc.

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Résumé

L'utilisation du patrimoine historique écrit dans le domaine de la biodiversité floristique et celui des plantes médicinales, en particulier, s'avère d'une importance capitale.

En effet, plusieurs recherches ont mis en relief des manuscrits arabes de Botanique de grande importance qui ont grandement modifié les données que nous possédons sur l'histoire de la botanique.

L'un des plus importants de ces manuscrits est le «Umdat at-tabib fi ma'rifati an-nabâti li kulli labîb» (c'est à dire: la référence du médecin en ce qui concerne la connaissance des plantes à l'usage de tout esprit judicieux). Cet important manuscrit de Botanique est attribué à un savant andalou du VI ème siècle de l'Hégire qui est Abu-l-Kheyr Al-Ichbili.

Quatres siècles plus tard, Al-Wazir Al-Ghassani, savant marocain de l'époque saâdienne, redonna vie à l'œuvre d'Abu-l-Kheyr Al-Ichbili en s'en inspirant largement dans son traité de matière médicale intitulé «Hadiquat al-azhar fi charh mahiyat al-ûchûb wa l'-aqqar» (c'est à dire: le jardin des fleurs pour l'exposition des caractères des herbes et des drogues).

Le XIIème siècles fut l'âge d'or de la botanique médicale par excellence. Trois noms andalous dominent cette époque. Il s'agit d'Abdallah Ben Sallah, Abû-l'Abbas En-Nabati et Ibn Al-Baytar. Leurs œuvres de Botanique médicale sont d'une importance indéniable, notamment, le traité des simples d'Ibn Al-Baytar.

Ainsi au cours de cet exposé nous saisissons l'occasion pour souligner l'histoire des applications et des usages des principales plantes médicinales, particulièrement en régions méditerranéennes occidentales.

Mots-clefs: Ethnobotanique, Patrimoine historique, Plantes médicinales, Maroc.

Introduction

Les vertus des plantes médicinales sont connues et employées depuis des siècles sous formes d'infusion, de décoction, de cataplasmes, de teintures et beaucoup d'autres formes pour se soigner et s'embellir. Les effets obtenus se sont transmis de génération en génération sans qu'on connaisse exactement les constituants et le mode d'action de ces substances.

Les marocains ont leur part utilisé depuis les temps anciens les plantes comme source de médicaments, d'alimentation et d'embellissement. Cette pratique de la médecine traditionnelle a pu se maintenir et s'enrichir jusqu'à nos jours grâce à la situation géographique, aux traditions socio-économiques et aux particularités du Maroc.

Au Maroc, il existe dans chaque région géographique une automédication familiale basée sur les connaissances ancestrales. Certaines espèces de plantes sont fréquemment employées dans le traitement de plusieurs maladies dont les plus importantes sont les affections du tube digestif, les affections du système respiratoire, les affections cardio-vasculaires et les affections dermatologiques.

D'ailleurs, l'université quarawiyine en 1893 a délivré des diplômes de médecine où on note que les candidats devaient connaître les plantes, les herbes médicinales et les fleurs, leurs vertus actives ou négatives, leurs noms, leurs genres et leurs espèces. Ils devaient savoir distiller les plantes et les administrer aux heures convenables.

Parmi les savants de la thérapeutique maghrébine ancienne citons: Ibn Zohr, Mohammed Assaquri, Ibn Tofail, Aboul kassim, Az-Zahraoui, Ibn Al Baklarich, Ibn Al Baytar, Abderrahman El Fassi, Abdelwahed Ibn Ahmed Addarraq.

Au fil des siècles, les méthodes analytiques modernes ont permis à la médecine par les plantes, de passer d'un usage strictement empirique à un emploi fondé sur des bases scientifiques.

L'utilisation des plantes médicinales au Maroc

Depuis l'antiquité, l'Homme a choisi pour se soigner des moyens simples à l'exemple des plantes qu'il avait à sa disposition, on parle de médecine traditionnelle qui est définie par l'organisation mondiale de la santé (O.M.S.) comme étant l'ensemble de toutes les connaissances et les pratiques, explicables ou non pour diagnostiquer, prévenir ou éliminer un déséquilibre mental, social ou physique en s'appuyant exclusivement sur l'expérience vécue et l'observation transmise de génération en génération par voie orale ou écrite (Nayab,1996).

Durant longtemps les peuples n'ont eu que les plantes pour se soigner qu'il s'agisse de maladies bénignes ou sérieuses. Chaque pays possède ses propres méthodes pour la sélection et utilisation des plantes utiles pour leur médication.

En Afrique les herboristes traditionnels sont plus nombreux que dans n'importe quel autre continent ceci est dû au commerce et l'influence de la culture arabe car les plantes médicinales ont fait l'objet d'échange commercial entre le Proche-Orient, l'Inde et l'Afrique du Nord-Est depuis trois mille ans environ, parmi les régions d'Afrique qui pratiquent cette médecine et les peuples nomades Berbères au Maroc, pour ces peuples la guérison dépend d'un monde magique dans le quel l'esprit influe sur la maladie et la mort, donc dans la culture berbère la possession par un djinn (esprit) est une cause principale de maladie. Le guérisseur prescrit des plantes aux propriétés magiques pour rétablir la santé. Si le patient ne se guérit pas on le soupçonne d'être victime du "mauvais œil"

La pharmacopée traditionnelle au Maroc est donc un système qui utilise les ressources naturelles et met en œuvre un savoir et une technique issue de la tradition orale et de survie de la médecine arabe classique. Le savoir thérapeutique se

transmet à l'intérieur du groupe, celui-ci tout en gardant une relative identité culturelle.

Des pratiques diverses dans le domaines de la phytothérapie et de la pharmacopée sont parfois cumulées par la même personne, mais la spécialisation ne porte pas toujours sur les procédés mais sur un type de maladie: stérilité féminine, épilepsie, paralysie, maladies des yeux, …Il existe encore des «saints» se réclamant de la médecine arabe classique et de nombreux parmi eux utilisent des traitements magico-religieux à base de plantes diverses.

Donc les pratiques médicinales populaires s'étaient transmises de génération en génération, et la plupart des herboristes étaient l'œuvre de médecins qui reprenaient très largement les travaux des auteurs classiques, mais certains s'appuyaient directement sur leur propre expérience donc la médecine traditionnelle s'est enrichie par les expériences personnelles.

Espèce utilisée	Famille	Mode de traitement	Partie utilisée	Effets thérapeutiques
Allium sativum L.	Liliacées	Usage local	Bulbe	Contre la chute des cheveux
Cinnamomum zeylanicum Nees	Lauracées	Usage local	Ecorce	Poudre calme les maux dentaires
Citrus limonium Risso.	Rutacées	Usage local	Fruit	contre les migraines de tête par application sur le front
Chenopodium ambroisoides L.	Chénopodiacées	Usage externe	feuille	Soigne les abcès
Lepidium sativum L	Crucifères	Usage externe	graine	Réchauffée = application directement en emplâtre pour mûrir les abcès
Citrullus colocynthis (L.) Schra	Cucurbitacées	Usage externe	Pulpe de fruit	Employée en compresse sur les morsures de serpents
Thymus vulgaris l.	Labiées	En Infusion	Parties aériennes fraîches	Contre les douleurs abdominales
Lippia citriodoral H.B. & K.	Verbénacées	En Infusion	Feuilles	Agité ou présentant des troubles digestifs
Ocimum basilicum	Labiées	En Infusion	Feuilles fraîches	Contre les douleurs gastriques, affections respiratoires et diarrhées
Lavandula officinalis Chaix *ex* Villars	Labiées	En Infusion	Sommités fleuries & Feuilles	Contre tous les refroidissements
Papaver rhoeas L	Papavéracées	En Infusion	Pétales	Contre les affections respiratoires
Chenopodium ambrosioides L	Chénopodiacées	En Décoction	Feuilles	refroidissements, les affections pulmonaires et rhumatismales
Lepidium sativum L	Crucifères	En Décoction	Graines	refroidissements et Les évanouissements
Thymus vulgaris L	Labiées	En Décoction	Parties aériennes fraîche	Refroidissement, rhume et rhumatismes
Marrubium vulgare L.	Labiées	En Décoction	Plante entière	Traitement du diabète et des vers

Tableau résumant l'utilisation de certaines plantes en médecine traditionnelle (El omari & Mouhib, 1997; Anonyme, 1997; Mimoudi; Sijelmassi, 1996. Anonyme, 1994; Nayab, 1996).

Conclusion

La recherche pharmacologique tend donc à donner une base scientifique à la médecine traditionnelle, fondée sur l'usage des plantes médicinales. Il est certain toutefois que le réexamen des plantes médicinales en vue d'évaluer l'activité et l'éventuelle toxicité dans l'usage médical traditionnel, on peut également découvrir des molécules et des structures nouvelles intéressantes pour la médecine moderne.

En Afrique les deux tiers de la population se soignent encore par la pharmacopée traditionnelle, et la médecine n'a jamais supplanté totalement la médecine par les plantes. Ainsi les chercheurs pluridisciplinaires découvrent tous les jours dans les plantes africaines des médicaments nouveaux selon certaines études de l'association pharmacienne inter-africaine 70% des médicaments importés en Afrique des pays occidentaux peuvent êtres remplacés par des remèdes médicinaux traditionnels avec des résultats équivalents (Mouhib & El omari, 1997).

Selon L'O.M.S. plus de 75% de la population mondiale est assistée par la médecine traditionnelle; mais dans ce dernier cas ces plantes ont été souvent des substances particulièrement dangereuses et éventuellement toxiques. L'intoxication thérapeutique causée parfois par les surdosages des produits dangereux à titre d'exemple: Euphorbes, Datura, Jusquiame, etc.

Donc le système thérapeutique est l'exemple d'une fusion remarquable entre une tradition locale tirant l'essentiel de ses ressources de l'environnement naturel et un savoir séculaire se rattachant à la médecine arabo-islamique, cette pratique reste vivante au Maroc comme l'atteste le nombre important des tradipraticiens.

Des efforts énormes sont déployés pour éviter le danger d'oubli qui menace cet héritage culturel oral. Ainsi L'Institut des Plantes Médicinales et Aromatiques (établissement universitaires de recherche dans ce domaine crée il y a deux année)

lance différentes enquêtes et travaux de terrains au Maroc permettant de transformer des traditions orales disséminées et éphémères en un savoir écrit synthétique et accessible à tous, garant de la pérennité de ces connaissances.

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Isolation of an antimicrobial compound from a South African Rosaceae species.

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The active components of approximately 25% of pharmaceuticals prescribed by doctors in developed countries originate from flowering plants[1]. This has led to a revival in interest in the medicinal properties of indigenous plants. It is claimed that many South African species belonging to the Rosaceae family possess medicinal properties[2]. Antimicrobial properties of a member of this family, an indigenous tree, often regarded as an invader, was investigated. Solvent extracts of the leaves and flowers were tested for their activity against a number of pathogenic strains of bacteria, fungi and yeasts. The extracts of one of the solvents, petroleum ether, inhibited the growth of *Staphylococcus aureus* and *Bacillus subtilis.*

The growth inhibition of these bacteria, when exposed to certain extracts and fractions, was used as a bioassay in the isolation of the active compounds. Purification of the active extracts was carried out using solvent extraction, liquid-liquid partitioning, column chromatography and preparative thin layer chromatography (PTLC). TLC was used throughout to follow the bioactive components.

The active compounds have been isolated and structurally elucidated using GC-MS and NMR. Both compounds have previously been isolated from a plant belonging to a unrelated family and are known for their antimalarial, anti-tumour promoting and anthelmintic properties.

The Rosaceae specie investigated, being in abundant supply, is an excellent source of anthelmintic agent and is easily accessible to rural communities. The use of these plant extracts as an anthelmintic agent is currently being patented.

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Traditional medicine and pharmacopoeia among the Isoceño-Guaraní (*Bolivian chaco*)

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Key words: Medicinal plants, Ethnopharmacology, Guaraní, Chaco, Bolivia, Traditional medicine, shamanism.

Introduction

Isoceño-guaraní belong to the extended Guaraní group, dwelling in Brazil, North Argentina, Paraguay, and Bolivia. In Bolivia, Isoceño are around 6000 people. They live in Izozog, an area located in the Cordillera Province, Santa Cruz Department. Isoceño-guaraní are permanent agricultors. They use a sophisticated system of irrigation from the nearby Parapetí river, allowing them to grow crops in semi-arid conditions.

Most valued staple food is maize, gift of the god *Aguara Tumpa* himself, from which Kägui, a ceremonial fermented drink is prepared. Also, food is processed from bean *(Vigna unguiculata),* manioc, sweet potato, pumkin, and products collected from the wild, such as Iguopei *Prosopis* spp., *(Fabaceae)*, Kumbaru *Geoffrea decorticans* (Fabaceae), Yuai *Ziziphus mistol* (Rhamnaceae), *Bromelia serra* (Bromeliaceae).

The Isoceño society is placed under the leadership of *Mburuvicha* (captains) for moral authority, and *Paye* (shamans) for religious authority.

Methodology of work

Under the supervision of the 3 *Paye* and their assistants, plants were collected in different ecosystems around the communities: forest alonside the Parapeti river, “algarrobales”, “sotales”, “choroquetales”, (predominancy of *Prosopis* spp., *Schinopsis* spp., and *Ruprechtia trifolia* respectively) and in the domestic space, around houses.

Plants names and uses were recorded, herbarium specimens were completed.

Open interviews were realized, with men and women from the communities speaking freely on diseases and treatments.

No midwives were interviewed.

Herbarium specimens were identified in the Herbario Nacional de Bolivia, and send to specialists.

A final 3-days workshop in May 2001 allowed us to check all our data with the *Paye* and all persons concerned.

Overview of the isoceño ethnomedicine

Diseases of super-natural origin

Paye are the one in charge of the well being and prosperity of the community in its whole.

Apart from curing physical disease, *Paye* are also requested to detain plagues or hazardous natural events, such as drought, inundations, game vanishing etc. *Paye* are also able to predict future and interpret dreams. In other words, the *Paye* is an intermediate between the present world and the supernatural world, a position shared by all shamans.

The *Paye* (or “good” shaman), is a person inhabited by a benevolent spirit, and has his counterpart in the person of the Mbaekua considered as the one from which evil happens: nevertheless this apparent simplification in roles is not that clear, as boundary *Paye-Mbaekua* is perceived wavering and always questioned.

When *Mbaekua* try to cause death, they introduce in their body victims what is designated in local spanish as “gusano/ bicho” (worm), called in guaraní Yzi. Disease caused by above mentioned Iya spirits are generally considered as far more benign, as generally no “worm” is introduced in the body. Then depending upon the animal or object used as medium for transmitting Yzi, or the kind of *Iya* spirit incriminated, the disease is classified as “simple” or “complicated”.

Disease aetiology is highlighted thanks to the *Paye* powers: in fact, its main and most important duty is to find the real origin of the disease: or induced by some malevolent *Mbaekua,* or caused by some offended *Iya,* or “natural”. Without no doubt, isoceño ethnomedicine is of etiological essence, and as long as the very cause of the disease is not highlighted, no stable health improvement can be expected: in this perspective it is not surprising that the treatment is influenced both by aetiology and symptoms.

In case of an *Mbaekua* disease the first task of the *Paye* is to extract the worm *Yzi* from the body patient. This is considered very often as being very hazardous for the *Paye* himself, in great risk of contamination. Also, in case of chronic severe disease many “extractions” must be performed, because the “mother of the worm” did have plenty time to reproduce inside the patient body, and repeated sessions are done, until the final extract of the “mother”.

The extraction of *Yzi* is performed in presence of the family and relatives of the sick person. The *Paye* smokes restless local tobacco, wrapped in a maize leave: the smoke is directed over the body patient, for the *Paye* to read signs. Alcohol can be also used, swallowed and spitted over the body patient. No hallucinogenic plant is used during this session, nor actually, nor in past times. During the smoking session, the *Paye* sings in low voice ritual songs calling for allied spirits, aiming to help him in the diagnostic, calm the “worm” inside the patient, and help for its extraction. The *Paye* extract the

worm by sucking the patient's skin, then spits it out, and deliver it to the relatives, which are in charge of burning it. For expulsion, some plants are most likely to be used by the *Paye*: among them, the milky sap of any Kurupikai *(Asclepias boliviensis, A. curassavica or Sapium haematospermum),* is dropped in the patient nostrils in order to get rid of *Yzi* when located there. Mboiyu *(Rhipsalis baccifera)* has a similar use, and Kavopaye guasu *(Senecio deferens)* is used by *Paye* after *Yzi* extraction: leaves are applied as poultice where sucking occurred, this in order to help skin and health recovery. When the "mother of the worm" is extracted, the *Paye* give instructions for the treatment continuation, which is under the responsibility to his assistant. Sometimes, it is considered that the extraction of *Yzi* and the recitation of specifics songs (related with some animal origin for example) is sufficient for the sick to recover. Despite knowing perfectly all plants and other kind of remedies from animal or mineral origin, the *Paye*, apart from giving instructions, do not handle any of them. In fact, remedies are prepared and administered by his assistant who generally knows few curatives or preventives songs, and, of course do not possess *Paye* powers.

Diseases of natural origin

In that case, when the intervention of *Mbaekua* or any *Iya* is not suspected, the patient does not consult the *Paye*. He ask just for the help of the *Paye* assistant. In that case, products from the pharmacopoeia are directly used.

Isoceño-Guarani pharmacopoeia

The Isoceño-Guarani pharmacopoeia is based mainly of plant parts and animal by-products. Also some mushrooms can be used. No mineral was mentionned to us. Hundred and eighty-nine species over the 306 different vegetal species collected were designated as having a medicinal use (61%). More than 22 species of animals were indicated as posible cure for various diseases.

If considered individually, plants are more prone to cure gastro-intestinal disorders, dermatological problems, fever, urinary problem.

When used alone, animal by-products are mainly recommended for snakes bites, pain, swellings, ear and eye pain, respiratory disease. Plants and animal by products are also very much in use against haemorrhages fever, muscular and rheumatic pain.

The average number of medicinal indications by species is higher for animals (1,6) than for plants (2,9).plants and animal by-products are generally mixed up in complex remedies. Plant or animal product can be used alone, or they can be mixed up with other plants, or animal by-products for enhancment of activity.

For external administration, many different aplication have been recorded such as:

oultices from plants, direct application of animal flesh, ointments with mashed plants mixed up in selected lukewarm animal grease, medicinal soaps (medicinal plants and animal grease), baths, massages with animal grease, soaking of plants in animal grease previous to application, calcination of bark or fruit's plants to obtain ashes, sprinkled on wounds, or dermatosis

For internal administration, the following preparation can be made:

decoction or infusion of plant/animal part drunk, animal by-product eaten, inhalation of smoke from plant put over live charcoal, breathing of crushed plant

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Supercritical fluid extraction of *Lippia scaberrima*

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Lippia scaberrima Sond, an indigenous, aromatic and medicinal South African plant, is rich in essential oil which has not yet been commercially utilized. The plant has been shown to exhibit antimicrobial activity and an infusion of the leaves is commonly used by indigenous communities as a remedy for mouth infections, haemorrhoids or as a purgutive[1]. Other Lippia species have been shown to have pediculocidal and scabicidal properties.

The supercritical fluid extraction (SFE) of the fragrance components contained in plants is a developing field for the industrial application of supercritical fluid processing[2]. Liquid CO_2 and supercritical CO_2 extracts give yields similar to that obtained by steam distillation, with the advantage that the CO_2 extracts are subjected to low temperatures and are therefore closest in composition to the headspace aroma in the botanical[3].

The essential oil of *Lippia scaberrima,* obtained using low CO_2 densities, was investigated and compared to the steam distillate. Different techniques of product collection as well as the effect of varying temperatures and pressures on the yield of specific compounds were investigated. Results showed that the terpenes could be separated from the paraffins and fatty acids. GC and GC-MS were used to identify the terpene content of the extracts and to follow the supercritical fluid extraction process. Antimicrobial tests were performed on all fractions collected. 1,8-cineole, a powerful antimicrobial agent, as well as carvone, a flavourant, were identified as major components of the terpene fraction.

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Alimentary and medicinal use of Annonaceae in the etiology of atypical parkinsonism in the French West Indies.

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Key words: Acetogenin, *Annona*, Annonaceae, complex I, environmental toxicity, isoquinoline alkaloid, Parkinson's disease, progressive supranuclear palsy.

A cluster of atypical parkinsonian syndromes in the French West Indies. In Guadeloupe, 75% of the parkinsonian patients have atypical clinical features, against 20% in highly developed regions of the western world. The Guadeloupean patients are clinically and histopathologically described as having progressive supranuclear palsy (PSP) or parkinsonism with motor neuron disease. These diseases are not responsibe to anti-parkinson drugs such as L-DOPA, and lead inexorably to death. The ethnic origins of patients are diverse, suggesting the action of a local pathogen rather than a genetic abnormality. Indeed, a case-control study demonstrated a strong association between the occurrence of these syndromes and the regular consumption, for alimentary or medicinal purposes, of plants of the Annonaceae family, especially *Annona* fruit trees (Capparos-Lefebvre 1999, 2001). Among them, *Annona muricata* L. (soursop, guanabana, graviola, corossol; Figure 1), well known for its edible fruit, is a classical "cooling" plant of creole popular phytotherapy. Its ground seeds are an insecticide. Its leaves are used externally in dermatosis. Infusions of the leaves are recommended for heart failure and digestive problems, and are frequently used to maintain a "healthy equilibrium" or as a sedative, from early childhood to old age, sometimes on a daily basis (Longuefosse 1996).

Mitochondrial dysfunction, Annonaceae and parkinsonism. Reduced activity of the mitochondrial respiratory chain complex I (NADH ubiquinone oxydoreductase) has been shown in several neurodegenerative disorders, including Parkinson's disease and PSP (Albers 2002, Beal 2000). Annonaceae are chemically very homogenous, and contain at least two types of complex I inhibitors: isoquinoline alkaloids (weak activity) and annonaceous acetogenins (high potency). To investigate whether they contribute to the phenotypes observed in Guadeloupean patients, chemical analyses and biological evaluations of alkaloids and acetogenins isolated from A. *muricata* were performed.

Neurotoxicity of the isoquinoline alkaloids of A. muricata. Isoquinoline alkaloids are present in all the parts of *A. muricata,* including the fruit (Lebœuf 1982, Hasrat 1997). Being present in teas, they may underlie the properties attributed to this plant by traditional medicine.

The implication of isoquinolines in the etiology of Parkinson's disease has been studied, but the results have been contradictory, particularly with respect to their mode of action (interaction with dopamine receptors and with monoamine transporters...). Using primary cultures of embryonic rat mesencephalon, Dr Lannuzel *et al.* have shown that the alkaloidic totum of the bark of *A. muricata,* as well as coreximine and reticuline (Figure 2), induce apoptotic death of dopaminergic and of other neurons *in vitro*, via metabolic deficiency (EC_{50} = 10 - 100 µg/mL at 24 h for dopaminergic neurons) (Lannuzel 2002).

Neurotoxicity of Annonaceous acetogenins. Annonaceous acetogenins constitute a unique and structurally homogenous class of polyketides. They are specific to the Annonaceae and can be found in most parts of these plants. Their biological activities and cytotoxicity gave rise to great hopes in the field of antitumoral research. Some acetogenins are among the most potent inhibitors of complex I known. Despite their relative lipophilicity and poor solubility in water, acetogenins – which are likely to fluidify in hot water – are present in herbal teas made from the plants (Guérineau 2003).

Annonacin (Figure 3), the major acetogenin of *A. muricata*, was proved to be neurotoxic:

- *In vitro*: Dr Lannuzel *et al.* have shown that in primary cultures of rat mesencephalon, annonacin induces the apoptotic death of all neurons and glial cells. It is 500 times more toxic than reticuline for dopaminergic neurons (Lannuzel 2003).

- *In vivo*: We carried out a subchronic (4 weeks) continuous systemic (i.v.) intoxication of Lewis rats with annonacin, at doses of 1.26, 3.8 and 7.6 mg/kg/day. Animals showed no signs of systemic illness or behavioural anomalies such as akinesia or postural instability. Qualitative and quantitative immunocytochemical and histochemical analyses made throughout the brains revealed widespread neurodegeneration at all doses. It was severe in the substantia nigra (SN) and in the basal ganglia, implicated in movement control (Figure 4). Microglial and astrocytic reactions were observed in the striatum and SN (Champy 2004). These observations are similar to the anatomopathological findings in autopsied Guadeloupean patients (Capparos-Lefebvre 2001).

Conclusion

Further epidemiological, toxicological and chemical studies are required, but these studies provide support for the hypothesis that life-long exposure of the French West Indian population to acetogenins and alkaloids from Annonaceae may induce a cumulative toxicity leading to the atypical parkinsonian syndromes observed in patients. This could also be the case among other communities from tropical areas. If so, this serious health issue might effectively be dealt with by preventive measures.

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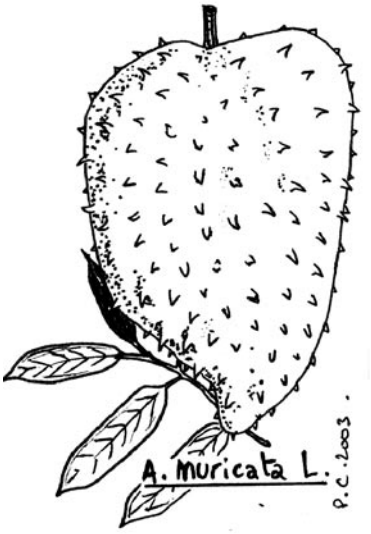

FIGURE 1. *Annona muricata* L., fruit and leaves (x 0.2).

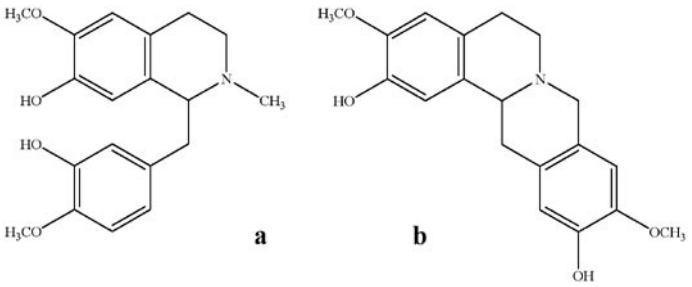

FIGURE 2. Structure of the major alkaloids of *A. muricata*:
Coreximine (**a** Benzyl-tetrahydro isoquinoline) and reticuline (**b** Tetrahydroprotoberberie).

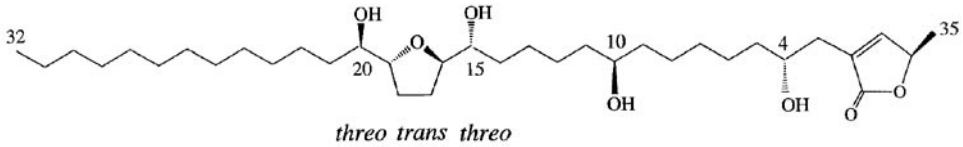

FIGURE 3. Structure of annonacin.

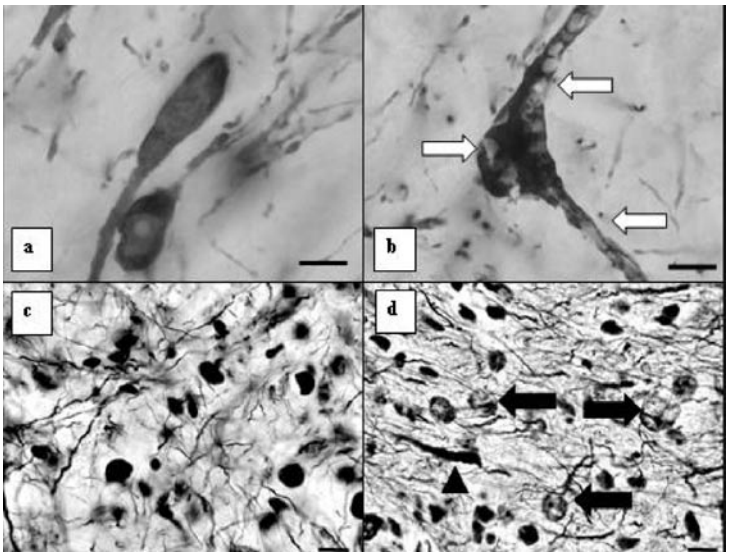

FIGURE 4. Neurodegeneration induced by annonacin *in vivo* in rats.
Dopaminergic neurons (stained by immunochemistry with an antibody against tyrosine hydroxylase; a, b) and Bodian silver stained cell nuclei (c, d) in the *substantia nigra* of a vehicle-treated rat (a, c) and of a rat infused i.v. for 4 weeks with annonacin at 3.8 mg/kg/d (b, d). Swollen nuclei (black arrows) and enlarged vacuolized cell bodies and neurites (white arrows) were typical of the degeneration observed. Dystrophic fibres could also be seen (arrow head). Scale bars: 10 µm.

Potenciales terapéuticas del extracto de *Mangifera indica* L. (Vimang), un nuevo producto natural cubano

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Un extracto acuoso de la corteza del tallo de *Mangifera indica* L (VIMANG) ha sido ampliamente usado en Cuba en prácticas etnomédicas y medicina tradicional con resultados positivos en el incremento de la calidad de vida de pacientes con tumores malignos, procesos inflamatorios y otras patologías. Atendiendo a las investigaciones etnofarmacológicas realizadas y con el objetivo de determinar las propiedades terapéuticas del extracto y sus mecanismos de acción farmacológica se han desarrollado diversos estudios preclínicos y clínicos que se ilustran en el presente trabajo.

Investigaciones fitoquímicas desarrolladas con el extracto de *M. indica* L han permitido determinar la presencia de 7 constituyentes polifenólicos, con la glucosilxantona magiferina como componente mayoritario y diferentes microelementos como zinc, cobre y selenio. Estudios *in vitro* e *in vivo* han demostrado que el extracto posee potente actividad antioxidante, acción anti-inflamatoria, analgésica y propiedades inmunomoduladoras. Estas acciones farmacológicas están relacionadas con su capacidad secuestradora de diferentes especies reactivas del oxígeno, la inhibición que produce sobre la liberación de óxido nítrico y diferentes cicocinas pro-inflamatorias en macrófagos activados, modelos de shock endotóxico, entre otros biomodelos. El extracto ha mostrado además capacidad inhibitoria de la actividad de la fosfolipasa A2 de secreción y la producción de eicosanoides, así como efectos que denotan su acción neuro y hepatoprotectora en modelos biológicos apropiados para el estudio de estos procesos. Más recientemente, atendiendo a las evidencias de efectividad preclínica y considerando su seguridad toxicológica, se han desarrollado diversas investigaciones clínicas con una crema VIMANG utilizada en el tratamiento de pacientes con dolores musculares y osteoarticulares, dermatitis y otras enfermedades dermatológicas e inflamatorias. Estos estudios han permitido comprobar la eficacia clínica del extracto como analgésico, anti-inflamatorio y en diversos patologías dermatológicas. Otro estudio, utilizando tabletas VIMANG como suplemento antioxidante en pacientes VIH/SIDA han demostrado la eficacia de este producto natural para reducir parámetros de estrés oxidativo asociados a la progresión del SIDA y en elevar los índices de calidad de vida en estos pacientes. Diversos estudios clínicos y nutricionales se están desarrollando en estos momentos, con el objetivo de conocer y demostrar las potencialidades terapéuticas de este extracto natural.

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Investigations biologiques et phytochimiques de *Hymenocardia acida* Tull (Hymenocardiaceae) plante à usage populaire en médecine traditionnelle guinéenne.

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Summary

Hymenocardia acida Tull (Hymenocardiaceae) is a very common shrub in tropical africa. The plant is very well known and used among the african traditional healers. In Guinean traditional medicine, the leaves, bark and root are widely against dermic infections, hypertension, inflammatory diseases…

With a minimal inhibited concentration of 30µg/ml, the chloroformic extract of the leaves showed an in vitro antibacterial effect against *Bacillus cereus* et *Staphylococcus aureus.* All the tested extracts were devoid of any activity against the other tested bacteria, fungi and virus. The methanol extract of the leaves exhibited an inhibitory effect on both alternative and classical pathways of complement system with IC_{50} of 60.34µg/ml and 13.32µg/ml, respectively.

Mots clefs: *Hymenocardia acida*, Médecine traditionnelle, Activités antimicrobiennes, antiinflammatoires et antiHTA, alcaloïdes, Hyménocardine.

Introduction

Hymenocardia acida est une plante largement employée en médecine traditionnelle guinéenne dans le traitement de la jaunisse, de l'éclampsie de grossesse, des maladies inflammatoires, des dermatoses et de l'hypertension artérielle. Les jeunes rameaux ferrugineux de la plante sont couverts d'une poussière rousse ou jaune ocre, le bois est dur et cassant [(1,2,3)]. De par sa fréquence d'utilisation, ses multiples indications en médecine traditionnelle et son abondance dans la flore guinéenne, la présente investigation a été menée dans le but d'une exploitation rationnelle de l'espèce.

Materiel et méthodes

Matériel végétal: Les échantillons ont été récoltés dans trois régions naturelles de la Guinée: Kindia (Basse Guinée), Kankan (Haute Guinée) et Mamou (Moyenne Guinée).

L'espèce a été formellement identifiée par le Département de Botanique du Centre National de Recherche et de Valorisation des Plantes Médicinales de Dubréka et un spécimen est déposé au niveau de l'herbarium du dit Centre.

- Préparation des extraits: Les drogues pulvérisées ont été soumises à une percolation exhaustive soit au chloroforme pour fournir un extrait apolaire soit au méthanol pour fournir un extrait polaire. Les extraits ont été concentrés sous vide. Les concentrations utilisées pour le test ont été de 1mg/ml avec une dilution de 0,5 pour les bactéries et champignons, 100µg/ml avec des dilutions de 50, 25,10 et 1µg/ml pour les virus.

Sur les résidus obtenus un criblage chimique au moyen des tests généraux de coloration et de précipitation et la chromatographie sur couche mince pour la détermination des groupes phytochimiques ont été réalisés [(4)].

Le fractionnement bioguidé et la purification des extraits ont été réalisés par une combinaison de la chromatographie sur colonne et de la chromatographie sur couche mince préparative [(5)].

- Microorganismes cibles:

Des tests biologiques par dilution *in vitro* ont été effectués au laboratoire de Microbiologie & d'Hygiène du Département des Sciences Pharmaceutiques de l'Université d'Anvers en Belgique sur des microorganismes pathogènes pour l'homme. Ces microorganismes sont des bactéries (*Bacillus cereus* ATCC14579, *Staphylococcus aureus* ATCC6538, *Pseudomons aeroginosa* ATCC15442, *Escherichia coli* ATCC8739), des champignons et lévures (*Candida albicans* ATCC10231, *Aspergillus niger* ATCC 16404, *Tricophyton rubrum* ATCC 10218) et des virus (*Herpès simplex* type 1, *Semliki forest* L 10, *Coxsakie* B2,*Vesicular stomatitis virus, Poliomyelitis virus Measles edmonton*). Le test antibactérien et antifongique a été réalisé par la méthode de dilution décrite par Vlietinck et Vanden Bergh [(6)].

L'essai sur le système complément, comprenant la voie classique et celle alternative a été réalisée selon la méthode décrite par Lasure *et al.* (1994)[(7)].

Resultats

Les échantillons de Kankan, Kindia et Mamou ont présenté un profil chromatographique identique. Dans les écorces de racine de *Hymenocardia acida* trois alcaloïdes parmi lesquels, Hymenocardine un alcaloïde peptidique ont été isolés.

Un fractionnement bioguidé par l'effet antibactérien sur *B. cereus* de l'extrait de base a identifié la fraction non polaire comme étant la plus active. La concentration minimale inhibitrice pour l'extrait apolaire des feuilles est de 30µg/ml ainsi que celle minimale bactéricide pour *B. cereus.* La concentration minimale inhibitrice est de 30µg/ml et celle minimale bactéricide de 60µg/ml pour *S. aureus. In vitro* l'extrait des feuilles présente également un effet inhibiteur significatif sur

les deux voies du système complément.

Une évaluation thérapeutique dans les conditions traditionnelles en collaboration avec le guérisseur et dans le milieu social de ce dernier a démontré l'effet antihypertenseur de l'extrait sur des patients volontaires de par une baisse des valeurs des pressions systoliques et diastoliques. L'impact positif de la plante sur l'éclampsie de grossesse a également été démontré au cours d'un essai clinique au service de la maternité de l'hôpital de Kankan [8]. Un topique préparé à partir de la fraction non polaire des feuilles a permis d'améliorer des cas de pyodermites au niveau du service de dermatologie du Centre Hospitalier Universitaire de Donka (Conakry) [9].

La présence de coumarines, de saponosides, et de tanins dans cette étude est conforme à celle réalisée au Nigeria en 1997sur une espèce du Katanga de l'ex-Zaïre [10,11]. Cependant, contrairement à une étude réalisée à Sérédou en 1982, la présence d'alcaloïdes dans les feuilles de *Hymenocardia acida* n'a pas été révelée [12].

La recherche fut négative dans notre étude pour les acides gras, les anthraquinones et les huiles essentielles. Du reste c'est la présence de l'hymenocardine qui a justifié la nouvelle classification du genre Hymenocardia dans la famille des Hymenocardiaceae en lieu et place des Euphorbiaceae [13].

Le fractionnement bioguidé à partir du *B. cereus* de l'extrait apolaire des feuilles Mamou a démontré une activité antibactérienne remarquable.

Des travaux antérieurs ont démontré également une activité antibactérienne de *Hymenocardia acida* en 1994 [14].

Conclusion

Les résultats préliminaires de ces investigations phytochimiques et biologiques ont permis de déceler la présence d'alcaloïdes, de coumarines, de flavonoïdes, de polyoses, et de tanins dans les différents drogues de *H.acida.* Les usages traditionnels de *H. acida* ont été supportés par cette étude. La détermination des activités, antibactérienne, antiHTA et antiinflammatoire des alcaloïdes isolés est en cours.

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Ethnopharmacological Knowledge in Moroccan and Andalusian Regions from the 13th Century

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Abstract

One hundred and fifty three plant species belonging to sixty seven botanical families cited in Ibn al-Baitar treatise (13th century) were selected for an ethno botanical comparative study undertaken in eastern Morocco and Andalucian districts in Spain. The authors investigated ethno pharmacological uses of all plant species with reference to traditional therapeutic applications contained in the treatise, in which 1172 herbal preparations were applied to treat fourteen disease groups. Actual ethno botanical data from Andalusian and Moroccan regions reveal that selected plant species were commonly used in contemporary traditional medicine, in 1108 and 713 herbal remedies, respectively. Three species, Lawsonia *inermis*, *Musa sapientium*, and *Argania spinosa* cited in Ibn al-Baitar treatise were employed in eastern districts of Morocco, but were not noted in Andalusia.

Résumé

135 espèces appartenant à 67 familles botaniques répertoriées dans Le traité des simples de Ibn al Baitar (13è siècle) sont sélectionnées pour une étude ethnobotanique comparative entre la région orientale du Maroc et l'Andalousie. Les données ethno pharmacologiques recueillies dans les deux régions sont comparées avec celles de ibn al Baitar dont 1172 préparations médicinales sont utilisées pour 14 groupes thérapeutiques. Les données ethnobotaniques de la région orientale du Maroc et de l'Andalousie sont respectivement de 713 et 1108 préparations traditionnelles.

Trois espèces, par contre, citées dans le traité des simples, *Lawsonia inermis*, *Musa sapientium*, et *Argania spinosa* qui sont d'utilisation courante au Maroc ont disparu des recettes médicinales traditionnelles de l'Andalousie.

Integrating Wik and Kugu (Australian Aboriginal) phytotherapeutic knowledge with Western science

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Key Words: Traditional Medicine; Aboriginal; Australia; Ethnobiology; Taxonomy.

Environmental degradation is impacting globally on biodiversity, including medicinal plant species, which are often a major component of traditional medicine and an important potential resource in pharmacy. Up to 80% of the developing world's population are dependent on traditional medicine for their primary health care (WHO 2002). It is thus important, not only to the welfare of the world's ecosystems, but also humanity, that knowledge is shared between the traditional custodians and western scientists to gain a better understanding - and thus ensure a sustainable and healthy future. Australia, with its high level of species endemism, also has high extinction rates: 13% of its native vegetation has been cleared, or substantially modified, since colonisation by Europeans just over 200 years ago (Australian Bureau of Statistics 2003). Loss, however, is not confined to species and habitats, but also local Indigenous languages and corresponding traditional knowledge.

"….my parents taught me the name of every tree, every plant, every fish….in twenty years this will all be forgotten. Young people today prefer to live in the busy world". (Wik-Alkan Traditional Owner 2002)

Aims

The main aim of this study was to record and integrate some remaining Australian Indigenous phytotherapeutic knowledge with western science. This required cognition of local taxonomies fundamental to communicating ideas about local biodiversity, as well as local medical paradigms. To overcome problems of representing these complex biological data within different ontologies a relational database was developed. The database serves as a repository of traditional knowledge, as well as facilitating inter-cultural communication and understanding between Wik and Kugu peoples and visiting scientists.

Methodologies

Ethnobotanical fieldwork in Australia was undertaken over 8 months (between June and September 2001 and June and November 2002). Local knowledge was recorded in collaboration with Wik and Kugu Elders and Traditional Owners, using anthropological techniques including participant-observation and structured/unstructured interviews (Martin 1995; Silverman 2001). Pupils from Aurukun's Koolkan School were involved with some of the data collection at the request of Elders. Voucher specimens were lodged at James Cook University (JCU) and Queensland State (BRI) herbaria.

To Wik and Kugu people the nature of knowledge is sacred, entrenched in Aboriginal Law; much is also secret. As a recorder of ethnobiological knowledge there is a huge responsibility to the traditional knowledge holders that this information will not be misused or misappropriated in any way. Memorandums of Understanding were developed to ensure that local peoples' Intellectual Property Rights (IPR) are protected. Cultural information recorded on the Aurukun ethnobiology database was entered against individual information sources. Flags are available to indicate if this information is either "sensitive" or "women's business".

The field study site, Aurukun, is a remote Aboriginal community (previously a mission) on the Gulf of Carpentaria, Cape York Peninsula (population c.1,300). The dirt road into Aurukun is impassable for up to 6 months of the year during the "Wet". The isolation and lack of economic opportunities has resulted in social deprivation: high unemployment, *"grog"* (alcoholism), domestic violence, poor health & low life expectancy. The Wik and Kugu people of Aurukun belong to 5 spirit clans, 15 language groups, and have numerous totemic affiliations. Most of the languages apart from Wik-Mungkan, the local *lingua franca,* have disappeared or are now spoken by only a few elderly people.

The country around Aurukun is rich in biodiversity and habitats including coastal mudflats, mangroves, tea tree swamps, wetlands, several river systems, savannah, eucalypt forest, vine thickets and riverine gallery forest. During the wet season the coastal strip is subject to massive flooding, at times reduced to a few kilometres wide. In contrast the open, predominantly eucalypt forest interior is vast. The country has been managed for thousands of years through burning regimes and sustainable use of natural resources. Resource management was embodied in Aboriginal tribal Law, which dictated when particular plants and animals could be used, and by whom. Pastoralism, mining, and the influx of feral animals and weeds are all having considerable impact on the local environment. A large area of Wik land will be clear-felled within the next few years to make way for an opencast bauxite mine. Aboriginal peoples have a strong emotional and spiritual connection to their traditional clan estates. A Wik-Mungkan traditional owner declared that the bauxite mine will mean *"… people won't be able to live on their own country anymore and will get sick."*

Aurukun ethnobiology database

Written using Microsoft Access, SQL and Visual Basic, the relational database developed contains in addition to cultural information, traditional phytotherapeutic use and processing; habitat type; taxonomic, biochemical and nutritional data; toxicity; voucher specimens; digital images; and references. The database integrates Wik/Kugu knowledge with western scientific knowledge and uses terms appropriate to local people and western scientists. To date there are over 1,000 scientific taxa recorded on the database. It is currently being used in Aurukun: as a tool to promote inter-generational

transmission of traditional knowledge in the local school; by the Aurukun Land & Sea Management Centre to assist conservation and land management. In addition, it is hoped that it will prove to be a useful resource in the area of health care via the local health clinic. As in western science, Wik people have developed a taxonomic system to communicate information about biodiversity. Binomials ('generic' and 'specific' terms) are used, as in the Linnaean system. Wik generic terms are habit based / contextual and include: *Wak* (herbaceous); *Kuuy* (vine); Yuk (tree); *Minh* (protein foods – edible birds, turtles, fish, etc.); and *May* (carbohydrate food – fruit, yams, etc.).There is a 'many to many' relationship between *Wik/Kugu* and scientific taxa which is represented logically in the relational database.

Discussion

Opar' is the Wik-Mungkan term that translates to "medicine", and is applied to both "bush medicine" and clinic prescribed pharmaceuticals. However, the Wik concept of what constitutes medicine differs from the western biomedical one. Opar' is not used solely to treat illness, but can be used in many other situations. Sickness in Wik terms does not only apply to one's body, but also to one's spirit, environment and society. There is also an overlap between foods and medicines: the nutritional & health giving properties of bush foods should not be underestimated.

Pharmaceutical scientists need to advise consumers on the safe, effective and appropriate use of all medicines, including traditional herbal medicines. Physicians also need to be aware of the healthcare choices and interventions of their patients. Detailed information about traditional herbal medicines is thus needed, including results of bioscientific studies on their pharmacological effects and active natural products.

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FIGURE 1. SAMINA KOWENKA WITH YUK KU'MUNGKAN, *MORINDA CITRIFOLIA* (RUBIACEAE) USED TRADITIONALLY AS A DYE, FOOD & MEDICINE.

FIGURE 2: SARAH EDWARDS WITH KUGU-UWANH "FATHER" (PEEP)
PRINCIPAL CULTURAL TEACHER AND RESPECTED 'SONGMAN', JOE NGALLAMETTA

Trial of Herbal therapy of *Mycetoma mycetomatis* In Sudanese patients

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This is a preliminary study on the effect of using plant (x) in the treatment of patients with black grain Eumycetma due to *Madurella mycetomatis.*

The use of herbal treatment in Sudanese patients has been well known over the country since a long time ago. Due to the mutilating surgical and prolonged medical treatment by drugs, which are very expensive and have side effects, people stared looking back on native treatment.

Stimulated by my own experience with plant (x) in the treatment of eumycetoma due to *M. mycetomatis* by which my own sister was treated several years ago, I decided to carry out a preliminary study on the same plant (x) for the treatment of similar cases.

The trial started since 1997, when 186 patients presenting with black grain eumycetoma whose diagnosis was confirmed by clinical and serological examination were included in this study, after obtaining the patients consent and ethical clearance from the Ministry of Health for using the herb for treatment.

The duration of treatment ranged between 1-12 months, depending on extent of the lesion and the response to treatment.

Out of the 186 patients, 74 (39%) did not continue the treatment and failed to come for follow up.

112 patients (61%) had the treatment and were followed up clinically and serologically until complete cure was obtained and for a 3-years period after complete cure.

2-4 weeks after applying the paste to the lesions, more sinuses opened up discharging the grains. This was followed by closure of the sinuses, decrease in size of the granuloma, and the skin going gradually back to normal. The duration depended on the extent of the lesion.

The crude plant and its extract were used in vitro sensitivity testing against *M. mycetomatis*. The work was carried out in the Mycology Laboratory, University of Khartoum.

Different concentrations of the crude plant were prepared and incorporated in the media (Sabouroud's Agar) after sterilization. The concentrations were 100 mg 50mg and 25mg per 100ml medium. A control was included with each test. The test and control were inoculated with equal inocula of *M. mycetomatis*.

After two weeks, when good growth in the control tubes was obtained, the test was red and it was found that the organism was inhibited by all the different concentrations of the crude plant.

The etanolic extract of the plant was tested in the same way using the following concentrations: 35 mg, 25 mg, and 15 mg per 100-ml medium. All the concentrations inhibited the growth of *M. mycetomatis*. Conclusion - according to *in vitro* and *in vivo* the herb is quite promising - clinically the herb is very effective - economically it is very cheap.

Insulinotropic activity of *Teucrium polium*

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The antihyperglycaemic activity of the crude extract of *T. polium* and one of its purified component were assessed by an *in vitro* investigation using isolated rat pancreatic islets.our date indicated that after treatment with a single dose at high glucose environment, the crude extract and the purified diterpene ester are capable of enhancing the secretion of insulin by the cultured islets by almost 230% and 153%, respectively. However, the pattern of insulin secretion by the treated islets did not changed compared to the untreated samples. The insulinotropic activity of the crude extract was also confirmed in STZ-diabetic rats that received orally a single dose of crude extract per day for six consecutive weeks. These data clearly indicates that *T. polium* capable of reducing blood glucose through its insulinotropic effects on pancreas.

Contemporary western herbal medicine – the interplay of tradition and of science.

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The resurgence of public interest in and demand for western herbal medicine has been well documented. In recent years, herbal medicine has become a widely accepted part of healthcare.(1) However, the effect of this mainstreaming on traditional herbalists (previously a marginalized group) has not been comprehensively explored. This paper shows that there is an uneasy relationship for the conjunction of different paradigms.

The broad aim of my research was to enquire into the practice of contemporary western herbal medicine in Australia, in particular the ways in which practitioners viewed their own practice, and the cultural context within which they operate. To this end, herbal practitioners in two Australian cities were interviewed. These practitioners are in private practice as independent prime-contact clinicians, treating patients independently of medical practitioners. The herbalists were interviewed concerning aspects of their clinical practice, including the relative place of herbal philosophy and the natural scientific assumptions of biomedicine.

Semi-structured interviews were conducted with 16 herbalists: 8 in Melbourne and 8 in Brisbane. The informants were asked about their thought processes during consultation, with regard to diagnosis and prescription, and the extent to which they are informed by concepts from both biomedicine and traditional herbal medicine. In particular they were asked about the idea of 'vital force', because vitalism remains a core assumption in all traditional herbal practice.

The respondents were 11 women and 5 men. In Australia, it is estimated that 75% of herbalists are women.(2) The respondents were aged between 25 and 50 years, and had been in practice between 2 and 20 years.

The methodological framework was grounded theory, including ethnographic research using basic social science based methods, predominantly interviews, surveys and participant observation.

Research findings: a brief discussion

All the respondents stated that they were doing 'something more' than biomedicine. All saw their herbal practice as not simply based on biomedical understandings of disease processes, but something different. Additionally, all practitioners saw their practice as being informed both by traditional herbal medicine, including the concepts of 'vital force' and 'physiological enhancement', and by biomedicine, which emphasises pathology.

Two thirds of the respondents expressed that they experienced some conflict between science and traditional herbal philosophy. Those who had most recently entered practice experienced the most conflict; those who had been longest in practice experienced least conflict.

The herbalists were questioned about their understanding of 'vital force'. This is an idea in traditional European herbal medicine that suggests that nature is a living entity. It posits that Vital force is found in all living things. Within this perspective, disease is a seen to be a result of a weakened vital force, and traditionally the aim of treatment is to strengthen the vital force, which is seen as the way to stimulate health. This idea is rejected within the field of biomedicine.

All but one of the respondents stated that they found the idea of 'vital force' to be a useful concept in practice and some practitioners stated that it was fundamental to their practice.

Fourteen of the sixteen respondents were of the opinion that traditional herbal philosophy is poorly documented. This is to be expected where oral transmission and practical example remain central in the training of traditional practitioners.

Summary of research findings

The major findings of this research can be summarized as follows

1. Australian herbalists are using current biomedical understandings but see themselves as not limited by this. Their therapeutic aims are informed by tradition, and include the concept of vital force, and the idea of physiological enhancement. The practitioners contrast this with biomedicine's focus on treatment of named diseases, which often involve clear pathological change.

2. All practitioners described their clinical practice as drawing on both traditional understanding and biomedicine. Some raised concerns as to a conflict between traditional practice and biomedicine, whilst others had found ways to accommodate the two perspectives.

3. Most respondents stated that they felt that the traditional aspects of herbal medicine were poorly documented. It appears that they learn integration, and the practical application of philosophy through practice, rather than during their training.

The commercial context of herbal practice appears to be at the forefront of most practitioners' minds. Thus although it was not an area identified by the interviewer, 50% of respondents expressed concern that herbal medicine was becoming increasingly product oriented rather than plant oriented -particularly at practitioner seminars.

The practice of contemporary western herbal medicine appears to be a rapidly changing field. The interplay of ideas that are based in natural science and those which originate from traditional practice should be eludicated.

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Pesquisaje de los efectos antiinflamatorio y/o analgésico en cinco extractos de origen marino

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Introducción

Los invertebrados y las plantas marinas han provisto una nueva fuente de sustancias farmacológicas para el estudio de mecanismos que median los procesos inflamatorios (Jacobs *et al.*, 1993). Se han descubierto nuevas clases estructurales de compuestos antiinflamatorios en la evaluación farmacológica de productos naturales marinos puros aislados de esponjas, gorgonias, corales y algas (Glaser *et al.*, 1989).

Debido a que en las costas cubanas hay abundancia de especies marinas, particularmente esponjas y celenterados aún poco estudiados, decidimos explorar los posibles efectos antiinflamatorios-analgésicos de cinco extractos provenientes de esponjas y gorgonias de nuestro archipiélago.

Palabras claves: antiinflamatorios marinos, fosfolipasa A_2, ciclooxigenasa, lipooxigenasa, analgésicos, esponjas, gorgonias.

Materiales y métodos

Las especies colectadas fueron: *Dysidea etheria* ***(De)***, *Ircinia felix* ***(If)***, *Tedania ignis* ***(Ti)***, *Plexaurella grisea* ***(Pg)*** *y Plexaurella dichotoma* ***(Pd)***. Los extractos se prepararon de acuerdo al procedimiento descrito por García y col, (1993), y fueron evaluados en los modelos de writhing inducido por ácido acético (Collier *et al*, 1968), inhibición de fosfolipasa A_2 de veneno de abeja (León *et al.*, 1984), edema de la pata de la rata (Neves *et al.*, 1993), edema de la oreja del ratón (Tubaro *et al*, 1986 y Young *et al,* 1984).

Como método estadístico se utilizó la prueba de Student a través del programa computarizado MICROSTA. Para el porciento de inhibición se utilizó la fórmula de Rao et al, (1993)

En la fig. 1 se observan los por cientos de inhibición de ***De*** en los modelos de inflamación en que este extracto presentó diferencias significativas que conjuntamente con la inhibición parcial de la fosfolipasa A_2 de veneno de abeja (dato no mostrado) conllevan a una inhibición de la formación de prostaglandinas. ***De*** también inhibió el edema de la pata inducido por serotonina tanto a los 30 como a los 60 minutos y las contorsiones inducidas por ácido acético en las tres dosis ensayadas (fig. 2).

En la Tabla 1 se observan los resultados significativos de ***If*** y en la Tabla 2 los del extracto obtenido de ***Ti***.

Los resultados de ***Pg*** en diferentes ensayos se muestran en la fig. 3. Se debe señalar que las contorsiones inducidas por ácido acético solamente fueron inhibidas significativamente por el extracto en la dosis de 5 mg/Kg (57% de inhibición).

El extracto obtenido de ***Pd*** como se muestra en la tabla 3, sólo tuvo efecto estadísticamente significativo en el edema de la pata inducido por histamina y en la inhibición de las contorsiones inducidas por ácido acético en la dosis de 20 mg/Kg (85%).

El análisis de los resultados permite suponer que los extractos estudiados muestran actividad analgésica en el modelo de contorsiones inducidas por ácido acético en ratón. En este modelo la expresión del ácido ribonucleico mensajero (ARNm) para COX-1 no se modifica y permanece constante durante 2 horas y el ARNm para COX-2 alcanza su máximo a los 90 minutos, mientras los niveles de prostaglandina E_2 alcanza el valor máximo en los primeros 30 minutos (Kusuhara, et al, 1998). Este es el tiempo que nosotros utilizamos en el modelo de las contorsiones inducidos por ácido acético y en el mismo predominan los niveles de prostaglandinas por lo que puede suponerse que las mismas se han formado por la vía de la COX-1.

Un grupo de los extractos estudiados manifiesta efectos antiinflamatorios a través de uno o más mecanismos de acción.

Entre los extractos estudiados encontramos que ***De*** y ***Ti*** inhiben parcialmente la acción de la fosfolipasa A_2 (veneno de abeja) que constituye un importante paso del proceso inflamatorio y ambos inhibieron el edema de la pata de la rata inducido por carragenina y el edema de la oreja del ratón inducido por aceite de croto. La mayor parte de los autores coinciden en que este modelo, al igual que el del edema de la oreja inducido por aceite de croto conllevan a la formación de PGE_2 (Krause y Kühne, 1994; Rengmongkol *et al.*, 1995) por lo que se puede suponer que otro de los efectos mostrados por estos extractos pudiera ser la inhibición de la vía ciclooxigenasa, lo que se correspondería con las acciones demostradas por el Luffariellolide y el Escalaradial, compuestos obtenidos de esponjas (Ireland *et al.*, 1993) al igual que estos extractos; también la indometacina inhibe la fosfolipasa A_2 a bajas dosis y, en dosis superiores, la formación de prostaglandina E_2 (Vane y Botting, 1995).Los resultados sugieren que los extractos que muestran actividad en los modelos de edema de la pata por carragenina y edema de la oreja por aceite de croto actúan inhibiendo la ciclooxigenasa-2.

En el caso de ***If*** además de inhibir parcialmente la fosfolipasa A_2 de veneno de abeja, inhibe el edema de la oreja inducido por ácido araquidónico. En este último modelo la mayoría de los autores admite que se forman leucotrienos y prostaglandinas, pero estas últimas en cantidades muy pequeñas, por lo que se plantea que es un modelo para evaluar fundamentalmente inhibidores de la vía lipooxigenasa (Young *et al*, 1984; 1993; Neves *et al*, 1993; Blazso y Gabor, 1995) por lo que suponemos que ***If*** inhibe esta vía. Esto se corresponde con la acción demostrada por las Pseudoterosinas A y E que fueron obtenidas a partir de gorgonias (Luedke, 1990).

En el caso del extracto ***Pg*** inhibe el edema de la pata de la rata inducido por carragenina y el edema de la oreja del ratón inducido por aceite de croto. Este extracto no muestra efectos inhibitorios sobre la fosfolipasa A_2 de veneno de abeja a la dosis ensayada, sin embargo si manifiesta su acción sobre la vía de la ciclooxigenasa.

En las fases iniciales del proceso inflamatorio intervienen la serotonina y la histamina. Es por esto que en nuestro pesquisaje incluímos los modelos de edema de la pata de la rata inducido por serotonina e histamina. Los extractos ***Pg*** y ***Pd*** inhiben el edema de la pata de la rata inducido por histamina y el extracto ***De*** el inducido por serotonina.

Los efectos inhibitorios observados mayores del 50% y producidos por dosis de hasta 50 mg/Kg con extractos totales se consideran satisfactorios (Payá et al, 1993), por lo que el conjunto de nuestros resultados permitió conocer las potencialidades de los organismos estudiados como posibles fuentes de compuestos con efectos antiinflamatorios y analgésicos.

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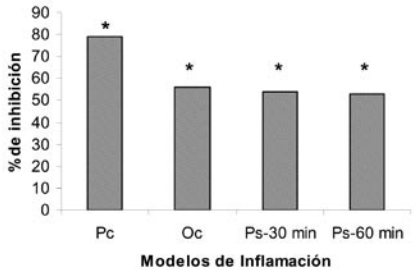

FIG. 1. Efecto de ***De*** en diferentes modelos de inflamación. pc: edema de la pata por carragenina, oc: edema de la oreja por aceite de croto, ps: edema de la pata por serotonina. (n=6) *P < 0.05

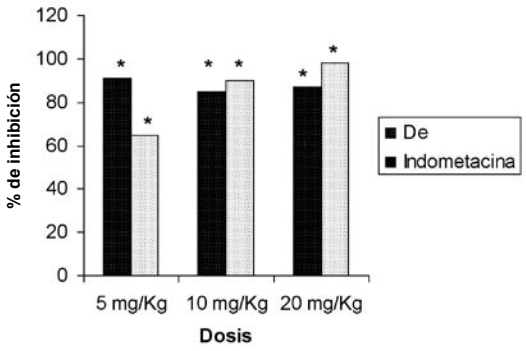

FIG. 2. Efecto de ***De*** en el modelo de contorsiones inducidas por ácido acético. (n=6) *p < 0.05.

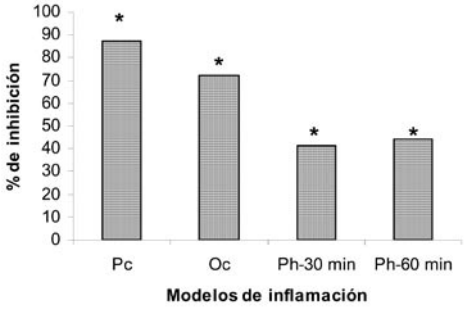

FIG. 3. Efecto de ***Pg*** en diferentes modelos de inflamación. (n=6) Pc: edema de la pata por carragenina, Oc: edema de la oreja por aceite de croto, Ph: edema de la pata por histamina. *p < 0.05

Modelos	Contorsiones inducidas por ácido acético en ratón			Edema de la oreja del ratón inducido por ácido araqui-dónico	Inhibición de fosfolipasa A_2 de veneno de abeja
Dosis	5 mg/Kg	10 mg/Kg	20 mg/Kg	50 mg/Kg	1mg/mL
If	70%	93%	90%	45%	+

TABLA 1. Efecto de *Ircinia felix* (If) en los modelos donde manifestó resultados significativos (por ciento de inhibición). (n=6)

Modelos	Edema de la pata por carregnina	Edema de la oreja por croto	Writhing por ácido acético	Writhing por ácido acético	Writhing por ácido acético	Inhibición de PLA_2
Dosis	30 mg/Kg	50 mg/Kg	5 mg/Kg	10 mg/Kg	20 mg/Kg	1 mg/mL
% de inhibición	87	69	66	93	82	+

TABLA 2. Efectos significativos del extracto de *Tedania ignis* (***Ti***) en diferentes ensayos (n=6)

Se soigner en forêt guyanaise: enquêtes sur l'automédication par les plantes chez les Amérindiens wayana

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Résumé

Des enquêtes quantitatives sur l'automédication par les plantes médicinales ont été réalisées chez les Amérindiens wayana de Guyane française. Ces enquêtes portaient sur les maladies et les symptômes les plus couramment relevées dans cette population, selon la méthodologie TRAMIL. Les résultats montrent un usage très important des plantes de la forêt, en particulier des lianes et des arbres, ce qui contraste avec les populations créoles qui utilisent préférentiellement des plantes rudérales et cultivées. Les résultats mettent également en évidence une nette tendance à l'abandon de ces pratiques, par les jeunes générations au profit de la biomédecine des dispensaires. Un projet de diffusion et de valorisation de ces savoirs auprès des jeunes, mais aussi des personnels de santé dans les dispensaires permettrait une meilleure prise en compte et intégration de ces pratiques populaires. La population wayana pourrait ainsi tirer au mieux partie des deux types de médecine, sans perdre ses propres savoirs sur la nature et ses usages.

Abstract

Quantitative surveys dealing with the use of medicinal plants for automedication pur poses have been performed among the Indian Wayana ethnic group, in french guiana.

This survey was based on the most frequently observable diseases and symptoms in this population, following the Tramil methodology.

Results evidenciated a very important use of plants from the forest, especially trees and lianas, contrary to creole people, who preferably use cultivated and rudérales plants.

Results also display that these medical practices are in strong decline especially among the young génération, more oriented towards biomedecine from the local healthcare dispensary.

A project of valorisation and diffusion of this traditional knowledge directed towards the young generation and the health staff, should lead to the recognition and a better integration of such popular practices.

Thus, it is expected that the Wayana population could benefit from both kind of medicine, without loosing its own knowledge on nature and his uses.

Introduction

Les Wayana sont des Amérindiens de famille linguistique karib, qui vivent en Guyane française (haut Maroni), au Surinam (Tapanahoni), et au Brésil (Jari et Paru). Ils représentent environ 1500 personnes dont 800 vivent en Guyane française. Leur population après avoir subi un effondrement démographique (elle est passée de 1500 personnes en 1890 à 500 vers 1950) est actuellement, grâce à une assistance médicale développée depuis les années 50 dans l'intérieur de la Guyane, en plein essor (Hurault, 2003). Les Wayana ont acquis tout récemment la nationalité française, et peuvent donc bénéficier de différentes aides sociales (RMI, allocations familiales…), mais ils continuent à dépendre essentiellement de l'agriculture, la chasse, la pêche et la cueillette pour leur alimentation. Vivant en étroit contact avec la forêt, les Wayana en connaissent également les ressources médicinales. D'autre part, le chamanisme continue à être pratiqué parallèlement à la biomédecine des dispensaire au niveau de chaque village (Chapuis, 2001). Cet article présente les résultats d'une enquête sur l'automédication par les plantes médicinales, dans le village de Taluwen sur le haut Maroni.

Méthodologie

La méthodologie employée est celle du programme TRAMIL (1999), mise au point par B. Weniger et L. Robineau. Elle est basée sur une approche quantitative et qualitative de l'usage populaire des plantes médicinales pour soigner les principaux problèmes de santé.

La première étape consiste à identifier les principaux problèmes de santé rencontrés dans la population étudiée. Cette liste est établie après discussion avec le personnel des dispensaires, puis confrontation avec le discours des personnes enquêtées. Le questionnaire porte ensuite, pour chaque maladie, sur la manière dont s'est soignée la personne la dernière fois qu'elle y a été confrontée.

Les résultats présentés ci-dessous sont ceux des enquêtes réalisées à Taluwen, deuxième village en importance par sa taille, après Antécume Pata. Il réunissait 133 personnes au moment de l'enquête (2002). Nous avons interrogé 25 personnes, c'est à dire environ 20% de la population villageoise, ce qui nous a conduit à visiter toutes les familles. Pour ce questionnaire, treize pathologies ont été retenues: diarrhée(touikapopkaï), amibiase (*mehutouika*), fièvre *(yemnë),* paludisme *(malalia),* rhume *(kumquat),* toux *(tohtohto),* mal de tête *(uputpïetumhak),* dermatose /mycose (osi), furoncle *(yuyu),* gale *(mututuk),* varicelle *(pile),* piqûre de raie *(sipali),* leishmaniose *(elekëimë)* (CF. TABLEAU 1 ET FIGURE 1).

Nous avons ensuite sélectionné pour chaque pathologie, les plantes citées avec une fréquence supérieure ou égale à 10 %, rapportée au nombre de personnes utilisant les remèdes traditionnels (TABLEAU 2). Nous avons également tenu compte de l'âge des personnes enquêtées, ce qui nous a permis de calculer le nombre moyen de pathologies soignées par automédication, en fonction des classes d'âges (FIGURE 2).

Résultats

Pathologie	Nombre de personnes ayant eu la maladie		Automédication par remèdes traditionnels			Dispensaire ou remèdes occidentaux			Chamanisme		
	N_1	% $N_1/25$	N_2	%	% relatif N_2/N_1	N_3	%	% relatif N_3/N_1	N_4	%	% relatif N_4/N_1
Diarrhée	25	100	16	64	64	8	32	32	0	0	0
Amibiase	11	44	3	12	27,3	4	16	36,4	6	24	54,5
Fièvre	25	100	11	44	44	15	60	60	2	8	8
Paludisme	14	56	4	16	28,6	10	40	71,4	1	4	7,1
Rhume	21	84	11	44	52,4	10	40	47,6	0	0	0
Toux	21	84	13	52	61,9	7	28	33,3	0	0	0
Mal de tête	20	80	9	36	45	9	36	45	0	0	0
Dermatose	19	76	11	44	57,9	9	36	47,4	0	0	0
Furoncle	21	84	13	52	61,9	6	24	28,6	0	0	0
Gale	21	84	9	36	42,8	11	44	52,4	0	0	0
Varicelle	15	60	8	32	53,3	7	28	46,7	0	0	0
Piqûre de raie	16	64	11	44	68,7	5	20	31,2	0	0	0
Leishmaniose	12	48	4	16	33,3	6	24	50	2	8	16,6

TABLEAU 1. Pathologies courantes sélectionnées pour l'enquête: % relatif des différents types de soins.

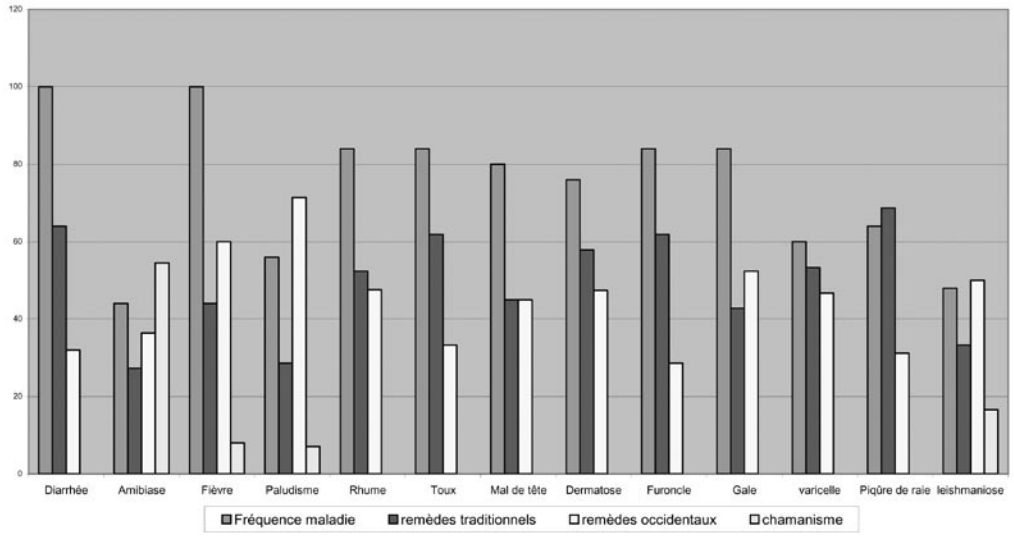

FIGURE 1. Fréquence relative des différentes médications pour chaque pathologie.

PATHOLOGIE	Nom wayana	Plante utilisée	Nom wayana	Forme biologique	Partie utilisée	Mode d'emploi	Fréqu. d'usage	Fréqu. relative (/nbre pers. ayant eu la maladie)	Fréqu. relative (/nbre pers. utilisant remèdes traditionnels)
Diarrhée	touikapopkaï	*Psidium goyava* MYRTACEAE	mopaya	arbre	Ecorce et feuilles Ou écorce seule	Décoction Voie orale	12%	12%	17,6%
		Carapa guianensis, *C. procera* MELIACEAE	kalapa	arbre	Ecorce	Décoction Voie orale	8%	8%	11,8%
Amibiase (sang dans les selles)	mehutouika	pas de plante significative (chamane ou dispensaire)							
Fièvre	yemnë	*Mansoa alliacea* BIGNONIACEAE	kuwapokan	liane	Tige feuillée	Décoction Bain	12%	12%	27,3%
					Intérieur de l'écorce	Dans l'eau froide au soleil en bain			
Paludisme	malalia	*Psidium personii* MYRTACEAE	takamalaimë	arbre	Tige et/ou feuilles	Décoction Voie orale	8%	14,3%	50%
Etat grippal, rhume	kumquat	*Tanaecium nocturnum* BIGNONIACEAE	ëmeli	liane	Feuilles froissées	Inhalation	36%	42,9%	81,8%
Toux	tohtohto	*Uncaria guianensis* RUBIACEAE	ekpapanalet	liane	Sève de la tige	Voie orale	20%	23,8%	38,4%
		Indéterminée	likilikiyu = kiliki	liane	Sève de la tige	Application locale au fond de la gorge	12%	14,3%	23%
		Tanaecium nocturnum BIGNONIACEAE	ëmeli	liane	Sève de la tige	Voie orale	8%	9,5%	15,4%
Mal de tête	uputpïetumhak	*Hernandia guianensis* HERNANDIACEAE	toloto	arbre	Ecorce	Décoction Voie orale	12%	15%	33,3%
					Sève	Bain pour tête			
Dermatose/ Mycose	osi	*Vismia cayennensis* CLUSIACEAE	osi epit	arbre	Sève	Application locale	28%	36,8%	63,6%
Furoncle	yuyu	*Zanthoxylum rhoifolium* RUTACEAE	kanikë	arbre	Sève tronc	Application locale	32 %	38,1%	57,1%
					Ecorce	Décoction en bain			

PATHOLOGIE	Nom wayana	Plante utilisée	Nom wayana	Forme biologique	Partie utilisée	Mode d'emploi	Fréqu. d'usage	Fréqu. relative (/nbre pers. ayant eu la maladie)	Fréqu. relative (/nbre pers. utilisant remèdes traditionnels)
Gale, ectoparasites	mututuk	*Geissospermum argenteum* APOCYNACEAE	wataki	arbre	Ecorce	Décoction en bain	20%	23,8%	55,5%
varicelle	pile	*Ormosia stipularis* FABACEAE	wapotoimë	arbre	Sève	Application locale	12%	20%	37,5%
Piqûre de raie	sipali	*Lonchocarpus chrysophyllus L. floribundus* FABACEAE	halihali	liane	Tige	Décoction en bain	20%	31,2%	45,5%
					Sève	Application locale			
		Solanum monachophyllum SOLANACEAE	Pupulipotï	herb-acée	Feuilles ou sève des feuilles	Application locale	16%	25%	36,4%
		Montrichardia arborescens ARACEAE	oko	herb-acée	Feuilles	Bain de vapeur ou application locale	12%	18,7%	27,3%
Leishmaniose (« pian-bois »)	elekëimë	Pas de plante significative (dispensaire ou chamane)							

TABLEAU 2. Plantes utilisées en automédication: mode d'emploi et fréquence d'utilisation.

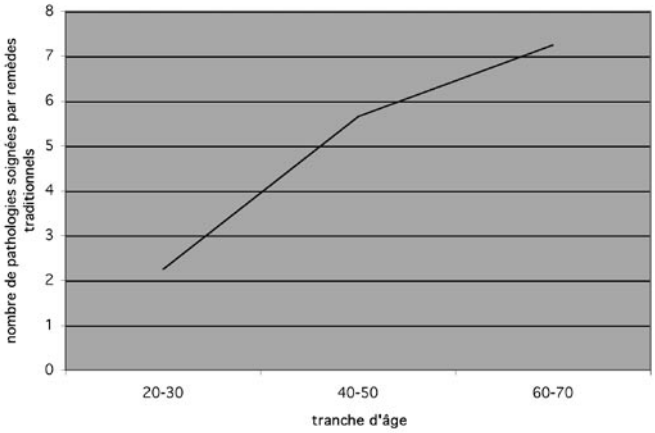

FIGURE 2. Nombre moyen de pathologies soignées par des remèdes traditionnels par tranche d'âge chez les femmes.

Discussion – conclusion

Les résultats de cette enquête mettent en évidence:

- Un taux d'automédication relativement élevée: 49,31 % en moyenne, ce qui signifie que près de la moitié des pathologies sélectionnées sont soignées par les remèdes traditionnels, en automédication.
- Un usage préférentiel des espèces forestières (arbres et lianes: 87,5% des plantes significatives), ce qui contraste assez fortement avec la population créole qui affectionne particulièrement les plantes de jardin et les rudérales (58% de la pharmacopée créole in Grenand *et al*, 1987). On trouve des plantes médicinales cultivées autour des cases, mais ces résultats montrent que les plus fréquemment employées restent les plantes de la forêt. Ceci nous renvoie à l'époque encore récente (18e siècle) où les Wayana vivaient de manière semi-nomade en forêt (et non en villages sédentaires au bord des fleuves).
- Une nette diminution de ces usages chez les jeunes générations (7 pathologies sur 13 sont soignées par les plantes chez les 60-70 ans, 5 sur 13 chez les 40-50 ans, contre 2 sur 13 chez les 20-30 ans). La principale raison invoquée est le manque de connaissances dans le domaine, surtout pour la reconnaissance des espèces utilisées. Précisons que les jeunes ont tous été scolarisés à l'école française, ce qui les soustrait à la participation aux activités parentales, et limite fortement la transmission des savoirs traditionnels entre les générations.

En conclusion, l'automédication par les remèdes traditionnels, si elle est encore relativement élevée (près de 50%) est en nette diminution chez les jeunes générations, qui se tournent de plus en plus vers le dispensaire et la médecine occidentale. Notons, toutefois que les pathologies sélectionnées étaient particulièrement orientées en ce sens, dans la mesure où nous n'avons pas retenu de pathologies reconnues uniquement par la bio-médecine, tel la tuberculose, ou de maladies typiquement traitées par le chamane, telle «la perte de son âme», par exemple. Il faut donc éviter des extrapolations abusives, qui mettraient en évidence un faible recours au chamanisme, à partir des résultats ci-dessus.

La restitution des résultats de cette enquête auprès de la population, en version bilingue wayana-français, est envisagée en particulier auprès des jeunes et des enfants (école), et du personnel de santé dans les dispensaires, pour faciliter une meilleure prise en compte et intégration de ces pratiques populaires par les praticiens de la bio-médecine. La création de jardins médicinaux paraît difficile à mettre en œuvre avec les arbres et les lianes. Par contre des parcours de reconnaissance de ces espèces en forêt est envisagée. D'autre part, des études en laboratoire sont en cours, dans le cadre du programme TRAMAZ, pour une validation scientifique de l'activité de ces plantes.

Le but souhaité étant, en effet, que la population wayana puisse tirer partie au mieux des deux types de médecines, traditionnelle et moderne, sans perdre ses propres savoirs sur la nature et ses usages.

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Inhibitory Action of *Solanum crispum* on Ca^{2+} Release Channels of Sarcoplasmic Reticulum of Swine Heart.

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Keywords: *Solanum crispum*; Ca^{2+} release channel; antihypertensive activity.

Introduction

Solanum crispum is a plant traditionally used in Chile for treatment of arterial hypertension (Montes and Wilkomirsky, 1985). In previous studies, we observed a sudden bradikardia and blood pressure reduction after the intravenous injection of a *S. crispum* extract in normal dogs (Alarcón *et al.* 1988). Then, we tested the effect of a crude extract of this plant in the activity of the calcium release channel (CRCh) of the sarcoplasmic reticulum (SR) of the swine heart muscle incorporated into planar lipid bilayer.

Exitation-contraction coupling, the series of events in cardiac muscle by which depolarization of the external membrane evokes a mechanical contraction, is largely dependent on the CRCh activity. CRCh is the major type of intracellular channel controlling Ca^{2+} movilization from the SR to the sarcoplasm during the contraction of the miocites (Endo, 2002). It is recognized that under certain cardiac inactivation patterns, the reduction of the tension development in muscle, can explain the hypotension generated in the arterial blood (Stergiopoulos, 1996). We report the existence of a possible novel ligand of the CRCh that interacts with CRCh in a simple manner inactivating the channel rapidly and reversibly and may thus contribute to understand the functional role of this protein.

Material and Methods

Plant material

S. crispum leaves, collected in Chillán, VIII Región in Chile, were authenticated by Professor Victor Finot of the Department of Animal Production, Faculty of Agronomy, University of Concepción. A voucher of specimen is deposited in the herbarium of the Faculty of Sciences, University of Bio-Bio, Chillán. Chile.

Preparation of extract

Shade-dried powdered leaves (200g) were soxhlet extracted with 90% MeOH to afford a dark brown semisolid mass (MESc; 4.7 g). Preliminary qualitative phytochemical analysis (Alarcón *et al.*, 1988) of MESc indicated the presence of solasodine, coumarines and the following flavonoids: 3-glycosid-3',4'-dihydroxyflavone; 3,3',4'-trihydroxyflavone; 3-glycosid-4'-hydroxyflavone y 3,4'-dihydroxyflavone. The solid extract was dissolved in distilled water (0.25g:10 ml) and used, after filtration, directly in bilayer preparation.

Preparation of SR microsomes

Cardiac heavy SR-enriched microsomes were isolated from swine hearts by the same procedure implemented for skeletal muscle (Fuentes *et al.*, 1994). Heavy microsomes sedimenting at 35-40% sucrose, suspended in 0.3 M sucrose, 0.1 M KCl and 5 mM Na-PIPES (pH 7.2), were used in all experiments.

Planar bilayer technique

Planar bilayer were composed of an equimolar mixture of phosphatidylethanolamine and phosphatidylserine (Aldrich Chemical Co., Milwaukee, WI, USA) dissolved in decane. Recordings were filtered through a low-pass Bessel (Frequency Devices, Haverhill, MA, USA) at 2 khz and digitized at 4 khz for analysis (Valdivia *et al.*, 1991). Recordings of Ca^{2+} release channel were made at a holding potential of + 20 mV in 250 mM cis-CsCl as the current carrier and 3 µM free Ca^{2+}. The trans solution was 50 mM CsCl. After channel reconstitution, the electric activity was recorded for at least 2 min. Then, S. *crispum* extract (0.05-0.150 mg/ml) was added to the cis side of the chamber, and channel activity was recorded during 2 min. Finally the cis solution was washed several times until recover the CRCh control activity.

Results and discussion

Although information on the structural and molecular properties of CRCh has accumulated rapidily, the functional role of this protein in excitation-contraction coupling and the signals that modulate and/or turn off the channel remain ambiguous and the mechanisms involved unclear (Fill and Copello, 2002). The use of planar bilayer technique makes it a powerful tool for the investigation of ligands such as a novel drugs, wich may interact with the CRCh. The direct interaction of S. *crispum* with the Ca^{2+} release channel in the the prescence of cumulative concentrations of the extract is shown in figure 1. Addition of *S. crispum* extract to the cis side produced a marked inhibition of the control activity. In these plots, open probability was averaged continuously every 5s for a total time of 60 s. Open probability average 0.65 in control decreased to 0.034 after addition of 0.15 mg/ml of the extract. The onset of the inactivation was fast and reached steady state within 20 s. Changes were reversible after removing 4-5 times the cis solution. The proposed *S. crispum* blokade of the release channel was further supported also in our laboratory by the fact that the plant extract inhibited the ryanodine binding (Fill and Coronado, 1988) in heavy SR vesicles of swine pig heart (Fuentes *et al.* 1991). These results revealed that some compound present in *S. crispum* had a high degree of specificity for the inactivation of the SR Ca^{2+} release channel of the swine heart muscle.

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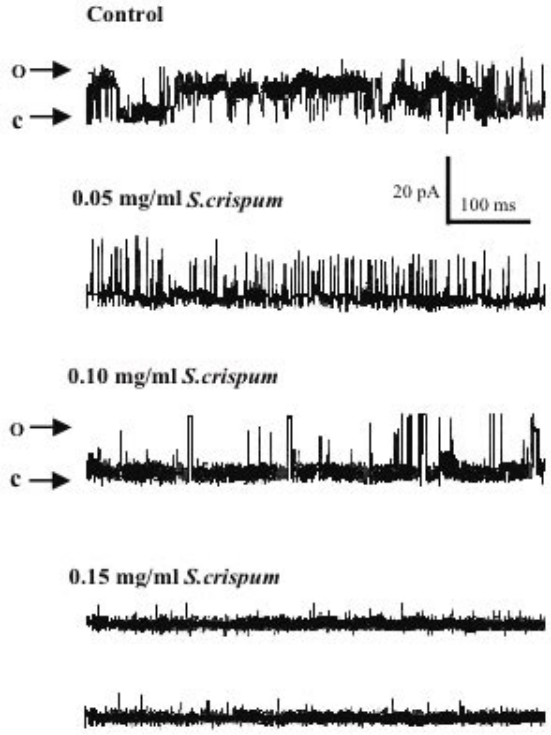

FIGURE 1. Effect of cumulative concentrations of *S. crispum* extract on Ca^{2+} release channel activity. SR microsomes were fused to planar bilayer in a gradient of 250/50 mM CsCl. Records were obtained from a single experiment at a holding potential of + 20 mV. (C=close, O=open).

Estudio de valor nutritivo y toxicidad de *Chamissoa altissima* (Jacq.) HBK. Amaranthaceae.

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Introducción

Chamissoa altissima (Jacq.)HBK (Amaranthaceae) es una planta tropical americana conocida en República Dominicana y Haití como *lyann panye* y en Cuba como *guanique*.

El cocimiento de las hojas y tallos condimentado con sal, es utilizado en la zona caribeña para combatir la astenia y la debilidad.

El objetivo del presente trabajo ha sido contribuir a la validación científica del uso popular de esta especie. Para ello hemos realizado un estudio de toxicidad aguda y crónica, un estudio fitoquímico y una serie de determinaciones fisico-químicas para evaluar su contenido en cenizas, nitrógeno, proteínas, grasas, fibras y pH.

Parte experimental

Material vegetal

Hojas y tallos de *Chamissoa altissima* (Jacq.)H.B.K. (Amaranthaceae) fueron proporcionados por el Dr. Germosen Robineau. El material vegetal fue identificado en el Jardín Botánico Nacional M. Moscoso (Santo Domingo, República Dominicana) por el Dr. F. Jiménez. Un ejemplar fue depositado en el Herbario de dicho Jardín Botánico (Jiménez 1492).

Preparación de los extractos utilizados

Con el material vegetal realizamos una infusión en agua caliente, seguida de maceración durante 24 horas. El macerado fue filtrado y evaporado a presión reducida. El residuo seco fue disuelto en solución salina para ser usado en los experimentos farmacológicos.

Toxicidad aguda

Un total de 30 ratones Swiss de ambos sexos, de edad comprendida 7-8 semanas, pesando 25-35 g fueron utilizados en el grupo control y en los grupos tratados.

Los extractos fueron administrados intaperitonealmente a dosis comprendidas entre 100-2000 mg/Kg.

Los síntomas de toxicidad (decrecimiento de la actividad motora, estimulación, piloerección y respiración irregular) y mortalidad fueron observados a las 48 horas según método descrito por Gallego. (Gallego, 1986).

Toxicidad crónica

Un total de 48 ratones Swiss de idénticas características a los usados en toxicidad aguda, fueron utilizados en los distintos lotes. La dosis seleccionada fue de 100 mg/Kg de peso por día, 1/5 de la dosis farmacologicamente activa, durante dos meses, siguiendo el método de Gallego.

La administración fue intraperitoneal y en los animales se estudiaron los síntomas internos y externos de toxicidad y mortalidad. Algunos órganos vitales fueron también examinados (médula espinal, riñón e hígado).

Estudio fitoquímico

Las partes aéreas fueron pulverizadas y extraídas sucesivamente en caliente con éter de petróleo, metanol y agua. En cada uno de los extractos se determinaron los principales grupos fitoquímicos: Taninos, flavonoides, cumarinas, antraquinonas, terpenos, lactonas, saponósidos y glúcidos

Valor nutritivo

Las muestras fueron separadas en tallos y hojas y se procedió a determinar: contenido en cenizas, proteínas, grasas y fibras (Kirk y col, 1996), (Potter,1986), así como el pH.

Resultados

Los resultados obtenidos muestran un valor de DL_{50} mayor de 2000 mg de residuo seco/Kg, lo que equivaldría a 100g de Droga /Kg, esto nos confirma la escasa toxicidad aguda de esta planta.

Durante el tratamiento crónico, el índice de mortalidad producido en los animales es prácticamente igual que en el grupo control y el análisis de órganos vitales no demuestra trastornos significativos, sólo un 5% de los animales machos muestran una ligera toxicidad hepática (TABLAS 1 Y 2).

En los estudios fitoquímico y de valor nutritivo realizados se han puesto de manifiesto: Carbohidratos, taninos y grasas (TABLA 3).

Conclusiones

La baja toxicidad que presenta *Chamissoa altissima* en los ensayos realizados, unido al alto contenido en carbohidratos,

proteínas y grasas, justificaría su empleo en medicina popular en casos de astenia y debilidad.

Los valores obtenidos son mas elevados que los de otras especies tradicionalmente utilizadas en alimentación, como son las espinacas, coliflores y lechugas entre otras.

Agradecimientos: Los autores expresan su agradecimiento al Dr. Lionel Robineau (Enda Caribe) por proporcionarnos la planta y al Dr. F. Jiménez (Jardín Botánico de Santo Domingo), por llevar a cabo su determinación.

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	NUMERO DE ANIMALES TRATADOS	MORTALIDAD/DIAS 15 30 45 60	TOTAL ANIMALES MUERTOS	LETALIDAD (%)
CONTROL	24	0 0 1 1	2	8,3
Sumidades de *Ch. altissima*	24	0 1 1 1	3	12,5

TABLA 1. Datos de mortalidad durante el tratamiento crónico con las partes aéreas de Chamissoa altissima.

		Riñón (inflamación glomerular)		Degeneración de túbulos renales		Toxicidad Hepática (cel. Kupffer)		Médula espinal	
		Machos	Hembras	Machos	Hembras	Machos	Hembras	Machos	Hembras
	Control	0	0	0	0	0	0	normal	normal
Sumidades de *Chamissoa altissima*		0	0	0	0	5%	0	normal	normal

TABLA 2. Trastornos observados en órganos vitales

DETERMINACIONES FÍSICAS	HOJAS (%)	TALLOS (%)
Extracto seco	92,05	91,26
Cenizas	19,15	8,71
Cenizas insolubles	1,40	0,45
DETERMINACIONES QUIMICAS	HOJAS (%)	TALLOS (%)
PH	6,42	6,01
Nitrógeno	1,16	2,39
Proteínas	7,26	14,92
Grasas	8,71	8,82
Fibras	13,93	39,39

TABLA 3. Datos cuantitativos del valor nutricional de Hojas y Tallos de *Chamissoa altissima* (Jacq.) H.B.K.

Uganda's Backyard Pharmacies. Pastoralist's Ethnoveterinary Knowledge

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Abstract

Over the last seven years, Christian Veterinary Mission (CVM) through their Livestock Programme, has been partnering with the marginalized Karamojong, a transhumant pastoralist tribe prone to violence. This ongoing programme aims to add value to the Karamojong's wealth of indigenous veterinary knowledge. A variety of participatory activities and methods have been employed including: data collection, ranking and field trials, propagation of best bets and economically viable plants, local capacity building of traditional livestock healers (TLH) to pursue Intellectual Property Rights (IPR), extraction and packaging of local medicines and ongoing developing through the CVM networks of Community Animal Health Workers (CAHW), TLH and women's groups. Five "modernized" local medicines have been recently packaged for ongoing community based field trials and promotion and 30 TLH have established Backyard Pharmacies (BPs). Meanwhile, two TLH associations have been registered at the country level as well as an ethnoveterinary information network, composed of various NGOs and GOs, that spreads across the three-district region. In conclusion, the encouragement of the traditional healers and the development their knowledge base has led them to value environmental conservation and to aim for a ready supply of medicines in both traditional and modernized forms. This allows them realize their potential and maximize the real benefits of their indigenous knowledge.

Key words: Indigenous Knowledge, Ethnoveterinary, traditional livestock healers, CAHW, Backyard Pharmacy, value-added medicines, Karamoja, pastoralist, IPR.

Karamoja is located in the remote northeastern corner of Uganda, a harsh environment characterized by arid and semi-arid lands (ASAL) among scattered acacia with unreliable rainfall. (1) The region has poor infrastructure coupled with insecurity. Most of the pastoralists carry AK47s, many engage in cattle raids and some of the youth resort to road banditry. However, Karamoja boasts a wealth of indigenous veterinary knowledge, an untapped potential that could dramatically improve the health of the pastoralists, their animals and also boost Karamoja's respect.

Unfortunately, as the world evolves around them, Karamoja's Indigenous Knowledge (IK), its land and its resources are slipping away. The Karamojong are forced to stay on smaller areas of land due to conflicts with neighbors and government, internal insecurity and limited water resources. Denuding the natural resources in desperation, the pastoralists utilize the land and their livestock to their advantage, without regard for tomorrow. The remaining knowledge holders destroy the trees to squeeze out the needed ethnoveterinary medicines (EVM) from its roots and bark. Those lacking IK remain struggling without the help of Ethnoveterinary Knowledge (EVK) (2).

The programme facilitates sharing amongst the IK holders and teaches them to replenish and preserve their natural resources through conservation techniques. This IK is integrated into the Community Animal Health Workers (CAHW) network (3, 4) women's groups, partner organizations and schools.

The CVM objectives include:

1. To promote, protect and preserve the Karamojong indigenous knowledge.

2. To promote mutual respect and trust within and around Karamoja.

3. To provide poverty alleviation through micro-enterprise development.

A variety of participatory activities and methods have been employed including: data collection, ranking and field trials, propagation of best bets and economically viable plants, local capacity building of traditional livestock healers (TLHs) to pursue intellectual property rights (IPR) and ongoing sharing on all levels. (FIGURE 1). Women's groups were also trained in a participatory way in methods for extracting active ingredients from the crude EVMs. They will soon be equipped to perform these extractions locally and to package these value-added EVMs(5).

To develop a list of priority plants, we started in 1998 with data collection followed by ranking of best bets. The authors visited 16 villages in the Bokora sub tribe over five months using group and individual interviews. The 201 TLHs which were visited identified 70 different EVM for 36 indigenous livestock diseases. They also recognized 82 distinct livestock diseases endemic to Central Karamoja(6). After four months of individual collection, the most active healers gathered to confirm the best bets. These best bets were first ranked by the Bokora group and then confirmed by the Pian TLHs. Finally, sitting together with a committee, the 18 priority plants were chosen based on rankings of local disease prevalence, confidence rankings, limited orthodox equivalents and those remedies which are seen to have an outside market potential.

In 1999, the best bets treatments were confirmed with Pian and Bokora TLH. The best bets were shared throughout the area and TLHs encouraged the use of proper harvesting techniques. In addition, TLHs collected germplasm to establish an EVM nursery. This nursery, based near the only flowing river of ASAL Karamoja, includes EVM but also human based

treatments, fodder and water purification plants. Over time, a few of the healers put in demonstration gardens containing these EVM to teach their own families, neighbors and other healers. The demonstration gardens serve as backyard pharmacies (BP) thus reducing far EVM searching.

The desire to share their EVM to realize an income was tempered by the fear of bio-piracy and IPR infringement. This led us to organize the healers into registered associations[7]. Association meetings are currently held quarterly.

International lawyers with Kenya's International Centre for Insect Physiology and Ecology-ICIPE[8] helped with IPR issues. IPR is a sensitive issue that attempts to protect the IK holders from bio-piracy, so that the benefits (monetary, acknowledgement and respect) are returned. Meanwhile IPR should be balanced with access and benefits sharing so that non-IK holders are able to also physically benefit from the remedies. The push for income generating was also slowed so that the propagation methods and plant materials could be in place to match the potential demand, finally hesitation was warranted so that the EVM could be validated and standardized.

The programme helped register three EVK Community Based Organizations (CBO's) in 2002. Two, which are solely comprised of the TLH, and the third, which is an ethnoveterinary information network, that spreads across the three-district region. The two TLH Associations are at the county level, known as Pian and Bokora, from neighboring districts. However, these two sub groups of Karamoja have a long history of fighting. CVM has brought these two groups together to share EVK and build peace. The third CBO, Karamoja Ethnoveterinary Information Network (KEVIN), includes members from the two TLHA and all the organizations involved in Karamoja livestock service delivery. Three local women's groups participate in the development of extraction procedures and other local income generating activities[5]. Hand in hand with these women's groups, the programme has now developed five modernized EVM (Wound Cream *(Harrisonia abyssinica),* Wound Ointment *(Abutilon hirtum),* Epaara Grease (local mineral), Tick, Scabies & Ringworm Oil *(Azaradicus indicus),* and Snake Bite Stone for ongoing community-based field trials and promotion through the KEVIN network[5].These value-added local EVM labels contain the TLH logo, developed with respect to IPR considerations, together with the directions for use and an experimental use disclaimer.

The healers' wound cream employs a simple extraction process with the ground dried *Harrisonia abyssinica* leaves. The cream has been shown to repel flies and speed up wound healing time. The healers tested it with good results on a variety of animal and human wounds, ranging from abscesses to mange. The *Abutilon hirtum* ointment uses basically the same extraction process as the above. The ointment causes abscesses to open, however, doesn't have fly repellant quality. Epaara grease, when applied to the dermatophilosis affected animals, reduces clinical signs within five days. TLHs also use it on canine demodex and goat mange.

Azaradicus indicus oil has been tested on scabies, ringworm and tick infested animals. The seed residue is used against BP aphid and locust attacks and for termite control. Neem has been effective, but needs re-application. The Snake Bite Stone field trials have been limited, but with successful results.

We are still in the process of standardization, after completing validation participatory field trials. Many active ingredients for these plants have already been identified and isolated, proving the value of these plants in the scientific realm[3]. Following field trails, a CVM pharmacist will secure Uganda National Drug Authority approval for regional sale. Some of the initial validation field trials have shown significant efficacy[9] and data analysis is still being compiled. We plan to develop more EVM for internal parasites remedies, retained placenta, eye ointment and another snakebite treatment.

We plan to avail EV kits to TLHs and CAHWs, containing the priority plants in an easily usable form, dosing equipment and some orthodox medicines. In order to have a ready supply of EVM and to teach others, 85% of the registered healers have set up BP near their homes. Meanwhile CVM has established a production woodlot for sustainable use

In conclusion, the encouragement of EVK has led TLH to be environmentally conscious and to teach others and to have a ready supply of medicines. They have realized the potential of their knowledge. The integrated approach has improved the sustainability of the pastoralists' lifestyle through EV micro-enterprise development versus a forced change of life. Initially CVM facilitated all the TLH activities, now, other NGOs cost share and TLHs pay their subscription and dues. The TLHA have elected their own executive committee; they sport association T-shirts and cultural pride. They've become good ambassadors for Karamoja and EVK, traveling to local schools and neighbors, visiting other pastoralists' areas and hosting visitors from universities. The attitude of quality sharing and sustaining has certainly infiltrated the TLHAs. The communities in the KEVIN programme area have and utilise more IK than those outside. More women and youth have been joining the THA, even those with formal education. Five primary schools have EVK clubs and some tangible results are being realized in the increased use of the pastoralists' modernized EVM.

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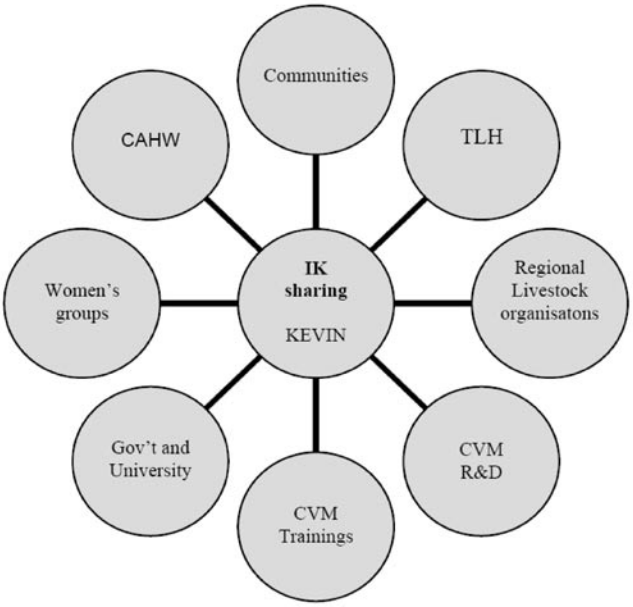

FIGURE 1. Reciprocal Sharing on all levels.

Composición del aceite esencial de *Lippia chiapasensis*

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Lippia chiapasensis es una planta perteneciente a la familia de las Verbenáceas. Aunque no existe ninguna referencia sobre su uso etnomédico, datos no publicados de nuestras investigaciones etnobotánicas indican que es utilizada por la etnia quiché, que vive en la región de Totonicapán (Guatemala), como aromática para afecciones respiratorias, dermatomucosas y nerviosas.

El objetivo de este trabajo es la elucidación de la composición del aceite esencial de las hojas de esta planta obtenido por hidrodestilación, según el método descrito en la Farmacopea Europea [(1)]. El material vegetal utilizado fue recolectado en Totonicapán en agosto de 2002. El análisis de la esencia se ha realizado por GC y GC-MS en dos columnas cromatográficas de diferente polaridad (Supelcowaxicapán en agosto de 2002. El análisis de la esencia se ha realizado por GC y GC-MS en dos columnas cromatográficas de diferente polaridad (Supelcowaxenidos a partir de patrones de ésteres metílicos de ácidos alifáticos, y por comparación de los correspondientes espectros de masas con los que poseemos en nuestra propia base de datos así como los descritos en la bibliografía.

Se han identificado más de sesenta substancias, representando alrededor del 85% del total de la muestra. El grupo más abundante es el de los monoterpenos oxigenados (principalmente de tipo carbonílico), siendo los más importantes: trans-dihidrocarvona (14.8%), geranial (10.8%), neral (7.7%) y 1,8-cineol (7.1%). También están presentes hidrocarburos monoterpénicos, como limoneno (5%) o canfeno (2.6%). La fracción sesquiterpénica es menos abundante, con el cariofileno (3.4%) como compuesto más importante de este grupo.

En la bibliografía no se ha encontrado descrita la composición de la esencia de esta especie, no obstante sí la de otras del mismo género. En algunos casos, sus componentes principales también han resultado ser *trans*-dihidrocarvona y geranial, como en *L. junelliana*[(2)] y algunos quimiotipos de *L. alba*[(3,4).]

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Le bain de fin de diète: un rituel de réintégration dans les Andes équatoriennes

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Mots clés: Andes, bain, diète, période puerpérale, plantes médicinales, pratiques traditionnelles, rituel, sage-femme.

Le bain de fin de diète est administré par la sage-femme au terme de la période puerpérale. Il a pour fonction de réintégrer la femme nouvellement accouchée à la vie sociale et communautaire.

La diète: un temps de transition entre des états

La diète est un temps déterminé de repos et d'isolement pour la femme nouvellement accouchée qui correspond à ce que nous appelons la période puerpérale. Autrefois, la durée était de 30 à 40 jours révolus; à l'heure actuelle, ce temps a tendance à diminuer par nécessité de reprendre rapidement les travaux des champs (Estrella 1991). Si ce temps symbolique de la diète n'est pas respecté, la femme s'expose à de graves complications post partum.

Ce temps révèle la fragilité transitoire et l'état de faiblesse propice à la contagion dans lequel la femme se trouve après avoir vécu deux états physiologiques opposés: la concentration de chaleur qui correspond au temps où elle porte l'enfant et l'accouchement, temps de froid intense consécutif à l'effort physique[1]. Durant cette période, la femme se soumet à un certain nombre de règles d'ordre alimentaires, de normes culturelles et d'interdits indiqués par la sage-femme, lui permettant de rétablir promptement son équilibre physique et émotionnel. L'analogie entre ce temps de réclusion de la période puerpérale est similaire au temps de marge ou d'isolement décrit par Van Gennep dans les rites de passages; ce temps de marge comporte également des tabous et des interdits alimentaires.

Le bain de fin de diète marque la fin de cette période de transition et correspond alors au rite d'agrégation à la communauté que Van Gennep qualifie de retour de couches social. La sage-femme assure la fonction de l'intermédiaire (Van Gennep 1981) dans la mise en œuvre du *bain de fin de diète,* tierce personne toujours présente dans les rites de passage, relais des changements d'états et garante du bon déroulement et de l'accomplissement du rituel.

Méthodologie

Les données ethnographiques ont été collectées auprès de plusieurs sages-femmes dans deux communautés rurales, d'origine cara-caranqui et otavalo sur les flancs du volcan Imbabura dans le nord est de l'Equateur par des entretiens non directifs sur une période de trois ans. L'herbier de l'Université Technique d'Ibarra a servi de référence pour identifier et vérifier les échantillons de plantes collectées. Les informations ont été croisées avec une étude sociologique sur la situation de la femme dans le nord du pays (Estrella 1991) et des notes de terrains et entretiens menés auprès des thérapeutes traditionnels de la région par un médecin italien[2] et son interprète (Balladelli et Colcha 1996).

Composition du bain et données ethnographiques

Le *bain de fin de diète* est composé d'un décocté de base de huit plantes[3] toutes sauvages, issues de la flore spontanée[4], classées dans la catégorie «très chaud». On remarque une homogénéité dans:

le choix des plantes qui composent le décocté,
le lieu de collecte (montagne, paramo, ravins),
le type biologique (5 arbres, 2 herbacées, 1 liane),
la catégorie classificatoire (très chaud),
la nature sauvage,
la partie de plante utilisée (feuille, branche, branche avec bourgeon),
l'indication thérapeutique *(fortifier le corps)*
le mode de préparation et d'administration (décocté par moitié en bain, moitié en prise).

Les huit plantes: arrayan *(Eugenia hallii* H.B.K.*),* matatzi (non identifiée), tupial (non identifiée), taruga fichana (non identifiée), pumamaqui *(Aralia avicennia efolia H.B.K.),* cerote piñan (*Hesperomeles heterophylla* (R.&P.) Hook), urcu zanahoria (*Arracacia xanthorrhiza* Baner[5]) et helecho macho *(Jari cundurales)* sont citées par l'ensemble des sages-femmes comme entrant dans la composition du bain de fin de diète alors que pour d'autres pratiques thérapeutiques, il existe une grande variabilité dans le choix des plantes.

Le lieu géographique de collecte des plantes médicinales, espace symbolique privilégié, est un critère classificatoire majeur pour ces communautés andines. Il a une incidence directe sur le potentiel thérapeutique de la plante traduit en terme de *force* vitale. Plus on s'éloigne de l'espace domestique connu, moins les lieux sont placés sous la dépendance humaine, plus il faut de force pour affronter cet espace car son accès est périlleux et présente des risques. Il est qualifié de *bravo*[6]. Les frontières symboliques entre les espaces géographiques sont fortement marquées, à l'image de la transition entre monde domestiqué et monde sauvage. Le potentiel thérapeutique d'une plante sauvage n'a aucune commune mesure avec celui d'une plante cultivée, très atténué.

Pour chacune des plantes du *bain de fin de diète,* la sage-femme nomme la plante et son lieu de collecte en apposant le terme *urcu*[7] au nom vernaculaire et ajoute: *«c'est une plante sauvage»*. Par l'association des qualificatifs urcu à sauvage, la sage-femme investit la plante de la force du lieu.

Le choix du type biologique de la plante, cinq plantes sur huit sont des arbres, a également une valeur symbolique pour la composition du bain. Toutes les sages-femmes s'accordent dans leurs descriptions sur la grande taille des arbres, elles déterminent leurs attributs: le bois est dur, *les feuilles ressemblent à des mains* …. Le cerote piñan *(Hesperomeles heterophylla)* est un bois dur qui sert à confectionner les outils utilisés dans l'agriculture indigène précise une sage-femme. Par analogie, l'usage de son bois dans le bain transmet à la femme la force de reprendre les travaux des champs. Les branches, feuilles et bourgeons représentent également la force vitale des arbres en pleine montée de sève.

La plante *sauvage* (non cultivée), son lieu de collecte, le type biologique, la partie de plante utilisée conditionnent la valeur thérapeutique du bain.

La classification de l'ensemble des plantes dans la catégorie «très chaude» témoigne de la détermination de l'objectif thérapeutique: transférer toute la chaleur nécessaire au corps de la femme afin qu'elle puisse reprendre la vie quotidienne.

L'indication thérapeutique révèle clairement l'objectif du rituel formulé dans une homogénéité surprenante par toutes les sages-femmes pour l'ensemble des plantes du décocté:

pour que le corps retrouve son endurance,
pour fortifier le corps,
pour que la femme puisse travailler et avoir de la force dans le futur,
pour que le corps devienne plus résistant,

Seule une sage-femme donne cette indication pour le cerote *(Hesperomeles heterophylla): pour que le froid n'entre pas dans la mère*[8]. Le cerote entrant dans la composition du bain, de par son appartenance à la catégorie «très chaud», transmet sa chaleur à la femme nouvellement accouchée. Ainsi, la plante, par sa chaleur, a une action préventive en protégeant la femme du froid qui pénétrerait la matrice et engendrerait la maladie[9].

Sept sur les huit plantes composant le bain de fin de diète ont une seule indication thérapeutique, elles ne sont pas utilisées par les sages-femmes pour d'autres indications thérapeutiques dans d'autres préparations[10]. La spécificité d'usage réservée à ces plantes renforce également leur valeur symbolique.

Toutes les sages-femmes pratiquent le même mode de préparation et d'administration du remède végétal: une décoction est confectionnée avec l'ensemble des plantes[11] dont une partie sert au bain et l'autre est absorbée par la femme (parfois pendant quelques jours).

L'homogénéité dans le choix des plantes, leur origine géographique, leur catégorie classificatoire, l'indication et le mode de préparation et d'administration confirme la valeur symbolique de cet acte thérapeutique.

La synergie d'action entre l'espace sauvage et la catégorie classificatoire «très chaud» des plantes associées va donner son potentiel thérapeutique à la décoction que la femme accouchée reçoit par transfert de force à travers le bain et l'absorption d'une partie du décocté. La plante est un vecteur de force transférée de la nature à l'homme. P. Lieutaghi, dans son ouvrage consacré aux plantes dépuratives en Haute Provence, met l'accent sur la puissance thérapeutique dont est investie la plante sauvage en médecine traditionnelle: «… l'importance particulière de la flore sauvage n'est nullement fortuite: la cure dépurative fait appel à la plante comme vecteur d'énergie brute, pouvoir que la domestication atténue au maximum.» (Lieutaghi 1986)

Il existe, dans cette société rurale andine, une continuité entre le corps de humain, la nature, la société et le cosmos.

Dans *le bain de fin de diète,* acte thérapeutique courant et d'apparence peu ritualisé, sans paroles sacrées associées ni mise en scène ordonnancée, les plantes portent une forte charge symbolique à travers les représentions qu'elles véhiculent. Dans la cosmologie andine, les plantes sont le support des transferts d'énergie par leur fonction symbolique directe et les actions de transformation opérées par le thérapeute.

Conclusion

Avec le rituel du *bain de fin de diète,* la sage-femme réaffirme les croyances et rétablit le lien social.

Le végétal, par sa double fonction thérapeutique et symbolique, est en adéquation avec les croyances, les représentations et le système social. Il traduit les symboles en devenant le support de l'acte thérapeutique, acte social et rituel qui ancre ses fondements dans la cosmologie.

Notes

1. On peut considérer ces états de concentration de chaleur de la grossesse puis de froid de l'accouchement comme un invariant présent dans toutes les Andes et dans de nombreuses ethnies de Méso-Amérique.

2. P.P. Balladelli et J.M. Colcha, dans leur ouvrage *Entre lo magico y lo natural. La médicina indigena, un testimonio de Pesillo*, reproduisent fidèlement leurs entretiens, ce qui constitue un matériel ethnographique riche et fiable.

3. Parfois une plante peut être ajoutée selon l'intérêt que lui attribue la sage-femme. Par exemple, l'une des sages-femmes ayant reçu une formation auprès du Centre de Santé occidental, ajoute de la *Mentha piperata L.,* espèce cultivée, pour prévenir les démangeaisons locales tout en la réintégrant dans une étiologie indigène (elle soigne la maladie provoquée par l'exposition à l'arc-en-ciel). Cet exemple témoigne de la dynamique du savoir et de la capacité d'intégration des éléments nouveaux.

4. On peut supposer que les plantes sauvages non identifiées appartiennent à la flore spontanée s'agissant de biotopes comme le paramo. A noter que, par ailleurs, dans leur pratique thérapeutique, de nombreuses espèces médicinales introduites comme

Mentha piperata L., *Origanum vulgare* L., *Ocimum basilicum* L. (entre autres) sont largement employées par les sages-femmes.
5. Il s'agit probablement de cette espèce de la famille des Apiaceae, originaire de l'Equateur et du Pérou. Dans ce cas, le nom vernaculaire change en fonction du lieu de collecte et de l'allégation thérapeutique.
6. *Sauvage, dur.*
7. Montagne en kechua, en référence à un espace sauvage et des terres incultes.
8. L'utérus est appelé *la mère.*
9. Une des maladies les plus redoutées de la période puerpérale s'appelle le *sobre parto,* il est causé par le non respect des interdits: bain complet de tout le corps avant la fin de la diète, ingestion d'aliments interdits, exposition au froid… L'agent pathogène est le froid.
10. Seul l'arrayan *(Eugenia hallii H.B.K.)* a une seconde indication thérapeutique (maux de dents en application locale).
11. «On cuisine une eau avec ces plantes», ce qui signifie que la plante cuit dans de l'eau.

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Plantes utilisées pour le *bain de fin de diète*

Nom vernaculaire Espagnol/kechua	Nom scientifique Famille botanique	Partie utilisée	Classification Chaud/tempéré et froid	Lieu de collecte	Origine de la plante	Indication
Arrayan	*Eugenia hallii* H. B. K. Myrtaceae	Feuille	Chaud ++	Sauvage Montagne	Flore spontanée	Pour que le corps retrouve son endurance
Cerote macho (E) Piñan (K)	*Hesperomeles heterophylla* (R. & P.) Hook Rosaceae	Feuille et branche	Chaud ++	Sauvage Ravins	Flore spontanée	Pour que le froid n'entre pas dans la mère (utérus)
Helecho macho	*Jari cundurales* Ptéridophytes	Feuille et branche	Chaud ++	Sauvage Montagne	Flore spontanée	Pour que le corps de la femme endure
Hierba buena	*Mentha piperita* L. Lamiacea	Feuille	Chaud ++	Potagers et échappée de jardins	Naturalisée	Pour éviter les démangeaisons comme pour le kuichic
Matatzi	Non identifiée	Feuille et branche avec bourgeons	Chaud ++	Sauvage Montagne	Probablement issue de la flore spontanée	Pour que la femme puisse travailler et avoir de la force dans le futur
Pumamaqui (Main du puma)	*Aralia avicennia efolia* H.B.K Araliaceae	Feuille et branche avec bourgeons	Chaud ++	Sauvage Montagne	Flore spontanée	Pour que le corps de la femme endure
Taruga fichana	Non identifiée	Branche et feuille	Chaud ++	Sauvage Montagne	Probablement issue de la flore spontanée	Pour fortifier le corps
Tupial	Non identifiée	Branche	Chaud ++	Sauvage Montagne	Probablement issue de la flore spontanée	Pour fortifier le corps
Sacha zanahoria ou urcu zanahoria	*Arracacia xanthorrhiza* Baner Apiaceae	Feuille	Chaud ++	Sauvage Montagne	Flore spontanée	Pour que le corps devienne plus résistant

Efectos antiflamatorio y antinociceptivo del extracto hidroalcohólico y fracciones de la especie *Cissus sulciccaulis* Baker

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En la región de Piracicaba, São Paulo, Brasil, la especie *Cissus sulcicaulis*, (Vitaceae), es utilizada como extracto oral o aplicación de la propia hoja en el local inflamado o con dolor. El extracto hidroalcohólico evaporado 70% (EHE), bien como sus fracciones liofilizadas obtenidas por partición, en acetato de etila (EEAC), en diclometano (EED) y en butanol (EEB) fueron preparados a partir de la parte aérea de la planta, colectada en el Huerto Forestal de la ESALQ (exsicata: VELL 835). Para los testes de analgesia fueron utilizados los modelos de contorción por ácido acético (1.2%), teste del dolor inducido por formalina, y el modelo de placa caliente (55ºC). Para los testes de actividad antinflamatoria fueron utilizados edema de pata (carragenina 1%), edema de oreja (óleo de cróton, 2.5%), cotton pellet y actividad antiartrítica (adyuvante de Freunds). Los animales (ratas, wistar, machos, 80 a 120g, e ratones, swiss, machos, 18-25g, N = 6-10) fueron pre-tratados 40 a 60 min. del inicio de los testes. EHE (500 e 1000 mg/Kg/vo) inhibió las contorciones en 41.4%, 85.9%, las fracciones EEAC (100, 200 e 300 mg/Kg/vo) y EEB (100 e 200 mg/Kg/vo) no inhibieron y solamente la dosis de 300 mg/Kg/vo de EEAC inhibió en 27.2% las contorciones.La antinocicepción del EHE (500 mg/Kg/vo) fue revertida parcialmente con la administración previa con naloxona en el modelo de placa caliente. El tiempo de lamedura de la pata fue reducido, en la fase inicial del dolor inducida por formalina en la dosis de 500 mg/Kg del EHE (40,3 ± 3,1 seg) y en las dosis de 250 e 500 mg/Kg en la fase tardía (60,7±8,1;35 ±3,0 seg) con relación al control (90,5±7,9seg). El EHE (500 mg/Kg/vo y sc) redujo el edema de pata en la primera hora (26.8% inhibición) y en la cuarta hora (46,06%) con relación al grupo de control en estos tiempos. Las fracciones EEAC y EEB no fueron efectivas por la vía oral en la dosis de 100 mg/Kg. Hubo reducción del granuloma cotton pellet, después de 7 días de tratamiento oral con EHE 250 y 350 mg/Kg/día en 41,24 y 51.41% respectivamente. La administración de EHE (350mg/Kg/dia, vo) bien como la asociación con fenilbutazona (150mg EHE + 40 mg FBTZ/ Kg/día, vo) diminuyeron el edema plantar en 30.4 y 38.9% producido por el adyuvante de Freunds con relación al control. El tratamiento tópico con EHE (1, 5 e 10%); EED y EEAC en las concentraciones (10 y 20%) inhibieron el edema de oreja en 32, 35, 42; 57,5; 81.6; 54.8 y 92.16 % respectivamente. La cromatografía en capafina sílica gel identificó la presencia de triterpenos, flavonoides e azúcares. Los ensayos de citotoxicidad revelaron que tanto EHE como EEB presentan baja toxicidad (por lo menos hasta concentraciones inferiores a 250 (microg/ml). La muestra EED tiene un IC50 de aproximadamente 225 microg/ml y un IC20 de aproximadamente 60 microg/ml. La administración del EHE por las vías oral e ip, en ratones, machos, N= 10, 30g, en dosis única, es prácticamente atóxica, (DL5010 g/Kg) presentando elevado margen de seguridad. El extracto presenta actividad antiedematogénica en los modelos de edema de pata y oreja con padrones de respuesta semejantes a las drogas de referencia y además de eso, posee actividad antiinflamatoria en modelos crónicos como granuloma cotton pellet y artritis por adyuvante de Freund. La actividad antinociceptiva en parte mediada por mecanismos centrales, con participación de receptores opióides en su efecto; y en parte, por mecanismos periféricos a través de la disminución de la respuesta a la fase 2 del teste de lamedura, sugiriendo la presencia de sustancias con actividad anti-cicloxigenase. La vía tópica presenta eficacia en el efecto antiinflamatorio superior a oral, justificando la forma de utilización popular de la misma.

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Anti-inflammatory and anti-nociceptive effects of the Hydroalcoholic extract and fractions of the specie *Cissus sulciccaulis* Baker

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In the Piracicaba region, São Paulo state (Brazil), the species *Cissus sulcicaulis* (Vitaceae) is used either as oral extract or by topically applying its leaves on the part that presents inflammation or pain. The evaporated hydroalcoholic extract 70% (EHE), as well as its lyophilized fractions obtained by partition – ethyl acetate (EEAC), dicloromethane ((EED) and butanol (EEB) – were prepared from the aerial part of the plant, which was collected in the Tree Farm at the local School of Agriculture–ESALQ (exsiccata: VELL 835). Twisting models triggered by acetic acid (1.2%), pain as well as tests induced by formalin and hot plate methods (55ºC) were used for analgesia tests. Hind paw oedema (carragenina 1%), ear oedema (croton oil, 2.5%), cotton pellet and anti-arthritis activity (adyuvante de Freunds) were performed for tests of anti-inflammatory activities. The animals (rats, wistar, males, 80 a 120g, and mice, swiss, males, 18-25g, N = 6-10) were pre-conditioned for 40 to 60 min. previous to the beginning of the tests. EHE (500 and 1000 mg/Kg/vo) inhibited contortions in 41.4%, 85.9%, the fractions EEAC (100, 200 and 300 mg/Kg/vo) and EEB (100 and 200 mg/Kg/vo) did not inhibit them. Only the 300 mg/Kg/vo dose of EEAC inhibited by 27.2% the wrinting. The anti-nociception of EHE (500 mg/Kg/vo) was reverted partially through the previous dispensing of naloxone in the hot plate model. The time for licking of the leg was reduced in the initial phase of the induced pain by applying formalin in a dose of 500 mg/Kg of the EHE (40,3 ± 3,1 seg) as well as a dose of 250 e 500 mg/Kg in the later phase (60,7±8,1;35 ±3,0 seg) compared to the control (90,5±7,9seg). The EHE (500 mg/Kg/vo and sc) reduced the leg edema in the first hour (26.8% inhibition) and in the fourth hour (46,06%) in comparison with the control group for these same times. The fractions EEAC and EEB were not effective when applied orally in a 100 mg/Kg dose. There was a 41,24 and a 51.41% reduction of the granuloma cotton pellet, after 7 days of oral treatment with EHE 250 and 350 mg/Kg/day. The dispensing of EHE (350mg/Kg/day, vo) as well as the association with phenylbutazone (150mg EHE + 40 mg FBTZ/ Kg/day, vo) diminished the oedema in 30.4 and 38.9% produced by the adjuvant of Freunds in comparison with the control. The topical treatment with EHE (1, 5 and 10%); EED and EEAC in given concentrations (10 and 20%) inhibited the ear oedema in 32, 35, 42; 57,5; 81.6; 54.8 and 92.16 %. Chromatography in a thin silicon gel plate identified the presence of triterpenos, flavonoids and sugar. Assays of citotoxicity revealed that both EHE and EEB present low toxicity – at least up to a concentration below 250 (microg/ml). The display of EED showed a IC50 of approximately 225 microg/ml and a IC20 of approximately 60 microg/ml. The dispensing of EHE orally and ip, in male mice, N= 10, 30g, in a sole dosis, is practically atoxic, (DL5010 g/Kg) presenting a high range of security. The extract presents anti-edematogenic activity in the models of leg and ear oedema, showing patterns of reaction similar to those of reference drugs. Moreover, it shows an anti-inflammatory activity in chronic models such as granuloma cotton pellet and arthritis with the adjuvant of Freund. The anti-nociceptive activity is mediated on the one hand by central mechanisms, with the participation of opioid receptors in its effect; and on the other hand by peripheral mechanisms by means of the decrease in the reaction to phase 2 of the limbing test, thus suggesting the presence of substances with anti-cicloxigenasic activity. The topical application shows a higher efficacy in its anti-inflammatory effect than the oral way, thus justifying the popular form of its use.

Problematique de l'integration de la medecine traditionnelle dans le systeme des soins de santé en Afrique: cas de la République Démocratique du Congo.

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Mots clés: Intégration, médecine traditionnelle, phytothérapie, tradipraticiens

Introduction

Actuellement les tradipraticiens congolais rendent d'énormes services à la population. Ils contribuent de façon efficace à la résolution du problème dans notre pays. Ils soignent aussi bien par la phytothérapie que par la psychothérapie (TAMBA VEMBA, 1981).

Les études récentes indiquent le recours à la médecine traditionnelle par plus de 80 % de la population congolaise et celle d'ailleurs en Afrique noire (OMS, 2002).

Il est établi en outre que 65 % des malades utilisent de manière concomitante les 2 médecines.

Mais que constate-t-on ce dernier temps?

1. Une prolifération des cabinets de guérisseurs ou tradipraticiens en milieu urbain;
2. Le manque d'intégration effective de cette médecine dans le système des soins de santé dû à plusieurs contraintes;
3. De nombreux chercheurs ont mené des études très concluantes malheureusement, ils ne peuvent aller jusqu'à la mise au point des médicaments traditionnels améliorés, faute des moyens financiers et matériels.

Objectif de l'étude

Recherche des voies et moyens d'intégration de celle-ci dans les soins de santé suivant l'aspect Phytothérapeutique et les médicaments traditionnels améliorés.

La forêt congolaise compte:

121 millions d'hectares, soit 53 % du territoire national ce qui représente:

- 47 % de superficie forestière du continent africain.
- 6 % de celles des forêts tropicales du monde.

Le territoire de la République Démocratique du Congo regorge près de 50.000 espèces végétales dans les forêts et savanes dont 5.000 sont médicinales (BIAYI, 2003).

Resultats de l'etude

Les investigations de la recherche menée auprès de tous les acteurs concernés nous permettent:

A) De classifier les phytotherapeutes en plusieurs groupes:

Les plus intéressants pour notre étude sont:

1°. Des laboratoires de production des médicaments intégrés à un système des soins de santé: cas de METRABU (Laboratoire de Fabrication des Médicaments Traditionnels et Améliorés de BUTEMBO).

2°. Des centres de recherche et production de médicaments dits traditionnels Améliorés: cas de CRMTA, (Centre de Recherche et de Production des Médicaments Traditionnels Améliorés)

1. METRABU

Ce laboratoire procède pour certaines plantes et pathologies, par des dilutions infinitésimales.

La technique est dite HOMEOPATHIE.

Le METRABU fonctionne suivant un modèle intégré pour dispenser des soins en partant de la culture des plantes médicinales jusqu'à l'administration des médicaments produits par ce laboratoire, aux malades qui consultent le centre.

Ce centre traite plusieurs maladies. (Voir tableau 1).

2. CRMTA (Centre de Recherche et de production des médicaments traditionnels améliorés)

Plus de 200 plantes médicinales à propriétés diverses ont été investiguées par le centre, le manque de financement fait traîner la mise en pratique des formes galéniques. Néanmoins, l'autofinancement a permis la mise au point de deux spécialités très appréciées dans notre pays et ailleurs telle la République du Congo (Brazzaville), il s'agit de:

Meyamycine® (Principe actif extrait d'une plante appartenant à la famille des euphorbiacées dont les propriétés sont anti –amibiennes, anti–bactériennes, anti–mycosiques, astringentes, absorbantes, …)

N.B: Activités confirmées par 156 médecins

Diazostimul® (Principe actif extrait d'une rubiacée qui est stimulant sexuel non hormonal et indiqué dans les cas

de: anaphrodisie ou absence de désir sexuel ou libido, anérection, anéjaculation, anorgasmie, stérilité masculine ou féminine, frigidité.

B) De confirmer de la possibilite de l'integration de la medecine traditionnelle

Il est établi en outre que 65 % des malades utilisent de manière concomitante les deux médecines. Et cela se passe parfois de manière frauduleuse au niveau des hôpitaux sans que le médecin traitant ne s'en aperçoive.

Les thermos et autres casseroles destinées à apporter la nourriture au malade hospitalisé servent aussi de transport de certaines potions et autres préparations issues de la médecine traditionnelle.

Modele d'integration de la medecine traditionnelle

Pour mieux arriver à intégrer cette médecine, certaines conditions doivent être préalablement remplies. Il s'agit de:

- La revalorisation de la médecine traditionnelle;
- L'exploitation rationnelle des médicaments issus des plantes médicinales ;
- La codification officielle de la médecine traditionnelle.

Contraintes a l'integration de la medecine traditionnelle

Plusieurs contraintes sont à surmonter notamment

1. Faiblesse dans la tradition orale;
2. Manque d'échanges d'idées et d'information entre tradipraticiens;
3. Goût du lucre;
4. Méfiance et réticence du professionnel de la santé vis-à-vis de la médecine traditionnelle (surtout de la part des Médecins);
5. Manque des publications suffisantes dans le domaine de la Médecine Traditionnelle;

Recommandations

- Identification et organisation des tradipraticiens afin de créer une corporation pour défendre leurs intérêts;
- Définition d'une politique sanitaire qui intègre et favorise le progrès de la Médecine Traditionnelle;
- Intégration dans le système de formation du personnel de la médecine moderne et ceci à tous les niveaux, un programme de formation en Médecine Traditionnelle;
- Promulgation d'un cadre juridique afin de protéger le droit de propriété et d'exploitation des découvertes des tradipraticiens;
- Demander aux chercheurs une certaine honnêteté scientifique et intellectuelle dans leurs collaborations avec les tradipraticiens.

Conclusion

L'anarchie dans le secteur de la santé; Les raisons socioculturelles de l'attrait vers médecine traditionnelle; La richesse floristique congolaise en plantes médicinales; L'impact du règne végétal dans l'arsenal médical moderne; L'épreuve de temps de médicaments traditionnels populaires … sont autant de raisons qui nous poussent à croire que la médecine traditionnelle peut être intégrée dans les soins de santé et résoudre beaucoup de problèmes sanitaires que nous connaissons en RD Congo et partant en Afrique.

01.	Amibiase	09.	Hypertension artérielle
02.	Asthme	10.	Malaria (paludisme)
03.	Ascaridiose	11.	Rhumatisme, goutte - douleurs sciatiques
04.	Diarrhée, dysentériforme et autres	12.	Pneumonie apneumocoques
05.	Fièvre typhoïde	13.	Sinusite
06.	Gingivite	14.	Impuissance sexuelle
07.	Gastrite	15.	Néphrite
08.	Hépatite (fièvre jeune)	16.	Cancer

TABLEAU 1. Différentes Pathologies traitées par METRABU. Source: KATSUVA, K, (1998)

N.°	Produits	Composition	Activités pharmacologiques
1.	Amibol	*Cinchona – Psidium guayava – Carica papaya – Allium sativum*	Amibicide
2.	Asthmophiline	*Blatta orientalla – Senega passiflore*	Broncho-dilatateur
3.	Vermifod	Aloes – *Predium guayava – Allium cepa – Allium sativum – Discorea*	Verminose: diarrhées, choléra, dysenterie, bacillaire
4.	Bronchoz	*Allium cepa – Zingiber officinalis – Senega – Antenus nobile*	Bronchite, toux
5.	Dermatoline Pommade	*Calendula – Phytolacca – Dodecandra – Plantago – Citrol limoneum*	Plaies, gales, dermatoses
6.	Hivomat gouttes	*Cannabis – Geranium – Dioscoria – Phytolacca*	Antibiotique: infections uro-génitales
7.	Malarinos gouttes	*Cinchona – Carica papaya* – Citron, NaCl	Antipaludéen

TABLEAU 2. Listes des quelques médicaments METRABU, leurs compositions et activités pharmacologiques

High Throughput Screening, an alternative to Ethnopharmacology

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Key-words: High throughput screening, Ethnopharmacology, Biodiversity.

The World Heath Organization estimates that more than 80% of the world population relies on traditional medicine for health care (Farnsworth, 1985). Ethnopharmacology is therefore a useful tool, and the validation of traditional knowledge allows the conservation and improvement of this learning (Cox, 1997). This approach has been validated by both historical legacy and by the discovery of the main drug classes (quinine, papaverine, morphine etc.) and has dominated the field of research up to the 1950's.

Recently, large pharmaceutical companies have been favoring an increasing popular technology called High Throughput Screening (HTS). The main way of discovering bioactive molecules is to screen large medicinal chemical libraries from combinatorial chemistry or from natural origin. Actually, recent progresses in structural biology, genomics and proteomics have made possible the discovery of thousands of new proteins and enzymes as potential targets for drug discovery programs. The novelty of these targets often results in lack of reference compounds and the only way to identify a molecule capable of binding and modulating the activity of proteins is to screen large numbers of chemodiverse structures. With the technical progress made in miniaturization and robotics, the HTS has become a major and popular strategy (Figure 1). The main problem with the avalanche of new targets has been to build up large chemical libraries. Combinatorial chemistry and parallel organic chemistry provide impressive numbers of compounds in a short space of time. That said, the chemical diversity of the compounds is very low compared with those from living organisms. Natural products present a broad and potent pharmacological activity as well as unsurpassed chemical diversity and originality. They are effective modulators of a wide variety of macromolecular targets, protein-protein interactions, etc. (Gould, 1997 & Verpoorte, 1998). Plants, microorganisms and marine organisms are largely unknown from a chemical and pharmacological point of view (Table 1).

Valorization of traditional medicinal knowledge is only possible when working on a target related with pathologies treated by local healers (skin inflammation, head aches etc.). Research into modulators of a new target in different fields will not be helped by local healer or 'shaman' knowledge. It is more judicious to screen using random, biodiverse natural libraries.

The need to share benefits is fair when biodiversity or traditional medicine is used to develop a new commercial drug. The Convention on Biodiversity regulates exchanges of biodiversity and knowledge between the local people and the industrial sector. However the definition of a fair exchange is still difficult to find and some big pharmaceutical companies have preferred to abandon research on natural products (Baker, 1995).

The 'Institut de Sciences et Technologies du Médicament de Toulouse' (ISTMT) is a successful and original example of public/private collaboration between CNRS, the 'Institut pour le Développement' (IRD) and Pierre FABRE. The goal of ISTMT is to discover new chemical entities active in oncology, central nervous system pathologies, inflammation and parasitic diseases by running HTS campaigns on plants and marine organisms using different joint research units in the field of Natural Product chemistry, Pharmacology and HTS (Figure 2).

As mentioned above, ethnopharmacology is a correct strategy for discovering bioactive molecules, protecting biodiversity and the valorization of traditional uses. However, even if its fruitful results are yet to be seen at market level, High Throughput Screening looks more efficient for the pharmaceutical industry in terms of project cycle times and constraints.

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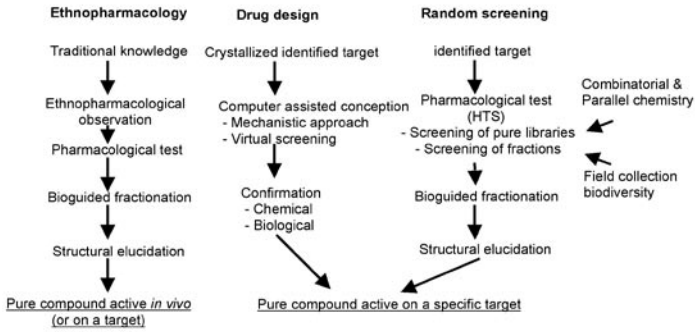

FIGURE 1. Research strategies of new lead compounds.

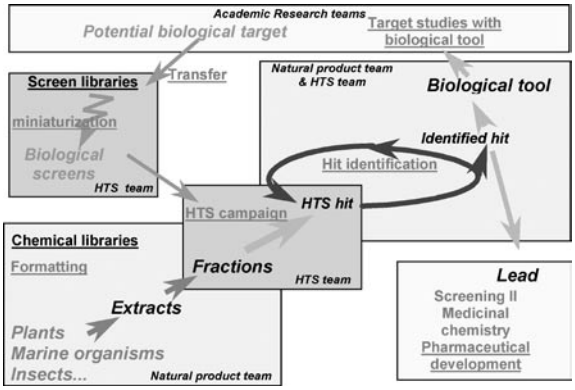

FIGURE 2. Task of the joint research units of the 'Institut de Sciences et Technologies du Médicament de Toulouse'.

Group	Known species	Estimated total species	Percentage of known species
Bacteria	4'760	40'000	12%
Fungi	69'000	1 500'000	5%
Bryophytes	17'000	25'000	68%
Gymnosperms	750	~ 750	~ 100 %
Angiosperms	250'000	270'000	93%
Protozoa	30'800	100'000	31%
Nematodes	15'000	500'000	3%
Insects	800'000	6 - 10 000'000	8-13 %
Fishes	19'000	21'000	90%
Birds	9'198	9'198	100%
Mammals	4'170	4'170	100%

TABLE 1. Number of described, estimated species & percentage of known species (Gould, 1997).

L'aromathérapie – une alternative de traitement

MARCULESCU, ANGELA [1]; SAND, CAMELIA [1]; MOSOIU, DANIELA [2]; BOBIT, DANA [3]; OPREAN, RADU [4]; BACANU, GHEORGHE [5]

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L'aromathérapie est un composant de la phytothérapie, fondée sur l'utilisation des essences de plantes (huiles volatiles ou essentielles), qui a des racines profondes dans la médecine traditionnelle roumaine.

L'aromathérapie agit par l'intermédiaire du sens, avec des implications principales dans la sensibilisation des émotions et des fonctions du cerveau. Sentir c'est respirer – une fonction essentielle de l'organisme. Pour bien vivre nous avons besoin d'une bonne respiration et l'aromathérapie peut influencer la respiration ; encore plus, les essences peuvent changer même l'état d'âme des personnes malades.

Les plantes aromatiques sont souvent les plantes qui aiment la lumière et l'air, étant celles qui accumulent la chaleur du soleil, dans les huiles essentielles. Les essences, avec leur odeur particulière et spéciale, sont le résultat de la concentration des éléments cosmiques dans les végétaux de la terre. Ces essences ont été considérées comme une expression divine dans le monde matériel. Les essences sont répandues dans la plante entière, mais habituellement elles sont concentrées dans un organe spécifique (la racine, les feuilles, les fleurs, les fruits) d'où elles sont extraites.

Un problème important c'est la technologie d'extraction des huiles volatiles contenues dans les plantes. On a constaté que l 'huile volatile n'est pas l'image fidèle de la composition des substances volatiles existantes dans la plante, car certains composants chimiques sensibles peuvent souffrir des réactions d'oxydation, de hydrolyse, de polymérisation, etc. pendant le processus d'extraction. Les recherches dans ce domaine ont montré que la plus performante méthode d'extraction des essences des plantes c'est l'extraction avec des liquides supercritiques, parce que les substances originales des plantes ne se dénaturent pas.

Du point de la vue scientifique l'aromathérapie est justifiée par les résultats obtenus dans les études pharmacologiques et microbiologiques en utilisant les huiles volatiles. Parmi les actions les plus importantes qui ont été mises en évidence, on peut préciser:

- l'action antibactérienne (bactéricide ou bactériostatique), à cause de la présence des substances phénoliques (carvacrol, tymol, eugenol), l'aldéhyde cinnamique, les monoterpenols (geraniol, linalol, thujanol, myrcenol, etc.) les aldéhydes (geranial, neral), les cetones (thujone, verbenone, carvone, camphre), les éthers (estragole, anethole), oxydes terpénique,
- l'action antifongique, à cause de la présence des alcools et des lactonnes sesquiterpeniques,
- l'action antivirale, attribuée à la présence des alcools, aldéhydes et cetones de monoterpenoides (cyneol, linaloloxid, linalol, etc.),
- l'action antiseptique (la désinfection des salles de réanimation et des chambres de malades contagieux) est le résultat des huiles volatiles phénolées sous forme d'aérosols,
- l'action désodorisante pour des chambres et aussi pour le corps,
- action stimulatrice pour le métabolisme de la cellule,
- action antiparasitaire, insecticide et insectifuge,
- action imunostimulatrice,

Comme méthodes de traitements dans l'aromathérapie on utilise: des randonnées dans les jardins de plantes odorantes et aromatisées, poudres de plantes odorantes dans des emballages spécifiques pour les chambres et pour des substances odorantes corporelles, des inhalations avec de plantes ou des essences, des bains avec des plantes ou des essences, des compresses, la lampe d'aromathérapie, des produits de massage corporel. Pour l'usage interne les huiles volatiles peuvent être administrées sous la forme de goûtes, perles ou capsules et sous la forme de thés. Les essences étant si concentrées elles sont utilisées en dilution. En fonction de leur composition, les essences peuvent agir différemment sur l'être humain.

Nous avons fait des études pour les traitements d'aromathérapie en utilisant les plantes aromatisantes et les huiles volatiles des espèces médicinales connues traditionnellement dans la médecine populaire roumaine. On peut y préciser:

Famille Labiatae (*Lavandula off.*,*Thymus serpyllllum*, *Thymus vulgaris*, *Salvia officinalis*, *Hyssopus off.*, *Origanum majorana*, *Origanum vulgare*, *Ocimum basilicum*, *Mentha piperita*, *Mentha crispa*, *Melisa off.*), Famille Umbeliferae (*Pimpinella anisum*, *Angelica archangelica*, *Coriandrum sativum*), Famille Compositae (*Artemisia abrotanum*, *Chrysanthemum* balsamita var *camfora* si var *carvona*), Famille Pinaceae (*Abies alba*, *Pinus sylvestris*, *Picea excelsa*).

Aromatherapy – an alternative of treatment

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Aromatherapy as a component of phitotherapy is based on the use of plants essences (volatile oils) and has deep roots in the Romanian traditional medicine.

Aromatherapy action by the smelling way– the sense with major implications in the sensitization of emotions and the brain functions. To smelling mean to breathe – a vital function of the organism. For a good feeling we need a good breathing and a good breathing can be influenced by aromatherapy, the essences that affect mood and mental function of the sick people.

The flavoured plants are usually, plants that like the light and the air, being that which accumulate the Sun heat by radiation, in essences. The essences have particular, especial fragrance, as a result of cosmic elements concentration in the earth vegetables. These essences were considered as a divine expression in the material world. The essences can be spread in the entire plant but usually they are concentrated (accumulated) inside a specific organ (root, leafs, flowers, fruits) from they are extracted then.

An important problem is the technology of extraction of volatile oils (of the essences) of plants. It was noted that volatile oils is not the faithful image of the composition of the existing volatile substances in the plant due to the fact that some sensitive chemical components can suffer from the reactions of oxidation, hydrolysis, polymerization, etc during the process of extraction. Research in this field showed that the most powerful method of extraction of the substances of plants is the extraction with supercritical liquids because the original substances of the plants are not denatured.

From the scientific point of view aromatherapy is justified by the results obtained in the pharmacological and microbiological studies carried out on volatile oils. It was marked out certainly actions among which it can specify:

the antibacterial action (bactericidal or bacteriostatic) due to the presence of the phenol substances (carvacrol, tymol, eugenol) aldéhyde cinnamique, monoterpen alcohols (geraniol, linalool, thujanol, myrcenol, etc.) aldehydes (geranial, neral), Ketones (thujone, verbenone, carvone, camphre), ethers (estragole, anethole), oxides of terpenoids

- the antiphungic action due to the presence of alcohols and. sesquiterpeniques lactones,
- the antiviral action due to the presence of alcohols, aldehydes and ketones of monoterpenoides (cyneol, linaloloxid, linalol,),
- the antiseptic action,
- the deodorizer action for the rooms and the body,
- the stimulative action for the metabolism cellular,
- the antiparasitaire, insecticide et insectifuge action,
- the action to fortify the immunity of the body,

As forms of treatments in aromatherapy it can use: walk out in the gardens with odorous and aromatized plants, powders of odorous plants in specific packing for the rooms and the odorous body ones, inhalations with plants or essences, baths with plants or essences, compress, the lamp of aromatherapy, products of body massage. For the internal use volatile oils can be managed in the form of taste, pearls or capsules and in the shape of teas. The substances (essences) being so concentrated are used in dilution. According to their composition, the substances can actuate different on the being human.

There are studies for the treatments by aromatherapy by using the aromatizing plants and volatile oils of the medicinal species used in the popular traditional medicine. Among them it can specify:

Familie Labiatae (*Lavandula off.*, *Thymus serpylllum*, *Thymus vulgaris*, *Salvia officinalis*, *Hyssopus off.*, *Origanum majorana*, *Origanum vulgare*, *Ocimum basilicum*, *Mentha piperita*, *Mentha crispa*, *Melisa off.*), Familie Umbeliferae (*Pimpinella anisum*, *Angelica archangelica*, *Coriandrum sativum*), Familie Compositae (*Artemisia abrotanum*, *Chrysanthemum balsamita* var *camfora* si var *carvona*), Familie Pinaceae (*Abies alba*, *Pinus sylvestris*, *Picea excelsa*).

Ethnomedicinal Knowledge in Morocco: Checklist of Rifian Medicinal plants

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Abstract

Ethnobotanical research undertaked in the Rif region in the northern zone of Morocco ((Merzouki *et al.*, 1997a, b; Merzouki *et al.*, 1999 ; Merzouki *et al.*, 2000) whitch principal aim is the elaboration of the traditional herbal remedies catalogue. Adopting an ethnobotanical methodology based on detailed interviews, 350 plant species are repertoried. The present work deal with 151 species belonging to 48 botanical families with their respectively ethno-medical uses.

Résumé

Les recherches ethnobotaniques menées dans le Rif, nord du Maroc (Merzouki *et al.*, 1997a, b; Merzouki *et al.*, 1999 ; Merzouki *et al.*, 2000) ont pour objectif essentiel la compilation des données ethno-médicinales de la région. En adoptant une méthodologie basée sur des enquêtes approfondies avec la population locale, 350 espèces sont répertoriées. Le présent travail comprend 151 espèces appartenant à 48 Familles botaniques avec leurs respectives utilisations ethno-médicinales.

Preliminary Study of Coriander's (*Coriandrum sativum* L.) Ethnobotany and Variability in the Alentejo Region

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Key words: Ethnobotany; Coriander; Germaplasm; Inquiries; Characterisation; Variability, Genetic Resources; *Coriandrum sativum*.

Introduction

In the last decades we have been assisting to a renewed interest in the study, investigation, consumption and production of aromatic and medicinal plants (AMP).

In Portugal there are good market perspectives for an increase in production, contributing to the development of rural populations, promoting farmer's well-being and fixing population in the rural space (Ribeiro, 2000).

As the knowledge about traditional use of AMP is disappearing, ethnobotany has an important role in saving the remaining information. The farmer's knowledge about use and production of traditional varieties is important to preserve our vegetal genetic resources.

The present ethnobotanic study about Coriander is included in a AGRO project and has the following goals: to contribute for the preservation, valorisation and characterisation of the species; perform ethnobotanic inquiries to understand and acquire knowledge about the traditional use of Coriander in Alentejo and; to observe morphologic descriptors of the collected populations to evaluate it's variability.

Methodology

The 28 sampled places were planned to guarantee a good heterogeneity of soil types, topography, altitude, latitude and longitude so that our studied area could be well represented (Fig. 1). In each local, we collected a seed sample, a soil sample, passport data and undertake an ethnobotanic inquiry (informant's social characterisation and informant's knowledge about Coriander's uses, production, culinary recipes, etc.).

To accomplish the objectives of the ethnobotanic inquiry and guarantee a complete and correct answer from our informants, during the performance of the ethnobotanic inquiries, it was important: to establish a first contact in a public place (coffee shop, market place, house front, etc.), to make an informal dialog using a simple language and to avoid dialog deviation from the interviewed.

A Portuguese and a Spanish commercial varieties were used as controls in the morphological descriptors essays. The morphological descriptors were based on Diederichen (1996) and follow another study developed by Farinha *et al.* (2003). The main characteristics observed for each sample in the pot essay performed in Elvas were: basal leaves number, length of the longer basal leaf; habit and shape of basal leaf, length and width of the upper stem leaf; plant height and biomass; fruit number; 100 fruit weight; beginning of flowering and fructification and number and weight of fruits per plant (table 1).

Results and results discussion

The informants were mainly male (Fig. 2). Nevertheless, they were accompanied by their wives, which had the knowledge about coriander, but for cultural reasons gave their husband name for the official identification of the ethnobotanic inquiries.

The informants aged above 60 years presented the majority of the interviewed people (Fig. 3). So, elder people posses the traditional knowledge and use this plant. This fact showed us that is urgent to accelerate the collection of traditional knowledge before it disappears.

The informants are, mainly, illiterate (57%) and about 42,9% went to elementary school (Fig. 4). Those results showed that people with high school instruction don't use coriander or its local varieties.

The majority of our informants have two sons or daughters, which can contribute, but does not assure the successful transmission of the traditional knowledge to future generations.

About 70 % of the interviewed informants are farmers in part-time (Fig. 5), dedicating a small length of time to medicinal and aromatic plants in general and to Coriander production in particular.

Coriander is often used in Alentejo; the majority of our informants use it at least once a week as food condiment on traditional recipes (Fig. 6 and 7). The aromatic and medicinal properties of this plant seem to be unknown.

Coriander as a very limited rank of popular names, for it's known only by «coentro» or «cheirinhos».

The inquiries took place in small size areas near the houses, where the families have their horticulture and AMP for auto-consumption. About 82,1% of the visited farms dedicated only 5 m^2 for Coriander and other AMP production (Fig. 8). Only 10,7% of the interviewed produce Coriander for sale in local markets.

The interviewed sow and use coriander plants all over the year, thought with a lower frequency in the summer due to the flowering stage of the plant in this season. The leaves and stems are used for culinary purposes; seeds are collected to guarantee future plant propagation.

Based on the soil samples collected, we can say that coriander is cultivated, mostly, in clayey-loam soils and can be found in all of the altitudinal variety of Alentejo (33 to 617 m).

The majority of the interviewed informants didn't indicate a Coriander's disease or pest. Some reported to have problems with snails, ants and aphids (Fig. 9).

Most of our samples were located in plane places, characteristic of Alentejo, but some samples were also collected in hill slopes and mountainous locations, which shows a great elasticity of this plant (Fig. 10).

From a total of 21 morphologic descriptors studied, 14 showed high statistical differences between seed varieties (genetic variability), being: basal leaves number, basal leaf growing type, basal leaf shape, length and width of the upper stem leaf, plant height, phenology, 100 fruit weight, biomass, number and weight of fruit/plant (Table 2).

Conclusions

The knowledge transmission about Coriander is declining due to rural abandonment, the ageing of rural populations and the lack of interest of the younger for the traditional way of life and traditional knowledge.

In spite of its aromatic and medicinal proprieties, our study indicates that Coriander is used in Alentejo only as a food condiment.

Coriander and other AMP are mainly cultivated in pots and small areas (5 m^2) in the neighbourhood of the houses.

From a total of 21 morphologic descriptors studied, 13 showed high statistical differences between accessions (genetic variability), being: basal leaves number, basal leaf habit, basal leaf shape, length and width of the upper stem leaf, plant height, phenology, 100 fruit weight, biomass, number and weight of fruit/plant.

It is urgent to continue the registration of the remaining traditional knowledge and to collect local seed varieties of Coriander and other useful plants to prevent it's extinction.

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Farinha, N.; Póvoa, O., Amante, I. Variabilidade morfológica existente numa colecção de germoplasma de coentro (Coriandrum sativum L.) do Sul de Portugal. Anais do ISA. 2003. (accepted for publication).

FIGURE 1. Sample places in the Alentejo region.

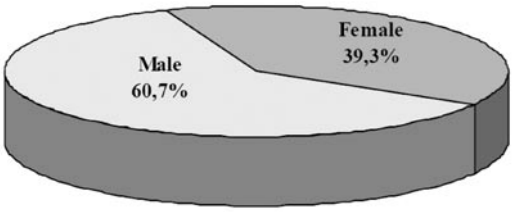

FIGURE 2. Informant's sex.

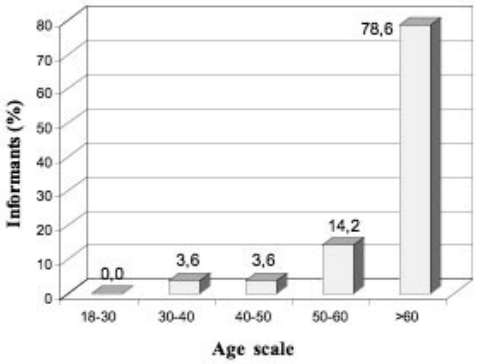

FIGURE 3. Informant's age.

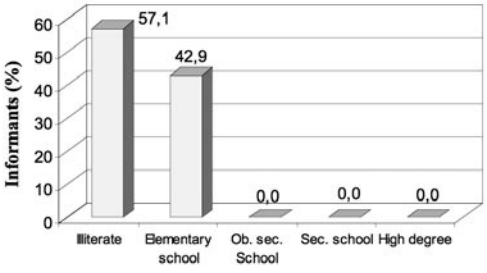

FIGURE 4. Informant's literacy.

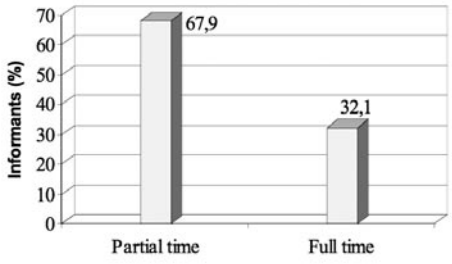

FIGURE 5. Informant's farm activity.

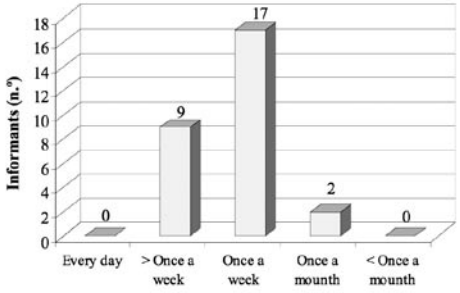

FIGURE 6. Frequency of Coriander's utilisation in traditional recipes.

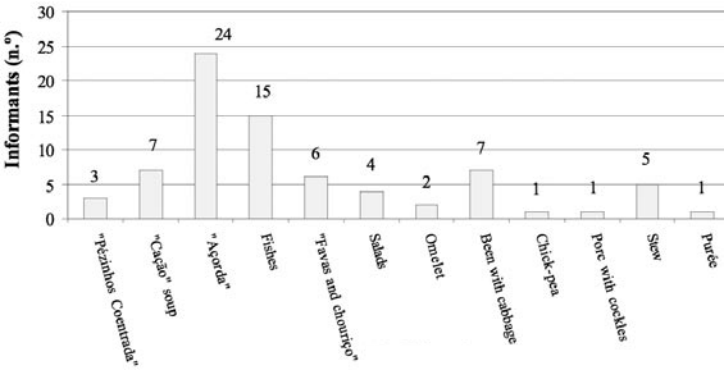

FIGURE 7. Coriander's traditional recipes referred by the informants.

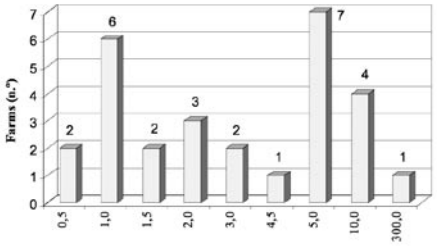

FIGURE 8. Area of production of Coriander and other aromatic and medicinal plants.

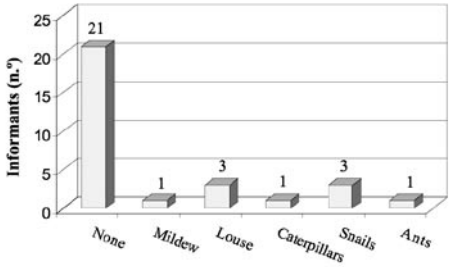

FIGURE 9. Coriander diseases referred by the informants.

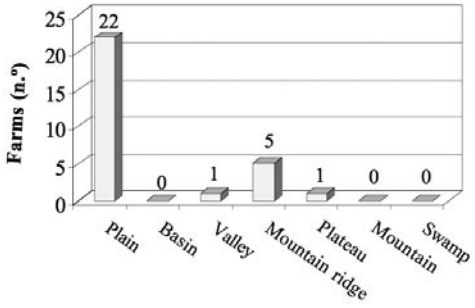

FIGURE 10. Topography of the sample places.

Observed characteristics	Abbreviators
Vegetative characteristics [a]	
Number of basal leaves	nfBa
1st basal leaf length	co1F
1st basal leaf petiole length	cp1F
Basal leaves growing type	hFBa
Biggest basal leaf blade length	cFBa
Biggest basal leaf blade shape	flFB
Upper stem leaf length	cFSu
Upper stem leaf width	lFSu
Plant high	altu
Number of ramifications	rami
Biomass/plant	Biom/pl
Phenologic characteristics	
Beginning of flowering	Infl
Full flowering	Plfl
Petal colour	cor
Beginning of fructification	Infr
Reproductive characteristics	
Number of reproductive node	nnrp
Number of fruits	nfru
1000 fruit weight	pmil
Fruit shape	fofr
Fruit weight/plant	pfru

[a] observed in the beginning of flowering.

TABLE 1. Morphological characteristics and it's abbreviators.

Variable	Significance	Variable	Significance	Variable	Significance
nfBa	*	Plfl	*	rami	ns
Co1F	ns	Infr	*	nfru	**
Cp1F	ns	Biom/pl	**	pfru	**
cFBa	ns	cFSu	*	pmil	*
hFBa	*	lFSu	**	fofr	ns
flFB	*	nnrp	ns	cor	ns
Infl	**	altu	***		*

Significance: ns - Not significant, * - Significant at 0,05 level, ** - Significant at 0,01 level. *** - Significant at 0,001 level.

TABLE 2. Analysis of variance output resume for the morphological characteristics differences between accessions.

Folkmedicina en población inmigrante de Benimaclet

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Palabras clave: Folkmedicina, inmigrante, fitoterapia

Introducción

El problema de la inmigración es una situación patente en España desde hace unos años. España ha pasado de ser un país de emigrantes hasta hace unas décadas para convertirse en país receptor de inmigrantes en los últimos diez años. Nuestro país no tiene asumido el papel de país receptor y las noticias en los medios de comunicación siguen insistiendo en los aspectos negativos de la inmigración.

Material y métodos

El propósito de esta investigación es estudiar los conocimientos y usos de folkmedicina en la población inmigrante de origen latinoamericano en el distrito de Benimaclet de la ciudad de Valencia. El siguiente trabajo se ha basado en entrevistas realizadas a los inmigrantes latinoamericanos que acudían a un centro de beneficencia de Benimaclet. Los criterios de inclusión en el estudios fueron los siguientes: Población inmigrante procedente de Latinoamérica, período de estancia en Valencia superior a 1 mes, mayores de 14 años, residencia en la zona de estudio.

El número de entrevistas realizadas ha sido de 87, de forma que se obtiene un intervalo de confianza del 95% (p0,05) para el bajo porcentaje de resultados positivos esperados según los resultados previos encontrados en estudios previos (Sanz, 1998).

Las entrevistas tenían un carácter semiestructurado, recogiéndose mediante preguntas cerradas datos demográficos y algunos datos generales sobre el estado de salud del entrevistado. La información aportada se completaba con preguntas abiertas para clarificar o añadir más datos a las preguntas realizadas previamente. Finalmente, se preguntaba sobre el conocimiento de remedios naturales o de folkmedicina y el uso que hacían de ellos en el nuevo entorno donde se asentaban.

Características de la población entrevistada

El número de entrevistado fue de 87 personas, con una edad media de 32 años. Predominan las mujeres, que suponen casi las ¾ de la muestra con 63 sujetos.

Según la procedencia, predominan los ecuatorianos, con 83 individuos. Le siguen los colombianos, 2 personas, y los argentinos y bolivianos con 1 entrevistado para cada nacionalidad. El estado civil más frecuente entre los entrevistados es el matrimonio o la pareja, con una total de 57 personas; le siguen los solteros o sin pareja estable con 19 personas y los divorciados con 10. El resto se completa con 1 viudo. Los matrimonios están constituidos mayoritariamente por individuos de mismo país, con hasta 9/10 de los que se confiesan casados o con pareja.

Resultados

En nuestra muestra, el número de inmigrantes que conocen remedios naturales o de medicina es muy alto, 81 personas, más de 9 de cada 10 entrevistados. Los que utilizan los remedios que conocen es más bajo, de 48 personas. Los individuos que conocen remedios de folkmedicina pero no los usan, 33 personas, no suelen especificar ningún motivo concreto para justificar la ausencia de uso de estos recursos, pero entre los que sí dan una respuesta, las razones más frecuentes son el desconocimiento de dichos remedios en Valencia o la ausencia de necesidad de emplearlos. El desconocimiento de la existencia en Valencia por parte de algunos entrevistados de las plantas o remedios a los que acudían en caso de necesidad y que no los empleen aquí por dicho motivo, muestra un claro proceso desadaptativo, que conlleva a largo plazo la pérdida de parte de la cultura médica propia, dado que se ha constatado que otros inmigrantes han acudido a herbolarios, a comercios o a su propio país para acceder a estos recursos.

Relación de remedios y/o productos de medicina popular empleados

Los productos de medicina tradicional o folkmedicina empleados por el colectivo inmigrante entrevistado en Benimaclet, ordenados de forma decreciente y señalando su frecuencia, se citan en la TABLA 1.

Clasificación de patologías y usos de medicina popular empleados

Las enfermedades o síntomas que han sido objeto de tratamiento con terapias alternativas por parte de los entrevistados se clasifican según la propuesta CIPSAP-2 WONCA, clasificación ya empleada en estudios desarrollados en Cataluña.

El conjunto de patologías que ha resultado ser más tratado con remedios populares ha sido el encuadrado en grupo IX, que corresponde a la patología digestiva. El síntoma tratado más prevalente ha sido el dolor de estómago, para el que se ha empleado fundamentalmente manzanilla, aunque también se ha usado poleo, menta, hierbabuena, cebolla, puerro, limón, té, anís, canela u orégano. Otros problemas tratados han sido el meteorismo o la diarrea.

El segundo grupo de patologías más tratadas ha sido el de las enfermedades infecciosas, grupo I de la clasificación CIPSAP-2 WONCA. Predominan las personas que han buscado solución para la gripe con remedios basados en la naranja, el limón o la *Coca Cola®*. Otras infecciones que se han solucionado con terapias diferentes a las de la medicina moderan son las amigdalitis, infecciones urinarias y conjuntivitis.

El grupo XVI, que incluye síntomas y signos mal definidos que no se encuadran bien en otros apartados, es tercer grupo más tratado por los inmigrantes. La tos es el síntoma más frecuente de este grupo. Habitualmente tiene un origen infeccioso. Para calmar la tos los entrevistados mencionan un jarabe a base de miel y cebolla y la leche con ajo. Otros signos y síntomas que se mencionan son la inflamación, las afecciones de garganta y los dolores menstruales. Los recursos empleados para su curación o alivio son la infusión de manzanilla para la inflamación, gárgaras de zumo de limón e infusión de manzanilla y ajo con miel de abeja para la garganta e infusiones de orégano o de higo para los dolores menstruales. Otro problema, más propio de los países latinoamericanos, el *malaire,* ha sido tratado por un entrevistado frotándose el cuerpo con un huevo y una cebolla.

La patología del sistema genito-urinario es el siguiente grupo con más usos de terapias no convencionales. Predominan los remedios relacionados con el riñón y sus problemas, en los que se emplean diversas plantas, sin prevalecer claramente ninguna.

Los otros grupos de la clasificación CIPSAP-2 WONCA que han sido tratados por las personas entrevistadas mediante remedios de folkmedicina son el V, VI, VIII, XII, XIII y XVIII.

Plantas de uso medicinal

Los remedios vegetales, clasificados de forma independiente según las familias, se agrupan en la TABLA 2. La distribución por especies, siguiendo una clasificación de más a menos frecuentes, se muestra en la TABLA 3.

Conclusiones

En este estudio se ha detectado que el grado de conocimiento de remedios de medicina tradicional es muy elevado, 9 de cada 10 personas, aunque el uso de estos remedios no es tan alto como sería de esperar con estos resultados (poco más de la mitad). Aunque los datos reflejan un uso de remedios tradicionales en más o menos la mitad de la población inmigrante residente en Benimaclet, este uso es superior al detectado en inmigrantes de otras poblaciones (Sanz, 1998). Las razones aducidas para no utilizar dichos conocimientos varían entre la incapacidad para encontrar estos recursos aquí (lo que refleja habitualmente un desconocimiento del nuevo entorno donde se desenvuelven) o la ausencia de necesidad de recurrir a ellos. El número de plantas y de usos más frecuentes en la medicina popular de los inmigrantes corresponde con aquellos que tratan sobre la patología digestiva y la infecciosa. Las plantas con uso medicinal más frecuentemente mencionadas han sido la manzanilla y el limón. En tercer y cuarto lugar están la cebolla y el llantén respectivamente.

En conclusión, el riesgo de que los inmigrantes pierdan parte de sus conocimientos médicos populares al integrarse en una nueva sociedad con asistencia sanitaria universal gratuita es un peligro que debe tenerse en cuenta, de forma que se procure conservar su riqueza cultural particular a la vez de que favorece su integración en nuestro medio.

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Manzanilla (*Chamomilla recutita* L.)	24	Rábano (*Raphanus sativus* L.)	3	Desenfriol®	1
Cebolla (*Allium cepa* L.)	10	Alcohol	2	Eucalipto (*Eucalyptus spp*)	1
Limón (*Citrus limon* (*Burn*)	10	Azúcar	2	Higo (*Ficus carica* L.)	1
Canela (*Cinnamomum zeylanicum* L.)	5	Cola de caballo (*Equisetum arvense* L.)	2	Huevo	1
Miel	5	Hierba buena (*Mentha spp.*)	2	Llantén (*Plantago major* L.)	1
Ajo (*Allium sativum* L.)	4	Lechuga (*Lactuca sativa* L.)	2	Menta (*Mentha piperita* L.)	2
Leche	4	Limonada	2	Poleo (*Minthostachys mollis* (Kunth) Benth)	1
Orégano (*Origanum vulgare* L.)	6	Naranja (*Citrus sinensis* L.)	2	Puerro (*Allium porrum* L.)	1
Té (*Thea spp.*)	4	Patata (*Solanum tuberosum* L.)	2	Sábila (*Aloe vera* L.)	1
Anís (*Pimpinella anisum* L.)	3	Alcanfor	1	Sebo de vaca	1
Boldo (*Peumus boldus*)	3	Clavo	1	Uña de gato (*Mimosa albida*)	1
Coca Cola®	3	Cheracol®	1	Valeriana (*Valeriana officinalis* L.)	1
Linaza (*Linum usitatissimum* L.)	3	Coco (*Cocos nucífera* L.)	1		

TABLA 1. Remedios y/o productos de medicina popular utilizados.

Familia	Frecuencia	Familia	Frecuencia
Agavaceae	3	Meliaceae	1
Amaranthaceae	1	Mimosaceae	6
Anonaceae	1	(Mollantín)	1
Asteraceae	9	Monimiacae	1
Boraginaceae	2	Moraceae	4
Bromalliceae	2	Myrtaceae	10
Caprifoliaceae	2	Palmaceae	1
Caricaceae	2	Plantaginaceae	18
Compositae	49	Polipodiaceae	1
Cruciferae	8	Portulacaceae	1
Cucurbitaceae	2	Rosaceae	6
Chenopodiaceae	4	Rutaceae	32
Equisetaceae	14	Simarubaceae	2
Euphorbiaccae	1	Solanaceae	16
Geramiaceae	1	Teaceae	5
Gramineae	5	Tiliaceae	6
Juglandaceae	1	Umbelliferae	9
Labiatae	34	Urticaceae	3
Lamiaceae	5	Valerianaceae	2
Lauraceae	10	Verbenaceae	9
Liliaceae	38	Violaceae	1
Linaceae	18	Vitaceae	1
Magnoliaceae	2	Zingiberaceae	2
Malvaceae	2		

TABLA 2. Relación de familias de especies vegetales utilizadas.

Especie	Frecuencia	Especie	Frecuencia
Chamomilla recutita L. Rauschert	44	*Eugenia caryophyllata* Thunb, *Eugenia aromatica* Ball.,	2
Citrus limon (Burn)	21	*Simaba cedron* Planch	2
Allium cepa L.	18	*Cyphomandra betacea* Sendt	2
Plantago major L.	18	*Lycopersicum esculentum* Miller	2
Linum usitatissimum L.	17	*Prunus persica*	2
Melissa officinalis L.	14	*Corandrum sativum*	2
Equisetum arvense L.	11	*Solanum nigrum* L.	2
Aloe vera L., *Aloe barbadensis* Miller, *Aloe vulgaris* Lam.	10	*Allium porrum* L.	2
Origanum vulgare L.	10	*Illicium verum* Hook f.	2
Solanum tuberosum L.,	10	*Valeriana officinalis* L	2
Cinnamomum zeylanicum L.,	9	*Amaranthus* spp.	1
Allium sativum L.	8	*Amygdalus communis* L.	1
Citrus sinensis L. Osbeck	7	*Anoda cristata* L. Schlechtendal, *Anoda hastata* Cav.	1
Eucalyptus spp.	7	*Annona muricata* L.	1
Mimosa albida	6	*Cedrela odorata* L.	1
Peumus boldus	6	*Chenopodium common*	1
Pimpinella anisum L.	6	*Chenopodium graveolens* L., *Chenopodium graveolens* Willd.	1
Tilia phatyphyllos Scopoli, *Tilia officinarum* Crantz.	6	*Cocos nucífera* L.	1
Aloysa tripilla L.	5	*Cucurbita pepo* L.	1
Aristeguietia glutinosa (Lam) King&Robinson	5	*Cucurbita* spp.	1
Lactuca sativa L.	5	*Cymbopogon citratus* (DC) Stapf	1
Minthostachys mollis (Kunth) Benth	5	*Daucus carota* L.	1
Thea spp.	5	*Erythroxylon coca*	1
Brassica oleracea	4	*Ficus carica* L.	1
Mentha spp.	4	*Juglans* spp.	1
Mentha x piperita L.	4	*Laurus persea* L.	1
Raphanus sativus L.	4	*Lavatera arborea* L.	1
Ruda graveolens L.	4	*Malus communis* DC	1
Verbena officinalis L.	4	*Manihot esculenta* Crantz	1
Zea mays L.	4	(Mollantín)	1
Zingiber officinale Roscoe	4	*Ocimum basilicum*	1
Artocarpus altilis	3	*Pavonia schiedeana Steudel*	1
Dracaena draco	3	*Pelargonium odoratissimum* L.	1
Equisetum giganteum L.	3	*Polypodium calaguala*	1
Taraxacum officinale Web	3	*Portulaca oleracea* L.	1
Urtica urens L.	3	*Pluchea odorata* L. Cass	1
Ananas comosus L. Merrill	2	*Prunus domestica* L.	1
Borago officinalis	2	*Psidium guajava* L.	1
Carica papaya L.	2	*Rosa* spp.	1
Chenopodium ambrosioides L.	2	*Rosmarinus officinalis* L.	1
Sambucus nigra L, *Sambucus peruviana*	2	*Vitis vinifera* L.	1

TABLA 3. Relación de especies vegetales utilizadas.

Biological activity of crude aqueous extracts from leaves, pods and seeds of *Catalpa bignonioides* Walter (Bignoniaceae)

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Keywords: *Catalpa bignonioides*. Extracts. Biological activities.

1. Introduction

Species belonging to the Bignoniaceae, neotropical family, are widely used in medicinal practice by the indigenous cultures of South America. Some of these species, like *Jacaranda micrantha* Cham., *Tabebuia caraiba, Tecoma sambucifolia* and *Tecoma stans* are know for the anti-inflammatory, antirheumatic, antinociceptive, narcotic or antisyphilitic activity of their extracts.

Catalpa genus has been less studied. However, it is known that water extracts from *C. ovata* fructus have mutagenic activity towards *Salmonella typhimurium* (Nozaka *et al.* 1989). Extracts of stem-bark of *C. ovata* has as well antitumoral activity (Fujiwara *et al.*, 1998).

2. Objectives

C. bignonioides is an species that had been introduced in Spain. As there are no preliminary studies, the objectives of this study are: a) preliminary phytochemical analysis of the plant extracts; b) test antimicrobial activity against five bacteria, one yeast and one fungi; c) evaluate cytotoxic activity against human tumor cells and d) investigate antinociceptive and antiinflamatory activities in rodents.

3. Materials and methods

Plant material

C. bignonioides was collected in Madrid (Spain). The voucher specimen was kept in the herbarium of the San Pablo CEU University under reference nº 250399.

Crude extracts from pods, seeds and leaves were prepared by decoction of 10 g of each pulverized material in 200 mL of water for 30 min. The resultant extracts were then filtrated and concentrated to dryness under reduced pressure. The yield was 22.9% (w/w) for pods, 14.1% (w/w) for leaves and 5.3% (w/w) for seeds.

Preliminary phytochemical analysis

Crude extracts were used for the identification of saponins, tannins, total phenols, anthraquinones, sterols and flavonoids using the methods previously described by Tona *et al.*, (1998).

Cytotoxicity assays

The cytotoxic effects were evaluated by MTT assay over human hepatome cell line HepG2 (ATCC, HB8065). IC50 was calculated for each extract.

Bacterial growth inhibition

Minimal inhibitory concentration (MIC) by microdilution method of the extracts were tested against: *E. coli* ATCC 35219; *P. aeruginosa* ATCC 9027; *S. aureus* ATCC 24213; E. faecalis ATCC 29212; S. *typhimurium* ATCC 13311.

Anti-inflammatory and antinociceptive test

Male Sprague-Dawley rats (200-250 g, San Pablo-CEU University breeding) and male OF1 mice (25-30 g, Iffa-Credo, France) were used. The doses used were 1 g/kg of c rude, 40 mg/kg of ethereal, 300 mg/kg of butanolic and 555 mg/kg of aqueous extract (10 mL/kg i.p.). Control animals were injected with physiological saline solution.

Antinociception was assessed by acetic acid writhing in the mouse (Koster, 1959). The anti-inflammatory activity was determined with the carrageenan-induced hindpaw edema in the rat (Winter, 1962).

4. Results and discussion

The potential antitumoral and antimicrobial activities (TABLE 1 AND 2) of Catalpa bignonioides extracts appear to be lesser therapeutic value than those of other Bignoniaceae; however this conclusion can be strictly applied only to the Spanish specimen of this species and we cannot rule out that other tropical plants might contain higher amounts of active substances or even different compounds of interest.

In contrast, the extracts exhibited a considerable degree of antinociceptive (FIGURE 1) and anti-inflammatory activity (Table 3), since they provided a pharmacological effect comparable to indomethacin. These results are somewhat preliminary and must be followed by comparative dose dependency studies after i.p. administration of the extracts. The results also show that the crude extracts of pods and leaves were more active with respect to those of seeds. These potential activities are probably related to the saponins, sterols or phenols contained in the leaves and pods.

Further studies of the principles contained in crude and aqueous extracts would be advisable, due to their pharmacological interest combined with low cytotoxic effect.

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Crude extract	Anth.	Sap.	Este.	Tan.	T. Ph.	Flav.	IC_{50} (mg/ml)
Seeds	-	+	+	-	+	-	28
Leaves	-	+	+	-	+	-	23.6
Pods	-	+	+	+	+	+	10.9

Anth.: anthraquinones, Sap.: saponins, Este.: sterols, Tan.: tannins, T.Ph.: total phenols, Flav.: flavonoids.

TABLE 1. Phytochemical screening and cytotoxic activity, against HEpG2 cells, of crude aqueous extracts from *Catalpa bignonioides*

Crude extract	*E. coli*	*Ps. aeruginosa*	*St. aureus*	*E. faecalis*	*S. tiphymurium*
Seeds	100	100	50	50	50
Leaves	6.25	100	12.5	12.5	6.25
Pods	6.25	50	12.5	12.5	3.12

TABLE 2. Antibacterial activity of crude aqueous extracts from *Catalpa bignonioides* (MIC, mg/ml)

Treatment	n	Paw volume (ml) after carrageenan injection			
		Baseline	1h	2h	3h
Saline	15	1.53±0.02	2.00±0.03	2.64±0.10	2.91±0.10
Indomethacin	14	1.55±0.02	1.79±0.03 *	2.18±0.04 *	2.43±0.04 *
Crude extract					
Seeds	6	1.56±0.01	1.92±0.07	2.62±0.20	2.86±0.25
Leaves	6	1.59±0.04	1.93±0.03	2.15±0.10 *	2.31±0.22 *
Pods	16	1.61±0.02	1.92±0.04	2.10±0.11 *	2.25±0.11 *

TABLE 3. Anti-inflammatory effect of crude aqueous extracts from *Catalpa bignonioides* on carrageenan-induced hind paw inflammation in the rat.(*, p 0.05 Vs saline)

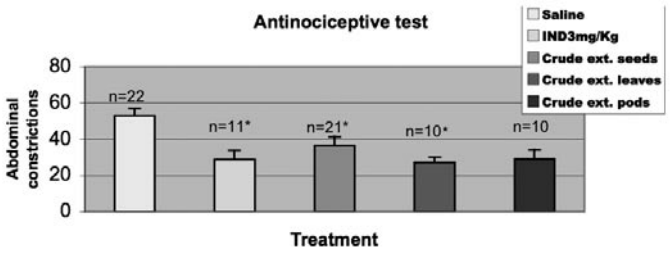

FIGURE 1. Effect of aqueous extracts of *C. bignonioides* on abdominal constrictions produced by acetic acid. Bars are means ± S.E.M. * P 0.05 Vs saline.

In vitro and *in vivo* sensitrirty of *Nocordia species* to plant (x)

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This is a preliminary study on the effect of plant (X) on the growth of Nocordia species.The use of herbal treatment in Sudanese patients has been well known all over the country since a long time ago. Due to the expensive surgical and medical treatment of different disease people prefer native treatment.

Plant (X) has been tested before for *Enmycetoma* and found to be very effective. This action stimulated us to test the plant on Nocordia species.

Using the plant on *N. brasiliensis* and *N. asteroids*.

In vitro: Different concentrations of the crude plant "100 - 50- and 25 mg/100m;) of Sabrouad's medium were used. Control sabrouad's medium without the plant was also included. All media were inoculate by the organisms (*N. brasiliensis* and *N. asteroids*) and incubated for up to 3 weeks. Growth of the test organisms was clear on the control medium. No growth was detected in all media with the different concentrations of the crude plant. Ethanolic extract of the plant was tried in the same way as above using different concentrations "60 - 30 and 15 mg/100ml sabrouad's" gave similar results.

In vivo test: in vivo testing was tried using 3 days old mice. The mice were first inoculated by *N. brasiliensis* in the foot pad. Infection appeared of the one week in the form of swelling. One week later a specimen was taken from the swelling and examined both microscopically and culturally and proved to be *N. brasiliensis*. trial of treatment of the infected mice was done using the plant in the form of paste applied locally. After application of the paste the swelling opened sinuses within one week. This was followed by closure of the sinuses decrease in size of the swelling and the lesion returned back to normal in about two weeks.

Control infected mice were included and the lesion was increasing.

Conclusion according to *in vitro* and *in vivo* the herb is quite promising and economically it is very cheap.

Medicinal and wild food plants from Senoufo area in Burkina Faso

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Key words: Medicinal plant – Food plant – Ethnobotany – Senoufo – Burkina Faso

Introduction

Ethnobotanical surveys were conducted close to Sindou village in south west Burkina Faso. This area is mainly inhabited by people from Senoufo ethny.

There were few studies in this area due to natural difficulties to access the area (hills, long rainy season). From a botanical point of view, the area is located in the south soudanian phyto - geographical area but some guinean species can be found along the rivers. Both the climate and relief could permit the vegetation to develop and local biodiversity is very rich and higher than anywhere in Burkina Faso (BOGNOUNOU, 1996).

Many traditional uses were then possible from these vegetal richness and we first tried to collect datas on wild food plants and on medicinal plants.

Methods

The ethnobotanical surveys were conducted in years 2000 – 2001 in the following conditions:

- Agreement of traditional authorities.
- Different social categories of people involved, especially women (for food plants), traditional healers (whose association was in charge of the survey) and Dozos (traditional hunters from Senoufo area).
- Surveys were conducted all around the year to get all kind of vegetation (annual or perennial plants).
- Collection of a voucher specimen for each mentioned plant.

The main objective was to register oral knowledges in Senoufo tradition about wild food plants and medicinal plants. Secundly, we also try to identify and translate when possible the vernacular names.

Results

1 - These surveys permitted us to collect first registered datas in Senoufo area from Burkina Faso about 45 vegetal species, belonging to 30 botanical families that are used, either for food (Table 1 and 2) or traditional medicine (Table 3).

2 - Among them, many plants are used both for food or medicine, which show how important some plants can be in a rural area: as an example, *Annona senegalensis* Pers. (ANNONACEAE) is used in traditional medicine (leaves or roots against diarrheas), for cooking (leaves) and the fruit is also collected.

3 - Local names in Senoufo language were either registered or confirmed (MALGRAS, 1992). It appears that some names are depending on:

- the possible use of a part of the plants: *Nauclea latifolia* Sm. (RUBIACEAE) as “old women spoon” since the leaves can be used for eating.
- the shape of the plant: *Cissus gracilis* G. *et* Perr. (VITACEAE) is a liana: its name is “the rope of richness”.
- from the name of an animal: like the fruit of *Flacourtia indica* Merill (FLACOURTIACEAE) known as “Elephant apple”
- the taste of the fruit: *Lannea microcarpa* Engl. *et* Krause (ANACARDIACEAE) as the “True Lannea”or “Good Lannea” and Lannea velutina A. Rich “The Lannea of the Hyena” that nobody wants except the hyena!

Conclusion

These results show how important the wild vegetal species are for these two human activities, that’s to say, food and medicine: collection of leaves and fruits from different species along the year offers a nutritional complement, specially for children or pregnant women (as schown by HELMFRID, 1997).

This is particulary true as far as vitamins, minerals and fibers are concerned, which is very important in Burkina Faso where main food is based on cereals (FAVIER *et al.*, 1993). We could identify a great number of species which contribute both to the health and to enjoy everyone (tasty wild fruits).

The survey leads to the same conclusion for the health of rural populations, since traditional medicine appears to be depending from local biodiversity in a very important manner. As we found before in other parts of south west Burkina Faso (OLIVIER *et al.* 2002), many species are used to treat most frequent diseases, using different parts of plants, mainly roots and leaves, in an area where modern medecine is lacking.

This is also a way to underline the main role of women who takes part in collection of wild plants both for food and traditional medicine, especially for pediatrics or obstetrics ailments.

This conducted us to encourage registration and teaching of traditional knowledges, and also to underline the great importance of protecting biodiversity.

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Species	Senoufo name	Traditional meaning / General informations
Annona senegalensis Pers. ANNONACEAE	Namurungo / Logossounga	-
Boerhavia diffusa L. NYCTAGYNACEAE	Pèpèwa	Boil the leaves into water. Eliminate the water, then cook with all the ingredients (salt, tomatoes, onions). Once can add peanuts butter.
Bombax costatum Pell. *et* Vuill. BOMBACEAE	Tanga / Zantalga	-
Cardiospermum halicacabum L. SAPINDACEAE	Bobo bourou	Boil the leaves with all ingredients. Once can add peanuts butter.
Cassia tora L. CAESALPINIACEAE	-	-
Cissus gracilis G. *et* Perr. VITACEAE	Namiawa	Boil the leaves with some potash, eliminate the water, then smash the leaves. Add spices and peanuts butter.
Cissus populnea G. *et* Perr. VITACEAE	Panpawa Foutogoulon	Panpawa: "Rope of richness"
Cussonia barteri Seem. ARALIAEAE	Nssokowan	Boil the leaves with some potash.
Ficus capensis Thumb MORACAE	Nintorogo	Boil the leaves with some potash, eliminate the water, then smash the leaves. Add spices and peanuts butter.
Leptadenia hastata (Pers.) Decne ASCLEPIADACEAE	Karakoro	-
Tamarindus indica L. CAESALPPINIACEAE	Shoshianga / Kataanga	To be sold on market. This species is protected and sometime cultivated.

TABLE 1. Some food plants whose leaves are used in cooking in Senoufo area, to be served with cereals main meals.

Species	Senoufo name	Traditional meaning / General informations
Annona senegalensis Pers. ANNONACEAE	Namurungo / Logossounga	Bush sweet sop or Bush sugar apple
Detarium microcarpum Guill. *et* Perr. CAESALPINIACEAE	Kaparga / Simfarga	Rich in C. Vitamin. Found on markets.
Diospyros mespiliformis A. Rich EBENACEAE	Nyaanga / Nyaa cige	Appreciated by shepherds.
Flacourtia indica Merill. FLACOURTIACEAE	Nasolo kabon	"Elefant Apple"
Gardenia erubescens Stapf. *et* Hutch. RUBIACEAE	Kacerge mugunon	Kacerge "to be eaten", opposite to *G. ternifolia* Schum. "Santugo kacerge", Kacerge of the Hyena.
Hexalobus monopetalus Engl. *et* Diels. ANNONACEAE	Yaco / Yacogo	Not so tasty!
Species	Senoufo name	Traditional meaning / General informations

Lannea microcarpa Engl. *et* Krause ANACARDIACEAE	Végé Ciwé	The "true" Végé compared to others Lannea species which are not so tasty: L. velutina A. Rich.: "Santugo Végé", Santugo of the Hyena.
Nauclea latifolia Sm. RUBIACEAE	Cinjere kasan	"Old women spoon" because the shape of the leave permits to use it as a spoon. Fruits are not very tasty.
Saba senegalensis Pich APOCYNACEAE	Kamperinge	Fruit juice. Found on markets.
Strychnos innocua Del. LOGANIACEAE	Kak upele	The fruit of the close species S. spinosa Lam. "Kak boghe" or "Kangbulo" is not eaten (risk of diarrhoea)
Syzygium guineense var *macrocarpum* Engl. MYRTACEAE	Sukomom / Wagbo tananga	Found along rivers.
Vitex doniana Sweet VERBENACEAE	Koro ciwé	The true "Koro". The other species, V. madiensis Oliv."Koro Lé" is not eatable and V. simplicifolia Oliv."Koro Nafan" can also be eaten. Sometime found on markets.
Ximenia americana Linn. OLACACEAE	Man, Maa	Tasty but acid fruit. Rich in vitamins.

TABLE 2. Some food plants in Senoufo area: fruits from the bush.

Species	Senoufo name	Diseases
Calotropis procera Ait. F. ASCLEPIADACEAE	Komitigi / Wourou woura	Wounds
Cassia tora L. CAESALPINIACEAE	Nbaregnakan	Hepatite - Jaundice
Diospyros mespiliformis A. Rich. EBENACEAE	Nyaanga / Nyaa cige	Cough / Respiratory diseases
Feretia apodanthera Del. RUBIACEAE	Engen kouya	General fatigue
Grewia cissoides Hutch *et* Dalz. TILIACEAE	Fouhou wa	Skin diseases
Nauclea latifolia Sm. RUBIACEAE	Cinjere kasan	Malaria / Diarrheae
Opilia celtidifolia Walp. OPILIACEAE	Kagbogo / Kamugi	Paralysis
Pericopsis laxiflora Van Meuween PAPILIONACEAE	Noubien nouwa	Rheumatisms
Sclerocarya birrea Hochst ANACARDIACEAE	Louwa	High blood pressure
Securidaca longepedunculata Fresen POLYGALACEAE	Wanzian	Snakes bites
Zanthoxylum zanthoxyloïdes Waterm. RUTACEAE	Nkologo	Hemorroïds

TABLE 3. Some medicinal plants in Senoufo area.

Screening de actividades antioxidante y antiinflamatoria de plantas medicinales colombianas

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Colombia ocupa el segundo lugar en biodiversidad vegetal en el planeta, parte de la cual tiene un uso etnofarmacológico centenario arraigado en nuestras comunidades indígenas y afroamericanas.

Es sabido que la actividad antioxidante constituye un mecanismo del efecto antiinflamatorio. Por esta razón se abordó el estudio de los extractos hidrosolubles de 10 plantas medicinales colombianas, evaluadas frente a las siguientes especies de oxígeno reactivas: radical superóxido (sistema xantina/XO), radical hidroxilo (sistema Fe^{3+}-EDTA/H_2O_2/ascorbato), radical peroxilo (sistema ABAP/lisozima); peroxidación lipídica en microsomas hepáticos de rata (sistema no enzimático Fe^{2+}/ascorbato). Los extractos con actividades mayores al 50% (Cf: 100 mg/mL) fueron consideradas antioxidantes. También se evaluó la capacidad antiinflamatoria en edema plantar por carragenina en rata. Sólo el extracto etanólico de *Physalis peruviana* presentó una actividad captadora del radical hidroxilo (CE_{50} 50–100 mg/mL). Los demás extractos presentaron un efecto de inducción aparente de la degradación de la desoxirribosa. Los extractos de Baccharis latifolia, *Calea peruviana*, *Curatella americana*, *Ilex guayusa*, *Jacaranda* sp., *Myrcianthes leucoxila* y *Salvia rubescens* presentaron inhibición de la reducción del NBT. Estos extractos contienen compuestos que interfieren la absorción U.V., por lo cual no fue posible determinar su efecto sobre la XO. La CE_{50} de protección a la lisozima en el sistema ABAP/lisozima es menor a 5mg/mL para los extractos de *Critoniella acuminata*, *Jacaranda* sp., *P. peruviana*, *Prestonia quinquangularis* e *I. guayusa*. Estos extractos no inhiben la lisozima ni promueven la lisis del *Micrococcus lysodeikticus* en el ensayo control. La peroxidación lipídica microsomal fue inhibida por los extractos de *B. latifolia*, *C. peruviana*, *C. americana*, *I. guayusa, Jacaranda* sp., *M. leucoxila* y *S. rubescens*. La actividad antioxidante no correlacionó con el contenido de polifenoles de los extractos (método Folin-Denis). En el edema plantar, presentaron actividad antiinflamatoria (inhibición≥50%) a la 1, 3 y 5 horas post administración de carragenina los extractos de *B. latifolia*, *C. americana*, *I. guayusa*, *M. leucoxila* y *P. peruviana* (100mg/Kg, i.p.). Estos resultados confirman las propiedade antioxidantes y antiinflamatorias de algunas plantas utilizadas en la medicina popular colombiana en el tratamiento de desórdenes que cursan con procesos inflamatorios, constituyendo una base racional para la validación del uso etnofarmacológico de dichas plantas.

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Screening of antioxidant and anti-inflammatory activities of colombian medicinal plants

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Colombia is the second country in vegetal biodiversity on the planet. Part of this biodiversity has centenarian ethnopharmacological use rooted in our indigenous and afroamerican communities.

It is well known that antioxidant activity is one of the mechanism dealing with anti-inflammatory effect. For this reason evaluation against several reactive oxygen species (ROS): superoxide radical (xanthine / XO system), hydroxyl radical, peroxyl radical (ABAP/lysozyme system); lipid peroxidation in rat hepatic microsomes (non-enzymatic system Fe^{2+}/ ascorbat) of hidrosoluble extracts of 10 colombian medicinal plants was accomplished. Extracts with activity greater than 50% (final concentration: 100 mg/mL) were considered antioxidants. Also anti-inflammatory ability on carrageenan-induced rat paw oedema was evaluated. The only extract showing scavenging activity on hydroxyl radical was the ethanolic extract of *Physalis peruviana* (EC_{50} 50–100 mg/mL). The rest of extracts exhibited an apparent deoxyribose degradation effect. *Baccharis latifolia, Calea peruviana, Curatella americana, Ilex guayusa, Jacaranda* sp., *Myrcianthes leucoxila* and *Salvia rubescens* extracts inhibited reduction of NBT. These extracts content compounds interfering UV absorption and for that reason it was not possible to establish the effect on XO. *Critoniella acuminata,* J*acaranda* sp., *P. peruviana, Prestonia quinquangularis* and *I. guayusa* extracts showed lysozyme protection on the ABAP/lysozyme system at concentration lesser than 5mg/mL. These extracts do not inhibit lysozyme neither promote lysis of *Micrococcus lysodeikticus* in the control assay. Lipid peroxidation was inhibited by *B. latifolia, C. peruviana, C. americana, I. guayusa, Jacaranda* sp., *M. leucoxila* and *S. rubescens* extracts. Antioxidant activity did not correlate with the content of polyphenols of the extracts (method Folin-Denis). In the model of carrageenan-induced rat paw oedema *B. latifolia*, *C. americana*, *I. guayusa, M. leucoxila* and *P. peruviana* extracts (100mg/Kg, i.p.), showed anti-inflammatory activity at 1, 3 and 5 hours after carrageenan administration. These result confirm antioxidant and anti-inflammatory activities of some colombian medicinal plants used in the treatment of disorders involving inflammatory processes and give the rational basis for validation of ethnopharmacological use of these plants.

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Malaria Drugs in Medieval Medical Literature: An Ethnopharmacological Approach[1]

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Key words: Historical ethnopharmacology, malaria, drug development.

Medieval medical literature as a source for novel pharmacological ideas

Ethnopharmacology, as a starting point for pharmacological research, can drastically shorten discovery time by utilizing the collective experience of traditional healers throughout generations.

The strength of medieval medical literature as a source of herbal information lies in the fact that the effects of a treatment have been tested in humans and results observed over a period of several generations. Earlier research[2] shows medieval drug therapies are, in general, solidly based on experience, developing an interplay between tradition and innovation. These therapies did, in fact, offer relief to patients, if not healing, and thus form a collection of suitable material for ethnopharmacological research.

Historical ethnopharmacology is, however, still in a developmental stage. To date, there are only a small number of previous studies in ethnopharmacological methods applied to historical materials.[3] I am, therefore, suggesting a new way of employing available early sources using malaria therapy in medieval Arabic and Latin medical treatises as an example.

The basic presupposition behind this research is that while medieval Arabic and Latin medicine was not necessarily objectively effective, in the sense of a complete healing, it did produce an objective physical effect improving a patient's physical state as connected with the disease.[4] This presupposition is based on the following points:

1. Arabic medicine was based on a written tradition already more than 1000 years old, and beginning with the medical writings of classical Greece. Added to this is folkloristic and protoscientific knowledge of peoples subjugated by, or in commerce with, the Arabs. This tradition was rich and necessarily tried by experience.

2. Practical experience of medical practitioners who often describe cases they themselves treated, along with the results.[5]

3. The high reputation of Arabic medicine in medieval Europe.[6]

4. Modern knowledge of the efficacy of effective herbal remedies, some of which - or drugs derived from them - are still being used in current western medical practice.[7]

Evaluation Criteria for Probable Effect

The method applied in the following is based on my previous relevant work[8] that included the development of ethnopharmacological methods for using ancient (especially Arabic and Latin) medical texts as sources for identifying drugs for modern clinical research. According to its results, historical continuity and the frequency of recommendation form excellent criteria for evaluating the probable effect of an herb. This method can be demonstrated using the history of malaria treatments in early sources in the following way:

A. Information on drugs used and their accompanying medieval theoretical background is gathered from texts.

B. A special method, based on frequency and historical continuity for the use of each drug, is employed to evaluate which of the medicinal plants would, with the highest probability, be effective against malaria and could thus be preferred in future pharmacological research.

C. The exactness of ethnopharmacological pre-laboratory screening is improved from the listing of possible drugs and indications for their use to the more exacting level of actual estimation of their medical potential.

Malaria Drugs in Medieval Medicine

The development of new antimalarial drugs is a main focus of modern pharmaceutical research efforts. New drugs are needed because the increasing plasmodial resistance necessitates finding completely new compounds instead of improving drugs on the basis of the same models.

The type of malaria being examined is the tertian malaria (therapy for quartan malaria was quite different), with both of its subtypes: Malaria Tertiana (caused by *Plasmodium vivax*) and Malaria Tropicana (caused by *Plasmodium falciparum*), as the disease in the middle ages could only be recognized by its symptoms.

Methodologically, we would be looking for drugs with antimalarial + antiplasmodial + antifever effects, of course they can help in many other unspecific ways (example: choleretic drugs may be clinically very important). Specifically, we are examining the genus, as most subspecies have not been studied well enough. Plants are identified by their generic names and according to their relevant groups (ex: *Cucumis* + *Citrullus* + *Cucurbita* together).

The sources used are *Kitab al-Qanun fi-l-Tibb by* Ibn Sina (Avicenna; 980-1037, Persia) and four commentaries on it: *Mugiz a/-Qanun by* Ibn al-Nafis (d. 1288, Damascus/Egypt); *Qanunca fi-l-Tibb by* Mahmud b. Muhammad al-Gaghmini (d. 1344-5, Khwarizm); and the commentaries in *Tertius Canonis Avicenne* by Gentile da Foligno (d. 1348, Italy) and Jacques Despars (d. 1458, Belgium/Paris).

Results

On the basis of the data, and according to the criteria above, a list of the most probable effective plants against malaria was compiled (SEE TABLE 4). It includes Ibn Sina's favorite plant drugs against malaria (= belonging to the 33% most recommended drugs by him), the favorites of the commentators, and the plant drugs with the strongest historical continuity. Based on the results of earlier research, the probability for these plants to be effective in the therapy of malaria is over 70% for each one of them.[8]

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Notes

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[2] Paavilainen HM. Medieval Pharmacology - Change and Continuity. A Case of Kitab al-Qanun fi-l-tibb by Ibn Sina. Unpublished PhD Dissertation, Hebrew University of Jerusalem; 2003.
[3] See, for ex., Riddle (1985, 1992); Stannard (1987); Scarborough (1987); Ortiz de Montellano (1990); Scarpa (1981); Holland (1996).
[4] Riddle, JM. Contraception and abortion from the ancient world to the Renaissance. Cambrigde, Havard; 1992.
[5] See Kuklien, 1973.
[6] See Woodings, 1971; Watt, 1972; Dolev, 1996.
[7] See Riddle 1985, pp. 58, 330; Holland, 1996, pp. 1-3.
[8] Paavilainen, 2003.

Latin Identification	Drug	Frequency
Convolvulus	Bindweed	13
Hordeum	Barley	9
Citrullus *Cucumis* *Cucurbita*	Cucurbitacees: Cucumbers + melons + pumpkins	9
Viola	Violet	7
Alhagi	Manna	6
Apium	Celery	5
Vitis	Grape	5
Terminalia	Myrobalan	5
Cassia	Senna	5
Punica	Pomegranate	4
Rosa	Rose	4

TABLE 1. Ibn Sina's favorite herbs against malaria

Latin identification	Drug	b.S.	b.N.	Gagh	GF	JD
Apium	Celery	5	--	--	2	12
Artemisia	Wormwood	2	--	--	3	8
Beta *Rumex*	Beet	3	--	--	1	8
Cassia	Senna	5	2	1	1	9
Cichorium	Cichory	1	1	--	--	29
Citrullus *Cucumis* *Cucurbita*	Cucurbitacees: Cucumbers + melons + pumpkins	9	13	--	5	31
Citrus	Lemon	--	4	--	--	4
Convolvolus	Bindweed	13	--	--	23	21
Hordeum	Barley	9	2	1	6	33
Lactuca	Lettuce	3	--	--	--	17
Nymphaea *Nuphar*	Water rose	--	10	--	--	9
Origanum	Marjoram	2	--	--	1	8
Piper	Pepper	1	--	--	2	8
Pisum	Pea	--	--	--	--	10
Polyporus	Agaric	1	--	--	3	6
Portulaca	Purslane	--	1	--	--	7
Prunus	Plums etc.	3	8	--	1	14
Punica	Pomegranate	4	6	--	2	9
Pyrus	Apple etc.	--	6	--	--	5
Rosa	Rose	4	4	--	5	25
Saccharum	Sugar	1	7	--	--	13
Sempervivum *Sedum*	Houseleek	--	2	--	--	8
Tamarindus	Tamarind	2	5	1	2	3
Viola	Violet	7	8	--	4	17
Vitis	Grapes	5	--	--	2	15

TABLE 2. Commentators' favorite herbs against malaria (Included are all the herbs favored by any of the commentators.)

b.S. = Ibn Sina, b.N. = Ibn al-Nafis, Gagh = al-Gaghmini, GF = Gentile da Foligno, JQ = Jacques Despars

# texts	Latin Identification	Drug	b.S.	b.N.	Gagh	GF	JD
5	*Cassia*	Senna	5	2	1	1	9
5	*Hordeum*	Barley	9	2	1	6	33
5	*Tamarindus*	Tamarind	2	5	1	2	3
4	*Bambusa* *Chalk*	Bamboo	1	1	--	2	4
4	*Citrullus* *Cucumis* *Cucurbita*	Cucurbitacees: cucumbers + melons + pumpkins	9	13	--	5	31
4	*Mentha*	Mint	1	1	--	1	2
4	*Prunus*	Plums etc.	3	8	--	1	14
4	*Punica*	Pomegranate	4	6	--	2	9
4	*Rosa*	Rose	4	4	--	5	25
4	*Saccharum*	Sugar	1	7	--	1	13

# texts	Latin Identification	Drug	b.S.	b.N.	Gagh	GF	JD
4	*Terminalia*	Myrobalan	5	1	--	2	7
4	*Viola*	Violet	7	8	--	4	17
3	*Anthemis* *Matricaria*	Camomile	1	--	--	1	5
3	*Apium*	Celery	5	--	--	2	12
3	*Artemisia*	Wormwood	2	--	--	3	8
3	*Beta* *Rumex*	Beet	3	--	--	1	8
3	*Cicer*	Cicer	1	--	--	2	5
3	*Cichorium*	Cichory	1	1	--	--	29
3	*Convolvulus*	Bindweed	13	--	--	23	21
3	*Foeniculum*	Fennel	1	--	--	1	6
3	*Fumaria*	Fumitory	1	--	--	1	3
3	*Origanum*	Marjoram	2	--	--	1	8
3	*Piper*	Pepper	1	--	--	2	8
3	*Plantago*	Fleawort	1	1	--	--	3
3	*Polyporus*	Agaric	1	--	--	3	6
3	*Valeriana* *Nardostachys*	Valerian	1	--	--	2	6
3	*Vitis*	Grapes	5	-	---	2	15

TABLE 3. Malaria drugs: historical continuity

b.S. = Ibn Sina, b.N. = Ibn al-Nafis, Gagh = al-Gaghmini, GF = Gentile da Foligno, JD = Jacques Despars # texts = in how many of the texts the drug is recommended.

Apium	*Nymphaea*
Artemisia	*Piper*
Cassia	*Prunus*
Cichorium	*Punica*
Citrullus	*Rosa*
Convolvulus	*Saccharum*
Cucumis	*Tamarindus*
Cucurbita	*Terminalia*
Hordeum	*Viola*
Lactuca	*Vitis*
Nuphar	

TABLE 4. Malaria herbs: suggestions for further research.

Antimicrobial activity of five Hungarian *Euphorbia* species

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Key words: Euphorbia species, microorganism, antimicrobial effect, phytochemical compounds.

Introduction

Members of the plant family Euphorbiaceae contain several phytochemical compounds in the latex. It contains terpenes and their esters, steroids, saponins, flavonoids, cyanogenic glycosides, alkaloids, tannins, organic acids, sugar alcohols, waxes and resins (Hegnauer 1992). Species of the five subfamilies have been studied for their antimicrobial effect for a long time. The name *Euphorbia* in subfamily Euphorbioideae means "dog milk" species in Hungarian. The prefix "dog" referred to the toxicity or unusability of these plants in folk medicine. "Milk" referred to the latex in the whole plants.

Five *Euphorbia* species living in Hungary and some of their compounds were tested against microorganisms in this study. The species below were selected for this study on the basis of ethnobotanical data and previous analysis of their compounds.

– *Euphorbia amygdaloides* L. (wood spurge)

Earlier name: *Euphorbia silvatica* Jacq., *Tithymalus amygdaloides* Hill.

Ethnobotanical name: fish killer grass, forest milk grass, dog tongue grass, snake grass (Jávorka 1925)

Phytochemical compounds: flavonoids (quercetin- and camphorol-3-glycosides, rhamnetin and its glycosides, podophyllin and a cyclit (Müller, Pohl 1970)

Effect: carcinostatic activity (List and Hörhammer 1973)

Application: anti-febrile effect of its root; seed oil is purgative. It was used for wounds, bruises and tumours in folk medicine. Varicosed feet were washed in its sap and burned body parts were sprinkled. Memos contain data about tea made from it against typhoid. The plant is used in animal medicine too: for injured horse hoof, sheep and cow nail pain; bited wounds are sprinkled with its milky sap (List and Hörhammer 1973).

– *Euphorbia cyparissias* L. (cypress spurge)

Earlier name: *Tithymalus cyparissias* Scop.

Ethnobotanical name: grass milk, donkey milk, dog milk, wolf milk, wolf grass milk, milky grass (Jávorka 1925), toxin grass and wet louse grass (Varró 1997).

Phytochemical compounds: flavonoids (quercetin- and camphorol-3-glucuronide and -gycoside), terpenes (euphol, β-amyrin, β-sitosterin, ingenol derivatives), resin, inosit- and sedoheptulose, gallic acid, hopenon B, cycloartanols (List and Hörhammer 1973), phorbol derivatives (Ott and Hecker 1980), a special lectin (Lenuweit 1999), euphorbon, euphorbin, saponins

Effect: it causes cocarcinogenesis, dermatitis, conjunctivitis, cornea defect, mydriasis, circulation problems, dizziness; it is toxic to the grazing animals: the latex colours the milk of milking animals red (List and Hörhammer 1973)

Application: it is used for psoriasis and eczema (List and Hörhammer 1973), for skin diseases, warts, bronchitis and as antidiarrhoicum. It is effective against P-388 lymphocytic leukemia system (Öksüz *et al.* 1994). Seed oil is purgative. Vapour of the chloroformic extract was used in anesthesia long ago. It is recommended for insomnia and ear constipation. Its condensed milky sap is one of the components of "emplastrum cantharides" (=blister bug plaster) (Varró 1997).

– *Euphorbia helioscopia* L. (sun spurge)

Earlier name: *Tithymalus helioscopia* Scop.

Ethnobotanical name: dog dill (Jávorka 1925)

Phytochemical compounds: flavonoids (quercetin-5,3-digalactoside, quercetin-3β-glycoside, querctein-3β-galactoside, quercetin-3β-galactosid-2"-gallate –Pohl *et al.* 1975–, camphorol-3-glycoside -Abdel-Salam *et al.* 1975-), euphol, euphorbol, lanosterol, terpenes, steroids, phorbol esters (Hegnauer 1992).

Effect: an oxytocin like effect; it causes dermatitis and ceratoconjunctivitis (Rossler 1985).

Application: as antisyphiliticum and vesicant at homeoepathy (List, Hörhammer 1973), and it is used for chronic bronchitis.

– *Euphorbia myrsinites* L. (myrtle or donkeytail spurge)

Phytochemical compounds: phorbolesters, tetraesters of an alcohol -myrsinol-, betulin, triterpenoids, diterpene esters (Öksüz *et al.* 1995)

Effect: it causes dermatitis, conjunctivitis, ingestion, swelling, blisters (Eberle *et al.* 1999)

Application: for verrucas (Eberle *et al.* 1999).

– *Euphorbia palustris* L. (swamp or marsh spurge)

Earlier name: *Tithymalus palustris* Hill.

Ethnobotanical name: swamp grass milk, lake grass milk, milky dry stalk (Jávorka 1925).

Phytochemical compounds: flavonoids (hyperosid, rhobidanol), phorbin acids, gallic acids, euphorbon (Hegnauer 1992).

Effect: it is poisonous to grazing animals (List, Hörhammer 1973).

Application: root against feber and tooth ache, latex for warts (List and Hörhammer 1973).

Materials and methods

– *Sample collection*

Plants were collected in the environs of Mecsek, a mountain in southwestern Hungary.

Euphorbia amygdaloides L.: from an oak forest.

Euphorbia cyparissias L.: from forest edge.

Euphorbia helioscopia L.: from a vineyard.

Euphorbia myrsinites L.: from the Botanical Garden of the University of Pécs.

Euphorbia palustris L.: from a marsh meadow.

– *Studied microorganisms*

Three bacteria, namely *Bacillus subtilis* (SZMC 0209), *Staphylococcus aureus* (OKI 29213) and *Escherichia coli* (OKI 35034) and a yeast *Candida albicans* (ATCC 10261) were tested in this study. They were grown for 48 hours on a special medium before the studies; bacteria at 37 ºC, fungi at 30 ºC.

– *Studied compounds*

The following phytochemical compounds of the plants were tested against the microorganisms: podophyllin (FIG. 1a) and rhamnetin (FIG. 1b) which can be found in E. amygdaloides, β-sitosterin (FIG. 1c), gallic acid (FIG. 1d) and quercetin (FIG. 1e) which are characteristic to *E. cyparissias,* and betulin (FIG. 1f) which is present in *E. myrsinites.*

– *Treatment*

0.25 g leaf of each species was ground in a braying mortar, then 2.5 ml or 5 ml DMSO or ethanol was added in order to prepare solutions of various concentrations (0.05 g/ml and 0.1 g/ml). The solutions were shaken at room temperature for some minutes, then they were filtered. These extracts were applied against microorganisms.

A special nutrient medium was prepared which is universal for bacteria and fungi: 4 g meat extract, 10 g glucose, 1 g yeast extract and 20 g agar. Distilled water was added to the components up to 1000 ml. PH was set to 7. This solution was boiled for 30 minutes, then 25-25 ml from it was poured out to each Petri dish. Each microorganism was suspensed in 1.5 ml physiological salt solution; these extracts were transferred to the dried surfaces of the nutrient medium.

Filter paper discs (diameter=5 mm), which were soaked in the different plant extracts, were put on the microorganisms. Control discs were soaked in ethanol and DMSO. Dishes with bacteria were stored at 37 ºC, those with fungi at 30 ºC for 2-5 days.

Results and discussion

Ethanolous plant extracts caused wider inhibitory zones than the extracts with DMSO at each species. Greater antimicrobial activity was detected in the case of extracts with both DMSO and ethanol of concentration 0.05 g/ml against *Bacillus subtilis* (FIG. 2) and the 0.05 g/ml DMSO extracts against *Staphylococcus aureus* (FIG. 3) than the 0.1 g/ml extracts against *Escherichia coli* (FIG. 4) and *Candida albicans* (FIG. 5). Extracts of concentration 0.05 g/ml were ineffective in some cases: those with ethanol against *Bacillus subtilis* (FIG. 2) and those with DMSO against *Candida albicans* (FIG. 5). *Bacillus subtilis* was the least sensitive to each plant extract.

Plant extracts of *Euphorbia helioscopia* and *E. amygdaloides* proved to be the most effective against all microorganisms (FIG. 2-5). Main compounds of *E. amygdaloides,* podophyllin and rhamnetin (FIG. 6-9) caused the widest zones around the discs. These compounds have the greatest antimicrobial activity. *E. helioscopia* may contains other effective compounds responsible for its great inhibitory effect. These compounds, however were not included in this study. Plants with the least inhibitory effect were *E. myrsinites,* E. palustris and *E. cyparissias* (FIG. 2-5). β-sitosterine and quercetin (FIG. 6-9) which are present in *E. cyparissias* were the least effective among the studied compounds.

On the basis of the above data it can be stated that the studied Euphorbia species were effective against the studied microorganisms to various degree. They contain irritant compounds too; the presence of these toxic compounds - as diterpenes and phorbol esters - limit the use of the crude latex in humans. Therefore they should be carefully investigated before usage.

Acknowledgement: I wish to thank Krisztina Takács, Judit Antal, Zsuzsa Koósz and Györgyi Horváth for the assistance in the laboratory works. I am grateful to Ágnes Farkas and Sándor Szilágyi for their help.

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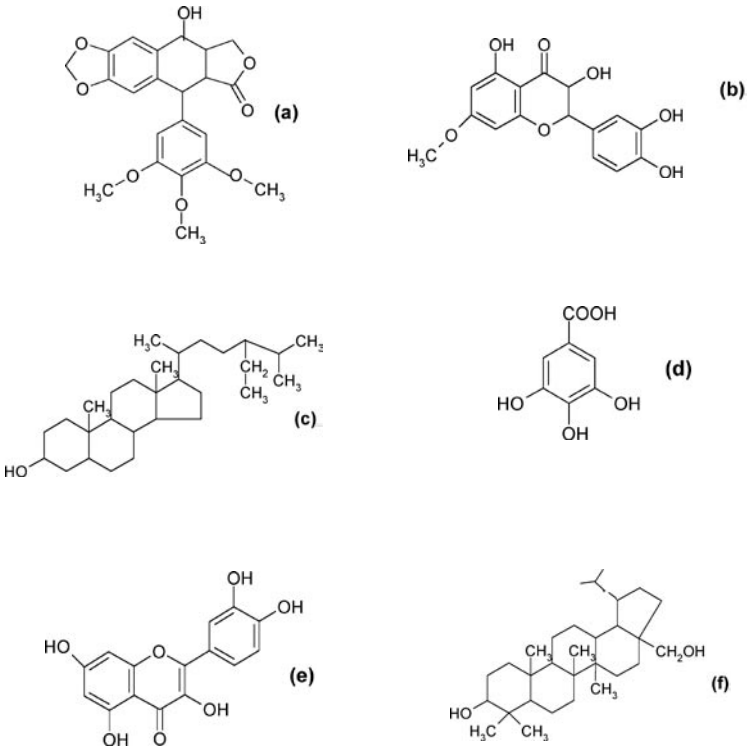

FIG. 1. Studied phytochemical compounds of the plants: (a) podophyllotoxin or podophyllin (in *E. amygdaloides*), (b) rhamnetin (in *E. amygdaloides*), (c) β-sitosterin (in *E. cyparissias*), (d) gallic acid (in *E.cyparissias* and *E. palustris*), (e) quercetin (in *E.cyparissias* and *E. helioscopia*) and (f) betulin (in *E. myesinites*).

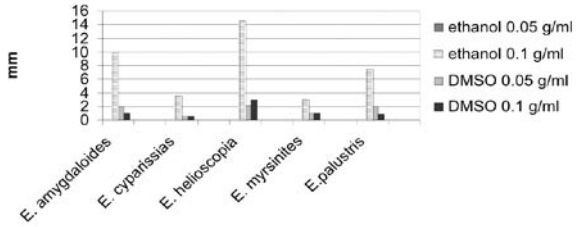

FIG. 2. Inhibitory zones of plants on *Bacillus subtilis.*

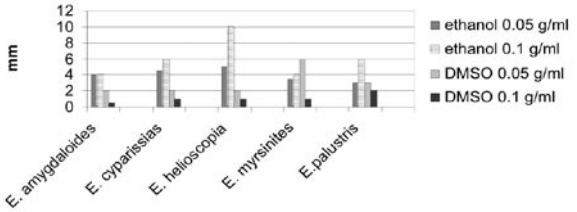

FIG. 3. Inhibitory zones of plants on *Staphylococcus aureus.*

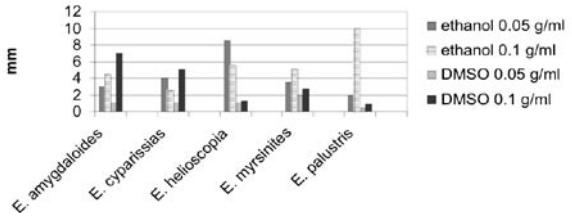

FIG. 4. Inhibitory zones of plants on *Escherichia coli.*

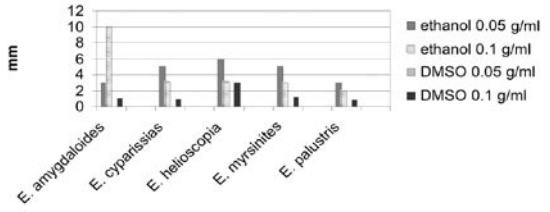

FIG. 5. Inhibitory zones of plants on *Candida albicans.*

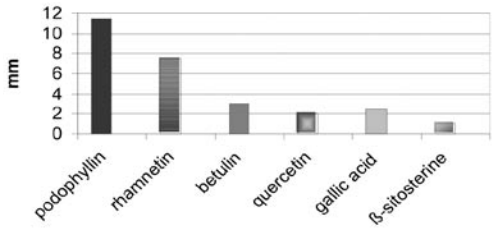

FIG. 6. Inhibitory zones of compounds on *Bacillus subtilis.*

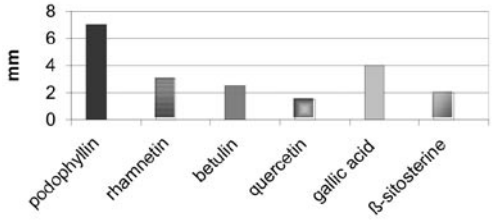

FIG. 7. Inhibitory zones of compounds on *Staphylococcus aureus.*

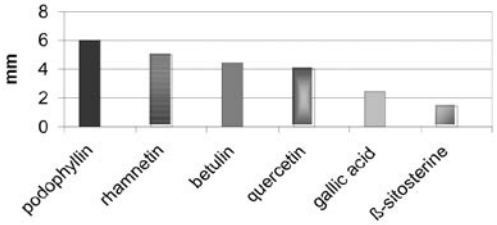

FIG. 8. Inhibitory zones of compounds on *Escherichia coli.*

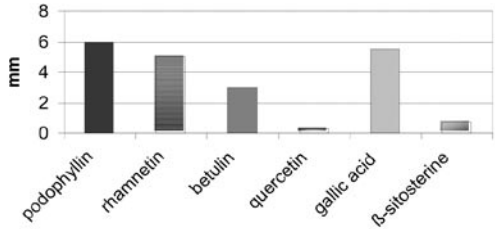

FIG. 9. Inhibitory zones of compounds on *Candida albicans.*

Terapeútica popular en Campoo (Cantabria, España)

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Palabras clave: Etnofarmacología, plantas medicinales, Campoo, Cordillera Cantábrica.

Introducción

Campoo es una comarca rural que comprende los valles meridionales de Cantabria (FIGURA 1). Debido a la escasa productividad del cultivo de cereales y leguminosas, estos cultivos se abandonaron y las tierras que ocupaban son ahora pastos de siega y de diente que alimentan a la cabaña ganadera compuesta fundamentalmente por vacas y caballos.

Aunque hoy en día la salud se confía básicamente al médico y los fármacos de origen sintético, algunas personas sobre todo mayores, prefieren visitar lo imprescindible a los profesionales sanitarios para curarse de sus dolencias. Estas personas son reacias a los medicamentos químicos y prefieren emplear, siempre que es posible, plantas medicinales u otros remedios caseros. A su vez, en parte de la población se observa una vuelta a valorar los antiguos sistemas terapéuticos, menos agresivos y con menos efectos secundarios, aunque mayoritariamente se prefieren los medicamentos, por considerarse más eficaces.

Metodología

Los datos se recopilaron entre septiembre de 1997 y julio de 2000. Para ello se realizaron 93 entrevistas abiertas y semiestructuradas a 107 personas oriundas de la comarca. Los datos provienen de narraciones sobre el uso local de plantas, de charlas sobre muestras vivas recién colectadas que se llevaban a la casa del informador y de paseos por el campo con el informante charlando sobre las plantas que se veían y recogían. Se dispone de pliegos testigos que se conservan en el herbario del Real Jardín Botánico de Madrid (MA).

Para establecer la importancia relativa (IR) de las plantas medicinales se elaboró un índice que consiste en un media ponderada del índice de Bennet & Prance (2000) y la frecuencia de citación o número de personas que refirieron el remedio. El IR se basa en el número normalizado de subcategorías terapéuticas (Rel ST) y el de sistemas o aparatos corporales para los que se emplea (Rel SC) y refleja la versatilidad de cada especie. Para valorar la importancia que las personas dan a cada especie se añade el número normalizado de la frecuencia de citación (Rel FC). El número normalizado se obtiene dividiendo el número de afecciones, aparatos o personas por el valor máximo de cada variable, por lo que es siempre un valor menor o igual a uno.

Se recogieron 299 remedios medicinales para curar 41 categorías patológicas agrupadas en 11 sistemas o aparatos (TABLA 1). Cada categoría incluye enfermedades (gripe) y síntomas (dolor de riñones) que reciben tratamientos similares así como algunas propiedades farmacológicas (diurético). Estas categorías se denominaron con 420 términos o expresiones literales distintas.

En la tabla 2 se presentan, ordenadas por los sistemas corporales a los que afecta, aquellas aplicaciones para las que al menos dos informantes indicaron el mismo tratamiento; los principales remedios con los que se curan, ordenados según su frecuencia de citación; y el modo como los informantes nombran dichas categorías. Mediante letra cursiva se diferencia el vocabulario local. Cuando coincide el nombre de la categoría establecida con el utilizado por los informantes se indica en cursiva igual que el resto del léxico local. Dentro de cada clase terapéutica se agrupan a su vez los términos bien por referirse a la mismo patología o síntoma (diarrea, colitis) o por tratarse de afecciones o acciones farmocológicas (abrir el apetito, da hambre) similares. Este tipo de thesaurus o vocabulario de términos relacionados entre sí es una herramienta muy útil para la comprensión de los campos semánticos estudiados (Fresquet & Tronchoni 1995).

Se recurre sobre todo a plantas silvestres que viven en los alrededores de los pueblos, aunque también a plantas cultivadas, sustancias de origen animal (leche, grasa) o a sustancias que se compran en el mercado (pez, aguarrás, vino, alcohol o zotal). En la materia médica local hay una clara preponderancia de los remedios de origen vegetal sobre los de origen animal y mineral (TABLA 1). La parte de la planta usada más frecuentemente es la sumidad florida. Predomina el uso interno, sobre todo tomar el cocimiento, aunque también se respiran los vapores, se aplican cataplasmas, se dan friegas o se lava la zona afectada.

Conclusiones

El uso y conocimiento de las plantas medicinales ha disminuido mucho, especialmente en los últimos 40 años debido a la generalización del sistema de salud pública. Únicamente se puede confirmar la vigencia del uso de 47 especies, la mayoría silvestres (TABLA 2).

Las especies con una importancia relativa mayor (IR) según su versatilidad y frecuencia de citación son: el saúco (*Sambucus nigra*), el romero (*Rosmarinus officinalis*), la ortiga (*Urtica dioica*), la manzanilla amarga (*Chamaemelum nobile*), la cola de caballo (*Equisetum arvense, E. telmateia*) y la malva (*Malva sylvestris*).

La gran mayoría de las plantas empleadas en Campoo son especies medicinales comunes en la medicina popular ibérica. No se han encontrado referencias del uso medicinal del cardo de arzolla (*Carduncellus mitissimus, Carlina hispanica*), la zarpa (*Daboecia cantabrica*), la surbia (*Digitalis parviflora*), la hierba de las siete sangrías (*Lithodora diffusa*) y Thymelaea ruizii, aunque sí de especies afines. El uso del ajo del antojil (*Lilium pyrenaicum, L. martagon*) para ayudar a soldar huesos rotos está escasamente documentado.

La mayor parte de las aplicaciones registradas son de origen vegetal (TABLA 1) y sirven para tratar trastornos circulatorios, de la piel y respiratorios (FIGURA 2).

El léxico empleado para nombrar las enfermedades es muy rico, mezcla de términos provenientes de la biomedicina y voces locales que cada vez más van quedando en el olvido.

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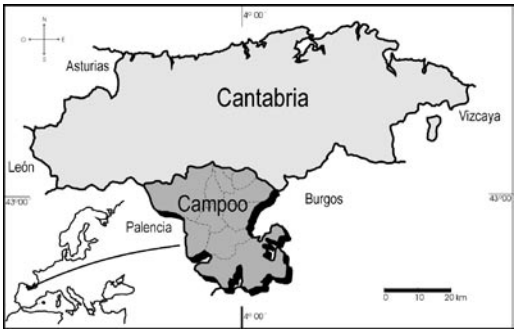

FIGURA 1. Localización del área de estudio

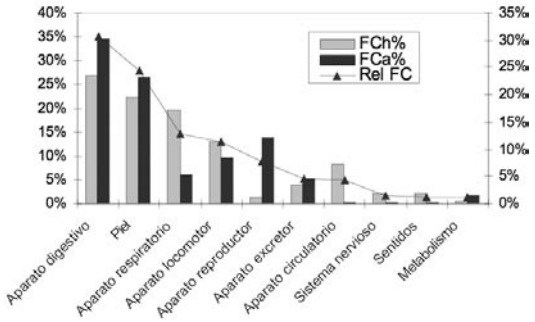

FIGURA 2. Frecuencia de citación de los remedios de origen vegetal según los sistemas corporales que curan. FCh% (frecuencia de citación de las aplicaciones medicinales expresada en porcentaje), FCa% (animales), Rel FC (valor medio entre FCh% y FCa%).

	Citas[1]	Aplicaciones	Categorías	Táxones/sustancias[2]
Vegetal	709	299	41	141
Animal	58	37	15	13
Mineral	35	25	16	13
Total	802	361	41	

TABLA 1. Origen de los remedios.

[1] Cita: número total de aplicaciones recopiladas; aplicación: combinación entre táxon o sustancia y patología tratada.

[2] Como esta columna es heterogénea no se indica los totales.

Aparato circulatorio

Enfermedades circulatorias

Para la sangre, sangre mal, se altera la sangre, adelgazar o rebajar la sangre, sangre gorda o fuerte, sobra sangre, tensión, rebajar o bajar la tensión
Circulación, circulación de la sangre
Purificar o limpiar la sangre, limpia el cuerpo
Quitar grasas, colesterol
Colza
Para el corazón

Urtica dioica (11), *Equisetum* sp. pl. (7), *Rhamnus alaternus* (5), *Rorippa nasturtium-aquaticum* (4), *Lithodora diffusa* (3)

Aparato digestivo

Aperitivo

Si se quita el apetito, abrir el apetito, entrar la gana o ganas de comer, cuando no querían comer, malas pa comer, si no comían, da hambre

Gentiana lutea (14)

Diarrea

Cagalera, descomposición, colitis, andar mal el vientre

Achillea millefolium (7), Mentha pulegium (7), Oryza sativa (5)

Digestivo

Trastornos digestivos, mala digestión, agiliza la digestión, para hacer la digestión, para la digestión, empacho, hacer daño la comida, no sentar o no ir bien la comida, comida pesada o fuerte, después de comer
Para el estómago, estomacal, malestar de o mal de estómago, tener mal el estómago, problemas estomacales, dolor de estómago
Ardor de estómago
Úlceras de estómago
Sienta, entona, tónico
Dolor de barriga, mal de tripa, dolor de tripa, tripas o tripina, para la o las tripas
Mal o dolor de vientre, para el vientre, relajamiento del vientre y el cuerpo
Cólico
Gases, carminativo, dolor, eliminar gases
Vesícula, activa la vesícula
Mareo

Chamaemelum nobile (17), *Sideritis hyssopifolia* (9), *Vitis vinifera* (7), *Helichrysum stoechas* (5), *Ruta chalepensis* (5), *Bidens aurea* (4), *Foeniculum vulgare* (4), *Lithospermum officinale* (4), *Olea europaea* (4), *Achillea millefolium* (3), *Mentha pulegium* (3), *Prunus spinosa* (3), *Thymus* sect. *Serpyllum* (3)

Laxante

Aumenta la evolución del intestino, limpia el intestino, estar estacionado, para cagar, pa ra ir al baño, para ir suave, da o produce diarrea, purga

Pinguicula grandiflora *(5)*

Lombrices

Lombrices de los niños o críos
Solitarias

Gentiana lutea (11)

Aparato excretor

Diurético

Para orinar, si no orina, problemas de orina, contención de orina
Para el riñón, dolor de riñones, frío en los ri-ñones
Cólico de riñón, cólico nefrítico, soltar o echar la piedra o piedras del riñón
Para la urea
Limpia el riñón, limpia los conductos del riñón
Limpia la vejiga
Si se retienen líquidos
Operados de próstata

Equisetum sp. pl. (8), *Lepidium latifolium* (4), *Zea mays* (3)

Aparato locomotor

Contusiones

Golpes
Inflamaciones, deshinchar, hinchazones, hinchaduras, para que no se te hinche
Hemostática, absorbe o ataja la sangre, ataja heridas internas, para que no salga la moratón

Inula sp. pl. (19), *Rosmarinus officinalis* (7), Alcohol (6), *Olea europea* (6), *Arnica montana* (4), *Sambucus nigra* (3)

Dolores musculares y articulares

Dolores musculares, de la musculatura, dolo-res de rodilla
Inflamaciones, dolor de pies
Esguinces, torceduras, recalcón, estirón
Dislocación, dislocao, disloque, luxación

Rosmarinus officinalis (4), Alcohol (3), *Inula* sp. pl. (3)

Fracturas

Roturas, romperse la pierna, coger fuerza al romperse
Para los huesos, calcificar los huesos, planta que tiene mucho calcio
Para la rodilla

Osmunda regalis (3), *Pinus pinaster* (2)

TABLA 2. Categorías patológicas y remedios empleados más frecuentemente. En cursiva se indican los términos empleados por los informantes.

Reúma

Antirreumática
Artritis
Gota, acido úrico, ciática, nervio ciático
Urtica dioica (5), *Bryonia dioica* (3)

Aparato respiratorio

Enfermedades vías respiratorias

Para el catarro, catarro de nariz o garganta, catarro agarrao fuerte, resfriaos, fríos, extraer el frío, constipado o costipao, congestión, cargazón de nariz, modorrera, morrina
Para la garganta, dolor de garganta, limpiar la garganta, anginas, manchas blancas en la garganta
Tos, quita la tos
Tos ferina
Flemas
Ronquera
Bronquios, limpia los bronquios, desintoxica los bronquios, fastidiado de los bronquios
Pulmonía
Bueno para los pulmones
Para sudar
Para la respiración
Gripe
Vías respiratorias
Origanum vulgare (21), *Eucalyptus globulus* (14), *Sambucus nigra* (14), *Malva sylvestris* (12), Miel (7), *Rosa* sp. pl. (7), *Rosmarinus officinalis* (6), *Brassica nigra* (5), *Pulmonaria longifolia* (4), *Rhamnus alaternus* (4), Alcohol (3), *Althaea officinalis* (3), *Ficus carica* (3), *Linum usitatissimum* (3), *Vitis vinifera* (3)

Piel

Alopecia

Caída del pelo, para el pelo, para la calva
Urtica dioica (3)

Forúnculos

Diviesos o liviesos, para que maduren los diviesos, para que saliera el nabo del divieso, reventar o ablandar liviesos, sacar la materia, el pus, para que supuren los granos, madurar o reventar granos, granos gordos
Blanduras, infección con pus, venir en supuración, infección, deshinchar
Panalizos, infección de uña
Allium cepa (5), *Malva sylvestris* (5), *Olea europea* (4), *Hylotelephium telephium* (3)

Picaduras

Picadura de abeja o de moscas, quitar el dolor, bajar el hinchazón

Picaduras (continuación)

Picadura de mosquito
Picadura de ortiga
Vitis vinifera (3)

Verrugas

Quitar, secar o cauterizar verrugas
Chelidonium majus (3)

Vulnerario

Heridas, curar heridas, madura las heridas, heridas fuertes o malas
Infecciones, desinfectar heridas, limpia, hinchazones con pus saca el pus
Cicatrizante, cicatrizar heridas, heridas que no cicatrizan, para que cierre la herida, cerrar heridas, echar o cria carne, echar piel, germinativo
Quemaduras, el quemao
Ombligo de los niños
Hemorragias, dejar de sangrar heridas, cortaduras, cortes o cortadas, tajada
Llagas de la boca, heridas en la boca
Grieta infectada
Mordedura de caballo
Úlceras varicosas
Se cayó una uña
Carduncellus mitissimus (16), Cera (11), *Olea europaea* (13), *Hedera* sp. pl. (7), *Juglans regia* (6), *Sambucus nigra* (6), *Chelidonium majus* (4), *Equisetum* sp. pl. (3), Grasa de cerdo (3), *Plantago media* (3), *Scrophularia balbisii* (3), *Rosmarinus officinalis* (3), *Vitis vinifera* (3)

Sentidos

Enfermedades del oído

Dolor de oídos, otitis
Leche de mujer (5), *Olea europaea* (3)

Enfermedades de la vista

Para ojos, ojos malos, ojos malos rojos o llorosos, llorar los ojos, picor de ojos, limpiar los ojos
Conjuntivitis
Orzuelo
Legañas
Nube
Para la vista
Chamaemelum nobile (6), *Rosa* sp. pl. (3)

Sistema nervioso

Sedante

Para los nervios, nervios, calmante para el sistema nervioso, estrés
Tilia platyphyllos (5)

TABLA 2. Continuación.

Nombre científico	Nombre vulgar		Nombre científico	Nombre vulgar
Achillea millefolium	milenrama		*Leuzea conifera*	cardo de arzolla
Arnica montana	árnica		*Lithodora diffusa*	hierba de las siete sangrías
**Aloysia citrodora*	hierba luisa		**Lithospermum officinale*	té blanco
**Bidens aurea*	té de huerta		*Malva sylvestris*	malva
**Calendula officinalis*	claveles		*Mentha aquatica*	menta
Carduncellus mitissimus	cardo de arzolla		*Mentha pulegium*	poleo
Carlina hispanica	cardo de arzolla		**Mentha x gentilis*	hierbabuena
**Citrus limon*	limón		**Olea europaea*	olivo
Chamaemelum nobile	manzanilla		*Origanum vulgare*	orégano
Chelidonium majus	planta del yodo		**Oriza sativa*	arroz
Equisetum arvense	cola de caballo		*Osmunda regalis*	antojil
**Eucalyptus globulus*	eucalipto		*Primula elatior*	bragas de cuco
Filipendula ulmaria	norotil		*Rhamnus alaternus*	carrasquilla
Foeniculum vulgare	anís		**Rosmarinus officinalis*	romero
Gentiana lutea	genciana		*Sambucus nigra*	saúgo
Hedera hibernica	hiedra		*Sideritis hyssopifolia*	té de lastra
Helichrysum stoechas	manzanilla de lastra		*Urtica dioica*	ortiga
Hypericum perforatum	corazoncillo		*Teucrium chamaedrys*	carrasquilla
Inula helenioides	árnica		*Thapsia villosa*	cardo de arzolla
Inula montana	árnica		*Thymelaea ruizii*	
Jasonia glutinosa	té de roca		*Thymus mastichina*	tomillo
Juglans regia	nogal		*Thymus pulegioides*	té morado
Lavandula latifolia	espliego		**Tilia platyphyllos*	tila
Lepidium latifolium	rompepiedras			

TABLA 3. Plantas medicinales cuyo uso sigue vigente. Con asterisco se indican las plantas de origen cultivado.

Fitoterapia popular. Plantas medicinales de uso tradicional en la península ibérica

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Palabras clave: España, etnofarmacología, medicina popular, Portugal

Introducción

La Península Ibérica es un pequeño continente dentro de Europa, de unos 600.000 km^2, con gran diversidad geológica, climática, geográfica, ecológica y biológica. Su flora vascular se compone de unas 7.000 especies. Las gentes, unos 50.000.000 entre españoles y portugueses, son el resultado de un mosaico racial y cultural, que condicionado por los avatares históricos han hecho uso del medio en que viven de muy diferente forma. Esta riqueza etnográfica, unida a su biodiversidad ha dado como resultado unos conocimientos y usos en fitoterapia que se han mantenido vigentes hasta la actualidad.

Metodología

Presentamos un estudio preliminar sobre plantas medicinales de uso popular en la Península Ibérica, basado en un buen antecedente; la obra de Font Quer (1962), que recoge gran parte de los conocimientos tradicionales populares, así como en otras obras más recientes: Villar & al. (1987), Mulet (1991), Bonet & al. (1999) y Fernández López & al. (1999). Además se dispone de un repertorio de más de 250 trabajos sobre medicina popular y plantas medicinales.

En el proyecto a realizar se evaluará la importancia de cada especie vegetal medicinal mediante una técnica de análisis, basada en el índice de importancia relativa (Bennet & Prance, 2000), en la que se consideran: 1) la frecuencia de citación, 2) los distintos usos referidos. Con ello se elaborará una lista con las principales especies utilizadas en la Península Ibérica.

Se tendrán en cuenta aspectos de conservación, de suma importancia, ya que solamente la disponibilidad del recurso permitirá que se pueda seguir usando. Es recomendable el cultivo de ciertas especies.

Resultados

Aventuramos aquí una lista previa de especies botánicas que nos parecen de mayor relevancia por su uso más general: *Althaea officinalis, Allium cepa, Allium sativum, Citrus limon, Crataegus monogyna, Cynodon dactylon, Chamaemelum nobile, Foeniculum vulgare, Glycyrrhiza glabra, Jasonia glutinosa, Juglans regia, Laurus nobilis, Lavandula latifolia, Malva sylvestris, Matricaria chamomilla, Melissa officinalis, Mentha pulegium, Ocimum basilicum, Olea europaea, Origanum vulgare, Phlomis lychnitis, Prunus dulcis, Rosmarinus officinalis, Ruta chalepensis, Salvia lavandulifolia, Thymus mastichina, Thymus vulgaris, Thymus zygis, Vitis vinifera* y *Zea mays*.

Otras especies de uso más restringido, algunas de ellas endemismos, pero que consideramos de interés: Arnica montana, *Artemisia granatensis, Bidens aurea, Borago officinalis, Centaurea ornata, Chelidonium majus, Cruciata glabra, Erodium petraeum, Filipendula ulmaria, Galium verum, Gentiana lutea, Glechoma hederacea, Hylotelephium telephium, Hypericum perforatum, Hyssopus officinalis, Inula montana, Inula salicina, Lavandula pedunculata, Leuzea conifera, Lilium candidum, Lilium pyrenaicum, Lithodora fruticosa, Marrubium alysson, Marrubium vulgare, Matricaria aurea, Mentha cervina, Micromeria fruticosa, Nepeta nepetella, Osmunda regalis, Paronychia argentea, Salvia candelabrum, Salvia verbenaca, Santolina oblongifolia, Satureja intricata, Satureja montana, Sideritis glacialis, Sideritis hirsuta, Sideritis hyssopifolia, Sideritis leucantha, Stachys officinalis, Tanacetum balsamita, Tanacetum parthenium, Tanacetum vulgare, Teucrium gnaphalodes, Teucrium pseudochamaepytis, Teucrium pyrenaicum, Thymus membranaceus, Thymus moroderi, Thymus pulegioides, Trifolium alpinum* y *Ziziphora hispanica*.

Algunos ejemplos agrupados según sus pautas de distribución y frecuencia de uso son:

1) Especies de amplia distribución y de uso popular general.

El cocimiento de las flores y hojas del majuelo o espino blanco (*Crataegus monogyna* Jacq.) se usa como calmante, para bajar la tensión, para depurar la sangre y para el catarro. En algunos lugares le llaman tila. Vive en toda la Península. Su uso está muy extendido.

El cocimiento de las flores de malva (*Malva sylvestris* L.) se utiliza para el catarro y para las enfermedades de la piel en lavado. También se toma para bajar la tensión. Frecuente en toda la Península Ibérica en lugares alterados y nitrificados. Su uso es habitual.

2) Especies comunes, exclusivas de la Península Ibérica o del oeste del Mediterráneo de uso muy extendido.

La mejorana silvestre o tomillo blanco [*Thymus mastichina* (L.) L.] se usa en infusión para los catarros y enfermedades del tubo respiratorio. Vive preferentemente sobre sustratos sueltos y arenosos, en toda la Península Ibérica, de donde es endemismo.

El cocimiento de té de roca, té de monte o té de Aragón (*Jasonia glutinosa* (L.) DC.) se usa como digestivo. Se encuentra en roquedos calizos; es planta de grietas de roca y florece en pleno verano, que es cuando se recolecta. Vive sobre todo hacia el este de la Península Ibérica. Su uso está muy extendido y es muy popular. Que se sepa solo se comercializa a pequeña escala. Sin embargo se puede cultivar fácilmente.

La hierba de las siete sangrías, sanguinaria [*Lithodora fruticosa* (L.) Griseb.] se toma en cocimiento sobre todo para bajar

la tensión. También para curar el catarro y como analgésico. Se encuentra formando parte de matorrales sobre suelos preferentemente básicos y secos en gran parte de la Península Ibérica, sobre todo hacia el este y el sur.

3) Especie de amplia distribución, pero de uso restringido a una región.

El té de prado o árnica (*Inula salicina* L.) se toma en infusión como digestiva exclusivamente en el valle del Lozoya, Madrid. En Cataluña se utiliza como antiinflamatoria por vía externa. Vive sobre todo en la mitad norte de la Península Ibérica y en toda Europa.

4) Endemismos locales de uso en la región de origen.

La infusión de la planta entera de manzanilla real, manzanilla de la sierra o manzanilla de Sierra Nevada (*Artemisia granatensis* Boiss.) se toma como estomacal y digestiva. Endemismo de Sierra Nevada, especie protegida en peligro de extinción. La gran tradición que existe en Granada del consumo de esta planta hace que al no disponer de ella y esté prohibida su recolección se creen problemas sociales. Sería muy deseable que esta planta se pusiera en cultivo y se comercializara.

El cantahueso (*Thymus moroderi* Pau *ex* Martínez) se utiliza en infusión como digestivo. Además con este tomillo se elabora un tradicional licor alicantino. Especie exclusiva de la provincia de Alicante.

5) Especie introducida americana y de uso común.

El té de Méjico, hierba hormiguera o pazote (*Chenopodium ambrosioides* L.) se usa en infusión como digestivo y también contra los parásitos intestinales. Especie de origen mejicano que se ha extendido por la Península Ibérica como planta nitrófila. Se utiliza como medicinal en casi todo el territorio.

6) Especie cultivada de uso común.

El cocimiento de las hojas de nogal (*Juglans regia* L.) se usa como antiséptico, para lavar los ojos, heridas y hemorroides. También por vía interna contra las úlceras de estómago, para bajar la tensión; el cocimiento de los frutos verdes contra los parásitos intestinales. También se usan las nueces verdes para hacer licores. Además se aprovechan sus frutos y su madera. Se trata de un árbol cultivado en toda la Península Ibérica, de uso muy extendido, y con numerosas razas de cultivo. A veces se asilvestra.

Conclusiones

Una estimación precisa, basada en estudios etnobotánicos y de medicina popular ibéricos, da como resultado que se usan como medicinales unas 1100 especies en la Península Ibérica.

Aunque el uso de plantas medicinales ha decrecido en los últimos 50 años, debido al progresivo aumento de la disponibilidad de fármacos, el uso de muchas hierbas como medios curativos sigue vivo, sobre todo en personas mayores y en medios rurales, en donde se siguen recolectando plantas. El conocimiento perdura, pero la transmisión de este a generaciones más jóvenes se está perdiendo.

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Physiological study of digitalis-glycosides in the *Digitalis lanata* (Ehrh.)

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Key words: digitalis-glykosides, naturally growing, cultivated, thin-layer chromatography

Introduction

The glycosides can be found in different parts of the plant (root, stem, leaf, fruit, seed, etc.) in small concentration. The glycosides are composed of the hydroxils of sugars and alcohols. The digitalis-glycosides do not dissolve in water, because the big carbohidrogen frame is too hydrofob. The digitalis-glycosides are active optically, Because they include asymmetry centres. The steran-frame of the digitalis-glycosides compose brightly fluorescing products with concentrated acids. (Wagner H, 1983.)

The cardiotonicums are indispensable the therapy of more serious models of the cardiac insufficiency so far. They step up the heart muscle contraction and reduce the heart frequency by means of their positive inotrop effects. (Bayer I. 1957.) They obtain the active ingredient from the leaves (Picture 1). The active ingredient is poisonous for vertebrates, but it is lost upon arthropoda. The plant lice crawl on the preflowering sprout (Picture 2). The ladybird is draw by her prey, the plant lice to the plant (Picture 3). The caterpillar eated tranquilly the plant too (Picture 4).

Materials and Methods

Samlpes from the population of naturally growing *Digitalis lanata* were collected in Nagyárpád, from the populations of cultivated Digitalis lanata in Budakalász and Bácsalmás and from the population naturally growing *Digitalis ferruginea* in Italy. The basis for comparisons were digoxin and gitoxin standards.

The dehydrated leaves were soaked in distilled water for a night. The ballast was removed with lead-acetate. After filtration and spin.drying, the samples were shaked out in chloroform – ether – ethyl alcohol (50:10:10). 20 µl from each sample was applied to the plate. The samples were developed in ethyl-acetate – methanol – water (75:10:7,5). The proving was done with four different reagents.

1) 25 per cent trichloric-acetic acid in alcohol and 3 per cent chloramin T in water (14:1). Then treated at 110ºC for 5 minutes (Picture 5).

2) Treated at 100ºC for 5 minutes, in vapour of 2 ml cc. hydrochloric acid and 10 ml cc. sulphuric acid. After it at 160ºC for 15 minutes (Picture 6).

3) 2 g antimon-trichlorid in 50 ml chloroform. After treated at 120ºC for 10 minutes (Picture 7).

4) 5 g trichloric-acetic acid in 50 ml chloroform. After the treatment at 120ºC for 10 minutes (Picture 8).

Pictures 5-8:

1. The sample of cultivated *Digitalis lanata* from Budakalász
2. The sample of cultivated *Digitalis lanata* from Bácsalmás
3. The sample of naturally growing *Digitalis lanata* from Nagyárpád
4. The sample of naturally growing *Digitalis ferruginea* from Italy
5. Digitoxin
6. Digoxin
7. Gitoxin
8. Lanatozide A

The plate was at 366 nm UV light for each case. The samples were compared with the standards. From the standards serial dilutions were made (10, 40, 70, 100 ng). The samples were developed in n-hexan – ethyl-methyl-keton – water (4: 16:0,4). The chromatograms were treated at 110ºC for 5 minutes, then in hydrochloric acid vapour, for 30 minutes, after it at 110ºC for 5 minutes. It was evaluated at 366 nm UV light too. (Botz L, 1995), (Verzár-Petri G. 1985). Digitoxin standard serial dilution (Picture 9). Gitoxin standard serial dilution (Picture 10).

Results and Discussion

Digitalis lanata comprises three genin-glycosides: lanatozide A, B and C. After the splitting of glycose and acethyl groups lanatozide A is transformed into digitoxin, lanatozide B into gitoxin and lanatozide C into digoxin. The lanatozides were in disintegrated condition. At 366 nm UV light, digitoxin fluoresced yellow, gitoxin light blue and digoxin purple. (Baumgarten G. 1963), (Baumgarten G. 1985). The four different provings were equivalent result. On the chromatograms, the spots from the samples of *Digitalis lanata* and *Digitalis ferruginea* differed in intensity. The samples of *Digitalis lanata* were stronger.

Thin-layer chromatography is suitable for separation of small amounts of substances in a mixture. The concentrations of the samples can be estimated in comparison with the spots of serial dilutions. (Macek K. 1972.) (Jork H, 1989.) The samples of naturally growing *Digitalis lanata* from Nagyárpád fluoresce weaker than the samples of cultivated *Digitalis lanata* and naturally growing *Digitalis ferruginea*. Therefore the quantity of effective substance in the population from Nagyárpád was smaller than in the cultivated populations. Consequently it is more probable that the sample of *Digitalis lanata* in Nagyárpád does not originated from cultivated population, but it is truly naturally growing.

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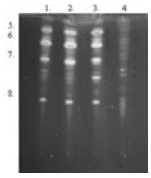
PICTURE 1.
Leaves of the *Digitalis lanata* before sprouting.

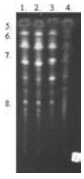
PICTURE 2.

PICTURE 3.

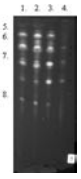
PICTURE 4.



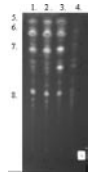
PICTURE 5. Reagent of trichloric-acetic acid in alcohol and chloramin T in water.



PICTURE 6. Reagent of cc. hydrochloric acid and cc. sulphuric acid.



PICTURE 7. Reagent of antimon-trichlorid in chloroform.

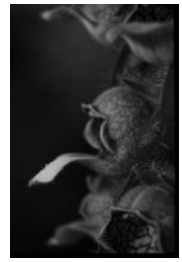


PICTURE 8. Reagent of trichloric-acetic acid in chloroform.

PICTURE 9. Digitoxin standard serial dilution.

PICTURE 10. Gitoxin standard serial dilution.

PICTURE 11. Flowering sprout of *Digitalis lanata*.



PICTURE 12. Flower portrait of *Digitalis lanata*.

The value of uses totaled indexes in Ethnobotanical Research with Ethnopharmacological purpose

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Key words: ethnobotany, ethnomedicine, ethnopharmacology, local food

Introduction

How can we go one step forward in the search for plants candidates for detailed study? It is important to separate the simple local use for a determined purpose and the successful repeated and widespread use for the same purpose (Elisabetsky & De Moraes, 1990). The answer is in the use of quantitative methods.

Quantitative ethnobotany is defined as: "the direct application of quantitative techniques to the analysis of contemporary plant use data". Usually quantitative plant use information is derived from individual or collective interviews and occasionally from behavioural data

In the uses totaled method, no attempt is made to quantify the relative importance of each use. The number of uses -or "activities"- are simply totaled, by category of plant use, plant taxon, or vegetation type. This has been the most popular approach, since it is the fastest and most straightforward way to quantify ethnobotanical data. It has two disadvantages. First, minor uses are treated as equivalent to even the most important of uses. Second, the total numbers of uses recorded may be more a function of research effort than of the relative significance of each use, plant, or vegetation type (Johns, Mhoro, Sanaya & Kimanani. 1994; Phillips, 1996; Phillips &. Gentry. 1993a and b).

We present some results of the study in three mountain areas of Castilla La Mancha (Spain) (Sierras de Alcaraz y Segura, Serranía de Cuenca and Cabañeros National Park).

Material and Methods

The area under study is situated in Central Spain (FIGURE 1). It consists of three mountain rural areas in three different Provinces (Albacete, Cuenca and Ciudad-Real). Here a wide range of plant species has been and still is in part used as medicinal resource.

Ethnobotanical semi-structured interviews in the field have been carried out in the quoted areas of Spain. Over 300 persons were interviewed (TABLE 1).

Results and Discussion

The highest variation in the number of remedies recorded in the individual interviews is from 5 to 111 in the mountains of Albacete (TABLE 1). Relevant remedies and available species, in absolute values and in percentages for the large therapeutic groups in the three study areas are presented.

Uses totaled by informant in Castilla La Mancha.

Here we include the number of references (plant remedies for specific ailments) obtained in each interview (individual or in group, and according with gender). The range goes from 1 to 150, and averages vary between 18 and 136.3. The more rewarding approach is obtained through interviews to groups of women. In general Serranía de Cuenca has shown a higher level of knowledge in terms of average number of references (TABLE 1).

Totaled uses and totaled species correlation

We studied the correlation in each one of these three areas between the number remedies and the number of species used.

In the mountains of Alcaraz and Segura (FIGURE 2) we find a high correlation (0.92). The residual values are low. In these areas they used an average of 60 species for each 100 remedies. We can detect a higher correlation in the Serranía de Cuenca Mountains (0.97), with some residual values still lower (FIGURE 3). Here use an average 62 species for each 100 remedies. For the area Cabañeros - Mounts of Toledo, the correlation is also higher than in the mountains of Alcaraz and Segura (0.96), being used in this area some 63 species for each 100 recorded remedies (Figure 4).

Medicinal Flora Totaled Method

The index of medicinal use of the ethnoflora (I_{mue}) is calculated as follows: $I_{mue} = N_{ms} / N_{ef}$. Where N_{ms} are the species used as medicinal in a territory and N_{ef} the species of the etnoflora. The highest degree in medicinal use of the ethnoflora is reached in the mountains of Albacete, where almost 50% of the species of the ethnoflora is used as medicinal. Then is the Cuenca Mountains where they are used as medicine 43.26% of their ethnoflora, lastly, in the Mounts of Toledo they are used as medicine only 36.41% of the species used and/or well-known.

Degree of use of medicinal resources.

The degree of use of the medicinal resources on the part of the inhabitants of a region comes determined by two types of factors. On one hand the strictly biological and environmental ones that condition the availability of medicinal species, are on the other hand they are strictly cultural and ethnopharmacological.

It has been carried out an analysis for the 15 more numerous families (with 50 or more species in the flora) studying the number of species used locally, as well as the number of species that potentially can be used. We have built this latter

through the field work and bibliographical revision with respect to the area. We added for this purpose those reported as used in the works of Villar and cols, Bonet, Blanco, Mulet and González Tejero (as cited by Verde, 2002).

With a high correlation level ($R^2 = 0.9392$) we obtained that it is used for the whole territory a 78% of the total of the available medicinal resources concerning the more relevant plant families.

On the other hand, if we consider the total of species of the territory including the less numerous families, the percentage diminishes to 59.64%, that is to say of the 559 species that should use we have only registered 430.

Acknowledgements: This research is part of the thesis of A. Verde and received a small support from the Junta de Comunidades de Castilla la Mancha for the field work.

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FIGURE 1. Situation in Spain of the three areas under study: Serranía de Cuenca, Sierras of Alcaraz and Segura and Cabañeros national park.

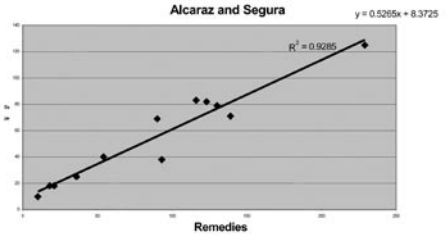

FIGURE 2. Totaled uses and totaled species correlation for the major medicinal plant families in Alcaraz and Segura (Albacete).

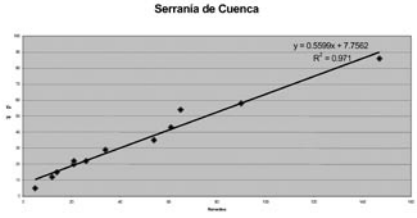

FIGURE 3. Totaled uses and totaled species correlation for the major medicinal plant fmilies in the Serranía de Cuenca.

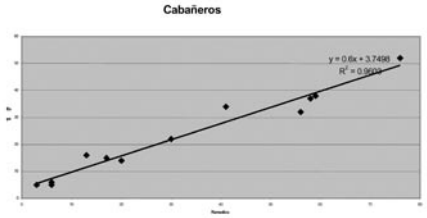

FIGURE 4. Totaled uses and totaled species correlation for the major medicinal plant fmilies in Cabañeros National Park and Montes de Toledo (Ciudad Real).

Values	Alcaraz and Segura	Serranía Cuenca	Cabañeros
	Women		
Minimum	5	23	16
Mean	35.64	40.6	31
Maximum	111	95	49
	Men		
Minimum	1	9	4
Mean	26.31	25.09	19.9
Maximum	104	48	42
	Groups of Women		
Minimum	76	109	-
Mean	88	136.3	
Maximum	100	150	-
	Groups of Men		
Minimum	15	36	31
Mean	18	36	38
Maximum	21	36	63

TABLE 1. Uses Totaled by Informant (number of different uses repòrted) in Sierras of Alcaraz and Segura, Serranía de Cuenca, and Cabañeros national park.

The traditional medicinal uses of gathered plant food in the mountains of Castilla La Mancha (Spain).

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Key words: ethnobotany, ethnomedicine, ethnopharmacology, local food

Introduction

Gathered plant food has been alternatively considered either as famine food or as expensive item of gastronomy. Examples of this kind of food range in the mountains of Castilla-La Mancha from well-known vascular plants such as wild asparagus or "collejas" (*Silene vulgaris* L.) to collected mushrooms or to relatively lesser known Berberidaceae, Papaveraceae, Rosaceae or Leguminosae species.

These foods are usually available in the forests of the area without cultivation and are locally consumed in particular periods of the year, some of them display toxicity that is avoided through complex processing. Techniques of collection and processing have been recorded. Here wild fruits are especially relevant although wild vegetables are also important.

Gathered plant food furnish nutritive substances (specially carbon hydrates, vitamins and minerals), but also contain secondary metabolites that can be of interest and may explain the medicinal uses among the local population.

Not all gathered food species are also used as medicine for particular ailments.

We started in this area our ethnobotanical research in the 80s that led to different publications (Verde, Rivera & Obon, 1998, Fajardo, Verde, Rivera & Obon, 2000; Verde, Fajardo, Rivera & Obón, 2001, Verde, 2002).

We present and discuss some results of the study in three mountain areas of Castilla La Mancha (Spain) (Sierras de Alcaraz y Segura, Serranía de Cuenca and Cabañeros National Park.

Material and Methods

The area under study is situated in Central Spain (FIGURE 1). It consists of three mountain rural areas in three different Provinces (Albacete, Cuenca and Ciudad-Real). Here a wide range of weedy and wild species are collected some among thess are known under the generic name of "collejas".

Ethnobotanical semi-structured interviews in the field have been carried out in the quoted areas of Spain. Over 300 persons were interviewed. The people interviewed were asked to furnish not only vernacular names of used plants, but also the frequency of use, where the plants grow and how they collected them, and other relevant information comprising recipes and medicinal properties recognised for the species in the zone.

Results and Discussion

Food plants (gathered and cultivated are quantitatively relevant in the local repertory of medicinal plant species in Castilla La Mancha Mountains (Sierras de Alcaraz and Segura, Serranía de Cuenca and Cabañeros National Park). Their importance can be underlined when compared with the toxic species (FIGURE 2).

Medicinal plants are used for different purposes that are organized in FIGURES 3 AND 4 in great groups. For each group are represented the number of different plant species used in local folk medicine, comprising food, toxic and others. Digestive complaints are those that deserve the highest diversity in medicinal species followed in order by Cardiovascular, Respiratory, Skin and Nervous System. The differences among areas are relevant in total number of species but all three areas show a similar pattern. FIGURE 3 shows data with the whole medicinal plant species. FIGURE 4 shows data with only the medicinal Gathered Food Plants that also are used in medicine. Here the pattern is different and the behavior of the different areas is also different. Cardiovascular and Respiratory indications are followed by digestive and Skin troubles.

Figure 5 displays the quantitative importance of the different plant families in number of species of the medicinal flora. Figure 6 shows the same relationships but here referred only to the gathered food plants. Compositae are in both most relevant in number of species, but followed second in order by Labiatae in the medicinal flora and Rosaceae in the medicinal gathered food plants, that are first in number in the Serranía de Cuenca.

Here the proportion of the Gathered Food Plant species that are used in local folk medicine is significantly higher than in Lower Segura Basin (50 to 80 % in front of 30 %) (Rivera, Obón, Cano & Robledo, 1994; Rivera & Obón, 1996a and b; Rivera et aliis in this book) (FIGURE 7).

Acknowledgements: This research started with the thesis of A. Verde and J. Fajardo and presently is being done with the support of the European Union Vth Framework Program (Contract QLK1-2001-00173, Local Food-Nutraceuticals).

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FIGURE 1. Situation of the Areas under study in Canstilla-La Mancha.

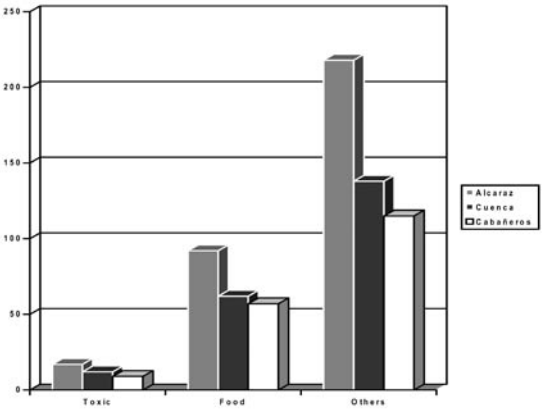

FIGURE 2. Numbers of toxic, food and not-toxic plus not-food medicinal plant species in the different areas.

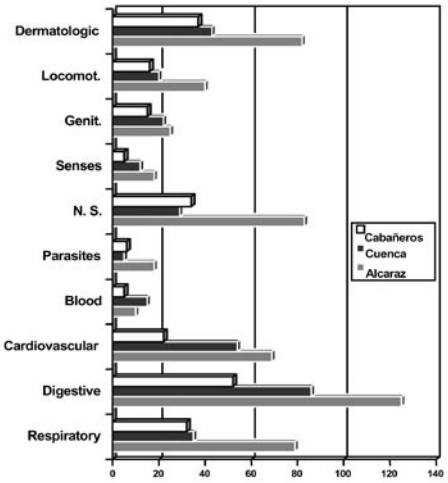

FIGURE 3. Number of different medicinal plant species used for specific ailments belonging to the major therapeutic groups.

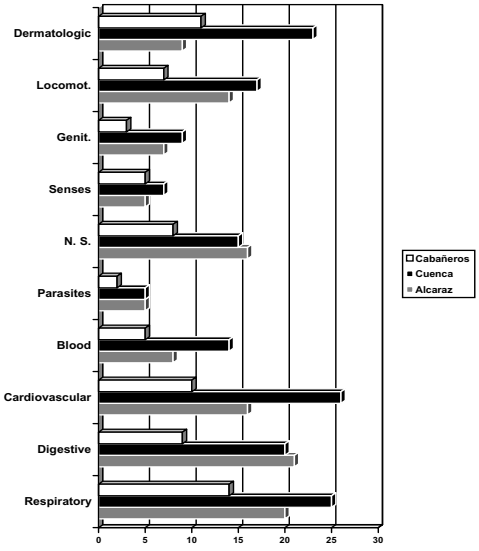

FIGURE 4. Number of different Gathered Plant Food medicinal species used for specific ailments belonging to the major therapeutic groups.

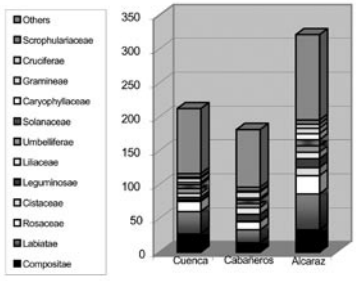

FIGURE 5. Relevance of the different plant families, expressed in terms of number of species that belong to the local medicinal flora.

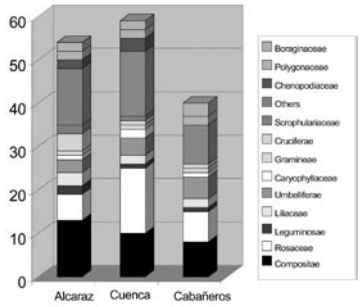

FIGURE 6. Relevance of the different plant families, expressed in terms of number of species that belong to the group of local food plants.

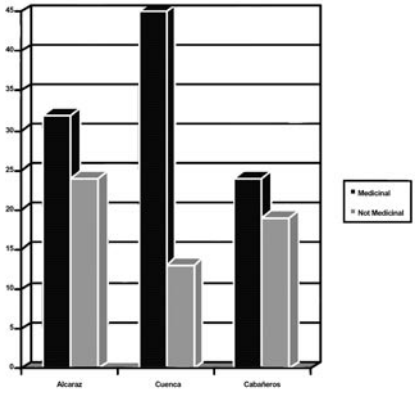

FIGURE 7. Total number of gathered food plant species in the three areas under study that are used and not used in local folk medicine.

The traditional medicinal uses of gathered plant food in Lower Basin of Segura River (Murcia and Alicante, Spain)

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Key words: ethnobotany, ethnomedicine, ethnopharmacology, local food

Introduction

Gathered plant food has been alternatively considered either as famine food or as expensive item of gastronomy. Examples of this kind of food in the Segura Basin range from well-known vascular plants such as "Ensalá del Campo" or "Ensalá de la Huerta" (comprising *Sonchus* spp., *Crepis* spp., *Scorzonera* spp.) or "Camarrojas" (*Cichorium* spp.) to relatively lesser known Cruciferae or Leguminosae species.

Most of these plants are available in the fields, orchards, groves, gardens and roadsides, growing as weeds, without cultivation, and are locally consumed in particular periods of the year.

Some of them display toxicity due to secondary metabolites such as alcaloids, lectins, cyanogenic glucosides and others, that is avoided through more or less complex plant processing (bleaching to fermentation). Techniques of collection and processing have been recorded during our field research. Here weedy greens constitute the most relevant group of consumed species.

The Gathered Plant Food supplies nutritive substances specially carbon hydrates, vitamins and minerals, but also contains secondary metabolites that can be of interest and may explain the medicinal uses among the local population.

Not all gathered food species are here used as medicine for particular ailments as it is shown below.

We started in this area our ethnobotanical research in the 80s that led to different publications (Rivera, Obón, Cano & Robledo, 1994; Rivera & Obón, 1996a and b).

We discuss here some results of the study in the groves of the Lower Segura Basin (Vega Baja) in Murcia province and around Orihuela (Alicante).

Material and Methods

The area under study is situated in Southern Spain extending along the lower Segura River valley in the provinces of Murcia and Alicante (FIGURE 1). It is a merging point of traditional irrigated agriculture, small industry and urban expansion.

Ethnobotanical semi-structured interviews in the field have been carried out in the quoted areas of Spain. Over 200 persons were interviewed. The people interviewed were asked to specify not only vernacular names of used plants, but also the frequency of use, where the plants grow and how they collected them, and other relevant information comprising recipes and medicinal properties recognised for the species in the zone.

Results and Discussion

Food plants (gathered and cultivated are quantitatively relevant in the local repertory of medicinal plants in Murcia, particularly in the Lower Segura Basin. Their importance can be underlined when compared with the toxic species although it is much less than the not-toxic not-food medicinal plants (FIGURE 2).

Quantitative importance of the different plan families is shown in FIGURES 3 AND 4 in number of species of the Medicinal Flora (FIG. 3) and the Gathered Food Plants (FIG. 4). The numbers of Compositae and Labiatae species are high in both groups. The Cruciferae and Liliaceae become relatively more relevant in number of species in the group of Gathered Food Plants.

Medicinal plants are used for different purposes that are organized (FIGURE 5) in great groups. For each group are represented the number of different plant species used in local folk medicine, comprising food, toxic and others. In black are represented data exclusive to the Gathered Food Plant species. Digestive remedies are the more numerous in both, followed of respiratory, Skin and Genito-Urinay remedies. The pattern is very similar for the general medicinal and the medicinal Gathered Food Plant groups.

Here the proportion of the Gathered Food Plant species that are used in local folk medicine is significantly lower than in Castilla-La Mancha (30 % in front of between 50 and 80 %) (Verde, Rivera & Obon, 1998; Fajardo, Verde, Rivera & Obon, 2000; Verde, Fajardo, Rivera & Obón, 2001; Verde, 2002; Rivera et aliis in this book) (FIGURE 6).

Acknowledgements: This research started with the thesis of F. Mendez and presently is being done with the support of the European Union Vth Framework Program (Contract QLK1-2001-00173 Local Food - Nutraceuticals).

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FIGURE 1. Situation of the areas under study.

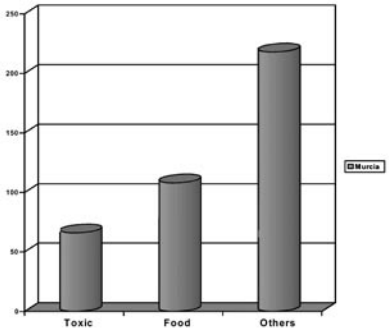

FIGURE 2. Number of toxic, food and not-toxic plus not food medicinal plant species in the Lower Segura Valley

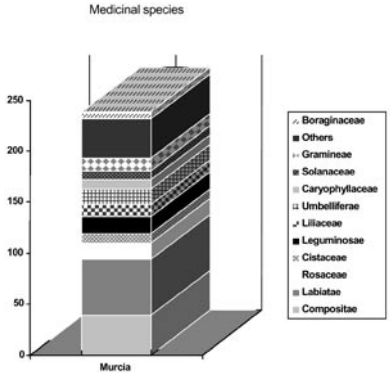

FIGURE 3. Relevance of the different plant families, expressed in terms of number of species that belong to the local medicinal flora in the Lower Segura Basin.

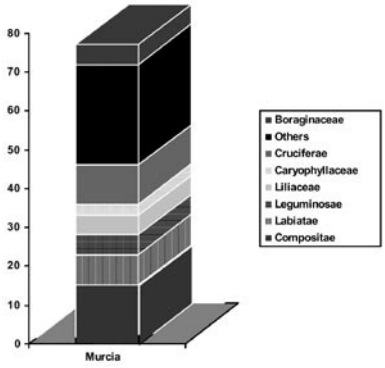

FIGURE 4. Relevance of the different plant families, expressed in terms of number of species of Gathered Food Plants that belong to the local medicinal flora in the Lower Segura Basin.

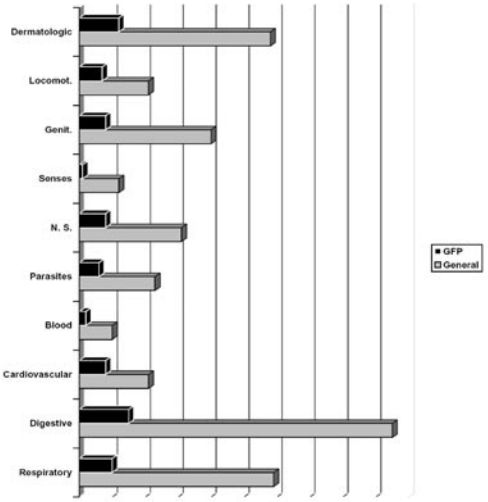

FIGURE 5. Number of medicinal plant species used for the different therapeutic groups. In black medicinal gathered food plants, in grey all medicinal plants.

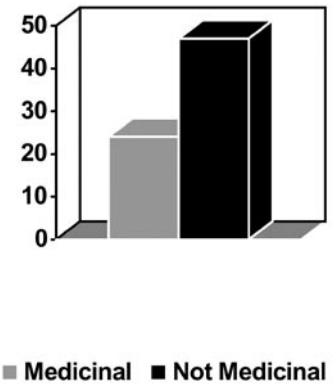

FIGURE 6. Total number of gathered food plant species that belong or not to the local medicinal flora in the Lower Segura Basin.

La herbolaria en el tratamiento de los problemas emocionales: entrevistas a los curanderos de la ciudad de México

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Palabras clave: plantas medicinales, medicina tradicional, problemas emocionales, ciudad de México.

La información que se presenta en este texto forma parte de un proyecto de investigación acerca del papel de la medicina tradicional en el tratamiento de problemas emocionales. Como objetivo principal se propuso conocer y describir cómo se significa el conocimiento y las prácticas de la medicina tradicional urbana para el tratamiento de padecimientos afectivos, así como detectar los motivos identificados por los usuarios para recurrir a los mismos. Aunque la información recolectada y analizada es muy vasta, en esta ocasión solamente nos enfocaremos en el uso de la herbolaria como una herramienta para el tratamiento de problemas emocionales por un grupo de curanderos urbanos de la ciudad de México.

El estudio se realizó con base en 13 relatos de médicos tradicionales siete hombres y seis mujeres (FIGURA 1). Como primer paso se plantearon las interrogantes sobre salud-enfermedad y técnicas de curación que se quería indagar; luego, se seleccionaron los casos mediante la estrategia de muestreo teórico propuesta por Glasser y Strauss (1967). Las entrevistas, basadas en guías conformadas por diversos temas clave, fueron grabadas y posteriormente transcritas; mientras que las observaciones se registraron en notas de campo. Finalmente, el material discursivo fue clasificado con la técnica de "categorización de significados". *Para este trabajo se presenta el análisis de las siguientes categorías: a) Adquisición del conocimiento herbolario, b) clasificación de las plantas c) uso de las plantas medicinales y c) el lugar que ocupan las plantas medicinales dentro del complejo proceso "terapéutico".*

En el México actual coexisten tanto la medicina "científica" como la "tradicional mexicana" y ambas muestran un gran interés en las plantas medicinales. Aun cuando los conocimientos de la herbolaria[1] mexicana se remontan al periodo precolombino, se observa una renovación suscitada por las exigencias contemporáneas. Encontramos que por un lado, se han fusionado con las prácticas medicinales de la conquista, las mestizas y las citadinas, por el otro, han incorporado elementos provenientes de otras culturas médicas como la China y la Hindú (Hersch, 1999). Entre la información estudiada se encontró que diez de los trece médicos entrevistados señalaron que el conocimiento de las plantas lo adquirieron dentro del seno familiar, este proceso de enseñanza se da en varias etapas y está basado en un aprendizaje empírico. Dos informantes aprendieron debido a las necesidades que imperaban en las comunidades donde vivían y uno más adquirió los conocimientos en una escuela de medicina naturista. Los curanderos conocen la forma y el momento en que hay que cortar las plantas; sin embargo, la mayoría las compran en un mercado ya sea frescas o secas debido a las limitaciones ecológicas características de la ciudad de México. Esta forma de adquirir las plantas impide saber con exactitud si fueron cortadas y procesadas de la manera correcta. Las plantas utilizadas con mayor frecuencia en los casos de problemas emocionales o de los nervios son alpiste, azahar, damiana de California, hierba de san Juan, flor de manita, flor de tila, lechuga, malva, pasiflora, tumbavaquero, toronjil y valeriana. La clasificación de las plantas medicinales se realizó a partir del discurso de los entrevistados. Durante la investigación, no se obtuvieron muestras de las plantas mencionadas para su posterior identificación y análisis químico. Sin embargo, para complementar la información se realizó una revisión bibliográfica de diversos estudios (Martínez, 1987; Dávila-Aranda y Germán Ramírez, 1991; Argueta Villamar, *et al.*, 1994; Aguilar-Contreras, 1994; Heinze y Ontiveros, 1998; Hersch-Martínez, 1999) documentados con investigación farmacológica (FIGURA 2). De acuerdo con los informantes, la herbolaria es fundamental para el tratamiento de patologías físicas u orgánicas, pero pasa a un segundo término cuando la enfermedad es de tipo "emocional", puesto que para este tipo de padecimientos son más importantes los recursos curativos asociados con rituales como las limpias y los tratamientos orientados en pláticas y consejos. El uso de las plantas se convierte en un recurso complementario que tiene muy poca eficacia si no va acompañado de otros recursos curativos. En cuanto a los problemas de tipo emocional, las plantas se utilizan principalmente como infusiones o en forma de baños. El tipo de planta que se recomienda, la forma de preparación y la frecuencia de uso se determina de acuerdo con: el tipo de padecimiento y/o gravedad de cada paciente; los síntomas observados y por el conocimiento práctico que tienen sobre la eficacia de ciertas plantas para enfermedades específicas. Se advirtieron algunas ambigüedades en el empleo de la herbolaria, en primer término, no se manejan con exactitud las dosis en que deben emplearse las plantas y en segundo lugar, no existe un conocimiento preciso de los compuestos activos que tiene una hierba específica.

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Entrevistado	Edad	Lugar de Nacimiento	Nivel de Estudios	Ocupaciones Actuales	Estado Civil
Carlos (curandero)	38 años	Distrito Federal	Licenciatura	Curanderismo	Casado
José (curandero)	27 años	Distrito Federal	Secundaria	Tiene un negocio de hierbas y veladoras y es curandero	Casado
Gustavo (médico tradicional)	39 años	Distrito Federal	Maestría	Médico tradicional	Soltero
Fernando (médico tradicional)	44 años	Distrito Federal	Secundaria	Curandero e instructor de danza tradicional Azteca	Unión Libre
Manuel (curandero)	33 años	Quintana Roo	Preparatoria	Curandero	Soltero
Mario (yerbero)	49 años	Distrito Federal	Sin estudios formales	Yerbero	Unión Libre
Pablo (yerbero y espiritualista)	34 años	Distrito Federal	1° Secundaria	Yerbero y espiritualista	Unión Libre
Martha (yerbera)	42 años	Distrito Federal	Secundaria	Comerciante de yerbas	Soltera
Mª Concepción (huesera)	63 años	Guanajuato	Sin estudios formales	Huesera y sobadora	Casada
Rosario (curandera)	57 años	Guerrero	Preparatoria	Curandera	Viuda
Carmen (curandera)	59 años	Tabasco	Vocacional	Curandera	Divorciada
Laura (curandera)	31 años	Distrito Federal	Vocacional	Curandera	Casada
Rocío (curandera)	32 años	Distrito Federal	Primaria	Tiene un negocio de hierbas y veladoras y es curandera	Casada

*Se presentan primero los datos de los médicos hombres y posteriormente los de las terapeutas entrevistadas.

FIGURA 1. Características Sociodemográficas de los médicos tradicionales*.

ALPISTE
Nombre científico: Familia Gramineae. *Phalaris canariensis* L. Usos señalados por los entrevistados: Para los nervios y la presión alta. Se hierven las semillas y se administra como infusión. Usos en la medicina tradicional: Para la presión alta. Se prepara un cocimiento con los frutos, se cuela y se toma como agua de tiempo por una semana. Farmacología: No hay estudios químicos o farmacológicos que comprueben su efectividad.

AZAHAR
Nombre científico: Familia Rutaceae. *Citrus aurantium* L. Usos señalados por los entrevistados: Nervios, agruras, amibas, insomnio. Se recomienda tomar un te de azahar por las noches para poder dormir. Usos en la medicina tradicional: trastornos digestivos y para arrojar la bilis. Para estos padecimientos se emplean las hojas y flores en infusión y se toma en ayunas. También se utiliza en afecciones ginecológicas y para la calentura. Se usa en ciertos padecimientos del Sistema Nervioso, para calmar los nervios, contra el insomnio y la epilepsia. Farmacología: Se han evaluado diversas partes de las plantas. En modelos experimentales con ratas y ratones, se ha observado actividad analgésica, antivicerosa, antiinflamatoria y depresora del sistema nervioso.

FIGURA 2. Relación de plantas utilizadas por los médicos tradicionales para el tratamiento de problemas emocionales.

DAMIANA DE CALIFORNIA
Nombre científico: Familia Turneraceae. *Turnera diffusa* Willd.
Usos señalados por los entrevistados: Para la impotencia sexual, problemas de los nervios y del estómago. Se preparan las hojas y tallo como infusión
Usos en la medicina tradicional: Se usa para la debilidad y la impotencia sexual, para promover la fertilidad, así como afrodisíaca y anticonceptiva. Para los casos anteriores se recomienda tomar la infusión hecha con toda la planta menos la raíz.
Otros usos medicinales son contra la tos, el catarro, el dolor de estómago y la debilidad muscular. También se usa para estimular el apetito y reforzar la sangre. En todos estos casos se recomienda tomar la planta en infusiones.
Farmacología: En estudios *in vitro* solamente se han comprobado las acciones hipoglicémica y antitumoral.

HIERBA DE SAN JUAN
Nombre científico: Familia Apocynaceae. *Macrosiphonia hypoleuca* (Benth.) Muell.
Usos señalados por los entrevistados: Para la depresión, histericismo, asma, catarros y dolores excesivos al menstruar. Se toma en forma de té para la tristeza o depresión. Con las flores de la hierba y aceite se hace una esencia que sirve para friccionar diversas partes del cuerpo.
Otros usos en la medicina tradicional: Es usada para el tratamiento de la tos, para disminuir loa cólicos de la mujer y para la neuritis. En los casos anteriores se aconseja tomar un té preparado con las ramas de la flor.
Farmacología: Se ha señalado que por sus efectos sobre las catecolaminas es útil en las alteraciones psicógenas, en los estados depresivos, en la ansiedad y en la agitación nerviosa.

FLOR DE MANITA
Nombre científico: Familia Sterculiaceae. *Chiranthodendron pentadactylon* Lam.
Usos señalados por los entrevistados: Para trastornos cardíacos y del sistema nervioso. Se recomienda preparar la flor como té y tomarse como agua de uso.
Usos en la medicina tradicional: Es utilizada para calmar los nervios preparada en té. El té debe tomarse cada vez que sea necesario. Generalmente se recomienda preparar el té mezclando la flor de manita con otras plantas como la magnolia, toronjil, tila, azahar, pasiflorina, damiana de California.
También se emplea para curar el corazón en conjunto con la flor de yoloxóchitl.
Farmacología: Su aplicación como estimulante cardíaco ha sido validado experimentalmente administrando un extracto de 300mg/kg de las flores a ratones ejerciendo un efecto anticolinérgico.

FLOR DE TILA
Nombre científico: Familia Tiliaceae. *Tilia mexicana* Schlechtendal
Usos señalados por los entrevistados: Para el sistema nervioso. Principalmente para calmar los nervios. Se toma el cocimiento de la flor preparado como infusión.
Usos en la medicina tradicional: Es utilizado principalmente para calmar los nervios. También se usa con frecuencia para tratar enfermedades del corazón y presión arterial. Se recomienda tomar la cocción de la flor para todos los padecimientos señalados.
Farmacología: Estudios realizados en laboratorio han mostrado la acción sedante en ratones.

LECHUGA
Nombre científico: Familia: Compositae. *Lactuca sativa* L.
Usos señalados por los entrevistados: Para la debilidad y la extenuación. Se recomienda cocer las hojas de la lechuga y utilizar este cocimiento en baños.
Usos en la medicina tradicional: Se utiliza especialmente para el insomnio, tomando una taza antes de acostarse. También se recomienda utilizarse en baños para "darle fuerza" a la persona. Se le usa contra la fiebre, nervios y para dormir a los niños.
Farmacología: Se ha demostrado que el extracto acuoso de las hojas produce una acción hipotensora en el perro. En estudios con ratas se demostró que un aumento en las dosis (50, 100, 200mg) provocó un decremento en la presión arterial y en la frecuencia cardiaca.

FIGURA 2. Continuación.

MALVA
Nombre científico: Familia Malvaceae. *Malva parviflora* L.
Usos señalados por los entrevistados: Estreñimiento, obesidad, gripa, asma, susto y coraje.
Usos en la medicina tradicional: Para el susto se utilizan las hojas y se prepara una infusión para tomar. También se recomienda en baños.
Farmacología: Solamente se ha comprobado si actividad diurética de una decocción administrada a ratas.

PASIFLORA
Nombre científico: Familia Passifloraceae. *Passiflora suberosa* L.
Usos señalados por los entrevistados: Para la ansiedad, el nerviosismo, el estrés y el insomnio. Se utiliza en forma de infusión o se recomienda en baños. En ambos casos tiene una función relajante.
Usos en la medicina tradicional: Se emplea para afecciones de los riñones y para los nervios.
Farmacología: Estudios farmacológicos señalan que la parte aérea de la planta posee propiedades sedantes y antiespasmódicas.

TUMBAVAQUERO
Nombre científico: Familia Convolvulaceae. *Ipomoea stans* Cav.
Usos señalados por los entrevistados: Para problemas de “epilepsia” e “histeria”. Se administra en forma de té.
Usos en la medicina tradicional: Se emplea para los nervios, para remediar este padecimiento se puede tomar la cocción de la planta o poner los tubérculos en alcohol por ocho días y después de este tiempo untarlo en la nuca, También se usa en el tratamiento del dolor del cerebro, cabeza, huesos y para los mareos.
Farmacología: Observaciones realizadas en el Instituto Médico Nacional indicaron que la raíz es útil en el tratamiento de la epilepsia.

TORONJIL
Nombre científico: Familia Labiate. *Agastache mexicana* (Kunth) Lint & Epling
Usos señalados por los curanderos: Para el susto; se recomienda tomar un té por las mañanas.
Otros usos en la medicina tradicional: Para el espanto, el mal de ojo y los nervios. Se emplea el cocimiento de la planta junto con otras plantas como el cempasuchil o la hierba del burro. Este cocimiento pude ingerirse o utilizarse para baños.
Farmacología: No existe información farmacológica que justifique el uso de esta planta

VALERIANA
Nombre científico: Familia Valerianaceae. *Valeriana edulis* Nutt. subsp. *procera* (Kunth) F.G.Mey.
Usos señalados por los entrevistados: Se usa contra la angustia, nerviosismo e insomnio. Se prepara la planta en forma de té.
Usos en la medicina tradicional: Se utiliza para dolores de pecho, esplada o cerebro. La hojas y la raíz de la plante se curten en alcohol durante ocho días y al término de este tiempo se frota el alcohol en la parte afectada.
Farmacología: Existe poca investigación sobre esta planta, pero se ha demostrado la actividad hipoglicémica en ratones.

FIGURA 2. Continuación.

Fuentes de información consultadas.

Nombres científicos: Martínez (1987); Argueta Villamar, *et al.* (1994).
Otros nombres populares: Martínez (1987); Argueta Villamar, *et al.* (1994).
Usos en la medicina tradicional: Argueta Villamar, *et al.* (1994); Hersch-Martínez (1999).
Farmacología: Argueta Villamar, *et al.* (1994); Heinze y Ontiveros (1998); Aguilar-Contreras (1994)

Inhibition of nucleic acid synthesis in K562 cell line by 3-hydrogenkwadaphnin from *Dendrostellera lessertii* (Thymelaeaceae)

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A new daphnan-type diterpene ester was isolated from D. lessertii. Based on ^{1}H and ^{13}CNMR and FAB/MS techniques, the new compound was characterized, for the first time, as 3-hydrogenkwadaphnin. Using eight different cancer cell lines, it was shown that 3-hydrogenkwadaphnin has an antiproliferative activity with an average IC50 value of 5 nM. The flow cytometry examination of K562 cells 24 hours after exposure to 3-hydrogenkwadaphnin, indicated that the new agent is capable of arresting the cells at G1/S checkpoint of their progression cycle. This observation was further confirmed by measuring the extent of (3H)-Thymidine incorporation into DNA of intact K562 cells. The results showed a 56% reduction in the extent of DNA biosynthesis compared to the untreated cells. Further in vitro investigation indicated that 3-hydrogenkwadaphnin exerts its action on DNA biosynthesis mainly through the rate limiting enzyme of purine biosynthetic pathway, inosin-5'-monophosphate dehydrogenase (IMPDH). Although no direct interaction between the purified enzyme and the drug was observed, the new agent was capable of reducing the IMPDH activity of the treated cells almost by 63% compared to the untreated samples. These data clearly indicate that 3-hydrogenkwadaphnin regulates the activity of IMPDH by a different mechanism other than the direct modulation of the enzyme activity.

Toxicity studies and phytochemical screening of four medicinal plants in the caribean

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Key words: *Anredera leptostachys, Bixa orellana, Eryngium foetidum, Haematoxylon campechianum, t*oxicity studies*, phytochemical screening*.

Introduction

A large number of single and compound herbal drugs are used in the traditional Caribbean system of medicine for the treatment of diverse ailments (Robineau, 1989, Germosen-Robineau, 1995). Four such medicinal plants which are used against diseases where long term treatment is required were selected for the present study. The parts used in this study and various medicinal properties attributed to these plants are given in TABLE 1.There are limited reports on the phytochemical constituents and on some of the pharmacological activities of these plants. However, data are available on their side or toxic effects in the literature. In this study the acute and chronic toxicity of these plants in mice was evaluated and a phytochemical screening was preformed.

Materials and methods

Plant material

The flowery plants were identified at the Jardin Botanico Nacional Dr. Rafael M. Moscoso (Santo Domingo) by Dr. F. Jimenez. The samples studied were: Tuber of *Anredera leptostachys* (Moq.) Steenis (Basellaceae) (Jimenez, 1445), seed of *Bixa orellana* L. (Bixaceae) (Jimenez, 1477), leaves of *Eyngium foetidum* L. (Apiaceae) (Jimenez, 1768) and leaves and woods of *Haematoxylon campechianum* L. (Caesalpinaceae) (Jimenez, 1617 and 1478 respectively).

Toxicity

The respective part of the plant was infused in boiling water and then macerated for 24 hours. The macerate was filtered and the solvent evaporated at low pressure. The water-free residue was suspended in normal saline and used in the experiments. Swis mice of both sexes, aged 7-8 weeks, weighing 25-35 g, and fed purina chow diet and water ad libitum were used.

Acute toxicity

A total of 120 swiss mice were randomly alloted to different control and treatment groups. The extracts in each case was injected intraperitoneal by in doses between 100 and 2000 mg/Kg. The general symtoms of toxicity and mortality were observed for 48 h following method described by Gallego (Gallego, 1986).

Chronic toxicity

A total of 144 swiss mice were randomly alloted to different treated and control groups. The extracts were injected intraperitoneally. The dose selected was 100 mg/kg body weigth per day, which is 1/5 of de pharmacologically active dose for a period of 2 months, following method described by Galllego (Gallego, 1986).The different parameters were subjected to statistical analysis by Student's test.

Phytochemical screening

The different plants parts were pulverized and successively extracted with petroleum ether, methanol and water.The extracts were concentrated under reduced pressure and the chemicals constituents of the residue were determined.

Results and discussion

The results of the acute toxicity studies (LD50) are summarized in TABLE 2.

The leaf of *H. campechianum* exhibited the most highest toxicity (215,12 ± 10,70 mg d.r./Kg). However, *E. foetidum* showed no signs of toxicity in the dose range of 200 mg d.r./Kg to 1400 mg d.r./Kg.

The results of the chronic toxicity studies are summarized in TABLES 3, 4 AND 5.

During chronic treatment loss of body weight or other abnormalities of the vital organ were observed as compared to the control.

The results of phytochemical studies are presented in TABLE 6.

Animals administered with A. *leptostachys* extract showed no significant changes during the acute treatment. However, on chronic treatment, the average weigth increase in this group was significative. This effect might be due to carbohydrates present in this extract. The observations of the vital organs were normal.

In acute treatment test *B. orellana* extract did not exhibit toxicity. At the higher dose, a decrease locomotor activity was observed. During the chronic treatment 5% of male mice and 2% of female mices developed hepatic toxicity but the others abnormalities were no observed. This seed contains greases, carotenes, sterols and triterpenes, leucoanthocyanins, catecols, tannis and carbohydrates. The importance of this seed in asthenia may be due to greases and carbohydrates content. This effect colouring may be attributed to carotenes. When it ingested over a period of several weeks, the seed produces carotenemia, a yellowed of the skin often firstly observed in the palms of the hands or on the soles of the feed (Tyler, 1988).

The acute toxicity studies *E. foetidum* extract did not present signs of toxicity. During chronic treatment no loss of body weight nor other abnormalities in the vital organs were observed.

The leaves of this plant contain flavonoids, catechol tannins, carbohydrates and saponins.

The leaves and the wood of *H. campechianum* produced stimulation, pilo-erection and rapid irregular respiration preceding death during acute treatment.

During the chronic treatment 37.5% and 24% of the animals died with the leaves and the wood extracts. There was significant changes in average body weight.

This leaves and the wood showed too toxic lesions in kidney and liver (TABLE 5), something less strong with the wood.

The leaves of this plant contain mainly the lactones and alkaloids and the wood contains especially the alkaloids and saponins. These compounds may be responsible for the observed toxicity and the undiserable effects.

The acute and chronic toxicity as a result of the present investigation may provide important evidence concerning the therapeutic safety of these drugs and assist in assessment of possible meausures to be introduced before these plants can be safely used in the health care system of the Caribbean.

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Plant	Part used	Uses or disease treated	References
*Anredera leptostachy*s (Moq.) Steenis (Basellaceae)	Tuber Leaf	Bone fracture Anti-inflammatory Analgesic Vulneraly Emollient	Germosen-Robineau 1995 Adjanohun, 1985 Adjanohun, 1985 Nuñez, 1975 Beuzer, 1973
Bixa orellana L. (Bixaceae)	Seed Root Leaf	Shock, Asthemia Emollient Diabetes Emmenagogue, Diu-retic, Antidiarrheal	Germosen-Robineau 1995 Martinez, 1959 Wong, 1976 Aguilar, 1966
Eryngium foetidum L. (Apiaceae)	Leaf Whole plant	Gastralgia, Diarrhea, Hypertension Vulneraly Febrifuge, Antirheumatic Emmenagogue	Robineau, 1989 Weniger, 1985 Stehle, 1962 Wong, 1976
Haematoxylon campechianum L. (Caesalpinaceae)	Leaf Wood	Amenorrhea,Anemia Shock Anemia Amenorrhea Diarrhea	Germosen-Robineau 1995 Wong,1976 Germosen-Rob.1995 Martinez, 1959

TABLE 1. Medicinal uses of the plants under investigation for the presents studies

	mg d.r./Kg ± SE	g plant/Kg ± SE
Anredera leptostachys (Moq.) Steenis Tuber	1043.38 ± 137.14	61.07 ± 7.93
Bixa orellana L. Seed	1092.25 ± 202.64	19.50 ± 3.62
Eryngium foetidum L. Leaves	1470.03 ± 124.35	11.12 ± 0.94
Haematoxylom campechianum L. Leaves Woods	215.12 ± 10.70 498.14 ± 66.38	0.76 ± 0.04 24.05 ± 3.20

TABLE 2. LD_{50} obtained with different plants

	nº of mice treated	Mortality (days) 15 30 45 60	Total of dead animals	Lethality (%)
Control	24	0 0 1 1	2	8.3
A. leptostachys Tuber	24	0 1 1 1	3	12.5
Bixa orellana Seeds	24	0 1 1 1	3	12.5
E. foetidum Leaves	24	0 0 2 2	4	16.6
H. campechianum Leaves Wood	24 24	1 2 2 4 0 1 2 3	9 6	37.5 ** 24.0 *

* p≤ 0.05 ** p≤ 0.001

TABLE 3. Quantitative data on the mortality induced in mice on chronic treatment with different plant extracts.

	Male mince Pre-treatment average body weight	Female mince Pre-treatment average body weight	Male mince Post-treatment average body weight	Female mince Post-treatment average body weight
Control	33,60 ± 0,30	27,02 ± 0,32	36,84 ± 0,39 *	29,01 ± 0,38 *
Tuber of *A. leptostachys*	32,32 ± 0,27	29,17 ± 0,25	34,80 ± 0,32 *	30,90 ± 0,42 *
Seeds of *B. orellana*	34,40 ± 0,32	28,43 ± 0,27	33,90 ± 0,42	28,06 ± 0,50
Leaves of *E. foetidum*	34,82 ± 0,31	28,94 ± 0,38	35,20 ± 0,49	27,86 ± 0,49
Leaves of *H. campechianum*	32,70 ± 0,28	29,43 ± 0,20	30,23 ± 0,41 *	27,10 ± 0,57 *
Wood of *H. campechianum*	34,90 ± 0,25	32,98 ± 0,24	32,20 ± 0,49 *	30,89 ± 0,49 *

* p0,05 ** p0,001

TABLA 4. Quantitative data on the average body weight in mice on chronic treatment with different plants extracts.

	Kidney (Glomerular inflammation)		Degeneration on the renal tubule		Liver (Hepatic toxicity) (Kupffer's cel.)		Spinal cord males females	
	males	females	males	females	males	females	males	females
Control	0	0	0	0	0	0	normal	
Tuber of *A. leptostachys*	0	0	0	0	0	0	normal	
Seeds of *B. orellana*	0	0	0	0	5%	2%	normal	
Leaves of *E. foetidum*	0	0	0	0	0	0	normal	
Leaves of *H. campechianum*	10%	20%	30%	50%	20%	40%	normal	
Wood of *H. campechianum*	5%	15%	20%	30%	l0%	25%	Normal	

TABLE 5. Disease observed on the vital organs.

	A. leptostachys (Tuber)	*B. orellana* (Seed)	*E. foetidum* (Leaf)	*H.campechianum* (Leaf)	*H.campechianum* (Wood)
greases	+	++	-	-	-
carotenes	-	+++	+	++	+
sterols and triterpenes	+	+++	+	++	-
quinones	-	-	-	+	-
lactones	-	+	-	+++	+
leucoantho-cyannins	-	++	-	++	+++
flavonoids	-	+	++	++	+
catechol tannins	-	++	+++	-	-
pyrogallol tannins	-	-	-	+++	+++
alkaloids	-	-	-	+++	++
carbo-hydrates	+++	+++	+++	+++	+++
saponins	++	+	++	-	+++

+ (weakly positive), ++ (positive), +++ (very positive), - (negative)

TABLE 6. The compounds identified in the phytochemical study.

Estudio multidisciplinar preliminar de especies características de la asociación vegetal *Thymo piperellae-Cistetum crispi*, matorral endémico valenciano

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Palabras clave: *Cistus, Erica, Thymus*, aceite esencial, antiespasmódico, antimicrobiano, indumento vegetal

Introducción

Hoy en día se está viviendo un retorno a lo natural que incluye un auge de la utilización de plantas medicinales, en este sentido, el paisaje mediterráneo es especialmente rico en estas especies y la tradición de su uso queda patente en los trabajos etnobotánicos (Font Quer, 1993; Fresquet, 2001; Mulet, 1987, 1991, 1994a y b, 1997; Peris & col., 2001) Actualmente, nuestra investigación se centra en las especies que caracterizan la asociación vegetal Thymo piperellae-Cistetum crispi, matorral endémico de la Comunidad Valenciana que se presenta como jaral-cantuesal en cuya composición habitual están presentes *Lavandula stoechas, Cistus* sp. pl. (*Cistus crispus*, *Cistus salvifolius, Cistus monspeliensis*) y algunos brezos como *Erica scoparia* (Costa, 1986; Soriano, 1997). Y se ha empezado el estudio con tres especies características de la asociación. *Thymus piperella* L. es un tomillo endémico que en el territorio se usa como condimento y saborizante en el adobo de aceitunas, *Erica scoparia* L. o brezo de escoba de la que no se ha encontrado ninguna información etnobotánica o etnofarmacológica y *Cistus crispus* L. o jara rizada a la que Mulet (1997) se refiere como tóxica.

Material y metodología

En *T. piperella*, *E. scoparia* y *C. crispus* se estudia la actividad de distintos extractos obtenidos de las hojas, de esta forma se establecen propiedades en grupos de sustancias que posteriormente se pueden aislar aplicando la metodología fitoquímica adecuada según el caso. Además, queda identificada la droga vegetal que se caracteriza morfológica y anatómicamente, requisito para su posterior reconocimiento y uso. El material ha sido recolectado en el territorio de estudio durante el mes de mayo.

Estudio fitoquímico

De *T. piperella, E. scoparia* y *C. crispus* se obtienen extractos metanólicos y de la primera además, su aceite esencial. El aceite esencial de T. piperella se extrae por hidrodestilación a partir de hojas frescas mediante un destilador Clevenger. Parte de la esencia se diluye en diclorometano para determinar sus componentes mediante GC-MS y contrastándolos con sustancias patrón. El resto se guarda en un vial en atmósfera inerte y 4ºC para un posterior ensayo microbiológico. Los extractos metanólicos de las tres especies se obtienen por maceración de las hojas secas y trituradas convenientemente con MeOH/H_2O 7:3. El extracto hidrometanólico obtenido se concentra para eliminar el disolvente y el resto se trata con disolventes de polaridad creciente (hexano, diclorometano y butanol). De este modo se puede disponer de tres extractos (hexánico, diclorometánico y butanólico) con los que se estudian sus actividades farmacológicas.

Estudio farmacológico

Estos estudios, se abordan desde diferentes puntos de vista:

- Estudios *in vivo.*

Ensayos toxicológicos: Toxicidad oral aguda (Guidelines OCDE). Esquema de Irwin. Actividad antiinflamatoria de los extractos inhibiendo el edema producido por la carragenina inyectada en la aponeurosis plantar de la rata. Actividad analgésica de los diferentes extractos frente a estímulos: Térmico (hot plate), químico (ac. Acético) y mecánico (analgesímetro).

- Estudios *in vitro.*

Estudio de la motilidad en músculo liso aislado (baño de órganos) para valorar los posibles efectos vasodilatadores de los extractos en aorta de rata. Efectos antiespasmódicos en intestino de cobaya y útero de rata. Acción relajante de vías aéreas en traquea de cobaya.

- Animales de experimentación.

Ratones albinos de un peso entre 25–30g para la toxicidad oral aguda, siguiendo la directiva de la Organización Mundial de Cooperación y Desarrollo Económico (OECD). Los extractos se administraron por vía oral (vo). También se utilizaron para pruebas de analgesia, administración por vía intraperitoneal (ip). Ratas hembras de la raza Wistar de un peso entre 180–200 g, fueron utilizadas tanto para pruebas antinflamatorias como para órgano aislado. Cobayos de peso entre 230–250 g, para técnicas de órgano aislado. El tratamiento de los animales durante la experimentación fue de acuerdo con el criterio de cuidado y manejo de animales de experimentación, publicado en el Boletín Oficial del Estado (B.O.E.) nº 86/609 (24-11-1986) y ampliada en el B.O.E nº 250 (18-10-1989).

Estudio estructural de la droga vegetal

Para el estudio micromorfológico de las epidermis se aplica la técnica de Microscopía Electrónica de Barrido (MEB)

sobre material (hoja) seco que se metaliza con Au-Pd y se observa con el MEB. Para el estudio anatómico se utiliza un microtomo de congelación con el que se obtienen las secciones que se colorean con la tinción diferencial safranina-verde rápido tras aclarado con hipoclorito sódico, se realizan preparaciones permanentes con Bálsamo de Canadá.

Resultados

Estudio fitoquímico

Se ha completado el análisis de la esencia de *T. piperella* y se han aislado e identificado dos sustancias en el extracto hexánico de E. scoparia. Los componentes mayoritarios de la esencia de T. piperella son *p*-cimeno (33%), timol (39%), α-terpineno (10%), como ya citaron Adzet & Passet (1976) y Blanquer & col. (1998); otros componentes destacables son borneol (2,4%), ß-cariofileno (2,0%), linalol (1,8%), mirceno (1,6%) y carvacrol (1,1%). El extracto hexánico de *Erica scoparia* se sometió a cromatografía de columna con una fase estacionaria de gel de sílice y una fase móvil de hexano y hexano-AcOEt 95:5). Se obtuvo un producto mayoritario que cristalizaba bien y que, tras realizar espectros de masas ^{13}C y ^{1}H, se identificó como una mezcla de ß-amirina y lupeol. Debido a la similitud de las estructuras y la polaridad no se han podido separar por cromatografía en columna.

Estudio farmacológico

Se han realizado los ensayos de toxicidad oral aguda basado en la Guideline 420 de la OCDE, en todos ellos obteniendo los siguientes resultados: *T. piperella* y *E. scoparia* no presentaron signo de toxicidad en ningún extractos a las dosis máximas ensayadas (2g/Kg). Sin embargo, los extractos de C. crispus a la mismas dosis produjeron la muerte de los animales por lo que se desestimó la continuación de los estudios farmacológicos con esta especie. Con *T. piperella* se procedió a la realización de un screening farmacológico consistente en ensayos de actividad analgésica (hot plate) y actividad antiinflamatoria (edema inducido por carragenina) *in vivo* sin observar resultados positivos. También se estudió la actividad frente a distintos mediadores (acetilcolina, histamina y noradrenalina) en órgano aislado in vitro observándose una actividad selectiva dosis-dependiente frente a las contracciones inducidas por acetilcolina. A nivel del SNC (test de Irwin), el extracto metanólico, presentó actividad depresora, dosis-dependiente. Se obtuvieron curvas dosis-respuesta acumulativas, induciendo contracciones con diferentes agonistas del músculo liso, en baño de órganos, en presencia y ausencia de los diferentes extractos (figuras 1-6). Solo en los casos donde el extracto metanolico de Tp presentó actividad se realizaron experimentos con los demás extractos (hexánico, diclorometano y butanólico). Se evaluaron las modificaciones en el efecto máximo (E_{max}) y en la (DE_{50}), asignándole un valor de 100 al efecto máximo obtenido con cada agonista. Por otra parte el efecto contractil de la acetilcolina (10^{-9} 10^{-3}) en íleon aislado de rata se redujo significativamente de manera dosis-dependiente mediante preincubación con las diferentes concentraciones de Tp-M. En este caso, el E_{max} se redujo un 25.3% (p0.05) y un 49.5% (p0.005) a las concentraciones de 100 y 200 µg/ml respectivamente, sin una significante modificación en la DE_{50} (1.42±0.5 x 10^{-6} M, 9.75±1.2 x 10^{-7} M, 3.4 ±1.5 x 10^{-6} M y 2.34±1 x 10^{-6} M para control, 10,100 y 200 µg/ml Tp-M respectivamente). Así, se ha encontrado actividad espasmolítica como se cita para otros tomillos (Cabo & col., 1986; Meister & col., 1999; Van Den Broucke & Lemli, 1981, 1983; Van Den Broucke & col., 1982). Además, se realizaron ensayos microbiológicos del aceite esencial, resultando ser un agente antimicrobiano de amplio espectro.

Estudio estructural de la droga vegetal

T. piperella presenta una hoja ancha característica con indumento muy peculiar con glándulas en fosetas y tricomas glandulares de pequeño tamaño (figura 7). *C. crispus* presenta una hoja de margen ondulado con indumento formado por tricomas estrellados y otros pluricelulares no ramificados y glandulares (figuras 8). *E. scoparia* tiene hoja casi acicular de pequeño tamaño, revoluta por los márgenes y con tricomas unicelulares simples en el envés (FIGURA 9).

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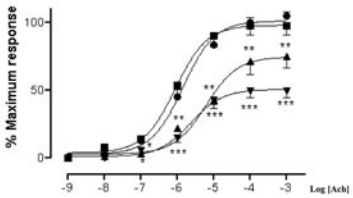


FIGURA 1. Curva concentración-respuesta de acetilcolina, en Ileon de rata en ausencia (•) y en presencia de Tp-Metanólico a las concentraciones de 10µg/ml (■), 100µg/ml (▲) y 200µg/ml (▼).

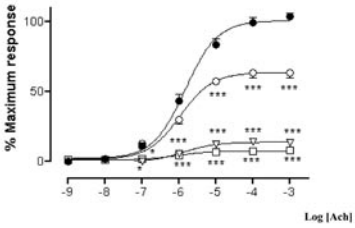


FIGURA 2. Curva concentración-respuesta acetilcolina, en íleon de rata en ausencia (•) y en presencia de Tp-Hexánico a las concentraciones de 10µg/ml (○), 100µg/ml (∇) y 200µg/ml (□).

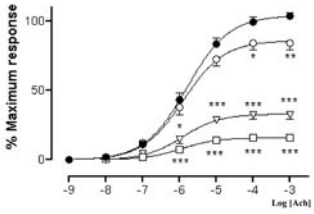


FIGURA 3. Curva concentración-respuesta acetilcolina en Ileon de rata en ausencia (•) y en presencia de Tp-Diclorometano a las concentraciones de 10µg/ml(○), 100µg/ml (∇) y 200µg/ml (□).

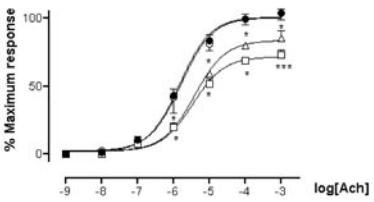


FIGURA 4. Curva concentración-respuesta a acetilcolina en Ileon de rata en ausencia (•) y en presencia de Tp-Butanolico a las concentraciones de 10µg/ml (○), 100µg/ml (▽) y 200µg/ml(□).

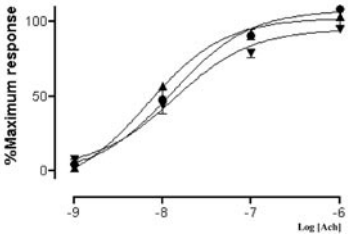


FIGURA 5. Curva concentración-respuesta a noradrenalina en aorta de rata en ausencia (•) y en presencia de Tp-Metanólico a las concentraciones de 100 µg/ml(▲) y 200µg/ml(▼).

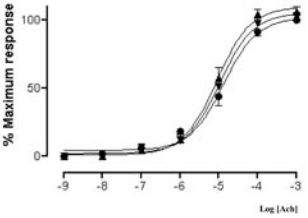
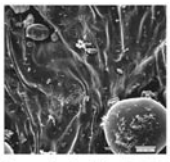
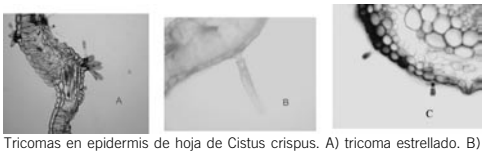


FIGURA 6. Curva concentracion-respuesta a Histamina, en traquea de cobaya en ausencia (•) y en presencia de Tp-Metanólico a las concentraciones de 100µg/ml (▲) y 200µg/ml (▼).



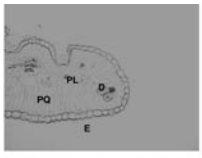
Tricoma glandular (TG) y glándula (G) en la epidermis foliar de *Thymus piperella*.

FIGURA 7.



Tricomas en epidermis de hoja de Cistus crispus. A) tricoma estrellado. B) tricoma pluricelular glandular. C) tricoma pluricelular glandular corto.

FIGURA 8.



Corte transversal de la hoja de *Erica scoparia*. E, epidermis. PQ parénquima en empalizada. PL, parénquima lagunar. D, drusas

FIGURA 9

Antiplasmodial activity of alkaloidic extracts from *Pavetta crassipes* (K. Schum) and *Acanthospermum hispidum* (DC), two plants used in traditional medicine in Burkina Faso

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Keywords: Antiplasmodial activity, *Pavetta crassipes, Acanthospermum hispidum, Plasmodium falciparum,* Traditional medicine

Introduction

In Burkina Faso, one of the principal approaches to chemotherapeutic research against malaria consists of investigating the antiparasitic activity of plants traditionally used against fever and jaundice. In the present study we planed to evaluate the antiplasmodial activity of alkaloidic extracts of two plants *Pavetta crassipes* K. Schum (Rubiaceae) and *Acanthospermum hispidum* DC (Asteraceae) selected by an ethnobotanical survey. Their in vitro antiplasmodial activity was assessed against references clones and wild isolates of *P. falciparum*.

Results and discussion

After screening tests, the alkaloidic extracts of *P. crassipes* and *A. hispidum* were selected for their promising *in vitro* activity against *Plasmodium falciparum* (TABLE 1).

The IC_{50} values of alkaloidic extracts against references clones and isolates were listed in table 2. Extracts were more active against isolates (about 20-fold greater) than against reference clones. These results confirmed the relevance of testing drugs sensitivity against isolates in spite of references clones. Alkaloidic extracts of *P. crassipes* were shown to be active *in vitro* against all isolates with IC_{50} values ranging from 25 to 208 ng/ml. Similar results were obtained with alkaloidic extracts of *A. hispidum* (geometric mean IC_{50}: 250 ng/ml).

Differences in isolates sensitivities were observed and may be due to the preliminary medicines administered before the assays with the extracts or to the physiological potential of the parasite to grow in a synthetic medium (Azas, 2002).

Alkaloidic extract of *P. crassipes* was the most potent extract tested in this study. IC_{50} values of alkaloidic extract of *P. crassipes* (geometric mean: 76 ng/ml) were three-fold lower than those of *A. hispidum* (geometric mean: 250 ng/ml).

Toxicity of both extracts was assessed against three human cell lines and selectivity indices were calculated (TABLE 2). Extracts exhibited weak toxicity and good cytotoxic:antiplasmodial ratios as defined by Phillipson (Muñoz, 1999).

Conclusion

Natural products isolated from plants used in traditional medicine which have in vitro potent antiplasmodial action represented potential sources of new antimalarial drugs (Gasquet, 1993; Wright, 1990). The results of this study indicate that "medicinal" plants should be studied systematically (Deharo, 2001), confirm the antimalarial potential of the alkaloidic extracts of *P. crassipes* and *A. hispidum* and justify their use in traditional medicine by traditional healers or herborists (Carvalho, 1991; Gbeassor, 1989). They encouraged to pursue investigations to identify the active alkaloids responsible for the antimalarial effects observed.

Experimental

Plant material - Two ethnobotanical surveys were realized in two parts of the country: the center part (Ouagadougou) and the West part (Bobo Dioulasso). The first one was effected in november 1999 at Ouagadougou and the second in december 2000 at Bobo Dioulasso and five villages surroundings (Leguema, Dinderesso, Bare, Borodougou, Koundimi). Plants were collected during the second survey. The traditional healers cited about one hundred plants traditionally used against malaria. Among them, two plants: *P. crassipes* (leaves) and *A. hispidum* (stem leaves) were selected for biological evaluation.

Reference clone - Antimalarial activity was assessed against reference clones: W2 chloroquine-resistant and the D6 chloroquine-sensitive (Trager, 1976).

Isolates - Veinous blood was collected before treatment from children (4 to 10 years). Samples with a monoinfection due to *P. falciparum* and a parasite count ranging from 0.5% to 9% were used to test drug sensitivity. Six isolates were selected for antimalarial assays.

Antimalarial assays - The 50% inhibitory concentration (IC_{50}) was determined by non linear regression processed on dose-response curves by the Table Curve software (Jandel Scientific, Paris, France). Isolates were considered chloroquine -resistant if the IC_{50} was greater than 100nM.

Cytotoxic assays - Toxicity of extracts was evaluated on three human cell lines that represented various models for toxicity assays: monocytes (THP1 cells), primary culture of normal melanocytes isolated from infant foreskin (MHN) and malignant

melanoma cells (HTB- 66) (Jean, 2001). Cell growth was estimated by flow cytometric counting after staining with 5µl propidium iodide (1mg/ml). Cytotoxic:antiplasmodial ratios (CAR) (IC_{50} mammalian cells lines / IC_{50} against parasites) were determined for each extract (Azas, 2002).

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Plant	Crude extracts				
	alkaloids	$CHCl_3$	CH_3OH	CH_3OH/H_2O (1/1)	H_2O
P. crassipes	4	10	10	10	500
A. hispidum	4CI50 10	10	10	10	64

TABLE 1: IC_{50} (ng/ml) of crude extracts of *P. crassipes* of *A. hispidum* on the strain W2 of *Plasmodium falciparum*.

	Isolate 1	Isolate 2	Isolate 3	Isolate 4	Isolate 5	Isolate 6	W2	D6
ALTPC	47	25	30	31	47	280	1230	1020
ALTAH	40	490	110	100	90	670	5020	4690
CQ	3,82	6,74	3,86	5,72	9,77	6,10	440	31
*CQ (nM)	9,16	16,16	9,26	13,71	23,43	14,63	*1055,55	74,09

• IC_{50} of chloroquine expressed in nM to validate the sensitivity of *P. falciparum* (for IC50100nM the strain is considered to be chloroquine-resistant)

TABLE 2: IC_{50} (ng/ml) of alkaloidic extracts of *P. crassipes* (ALTPC), of *A. hispidum* (ALTAH) and of chloroquine (CQ) on isolates and references clones of *Plasmodium falciparum*.

Plants	THP1	MHN	HTB66	Range of CAR for the three lines							
				Isolate 1	Isolate 2	Isolate 3	Isolate 4	Isolate 5	Isolate 6	W2 strain	D6 strain
ALTPC	46.1	62.7	79.9	980<CAR<1702	1842<CAR<4000	1535<CAR<2700	1486<CAR<2581	980<CAR<1702	164<CAR<286	37<CAR<65	45<CAR<79
ALTAH	60.2	79.8	100.8	1282<CAR<2144	2410<CAR<4033	547<CAR<916	602<CAR<1008	669<CAR<1120	90<CAR<151	10<CAR<21	13<CAR<22

TABLE 3: IC_{50} (µg/ml) of alkaloidic extracts of *P. crassipes* (ALTPC), of *A. hispidum* (ALTAH) against three human cell lines (THP1; MHN; HTB66) and range of cytotoxic:antiplasmodial ratios or CAR (IC 50 against mammalian cell lines / IC 50 against parasite)

Therapeutic Significance of Spices in daily dietary regimen: An Ayurvedic Perspective

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Ayurveda, better known to the Western World as the Science of life, is the Traditional medical System of India. All the basic concepts of Ayurveda aim at not only treating the root cause of the disease but emphasize more on maintenance of health, promotion of well-being & prevention of disease. For all these facets of a 'Quality life' Ayurveda advocates the equilibrated state of 'digestive fire' known as 'Jatharagni'. In all Ayurvedic Classical texts vitiated state of 'digestive fire' is accounted to be the root cause of all diseases. The type of food one takes determines the proper functioning of this 'digestive fire'. As per Ayurveda, food and its utilization represent a fundamental parameter & the entire concept of health & disease revolves around this doctrine. The difference between ease & dis-ease is correlated to the wholesome and unwholesome food. Food itself depends upon the 'digestive fire' for its utilization as the precursor nutrients of tissue elements cannot be formed from a food that has not been properly digested & metabolized. Spices make an integral part of daily dietary regimen and, as per Ayurvedic classics, are attributed with properties viz. taste enhancing *(Elettaria cardamomum, Foeniculum vulgare, etc);* food relishing *(Punica granatum, Coriandrum sativum);* anti-fetor *(Syzygium aromaticum, Elettaria cardamomum);* sialogogues *(Tamarindus indicus, Capsicum annuum);* digestion promoting *(Mesua ferrea);* stomachics *(Foeniculum vulgare, Piper nigrum);* satiety producing *(Zingiber officinale, Carum carvi);* appetizing *(Cuminum cyminum, Mentha spicata);* carminative *(Ferula asafoetida, Trachyspermum ammi);* anti-emetic *(Anethum sowa);* anti-spasmodic *(Ferula asafoetida, Trachyspermum ammi);* anti-diarrhoeal *(Myristica fragrans, Punica granatum);* etc. All these properties support the digestion, metabolism, assimilation, transportation & distribution of the food to the body tissues. Apart from the properties attributable to the digestive system, some spices possess certain other important therapeutic values like: anti-diabetic *(Curcuma longa);* anti-arthritic *(Zingiber officinale);* anti-obesity *(Garcinia species);* anti-inflammatory *(Allium sativum);* analgesic *(Trachyspermum ammi);* mucolytic *(Cinnamomum zeylanicum, Syzygium aromaticum);* anti-tussive *(Piper longum);* anti-asthmatic *(Hedychium spicatum);* hemostyptic *(Mesua ferrea)* etc. Research studies on spices have confirmed the activities like anti-mutagenic *(Piper nigrum[1]);* bio-enhancing (*Piper nigrum[2] & Piper longum[3]);* melanocyte proliferation *(Piper nigrum[4]);* coronary vasodilation *(Piper longum[5]);* anti-oxidant *(Amomum subulatum[6], Curcuma longa[7], Zingiber officinale[8], Cinnamomum zeylanicum[9]);* dermal penetration enhancing *(Elettaria cardamomum[10]);* anti-thrombotic & psychotropic *(Myristica fragrans[11]);* anti-platelet aggregation *(Zingiber officinale[12], Syzygium aromaticum[13]);* insulin signaling *(Cinnamomum zeylanicum[14]);* anti-tumor & anti-mutagenic *(Curcuma longa[15]);* anti-atherogenic *(Zingiber officinale[16]);* hypocholesterolemic & hypolipidemic *(Myristica fragrans[17], Curcuma longa[18], Cuminum cyminum[19], Coriandrum sativum[20]);* anti-ulcerogenic *(Zingiber officinale[21], Amomum subulatum[22]);* anti-viral *(Punica granatum[23], Syzygium aromaticum[24]);* hypoglycemic *(Curcuma longa[25], Punica granatum[26], Trigonella foenum-graecum[27])* etc. The therapeutic significance of spices in daily dietary regimen in view of the prevention of majority of diseases and their ability to even cure the ailments would be highlighted in the presentation with an objective of opening up newer avenues for interested researchers.

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Adaptación de las plantas indianas a la medicina tradicional polaca

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El objeto de este trabajo es determinar, qué plantas comestibles y medicinales de las Indias, que habían sido conocidas hasta el fin del siglo XX, se adaptaron a la medicina popular.

Material y métodos

Se ha aplicado un análisis de los materiales de archivo provenientes de los siglos desde XVII hasta XX. En primer lugar los autores determinaron qué plantas americanas habían sido conocidas en las tierras polacas y luego averiguaron desde hace cuándo habían sido usadas en la medicina popular.

Resultados

En Polonia, las primeras plantas de proveniencia americana fueron descritas como plantas medicinales y cultivables por Sirenius (Szymon Syreñski, 1540-1611). "El Herbario..." contenía descripciones de 765 plantas europeas y exóticas. Sirenius describió tomates, el maíz, el frejol, el amaranto (Amaranthus caudatus), el girasol. La protectora de Sirenius, princesa Anna de Waza, cultivó el tabaco. Fue el Rey Jan III Sobieski quien trajo patatas para Polonia, pero su cultivo se propagó sólo en el período napoleónico. Todas las plantas mencionadas no se aplicaban ampliamente en la medicina oficial, a excepción de la jalapa, la ipepacuana y el quino, que estaban omnipresentes en la medicina europea.

En Polonia las investigaciones etnofarmacológicas fueron iniciadas por el profesor J. Rostafiñski en el siglo XIX. En aquel tiempo la patata entró en la medicina popular como la primera planta americana. En 1821, en Rusia, K.Put describió el tratamiento de quemaduras y las acciones antiescorbúticas. La patata, la judía, el girasol, la robinia, el pimiento, la pasionaria y el maíz llegaron a las farmacias de los Hermanos de la Orden Hospitalaria de San Juan de Dios.

Conclusiones

1. La patata fue adaptada a la medicina popular polaca como un remedio contra quemaduras y liquenes y después contra las úlceras gástricas y duodenales.
2. Ahora la medicina popular aplica también la judía, el maíz, el girasol, el pimiento y el tomate.

The adaptation of Indian plants to polish Folkmedicine

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The object: to determine what edible and medicinal plants of Indian origin, which had been discovered by the end of the 20th century, were adapted to folk medicine.

Material and methods

A historiographical analysis of archival material from the 17th to 20th century has been conducted. First the authors established what American plants were known in Poland. Then they verified if and since when they had been used in polish traditional medicine.

Results

First medicinal and cultivated plants of American origin were described in Poland by Sirenius (Szymon Syreñski, 1540-1611). His "Herbarium…" included descriptions of 765 European and exotic plants. Sirenius described, among other things, tomato, maize, beans, amaranth (Amaranthus caudatus) and sunflower. Sirenius's patroness, Princess Anna Wazówna, cultivated tobacco. It was the King Jan III Sobieski who brought potatoes to Poland, but their cultivation spread in the Napoleonic period. Anyway, all those plants were seldom used in official medicine, unlike the jalap, ipecac and quinine, which were omnipresent in European medicine.

Ethnopharmacological studies in Poland were initiated by professor Józef Rostafiñski in the 19th century. In that period potato became the first American plant to make its way to traditional medicine. In 1821, in Russia, K. Put described its role in the treatment of burns and its antiscorbutic activity. Potato, beans, sunflower, robinia, paprika, passionflower and maize were introduced into pharmacies run by brothers of the Order of St. John of God.

Conclusions

1. Potato was adapted to Polish folk medicine as a remedy for burns, lichens and chronic duodenal and gastric ulcer diseases.
2. Nowadays popular medicine also uses beans, maize, sunflower, paprika and tomato.

Noción de los medios de la medicina indiana entre los empleados de los servicios de sanidad polacos

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El objeto de este trabajo es averiguar: qué medicamentos naturales de proveniencia indiana son conocidos en los servicios de sanidad polacos, si son recomendados a los pacientes - y en qué tipo de casos, si sus efectos terapéuticos son conocidos.

Material y métodos

A través de un cuestionario se han realizado investigaciones en la Escuela Superior de Medicina en Szczecin, abarcando 52 médicos de varias especialidades, 80 enfermeras y 100 estudiantes de las siguientes facultades: medicina, enfermería, socorrismo, estomatología. La entomedicina ha sido incluida en el programa de enseñanza de los estudiantes de enfermería. En otras facultades no había clases de esta materia. El cuestionario incluía preguntas relacionadas con los conocimientos de las plantas andinas y amazónicas, así como con la acción de la vilcacora, el pau d'arco y otros remedios de la medicina natural del Nuevo Mundo.

Resultados

72% de los investigados conocen por lo menos una planta medicinal de América. Se ha notado que los conocimientos de respectivas plantas son bastante selectivos, o sea, que no se conoce bien ni sus orígenes ni propiedades terapéuticas.

Conclusiones

1. Se nota interés por las propiedades terapéuticas de plantas.
2. La mayoría de los respondientes opina que los efectos de esos medicamentos son favorables.
3. Sólo 3% de los investigados los han recomendado a sus pacientes.
4. En comparación con los médicos y estudiantes de medicina, socorrismo y estomatología, las enfermeras y los estudiantes de enfermería que han participado en clases de etnomedicina, tienen mejores conocimientos de las plantas de la medicina andina.

What do polish health service workers know about Indian medicine?

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The object of the paper is to verify : what natural remedies of Indian origin are known by Polish Health Service workers; if, and in what cases, they are recommended to patients; and if their therapeutic effects are known.

Material and methods

The questionnaire was conducted at the Pomeranian Medical Academy in Szczecin. It was addressed to : 52 doctors of different specialties, 80 nurses and 100 students from such faculties as : medicine, nursing, first aid, stomatology. Enthomedicine was introduced into the Nursing Faculty currriculum. However, there were no enthomedicine classes at other Faculties. The questionnaire included questions about Andean and Amazonian plants and about the action of vilcacora, pau d'arco and some other natural remedies of the New World origin.

Results

72% of the questionnaire respondents know at least one American medicinal plant. However, selective knowledge of particular plants has been noticed. The origins of plants and their therapuetic features are scarcely known.

Conclusions

1. The interest in plant therapuetic features is in evidence.
2. A substantial part of the respondents recognize good qualities of these remedies.
3. Only 3% of the respondents recommended them to their patients.
4. Nurses and the students of Nursing Faculty, who took part in enthomedicine classes, know the Andean medicinal plants much better than doctors and the students of medical, first aid and stomatology faculties.

Integration of Medicinal Plants from French Overseas Departments in the French Pharmacopoeia

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The French regulation for medicinal plants defines 454 species for allopathic and/or homeopathic use. These species are registered and figure in the French Pharmacopoeia as part of the French pharmaceutical monopoly. The majority of these medicinal species are native from Europe. En addition, the French pharmaceutical legislation prescribes that no medicinal product may be placed on the market without having obtained a marketing authorization on the basis of European harmonised requirements. In principle, the application for such a marketing authorisation has to contain the results of tests and trials on quality, safety and efficacy of the product. However, for many herbal medicinal products, which are being used for a long period, sufficient published scientific literature is not available so that a well-established medicinal use cannot be demonstrated. New tests and trials are in theory possible, but lead to significant financial burdens for the companies concerned, often small or medium-sized enterprises. For these reasons, the French health's authorities implemented a simplified registration procedure allowing the registration and, hence, the marketing of certain traditional herbal medicinal products from a selection of 205 medicinal plants, without requiring documents on tests and trials on safety and efficacy.

On the other hand, Martinique and Guadeloupe are two french Departments belonging to the Caribbean Basin, where still exist strong popular medical practices based on the use of local medicinal plants. Nevertheless, only a few of these medicinal species can be found in the French Pharmacopoeia, and none of these plants benefits from the simplified registration procedure for marketing authorisation. The possibility for native medicinal plants from the French Overseas departments, with well-established traditional medicinal use, to appear in the French Pharmacopoeia, and eventually benefit from the simplified registration procedure for marketing authorisation, would be a recognition of the cultural traditions of these communities and led subsequently to employment opportunities especially in small and medium-sized enterprises.

For these reasons, we undertook to compile therapeutical monographs for a first set of Caribbean plants with well-established traditional medicinal use. Together with these monographs, we also established technical sheets, in order to ensure specific botanical identification and consistent quality for this plant material. This approach is illustrated with the study of the following medicinal drugs:

Cordia martinicensis R. *et* S. (Boraginaceae), leaf

Eclipta alba (L.) Hassk. (Asteraceae), leaf

Lippia alba N.E.Br. (Verbenaceae), leaf

Senna alata L. (Caesalpinaceae), leaf

Intégration dans la Pharmacopée Française de plantes d'usage traditionnel dans les Départements français d'Outre-Mer

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La règlementation française actuelle dans le domaine des plantes médicinales définit comme faisant partie du monopole pharmaceutique une liste de 454 plantes médicinales utilisées en allopathie et, pour certaines d'entre elles, en homéopathie. Cette liste figure dans la Pharmacopée française, et concerne essentiellement des plantes utilisées de longue date en Europe. Par ailleurs, l'usage croissant de médicaments à base de plantes et l'importance de ce secteur de l'industrie pharmaceutique pour l'emploi, en particulier dans les petites et moyennes entreprises a conduit les autorités sanitaires françaises a mettre au point une procédure spéciale d'enregistrement et de mise sur le marché pour certains médicaments traditionnels à base de plantes sans exiger de dossier faisant état des résultats des essais sur les aspects pharmacodynamiques, pharmacocinétiques, toxicologiques ou cliniques. Cette procédure abrégée concerne 205 plantes médicinales, toute inscrites à la Pharmacopée française, et pour lesquelles on dispose d'une documentation bien établie sur leur usage traditionnel en France et leur sécurité d'emploi.

La Martinique et la Guadeloupe sont deux départements français faisant partie de l'aire caraïbe, une région de riches traditions ethnopharmacologiques où s'est développée une médecine traditionnelle héritière de trois courants culturels: amérindien, européen et africain. De nombreuses études font état de la persistance de traditions thérapeutiques ancestrales, fondées sur l'utilisation de plantes médicinales autochtones, chez une partie importante de la population de ces deux départements français d'Outre-mer. Pourtant, seul un très petit nombre des plantes utilisées sur place font partie des plantes médicinales inscrites à la Pharmacopée française, et aucune des plantes autochtones ne figure dans la liste des plantes bénéficiant de la procédure d'enregistrement et de mise sur le marché abrégée.

L'élargissement de la liste actuelle des plantes inscrites à la Pharmacopée française à d'autres plantes médicinales, notamment celles utilisées traditionnellement dans les Départements français d'Outre-Mer, constituerait, à la fois, une

reconnaissance de ces usages ancestraux et un encouragement pour une exploitation raisonnée de ces ressources de la biodiversité locale. A cette fin, à partir d'une première sélection de plantes antillaises d'utilisation courante, nous avons entrepris de rédiger, d'une part, des monographies d'usages attestant de leur sécurité d'emploi, d'autre part, des fiches techniques permettant d'assurer le contrôle de l'identité et de la qualité des organes de ces plantes utilisés traditionnellement.

Cette démarche est illustrée avec les études réalisées sur les quatre drogues suivantes:

Cordia martinicensis R. *et* S. (Boraginaceae), feuilles.

Eclipta alba (L.) Hassk. (Asteraceae), feuilles.

Lippia alba N.E.Br. (Verbenaceae), feuilles.

Senna alata L. (Caesalpinaceae), feuilles.

In vivo screening of anti-inflammatory and antinociceptive activity Turkish folk remedies

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Key words: Anti-inflammatory activity, Antinociceptive activity, *Helleborus orientalis* Lam., *Juglans regia* L., *Laurocerasus officinalis* Roemer, *Nerium oleander* L., *Rhododendron ponticum* L., *Rubus hirtus* Walds. *et* Kit, *Rubus sanctus* Schreber, Turkish folk medicine.

The present investigation represents a preliminary screening in an ongoing program on plants used in Turkish traditional medicine for the treatment of rheumatism and related inflammatory diseases. In vivo anti-inflammatory and antinociceptive activities of the ethanolic (EtOH) and aqueous (H_2O) extracts from the following plant parts were investigated in order to validate their medicinal utilization (Yesilada, 2002); *Helleborus orientalis* Lam. (Ranunculaceae) (roots, herbs), *Juglans regia* L. (Juglandaceae) (leaves), *Laurocerasus officinalis* Roemer (Rosaceae) (leaves), *Nerium oleander* L. (Apocynaceae) (fresh or dried flowers, leaves), *Rhododendron ponticum* L. (Ericaceae) (branches), *Rubus hirtus* Walds. *et* Kit (Rosaceae) (aerial parts) and *Rubus sanctus* Schreber (aerial parts, roots).

Experimental

- Plant materials

Plant materials were collected from different localities during May and August 2002 in Turkey. Authenticated voucher specimens were deposited in the Herbarium of Faculty of Pharmacy, Gazi University.

- Preparation of plant extracts

Each plant material was dried under shade and then powdered. Extracts were prepared as described below.

EtOH extract: Either fresh (15 g) or dried (10 g) plant material was extracted with 96% EtOH at room temperature (2 x 50 ml). The combined extract was evaporated to dryness in vacuo to give "EtOH extract".

H_2O extract: Fresh (15 g) or dried (10 g) plant material was extracted with distilled H_2O at room temperature (2 x 50 ml). The combined aqueous extract was lyophilized to give the crude dry extract.

- Pharmacological procedures

A minimum of six male Swiss albino mice (20-25 g) were used in each group. Either indomethacin (10 mg/kg) or acetyl salicylic acid (ASA) (200 mg/kg) in 0.5 % CMC was used as reference drug. Test materials were administered orally in 500 mg/kg dose after suspending in 0.5% sodium carboxymethyl cellulose suspension in distilled H_2O. The control group animals received the same experimental handling as those of the test groups except that the drug treatment was replaced with appropriate volumes of the dosing vehicle

Antinociceptive activity: p-Benzoquinone-induced abdominal constriction test in mice: The method of Okun *et al.*, (1963) was followed. 60 min after the administration of test samples, the mice were intraperitoneally injected with 0.1 ml/10 g b.w. of 2.5% p-benzoquinone solution in distilled H_2O.

Anti-inflammatory activity: Carrageenan-induced hind paw oedema: The method of Kasahara *et al.* (1985) was used with modifications in measuring periods. 60 min after the administration of test sample or dosing vehicle each mouse was injected with freshly prepared (0.5 mg/25 µl) suspension of carrageenan in physiological saline into subplantar tissue of the right hind paw. As the control, 25 µl saline solutions were injected into that of the left hind paw. The difference in footpad thickness between the right and left foot was measured with a pair of dial thickness gauge calipers (Ozaki Co., Tokyo, Japan).

- Gastric-ulcerogenic effect

After the analgesic activity experiment mice were killed under deep ether anesthesia and stomachs were removed. Then the abdomen of each mouse was opened through the greater curvature and examined under dissecting microscope for lesions or bleedings.

- Statistical analysis of data

Data obtained from animal experiments were expressed as mean standard error (±SEM). Statistical differences between the treatments and the control were evaluated by ANOVA and Students-Newman-Keuls post-hoc tests. p0.05 was considered to be significant (* p0.05; ** p0.01; *** p0.001).

Results and discussion

Results of the *in vivo* activity assessment are given in TABLES 1 AND 2. All the extracts studied were shown to possess significant antinociceptive activity, except that of aqueous extract from Rubus hirtus aerial parts. However, only the EtOH extracts of *H. orientalis* roots, *J. regia* leaves, *L. officinalis* leaves, *N. oleander* dried and fresh flowers, *R. ponticum* leaves exhibited potent anti-inflammatory activity against carrageenan-induced hind paw edema model in mice without inducing any gastric damage. Since direct external application of these active plant materials are suggested in Turkish folk medicine without solvent extraction, it can be postulated that less polar constituents which are not soluble in water might be active and results of the present study confirmed the folkloric application.

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Material	Part used	Extract type	Number of writhings ± SEM	Inhibitory ratio (%)	Ratio of ulceration
Control			46.8±2.79		0/6
Helleborus orientalis	RT	W	32.2±2.23	31.2***	0/6
		E	14.8±0.96	68.4***	0/6
	HB	W	33.2±1.94	29.1**	0/6
		E	21±1.79	55.1**	0/6
Juglans regia	LF	W	33±2.31	29.5**	0/6
		E	15±1.59	67.9***	0/6
Laurocerasus officinalis	LF	W	37.3±1.87	20.3*	0/6
		E	19.2±1.76	58.9***	0/6
Nerium oleander	FL (fresh)	W	29.5±2.05	36.9***	0/6
		E	15.7±0.56	66.5***	0/6
	FL (dried)	W	33.1±1.56	29.2**	0/6
		E	15.7±0.67	66.5***	0/6
	LF	W	33.7±1.73	27.9**	3/6
		E	24.7±0.84	47.2**	2/6
Rhododendron ponticum	LF	W	30.8±1.76	34.2***	0/6
		E	13.8±1.28	70.5***	0/6
Rubus sanctus	RT	W	37.2±2.18	20.5*	1/6
		E	27.8±1.87	40.6***	0/6
	AE	W	36.5±2.81	22*	0/6
		E	21.2±2.27	54.7***	0/6
Rubus hirtus	AE	W	37.7±2.92	19.4	2/6
		E	24.5±1.88	47.6***	1/6
ASA			22.2±1.49	52.6***	3/6

Abbreviations: AE, aerial part; E, ethanol extract; FL, flowers; HB, herbs; LF, leaves; RT, roots; W, water extract

TABLE 1. Effect of the materials against p-benzoquinone-induced writhings in mice

Material	Part used	Extract type	Swelling thickness (x10^{-2}mm) ± SEM (% inhibition)			
			90 min	180 min	270 min	360 min
Control			49.8±4.94	57.2±4.83	63.5±5.04	68±3.95
Helleborus orientalis	RT	W	44.3±4.84 (11)	47.3±3.02 (17.3)	51.8±2.73 (18.4)	54.8±3.19 (19.4)
		E	34.8±4.03 (30.1)	41.2±4.57 (27.9)	41.8±4.56 (34.1)**	40±3.68 (41.1)***
	HB	W	46±2.81 (7.6)	51.8±2.99 (9.4)	55.7±3.12 (12.3)	61.5±2.32 (9.6)
		E	45.9±4.88 (7.8)	51.8±4.72 (9.4)	57.3±5.75 (9.8)	58.7±3.79 (13.6)
Juglans regia	LF	W	46.2±5.03 (7.2)	51.3±4.58 (10.3)	56.8±4.48 (10.6)	59.7±3.28 (12.2)
		E	34.4±3.76 (30.9)	39.7±2.98 (30.6)*	44.3±3.35 (30.2)**	45.9±2.32 (32.5)**
Laurocerasus officinalis	LF	W	47.5±4.47 (4.6)	51.7±3.82 (9.6)	57.3±4.14 (9.8)	58±3.22 (14.7)
		E	37.6±3.69 (24.5)	43±3.42 (24.8)	47.2±5.30 (25.6)*	47.5±4.1 (30.1)**
Nerium oleander	FL (fresh)	W	42.3±4.96 (15.1)	47.7±5.05 (16.6)	54.3±4.95 (14.5)	60±5.47 (11.8)
		E	38.9±3.31 (21.9)	44.2±3.15 (22.7)	43.4±3.61 (31.6)**	42.4±2.81 (37.6)***
	FL (dried)	W	44.3±5.60 (11)	49±5.63 (14.3)	54.3±5.29 (14.5)	59.5±4.98 (12.5)
		E	37.2±4.92 (25.2)	39.3±4.28 (31.2)**	42.1±5.80 (33.6)**	41.9±3.23 (38.4)***
	LF	W	47.7±3.24 (4.2)	52.3±3.61 (8.6)	57±3.97 (10.2)	61.3±3.80 (9.9)
		E	44.1±2.83 (11.1)	50.3±2.90 (12.1)	56.2±3.25 (11.5)	59.3±2.08 (12.8)
Rhododendron ponticum	LF	W	45±2.48 (9.6)	48.7±4.17 (14.9)	56.7±2.88 (10.7)	61.5±2.99 (9.6)
		E	38.6±4.21 (22.5)	39.9±3.48 (30.2)*	40.1±4.58 (36.9)**	43.3±2.89 (36.3)***
Rubus sanctus	RT	W	44.8±4.55 (10)	52.3±4.49 (8.6))	57.2±4.41 (9.9)	59.7±4.18 (12.2)
		E	44.5±4.21 (10.5)	50.3±3.94 (12.1)	56.1±4.89 (11.6)	57.3±4.36 (15.7)
	AE	W	44.5±4.05 (10.6)	49.2±3.69 (13.9)	54.7±3.75 (13.9)	55.3±2.22 (18.7)
		E	42.3±2.78 (15.1)	47.9±3.11 (16.3)	54.1±3.41 (14.8)	57.2±2.72 (15.9)
Rubus hirtus	AE	W	42.2±2.73 (15.3)	48.3±2.95 (15.6)	54.5±2.79 (14.2)	60±3.09 (11.8)
		E	45.8±4.30 (8)	52.8±3.11 (7.7)	56.9±4.69 (10.4)	59.6±3.69 (12.4)

TABLE 2. Effects of the extracts against carrageenan-induced paw edema in mice.