ETHNOBOTANY IN THE CENTER OF PORTUGAL (SANTARÉM)

N. Gaspar*, J. Godinho*, T. Vasconcelos**, D. Caldas*, P. Mendes*, O. Barros*
*Escola Superior Agrária de Santarém
**Instituto Superior de Agronomia

Abstract
In recent years, the interest in the practical applications of local people's knowledge has been renewed. The potential uses of ethnobotanical information can be used for new marketable purposes. In order to keep alive the ancient relationship of useful flora amongst our people, we carried out ethnobotanical research in the Center of Portugal (Santarém). Useful plants and traditional remedies and other uses are inventoried. Morphological aspects of the most important taxa are registered.
A palynological investigation on the honeybee nectar and pollen sources gathering strategies using honey and pollen loads has been developed in the central part of Portugal (Santarém). All the data collection was compared with the results of floristic surveys in the region.

Introduction

In the region of Santarém, there are no ethnobotany studies. With this research, we are trying to save what is left from a country culture that has becoming to a fade-out during its oral transmission from one generation to another.
Bee products like pollen loads, beebread, propels, wax, royal jelly and bee venom, are very important due to nutritious and medicinal effects in humans and animals. Pollen analysis, applied to the honeybee (melissopalynology) and honeybee products, is determinant for botanical and geographical identification and even for fraud detection. In this work, it remains the objective to know the forage sources of honeybees in this region.

Material and Methods

Ethnobotanical data was obtained by interviewing rural people in the district of Santarém. The research on field was performed in 48 villages. Voucher species were collected for further taxonomic determination.
Taxonomic determination is in accordance with the following nomenclatures: Castroviejo *et al.* (1986), Franco (1971, 1984 e 1994), Tutin *et al.* (1986) and Valdés *et al*. (1987), pollen with Reille (1995) and Valdés *et al*. (1987).
Comparisons of species took place at Instituto Superior de Agronomia Herbarium (LISI) in the Plant Protection and Phytoecology Department.
For the pollen morphology study, the samples are collected during the floristic surveys and submitted to a number of standardized preparation techniques (Louveaux *et al*., 1978). The sample is acetolysed to increase the detail of the pollen exine (Erdtman, 1960).

Results

Traditional medicinal plants widely used in Santarém are summarized in table 1 with botanical name, local name, ethnofarmacological effects and preparation of remedy**.**
101 species distributed for 45 families are referred with medicinal interest.

Table 1. Folk medicine in Santarém (center of Portugal).

Botanical name (Local name)	Ethnofarmacological effects	
Agrimonia eupatoria L. (agrimonia)	Digestive Carminative	A decoction of the plant's aerial part is used to fight the indisposition and it is good for the stomach.
Asphodelus ramosus *L.* (abrótea, abrigota)		The juice obtained from the roots is applied on eczemas
Centaurium erythraea Rafn. (fel da terra)	Hypoglycaemic Cholarectic, chologogue Appetite stimulating	A decoction of the plant's aerial part has some benefits: • on diabetes; • on liver; • as an appetite stimulator
Chamaemelum nobile (L.) All. (marcela, macela)	Antipyretic, Appetite stimulating Cholarectic, chologogue	A decoction of the capitula: • is used to combat the fever and malaria; • is used as an appetite stimulator; • has benefits on the gall bladder
Chelidonium majus L. (tintureira)	Healing	The application of latex directly on the wounds (as healing) and on the warts is used to eliminate them
Daphne gnidium L. (trovisco, trovisco fêmea)	Healing	The external part of the steam comes out in strips and is applied to livestock tails, after cutting, as a bandage due to its heeling properties.
Datura stramonium L. (figueira do inferno)	Anti-inflammatory Anti-asthmatic	Local applications on furunculous and *"penerícios"* to eliminate them. Leafs can be smoked as anti-asthmatic (inhaling the smoke has the same effect).
Ecbalium elaterium A. Rich (pepino de s. gregório)	Respiratory aid Local analgesics	The fruit juice is extracted with a dropper and applied in the nose for sinusitis. The fruit infusion in alcohol can also be used to relieve pains.
Euphorbia characias L. (trovisco, trovisco macho)	Abrasive	Application of latex directly on the corns.
Geranium purpureum L. (erva de s. roberto, salsa brava)	Digestive Chologogue e cholarectic Diuretic Anti diarrhoea Cancer treatment	The decoction of the aerial part of the plant has a beneficial effect on the stomach, intestines and gall bladder; regulates urea; against diarrhoea and prevents cancer; A decoction mixed with aerial part of *Hypericum perforatum* and *Melissa officinalis* has a beneficial effect on the liver; A decoction mixed with aerial part of *Geranium purpureum, Lippia citriodra and Phlomis lychnitis* has a beneficial effect on the heart and legs with varicose veins. (washings)
Fraxinus angustifolia Vahl. (freixo)	Digestive Carminative Dyspepsia combat Analgesic Anti-inflammatory	A decoction of the leaves has a beneficial effect on: • on indisposition; • for intestines and stomach; • to regulate cholesterol; • to fight obesity; • to rejuvenate; • as an analgesic (namely on rheumatic and gout);

Table 1. Continued.

Botanical name (Local name)	Ethnofarmacological effects	
Hypericum perforatum L. (doiradinha, hipericão, pericão, pelicão)	Cholarectic e chologogue Digestive Laxative	Has some benefits on: • liver, gall bladder, nook and stomach: • malaria; • dysmenorrhoea • constipation; Mixed with *Foeniculum vulgare* has some benefits on liver and gall bladder; Mixed with *Phlomis lychnitis*, *Lippia citriodora* and *Tilia* spp has some benefits on liver and stomach.
Lavatera cretica L. *Lavatera trimestris* L. *Malva* sp. (malvas)	Anti-inflammatory Analgesic Antiseptic Cholarectic e chologogue Anti-parasite Healing Laxative	A decoction of the aerial part has some benefits, in external uses, on wounds, haemorrhoidal, sprain or eyes wash. Drink a decoction has some benefits: • against infection, inflammations, internal wounds; • on bladder, intestine, liver, muscular pains and stomach pains; constipation; • as vermifuge (to fight belly worm). Can be used for enema.
Lythrum salicaria L. (erva carapau, carapauzeiro)	Digestive Carminative	A decoction of the aerial part of the plant has some benefits on indisposition, intestines, nook, colic and diarrhea.
Mentha sp. (hortelã de burro)	Anti- parasite (Vermifuge)	A decoction of the leaves is used as anti-parasite.
Mentha pulegium L. (poejo)	Anti-cough	A decoction of inflorescences has some benefits as anti-cough and colds.
Parietaria puntacta Willd (erva cobrinha, alfavaca da cobra)	Anti-haemorrhoidal antiseptic	A decoction of the aerial part: • has some beneficial effects to the intestines • has some benefits to the haemorrhoidal; • skin washes; • babies wash.
Olea europaea L. var. *europaea/ Olea europaea* L. var. *sylvestris* (Miller) Lehr (oliveira/zambujeiro)	Hypotensive medicine Hypoglycaemic Anti-acid	A decoction of the leaves has some benefits against hypertension and diabetes; To chew the leaves has some benefits against acidity.
Quercus suber L. (sobreiro)	Healing	Boiling the cork with olive oil has some benefits on animal wounds and itch;
Rosa canina L. *Rosa pouzinii* Tratt. (roseiras bravas)	Antiseptic Laxative	A decoction of the petals is used to wash the eyes; A decoction of the fruit has some benefits on colic and constipation.

Table 1. Continued.

Botanical name (Local name)	Ethnofarmacological effects	
Rosmarinus officinalis L. (alecrim, anecril)	Antiseptic Hypotensive medicine Analgesic Vasodilatation	A decoction of the aerial part: • used as throat antiseptic; • controls hypo tension; • Has some beneficial effects against violent cephalalgy; The aerial part burned with (*Eucalypto* spp) is used as an insect repellent; The infusion in alcohol can also be used to relieve headaches; A decoction of little branches join in bath has some benefits on rheumatism. The oil obtained from the plant has some benefits against baldhead.
Rubus ulmifolius Schott (silva, balsa)	Anti-diarrhoea Anti-cough Anti-fungi Anti-inflammatory hypoglycaemic	A decoction of sprouts has some benefits: • On diarrhea and renal colic; • On mouthwash against aphtae; • On throat pains as gargle; • As a hypotensive medicine; • On diabetes and cough;
Trifolium angustifolium L. (trevo bravo, rabo de gato, rabo de raposa)	Anti-diarrhoea carminative	The decoction of the dry spike has some benefits to treat diarrhea, and relieve colic and stomach pain.

The most common usage is the decoction or extraction the flavor of by boiling the whole aerial part or portions of the plant. The *"tisanas"* (tea) are used not so often. Fragments of plants are dropped in a pan with cold water that goes on the heat until boiling. This process is very similar with decoction. Another form of usage is the *"lambedor"* (frequently called *"limedoure or limedouro"*). It is a kind of syrup obtained by boiling leaves, roots and/or fruits from one or different varieties of vegetal specimens, with a large amount of sugar (usually brown sugar).

In 621 botanic specimens listed in floristic surveys in the region of Santarém, nearly 150 of them, included in 99 pollen types, were identified in pollen and honey samples collected each week, along one year (see table 2).

In 101 botanic families surveyed, only 10 of them, like pollen and nectar, are currently resources for honeybee in this region (*Myrtaceae, Cruciferae, Compositae, Leguminosae, Rosaceae, Boraginaceae, Salicaceae, Cistaceae, Plantaginaceae* and *Papaveraceae*). It is evident the aim contribution of the wild and spontaneous species against the cultivated ones.

Table 2. Sources of nectar and pollen for honeybee in the Santarém region.

Pollen type	Nectar and pollen resources for honeybee
Lythrum	*Lythrum junceum* Banks & Solander
Mentha	*Mentha pulegium* L.; *Mentha suaveolens* Ehrh..; *Origanum virens Hoffmanns.* & Link.; *Rosmarinus officinalis* L.
Myrtus	*Eucalyptus globulus* Labill.; *Myrtus communis* L.
Olea europaea	*Olea europaea* L. var. *sylvestris* (Miller) *Lehr*; *Olea europaea* L.
Ononis	*Melilotus segetalis* L.; *Ononis repens* L.; *Ononis viscosa* L.
Oxalis	*Oxalis corniculata* L.; *Oxalis pes-caprae* L.
Palmae	*Chamaerops humilis* L. *var. lusitanica* Becc.; *Phoenix canariensis* Chab.
Papaver rhoeas	*Papaver dubium* L.; *Papaver hybridum* L.; *Papaver rhoeas* L.; *Papaver somniferum* L.
Plantago coronopus	*Plantago coronopus* L. ssp. *coronopus*
Plantago lanceolata	*Plantago lagopus* L.; *Plantago lanceolata* L.
Prunus	*Prunus armeniaca* L.; *Prunus avium* L.; *Prunus cerasus* L.; *Prunus domestica* L.; *Prunus dulcis* (Miller) D. A.Webb; *Prunus persica* (L.) Batsch; *Prunus pissardii* Carrière; *Prunus serotina* Ehrh.
Prunus spinosa	*Prunus spinosa* L.
Pyrus	*Eriobotrya japonica* L.; *Malus domestica* Borkh.; *Pyrus bourgeana* Decne.; *Pyrus communis* L.; *Cydonia oblonga* Miller.
Quercus coccifera	*Quercus coccifera* L.
Quercus suber	*Quercus suber* L.
Ranunculus	*Ranunculus muricatus* L.; *Ranunculus trilobus* Desf.
Raphanus	*Hirschfeldia incana* (L.) Lagreze-Fossat; *Nasturtium officinale* R. Br.; *Raphanus raphanistrum* L..
Reseda	*Reseda lutea* L.; *Reseda media* Lag.
Rhamnus	*Rhamnus alaternus* L.
Rosa	*Rosa canina* L.; *Rosa sempervirens* L..
Rubus ulmifolius	*Rubus ulmifolius* Schott
Salix	*Salix atrocinerea* Brot.
Sinapis	*Brassica napus* L.; *Diplotaxis catholica* (L.) D. C. ; *Sinapis alba* L.; *Sinapis arvensis* L.
Solanum nigrum	*Solanum nigrum* L.; *Solanum tuberosum* L.
Tuberaria	*Halimium commutatum* Pau.; *Tuberaria guttata* (L.) Fourr; *Tuberaria lignosa* (Sweet) Samp.
Ulex	*Cytisus striatus* (Hill) Rothm.; *Genista triacanthos* Brot.; *Ulex parviflorus* Pourret.
Viburnum tinus	*Viburnum tinus* L.
Zea	*Zea mays* L.
Acer campestre	*Acer pseudoplatanus* L.
Acer negundo	*Acer negundo* L.
Aesculus hippocastaneum	*Aesculus hippocastaneum* L. *'Rosea'*
Anthemis	*Anacyclus radiatus Loisel*; *Anthemis arvensis* L.; *Chamaemelum fuscatum* (Brot.) Vasc.; *Chrysanthemum segetum* L.; *Coleostephus myconis* (L.) Reichenb. f ; *Lepidophorum repandum* (L.) DC.
Asparagus/Muscari	*Smilax aspera*; *Muscari comosum* (L.) Miller
Calluna vulgaris	*Calluna vulgaris* (L.) Hull
Capsella bursa-pastoris	*Rapistrum rugosum* (L.) All.
Carduus	*Carduus tenuiflorus* Curtis; *Galactites tomentosa* Moench
Carpobrotus edulis	*Carpobrotus edulis* (L.) N. E. Br.
Ceratonia siliqua	*Ceratonia siliqua* L.; *Citrus aurantium* L.

Table 2. Continued.

Pollen type	Nectar and pollen resources for honeybee
Chenopodiaceae	*Chenopodium album* L. *Album*
Cirsium	*Cirsium arvense* (L.) Scop.
Cistus albidus/crispus	*Cistus albidus* L.
Cistus crispus	*Cistus crispus* L.
Cistus monspeliensis	*Cistus monspeliensis* L.; *Cistus psilosepalus* Sweet
Cistus salvifolius	*Cistus salvifolius* L.
Compositae liguliflorae	*Andryala integrifolia* L.; *Cichorium endivia* L.; *Cichorium intybus* L.; *Crepis capillaris* (L.) Wallr.; *Hedypnois cretica* (L.) Dumont-Courset; *Hypochaeris glabra* L.; *Leontodon taraxacoides* (Vill.) Mérat; *Picris echioides* L.; *Reichardia picroides* (L.) Roth; *Scolymus hispanicus* L.; *Scolymus maculatus* L.; *Sonchus asper* (L.) Hill; *Sonchus oleraceus* L.; *Sonchus tenerrimus* L.; *Tolpis barbata* (L.) Gaertner; *Urospermum picroides* (L.) Scop ex F. W. Schmidt
Echium vulgare	*Echium plantagineum* L.
Erica	*Erica australis* L. ssp. *australis*; *Erica scoparia* L.; *Erica umbellata* L.; *Erica arborea* L.
Falcaria vulgaris	*Torilis arvensis* (Hudson) Link; *Torilis japonica* (Houtt.) DC.; *Torilis nodosa* (L.) Gaertner.
Fraxinus	*Fraxinus angustifolia* Vahl.
Halimium halimifolium	*Halimium halimifolium* (L.) Willk.
Inula	*Dittrichia viscosa* (L.) W. Greuter
Jasione	*Jasione montana* L.
Lavandula	*Lavandula luisieri* (Roseira) Rivas Martínez
Linaria	*Anarrhinum bellidifolium* (L.) Willd.; *Linaria spartea* (L.) Willd. ssp. *virgata*
Lonicera	*Lonicera implexa* Aiton

In the figures 1 to 11 are presented some morphological aspects of the taxa *Asphodelus ramosus* L., *Calamintha baetica* Boiss. & Reuter, *Centaurium erythraea* Rafn, *Chamaespartium tridentatum* (L.) P. Gibbs, *Hypericum perforatum* L, *Lavatera cretica* L., *Lonicera implexa* Aiton, *Origanum virens* Hoffmanns & Link, *Rosmarinus officinalis* L., *Rubus ulmifolius* Schott and *Scolymus hispanicus* L.

Figure 1. *Asphodelus ramosus* L. (aerial parts and pollen)

Figure 2 *Calamintha baetica* Boiss. & Reuter, (aerial parts and pollen)

Figure 3 *Centaurium erythraea* Rafn *Centaurium erythraea* Rafn (aerial parts, pollen and seeds)

Figure 4 *Chamaespartium tridentatum* (L.) P. Gibbs (aerial parts and pollen)

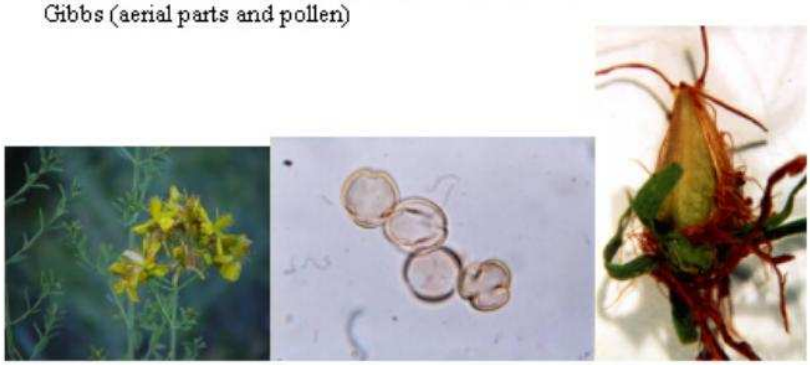

Figure 5 *Hypericum perforatum* L (aerial parts, fruits and pollen)

Figure 6 *Lavatera cretica* L. (aerial parts, fruits and pollen)

Figure 7. *Lonicera implexa* Aiton (aerial parts and pollen)

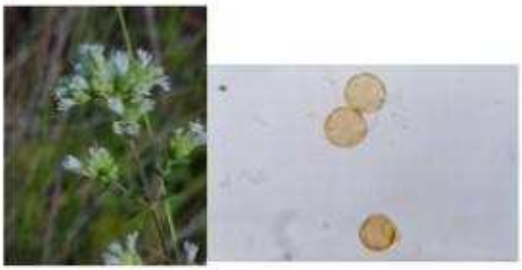

Figure 8. *Origanum virens* Hoffmanns & Link (aerial parts and pollen)

Figure 9. *Rosmarinus officinalis* L (aerial parts and pollen)

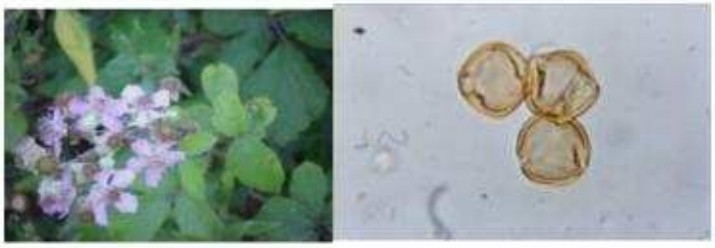

Figure 10., *Rubus ulmifolius* Schott (aerial parts and pollen)

Figure 11. *Scolymus hispanicus* L. (aerial parts and pollen)

Acknowlegments
We would like to thank Dr Maria José Oliveira and Belchior Mira who read and correct the manuscript.

Literature cited

Erdtman, G. (1960). The acetolysis method. *Svenks. Bot Tidskr*. **54**, 561-564.

Franco, J. (1971-1984). *Nova Flora de Portugal* (*Continente e Açores*).Vol I e II. Lisboa.

Franco, J. (1994). *Nova Flora de Portugal* (Continente e Açores) Vol III (Fascículo I). Lisboa.

Louveaux, J.; Maurizio, A.; Vorwohl, G. (1978). Methods of Melissopalynology. *Bee World*, **59** (4), 139-152.

Paiva, J. e Villar, L. (1986). *Flora Iberica, Plantas Vasculares de la Peninsula Iberica e Islas Baleares*. Real Jardin Botanico, C.S.I.C. Madrid.

Reille, Maurice (1995) - *Pollen et spores d´Europe et d´Afrique du Nord* - (*supplement 1*) -1327 pag.. Laboratoire de Botanique Historique et Palynologie. Empora (ed.). France.

Tutin, T. G.; Heywood, V. H.; Burges, N. A.; Moore, D. M.; Valentine, D. H.; Walters, S. M.; Webb, D. A. (1986) - *Flora Europaea* Cambridge University Press (ed.). Cambridge. Inglaterra.

Valdes, B.; Diez, M. S.; Fernandez, I. (1987)- *Atlas polínico de Andalucia Occidental*. Instituto de Desarrollo.

Valdés, B.; Talavera, S. e Fernandez-Galliano, E. (1987). *Flora Vascular de Andalucia Occidental*, vol 1-3. Ketres Ed.. Barcelona.