

**IRA**  
Medenine  
Tunisia



**USDA**  
ARS-OIRP  
USA



**ICARDA**  
Syria



**Project :**

**Biological diversity, cultural and economic values of medicinal, herbal and aromatic plants (PAME) in southern Tunisia**



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# **Biological diversity, cultural and economic values of medicinal, herbal and aromatic plants (PAME) in southern Tunisia**

## **Foreward:**

All informations presented here are not of IRA team only, but the fruit of a larger consultation and ideas exchange undertaken for the last two years between all operators of the PAME sector at national level. It needs to be completed and improved in order to find out appropriate methods for upgrading PAME sector in Tunisia.

It would like to thank all operators and partners for their kind collaboration.

## **1- Project presentation**

### **1-1- Partners**

- IRA (Arid Land Institute) Médenine- Tunisia
- USDA- ARS-OIRP, USA
- ICARDA
- Other national partners : Development agencies, Professional organizations, NGOs, Research institutes, Universities, private ...

### **1-2- Objectives**

1. Conserve, manage, and sustainably use, both *in situ* and *ex situ*, medicinal, herbal and aromatic plants in arid and semi-arid areas;
2. Institutionally strengthen collaborating agencies, i.e. scientific research institutes, extension services, universities, NGOs, *etc.* to add value to medicinal herbal and aromatic plants through processing, chemical analysis and marketing;
3. Improve public awareness of the importance of medicinal plants and build on traditional knowledge and cultural heritage.
4. Prepare a national database on indigenous medicinal and herbal plants, starting with southern Tunisia, in order to assess their usage, status, and ecosystems;

## **2- National operators involved in PAME sector**

Information collected about different operators interested in PAME permitted their classification according to the role they play within the sector. Table 1 presents the preliminary list of different stakeholders.

**Table 1: Operators interested in PAME in Tunisia (preliminary list)**

<b>Categories</b>	<b>Number</b>	<b>Institutions/ Individuals</b>
Research institutions	16	<ul style="list-style-type: none"> <li>- IRA</li> <li>- F. Sc. (Gabès, Gafsa , Monastir, Tunis)</li> <li>- F. Ph. Monastir, F. Médecine Monastir</li> <li>- ESHE de Chott-Meriem</li> <li>- ESA Kef</li> <li>- INAT</li> <li>- INSAT</li> <li>- Institut Sup. de Biotec. de Monastir</li> <li>- INRAT</li> <li>- INRGREF</li> <li>- INRAP</li> <li>- INRST</li> </ul>
Development agencies	7	<ul style="list-style-type: none"> <li>- Directions centrales : DGPA, DGF, BN Gènes, AVFA, APIA, ONAGRI, CEPEX</li> <li>- Directions régionales : CRDA ; CFPA ; Offices (ODS),...</li> </ul>
NGOs	9	<ul style="list-style-type: none"> <li>- Association de Sauvegarde de l'Oasis de Chénini</li> <li>- Association des Jeunes de Zammour</li> <li>- Association de Conservation et de Réhabilitation du Patrimoine – Beni Khédache</li> <li>- Association du Développement Durable de Beni Khédache</li> <li>- Association de Préservation de la Biodiversité -Beni Khédache</li> <li>- Association Mémoire de la Terre –Tataouine</li> <li>- Association du Développement et de la Protection du Patrimoine Culturel et Cultural de la région de Tamezret</li> <li>- Association de Sauvegarde de la Nature et de Protection de l'Environnement à Douiret</li> <li>- Association des plantes médicinales à Hammam –Sousse</li> </ul>
Socio-prfes. organisations	4	<ul style="list-style-type: none"> <li>UTAP</li> <li>Coopérative de néroli –Nabeul</li> <li>Groupement des Industries de Conserves Alimentaires (GICA)</li> <li>Chambre syndicale des producteurs d'huiles essentielles</li> </ul>
Funding agencies	5	<ul style="list-style-type: none"> <li>- Banques (BNA), Fond de promotion de l'emploi 21-21</li> <li>- Organismes internationaux (FIDA, Banque Mondiale, GEF,...)</li> </ul>
Private companies	20	<ul style="list-style-type: none"> <li>SANESSENCE; KAMY; CERINA; AJENNET TOUNES ;</li> <li>BIO-FLORA; PRIM'AROM; AROMAT; SCHEDAN ;</li> <li>CARTHAGO THERMALISME- KIPROFA; KANT</li> <li>ESSENCES ; KG FLOWERS ; PARACHIMIC ...</li> </ul>
Exporters	2	<ul style="list-style-type: none"> <li>Société Internationale import export et commerce internationale</li> <li>Société Bouselmi export</li> </ul>
Pharmacists, Doctores	3	<ul style="list-style-type: none"> <li>AMOR Kamel</li> <li>GODCHA Mohamed</li> <li>SAIDI Salaheddine</li> </ul>
Herborists		19 herboristes fixes et plusieurs autres ambulants ont été

		recensés par l'IRA au niveau des trois gouvernorats du sud est (Gabès- Médenine- Tataouine).
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### 3- Establishing priority within PAME species

Several studies were carried out with the aim to assess PAME in Tunisia. Species number reported varied from 40 to more than 200 due to:

- variability of the extent of the study ;
- variability of major use considered for target species of the study;
- consideration of socio-economic aspects related with studied species.

MAPE species selection depends mainly on objectives of activities undertaken or planned. Germplasm conservation should concern all species. Research activities concern limited number of species mainly those of real importance (large distribution, multiuse, economic value,...). Domestication and cultivation may concern restricted number of species. Those with added value, particularly in international market, are to be considered for exportation.

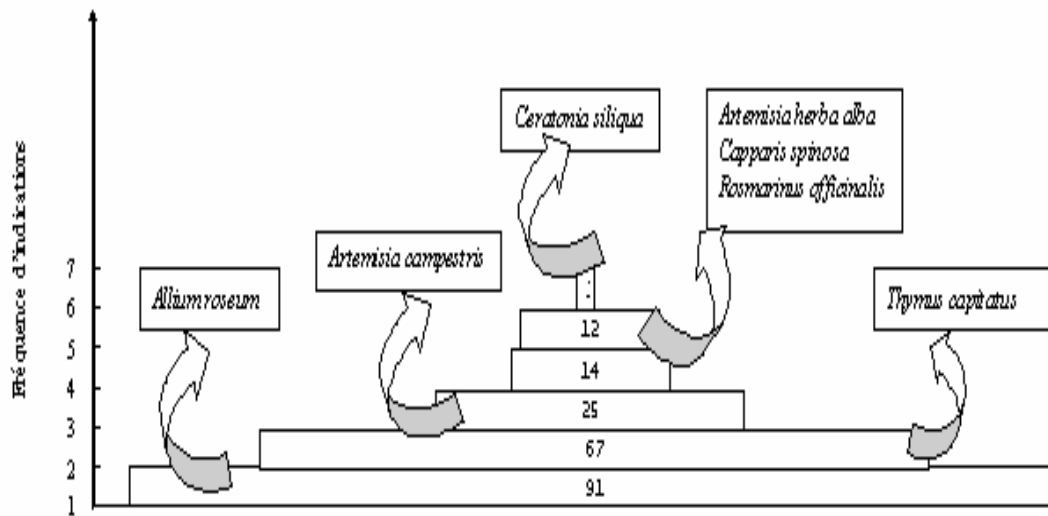
During the first evaluation mission of this project, a first PAME species selection was made. Two lists were produced:

**Short list** containing *Allium roseum*, *Rosmarinus officinalis*, *Artemisia herba alba* and *Capparis spinosa*.

**Larger list**, containing *Allium roseum*, *Rosmarinus officinalis*, *Artemisia herba alba*, *Capparis spinosa*, *Periploca laevigata*, *Artemisia compestris*, *Acacia raddiana*, *Matricaria aurea*, *Juniperus phoenicea* and *Rhus tripartitum*.

Relative importance of species reported in former studies and their economic value revealed by the study done in the framework of the present project are criteria to be considered for priority establishment.

Based on mentioned criteria, a list of PAME with high priority is elaborated and may serve as target species list for a future project on PAME in Tunisia (See fig 1)



**Figure 1 : Importance of PAME in Tunisia based on reporting frequency in different inventories**

#### 4- Ongoing research-development projects with relevance to the PAME

To insure complementarily and synergy between rural development activities and for the better use of funds and infrastructure, it's useful to inventory research-development projects already undertaken and presenting potential interest for the improvement of PAME sector in Tunisia (table 3 )

**Table 2 : Ongoing R-D projects related to the PAME**

Project	Operator(s)	Duration	Components
Natural resources management	MOA CRDA -Médenine	1998-2002 (prolonged)	-Hydraulic management and conservation of soil and water - Revegetation of degraded areas and combating desertification -Enhancement of woman role -Development of rural infrastructures
Jessours and ksours of Benikhedache	Conseil regional- Médenine ADD-IRA	2001-2005	-Natural resources -Specific agricultural products -Hand made products -Alternative tourism
Agropasture development of Dhahar region	MOA CRDA- Kebili- Gabès- Médenine - Tataouine	2003-2009	-Pasture integrated management -Irrigated agriculture development -Agriculture services enhancement -Improvement of rural roads -Diversification of income sources
Integrated agriculture development of Kasserine region	CRDA-kasserine	2001-2005	-Soil and water conservation -Reinforcement of rural infrastructures -Agro-pasture development -Capacity building of rural institutions
Integrated agricultural development of Gabes region	CRDA-Gabes	2001-2005	
Integrated agricultural development of Gafsa region	CRDA- Gafsa	2001-2005	

## **5- Lessons learnt from the experience of Other countries (Syria, Lebanon & Jordan)**

A delegation of seven persons, with special interest on PAME, participated in a mission organized in the framework of the collaborative IRA-USDA-ICARDA Project.

The main objective of the mission visit is to be informed on the experience gained by the countries visited in the following areas:

- *In-situ* conservation of phylogenetic resources and sustainable management of biodiversity

- Production, exploitation and utilization of aromatic and medicinal plants and spices (PAME)
- Study of the spices, aromatic and medicinal plants and essential oils sector
- Transformation, industrialization and packaging of PAME
- Research programs on PAME in the three countries.
- Sector institutional organization and mechanisms in the three countries (decisional processus, partners, *etc...*)

Visits in the three countries covered projects and institutions dealing with the following areas:

- Plants genetic resources conservation (regional GEF/ICARDA project implemented in the three countries)
- Transformation and valorisation (use) of PAME

Main lesson learnt is that PAME sector is very large and complex. Its improvement requires the contribution of several parties with a holistic and multidisciplinary approach. It requires also:

- the implementation of regulation and legislation favouring production and transformation dynamics and encouraging development initiatives either individual or collective;
- an innovative and applied research able to highlight the potentialities of local PGR, to better manage the biodiversity and to solve technical constraints of the sector from the production to the transformation and final use.

## **6- Constitution of steering and technical committees**

To meet national development objectives, a steering committee of the project was created.

Members are:

- Representative of the Ministry of the Agriculture, Environment and Hydraulic Resources
- Representative of the Ministry of Higher Education, Scientific Research and Technology,
- Representative of the Ministry of Public Health
- Representative of UTAP (Union Tunisienne pour l'Agriculture et la Pêche)
- Director of regional office of ICARDA at Tunis
- Representative of International Office Research Program , USDA- ARS
- Director General of IRA –Médenine
- National Project Manager

- Head of Rural Societies and Economics Lab-IRA

This steering committee held its first meeting on December 28, 2002 at Tunis. All members were informed about project (phase 1) components and partners.

Scientific, environmental and socio-economic impacts of the project were highlighted. The “holistic (filière)” approach was approved.

On another hand, to meet project objectives, a technical committee, representing all stakeholders, was created and held its first meeting on February 21, 2003 at IRA. Main suggestions and recommendations were:

- invite a representative of the National Gene Bank (under implementation) and a representative of the Marketing Permission Office of the Ministry of Public Health to join this technical committee ;

- assess national capacities, particularly pharmacists and doctors, and complete the inventory of knowledge (studies, species used in phototherapy...) in the field of PAME;

- enhance research activities for conservation, characterization, domestication transformation and handling technologies and use of PAME;

- in situ* conservation of PGR and enhancement of cultivation of species that are actually collected from natural habitat to alleviate plant cover degradation;

- select better adapted species to arid environment constraints;

- rehabilitate local popular knowledge for better use and diversification of rural products raised from PAME;

- establish and / or activate specialized organisms (associations, cooperatives...) to better use common heavy equipments;

- identify a limited number of PAME with high priority and make technical references summarizing all information about these species;

- create the following sub-committees in order to overcome complexity and multiplicity of aspects related with PAME:

- S-C 1: Identification, conservation and evaluation

- S-C 2: Chemical analyses

- S-C 3: Transformation technologies

- S-C 4: Use and marketing

- S-C 5: Regulation, legislation and institutional aspects

- S-C 6: Socio-economic aspects

## **7- Development of technical “leaflet” for target species**

Based on available information the development of technical leaflets was undertaken for *Capparis spinosa* and *Rosmarinus officinalis*. It includes geographical distribution, biological and ecological characteristics, propagation and cultivation techniques, conservation, uses...)

## **8- Establishment of a PAME data base**

- Investigation made by project team at local universities, research institutes and other operators permitted the establishment of a large documentary base (160 references).
- Investigation made by partners from USA at the National Agricultural Library permitted the identification of about 2000 references dealing with the 10 PAME identified during the first evaluation mission. Among these, 167 references are being acquired by the project.
- A data base concerning the selected 10 PAME is being established. Gathered informations include geographical distribution, biological characteristics and related references for each species.
- A GIS for PAME is already established. It's useful for local (Matmata mountains) and national scale. Information layers include climatic aspects (temperature, humidity), soil and water resources, natural vegetation, population density, geographical distribution and importance of target species (*Artemisia herba alba*, *Rosmarinus officinalis*, *Allium roseum*,...)