

Paper brochure for workers with youth

Training tools and methodologies

This is a guide for teachers and educators about training materials and the correct way of use and dissemination.

Three training and learning materials are proposed: A Study Book, a Practical Handbook and an atlas of plants (Herb Atlas).

- **Study book:** Book of contents about the collection, the cultivation and elaboration of products based on aromatic and medicinal plants, basic for the young students. This book will be given to the student at the beginning of the course to study, consult, clarify doubts, take notes, etc.
- **Practical handbook:** this is a series of PowerPoint presentations, which can be used by both teachers and students, which includes concepts and resources, but also very practical learning activities and exercises. These PowerPoints will be used by teachers and educators to follow a logical order of learning. Stopping at any time that a learning activity is proposed, with the aim that the student take his time to do it.
- An **Herb Atlas:** it contains some of the most common and interesting plants of Costa Rica, Jamaica and Brazil, to be harvested by wild collection or cultivation. Includes photos, descriptions, tips and tricks for cultivation, domestication, processing and medicinal uses. This document will be delivered to the students at the time of beginning of the course.

These materials will be the support for the Training Courses that will be carried out in each country, with the aim of training young people for potential professional options related to the useable plants.

Along with these materials, a self-assessment test, test questions, and a list of frequently asked questions are also available.



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Materials	
Study book for young people. Text	<p>Textbook for students, containing detailed information on Wild collection, Cultivation and Processing.</p> <p>The contents are as follows:</p> <p>PART I. INTRODUCTION AND WILD COLLECTION OF AROMATIC AND MEDICINAL PLANTS</p> <ol style="list-style-type: none"> 1. Introduction to medicinal and aromatic plants. Traditional and industrial main uses. Main species produced and marketed. 2. Wild harvesting collection <p>PART II. CULTIVATION OF AROMATIC AND MEDICINAL PLANTS</p> <ol style="list-style-type: none"> 3. Production of aromatic and medicinal plants 4. Cultivation stages of medicinal and aromatic plants 5. Good farming practices <p>PART III. PROCESSING AND SALE OF AROMATIC AND MEDICINAL PLANTS</p> <ol style="list-style-type: none"> 6. Processing of medicinal and aromatic plants: conservation, drying, distillation, extraction 7. Development of herbal products. Good manufacturing practices. 8. Marketing and commercialization. Legislation, standards and certification. <p>INFORMATION SOURCES</p>
Practical handbook. PowerPoint	<p>This manual includes class notes and exercises to learn all about the production of medicinal plants.</p> <p>Topics related to Cultivation, Collection, Processing and Marketing will be addressed</p> <p>Specifically:</p> <ol style="list-style-type: none"> 1. Cultivation <ol style="list-style-type: none"> 1.1. Site selection and preparation 1.2. Collection and multiplication of the plant for cultivation 1.3. Installing the crop in the field (design) 1.4. Cultivation maintenance 2. Collection <ol style="list-style-type: none"> 2.1. Wild harvesting 2.2. Agricultural harvesting 3. Processing <ol style="list-style-type: none"> 3.1. Primary transformation <ol style="list-style-type: none"> 3.1.1. Refrigeration 3.1.2. Freezing 3.1.3. Drying 3.1.4. Distillation 3.1.5. Extraction 3.1.6. Packaging, labelling, storage and documentation 3.2. Food manufacturing <ol style="list-style-type: none"> 3.2.2. Manufacture of medicinal products 3.2.3. Manufacture of cosmetics 3.2.4. Manufacture of agricultural extracts 3.2.5. Manufacture of air fresheners

	<p>3.2.6. Quality control 3.2.7. Marketing</p>
<p>Herb Atlas</p>	<p>It is a manual of sheets of the most interesting and common aromatic and medicinal plants of Costa Rica, Jamaica and Brazil.</p> <p>These sheets contain information on specific descriptions, tips and tricks for cultivation and processing, and information on their medicinal properties and main uses.</p> <p>Specifically, each file is structured as follows:</p> <ul style="list-style-type: none"> • Scientific name • Local name (English, Spanish, Portuguese) • Botanical description • Habitat • Cultivation • Harvest • Transformation • Main uses • Medicinal properties <p>The species described are the following:</p> <ol style="list-style-type: none"> 1. <i>Aloe vera</i> 2. <i>Baccharis trimera</i> 3. <i>Costus spicatus</i> 4. <i>Cymbopogon citratus</i> 5. <i>Hibiscus sabdariffa</i> 6. <i>Justicia pectoralis</i> 7. <i>Lippia alba</i> 8. <i>Maytenus aquifolium</i> / <i>Maytenus ilicifolia</i> 9. <i>Matricaria recutita</i> (<i>Chamomilla recutita</i>) 10. <i>Momordica charantia</i> 11. <i>Morinda citrifolia</i> 12. <i>Ocimum basilicum</i> 13. <i>Petiveria alliacea</i> 14. <i>Psidium guajava</i> 15. <i>Zingiber officinale</i>

An initial evaluation of young people and follow-up is recommended. Also a complete final evaluation related to the contents of the course, documentation, materials, trainers, methodology, theoretical and practical contents, knowledge of the teaching staff, promotion of participation and exchange of experiences, assimilation of contents and vision of professional possibilities.

It is advisable to educate with vision of entrepreneurs; to develop the creative and innovative potential of young people; to share methodologies, experiences and tools to build common knowledge; to support a dialogue and exchange among participants working in groups to develop cross-cutting values: be critical, open-minded and full of fresh ideas; to boost their skills and foster exchange and networking among participants; to develop interactive learning in workshops and make them more aware of their own abilities and stimulate their spirit of initiative and creativity.

Proposals for learning activities

1. Perform a collection of mature wild seeds, and with it, make a seedling tray.
2. Design a production of aromatic plants, from the cultivation to the obtaining of fresh plant.
3. Plan the wild collection of a species, make the drying and develop a product.
4. Complete a " Raw material data sheet" from the parameters considered fundamental.
5. Prepare or complete a questionnaire from a raw material supplier.
6. Design a label for an infusion of medicinal plants containing the required text.
7. Perform an audit following a supplier approval questionnaire. Ask about:
 - Organization.
 - Staff.
 - Facilities.
 - Equipment.
 - Documentation.
 - Work system.
 - Material flow.
 - Quality control.
 - Production.
 - Warehouse.

Self-evaluation or evaluation

Test

Identify the correct answer to each question. Remember that there is only one correct answer.

1. It is preferable to control the wild collection of some species.
 - a. True.
 - b. False.

2. Pesticides, herbicides and insecticides can be used in cultivation and storage.
 - a. True.
 - b. False.

3. For the final quality of a raw material the chemotype is fundamental
 - a. True.
 - b. False.

4. In an organic crop certain chemical fertilizers, herbicides and insecticides can be used.
 - a. True.
 - b. False.

5. Refrigeration preserves the organoleptic characteristics and texture
 - a. True.
 - b. False.

6. It is appropriate to transport a packaged drug in a truck without a cover.
 - a. True.
 - b. False.

7. The raw material preservation is only conditioned by the packaging.
 - a. True.
 - b. False.

8. Identify when to collect the leaves.
- Each Spring
 - In Spring and Autumn
 - Before the plant blossoms
 - After the plant blossoms
9. You must collect a part of the plant, which one?
- The roots.
 - Leaves and flowers
 - The used part
 - Flowering tops
10. The container is important to keep a drug, when?
- It is always important
 - It does not matter
 - Packaging has nothing to do with conservation
 - It is important in essential oils.
11. Indicate recommended temperature and humidity conditions for a medicinal plant store.
- High temperature and high humidity.
 - Low temperature and low humidity.
 - High temperature and low humidity.
 - Low temperature and high humidity.
12. Match the items in the left column with their corresponding item in the right column:

1. Documentation	a. Dried and crushed
2. Package	b. Data sheet
3. Cultivation	c. conservation
4. Primary transformation	d. Seedling tray
	e. irradiation

Test Solution

1. A-True, those that are under overexploitation and are decreasing the number of populations.
2. A- True, provided that the waiting times for collection are respected and provided they are applied in the warehouse with all due precautions.
3. A- True, a non-official chemotype will give a qualitative and quantitative content of active principles that will not correspond to what is required by pharmacopoeia.
4. B-False, no synthetic chemical can be used.
5. A- True, the smell, colour, taste and texture are perfectly preserved.
6. B-False, must be packed and the truck must be covered.
7. B-False. All processes affect the quality of the product and therefore the conservation of the product.
8. C. It is preferable before the plant blossoms since, generally, it is when the greater content in active principles is found.
9. C. The used part is collected, not always flowers or roots, only sometimes, and almost never the flowering tops, only sometimes.
10. A. The packaging is always important to preserve a raw material or a final product.
11. B. Cold and low humidity do not allow microorganisms or insects to grow.
12. Solution: 1-b; 2-c; 3-d; 4-a The technical file is a document to be prepared by the farmer. The packaging allows the preservation of the product. The seedling tray is used to start the crop. The drying and crushing of a drug constitute a primary transformation.

Open Exam Questions

1. How does drying affect the quality of a plant drug?

1/2 page extension

Correction criteria for tutoring:

Drying affects organoleptic characteristics, to the result of loss of mass by drying, to the content in foreign elements if animals are allowed to enter or if it is dried in a dirty place, to the content in active ingredients, microbial contamination and aflatoxins residues, to the expiration and stability of the drug, and may not be a homogeneous batch.

2. Which crop and harvest factors affect the quality of a raw material?

1-page extension

Correction criteria for tutoring:

Misuse of pesticides (pests and diseases) and herbicides (weeds), the quality of irrigation water, air (treatments in neighbouring fields) and land (pesticide residues and heavy metals) without control, the choice of a species that does not adapt to the environmental and soil and climatic conditions of the area, the choice of a non-medicinal variety or chemotype, not weeding the field will increase the foreign elements (other plants), incorrect mechanical collection that collects too much earth or does not separate well the part of the plant used, uncontrolled pests and phytopathology, wait too long between picking and drying or distilling, an exposure to the sun of material collected from several hours, do not pick up the part of the plant that is used at the right time and to err on the wild collection of species.