INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Pharmacognosy			Field of study	-								
Bachelor in	Pharmacy			School	School of Health								
Academic Year	2023/2024	Year of study	2	Level	1-2	ECTS credits	5.0						
Type	Semestral	Semester	1	Code	9549-803-2101-00-23								
Workload (hours)	135	Contact hours	T -	TP 30	PL 30	TC -	S -	E -	OT 7,5	O -			

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Joana Andrea Soares Amaral, Tiane Cristine Finimundy

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Characterize the chemistry of primary and secondary metabolites derivatives from acetate, shiquimate and mevalonate pathways with biological activity or pharmaceutical technological value.
2. To identify different plants characterized by the presence of different secondary metabolites;
3. To identify different plants used in traditional herbal medicine and their biological properties
4. To know techniques of determination and standardization of plants active constituents as well as their major pharmaceutical applications
5. To know extraction techniques of natural products with biological activity or pharmaceutical technological value

Prerequisites

Not applicable

Course contents

Pharmacopoeias. Plants used in herbal medicine characterized by the presence of sugars and derivatives of acetate and shikimate pathways. Chemical composition, extraction and pharmacological properties of derivatives of shikimate, acetate and mevalonate pathways.

Course contents (extended version)

1. Pharmacopoeias.
2. Plants used in herbal medicine characterized by the presence of sugars
   - Homogenous polyholosides from higher plants (starch and cellulose)
   - Homogenous polyholosides from shelfish (chitin and chitosan)
   - Homogenous polyholosides from bacteria (dextrans)
   - Heterogenous polyholosides (gums, polysaccharide mucilage from seaweed and from higher plants)
3. Plants used in herbal medicine characterized by the presence of derivatives of acetate pathway
   - Quinones. Naftoquinones. Laxative anthraquinones
   - Anthracene derivatives: biosynthesis, glycosilation and pharmacological activity, dimerization
   - Anthracene derivatives: physico-chemical properties, therapeutic use and contraindications
4. Plants used in herbal medicine characterized by the presence of derivatives of shikimate pathway
   - Simple phenolics and phenolic acids
   - Salicylates
   - Coumarins. Coumarins and anticoagulant activity
   - Furanocoumarins: toxicity, applications in PUVA therapy
   - Flavonoids. Biossynthesis. Physico-chemical characteristics. Therapeutic and antioxidant uses
   - Tannins. Hydrolysable and condensed tannins. Biologival properties and usefulness to man
5. Chemical composition, extraction and pharmacological properties of derivatives of mevalonate pathway
   - Essential oils
   - Phytosterols
   - Cardiotonics. Herbal drugs used for compounds isolation
6. Nitrogenous compounds
   - Xanthines (caffeine, theophylline) and example of alkaloids.

Recommended reading

1. Heinrich, M. , Barnes, J. , Gibbons, S. , Williamson, E. M. (2006). Fundamentals of Pharmacognosy and Phytotherapy. Edinburgh: Churchill Livingstone.
2. Cunha, A. P. (2005). Farmacognosia e Fitoquímica. Lisboa: Fundação Calouste Gulbenkian.
3. Bruneton, J. (2001). Farmacognosia, Fitoquímica, Plantas Medicinales (2ª Ed). Zaragoza: Acribia.
4. Cunha, A. P. (2006). Plantas e Produtos Vegetais em Fitoterapia. Lisboa: Fundação Calouste Gulbenkian
5. Costa, A. F. (2001). Farmacognosia. Lisboa: Fundação Calouste Gulbenkian.

Teaching and learning methods

Theoretical Classes: Lectures of theoretical contents. Practical classes: Guided searching into pharmacopeias and scientific databases. Individual and team case studies. Laboratory classes: performance of laboratorial classes and experimental protocols.

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 25% (Theoretic-pratical test.)
   - Work Discussion - 15% (Oral presentation and discussion of a group bibliographic research work.)
   - Intermediate Written Test - 30% (Theoretical component. Minimum grade: 7. 5 values)
   - Final Written Exam - 30% (Theoretical component. Minimum grade: 7. 5 values)
2. Alternative 2 - (Regular, Student Worker) (Supplementary, Special)
   - Final Written Exam - 25% (Realização de teste teórico-prático.)
   - Final Written Exam - 60% (Minimum grade: 7. 5 values)
   - Work Discussion - 15% (Oral presentation and discussion of a group bibliographic research work.)

Language of instruction

1. Portuguese

Language of instruction

2. Portuguese, with additional English support for foreign students.

Electronic validation

Joana Andrea Soares Amaral	Olívia Rodrigues Pereira	Luis Migue Fernandes Nascimento	Adília Maria Pires da Silva Fernandes
12-11-2023	15-11-2023	15-11-2023	21-11-2023