28417 - Parasitology

Syllabus Information

Academic Year: 2019/20
Subject: 28417 - Parasitology
Faculty / School: 105 - Facultad de Veterinaria
Degree: 451 - Degree in Veterinary Science
ECTS: 6.0
Year: 2
Semester: Second semester
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

The approach in this subject starts from the situation of need to know the relationships established between living beings and more specifically those of negative type (parasitism) result of which one of the parts suffers a potential damage or current more or less important (host) while the other gets a benefit (parasite). This course focuses on the general knowledge of this biological phenomenon (parasitism), as well as the specific characteristics of parasitic living beings and the relationships they establish with their hosts, without forgetting the effect it has on each of the components and on the relationship itself with the environment. From the conceptual point of view, the relation of parasitism is usually established by living beings with a not very complex organizational level, viruses, bacteria, fungi, protozoa, helminths and to a lesser extent arthropod. In our country the first three groups are studied in the subject of Microbiology, while the protozoa, helminths and arthropods are studied in the subject of Parasitology.

Within the organisms that have parasitic life (obligatory or optional) this subject is addressed to those that affect animals of veterinary interest (income, company, wild and exotic) and also the human species (zoonosis).

The general objective, therefore, is for the student to know, understand and know how to apply the phenomenon of parasitism and its components and how it influences the health and productive aspects of animals of veterinary interest, as well as their role in Public Health (zoonoses and pests).

The student must know and understand the morphological, physiological, genetic and reproductive characteristics of the parasites, which will influence the final result of the relationship parasite-host, i.e. that the damage they cause is more or less important (parasitism or parasitosis).

It must also know and understand the mechanisms that the host (domestic animals, animals of veterinary interest and the human species) develop and set in motion to defend against them. Fundamentally the mechanisms of innate and acquired resistance (specific immune response)

You must also know and understand that and how environmental factors influence and act in the parasite-host relationship and in the two components separately.

This acquired knowledge and skills will enable you to understand the epidemiology, pathogenesis, clinical picture, diagnosis, therapeutics and prevention/control of the diseases they cause in animals and in the human species.

1.2.Context and importance of this course in the degree

Due to the basic character of clinical sciences and animal health of this subject, its overcoming must enable students to follow the rest of specific subjects of the degree.

At the same time and in a generic way, the student must acquire the competences listed in the Order ECI/333/2008:

FBC14- Study of microorganisms and parasites that affect animals and those that have an industrial, biotechnological or ecological application

FBC03 - Morphology, bionomy and systematics of animals and plants of veterinary interest

FBC15 - Bases and technical applications of the immune response

FBC17 - Description and pathogenesis of general alterations in the structure and function of cells, tissues, organs and systems.

CCSA04 - Recognition and diagnosis of different types of lesions and their association with pathological processes.

1.3.Recommendations to take this course

It is advisable to have studied Biology in the courses prior to entering the Degree, as well as having basic computer skills and average knowledge of the English language.

Requires previous knowledge of zoology, anatomy, physiology, cytology, histology and immunology.

2.Learning goals

2.1.Competences

On successful completion of this course, students will be able to:

- Make use of critical scientific reasoning in the knowledge, evaluation and understanding of parasites as living agents producing disease and their role in health, animal production and public health.
- Apply the knowledge acquired in the understanding of epidemiology, pathogenesis, immune response, clinical, diagnostic, therapeutic, prevention and control of the infections they produce.
- Understand how environmental factors influence the health-disease of the animals under study in the veterinary degree and in the human species.
- Use parasitological diagnostic tools (Systematics and taxonomy, laboratory techniques).
- Use the Internet as a source of information as well as a means of communication.
- Master the aspects of communication, both oral and written. Show ability to organize and plan work autonomously.

2.2.Learning goals

If students complete the course successfully, they should be able to:

- Understand the biological phenomenon of parasitism
- Recognize the relationships between the components of the biological phenomenon of parasitism, Parasite-Host and how this relationship is influenced by the Environment (environmental factors).
- Handle the definitions of the main components of the parasitism relationship.
- Relate the main concepts and components of the biological phenomenon of parasitism.
- Recognize the structural (anatomical), physiological, genetic and ecological components of parasites (protozoa, helminths and arthropods).
- Understand and manage the taxonomy and systematics of parasite living beings that are studied in the subject.
- It is able to understand and apply the knowledge of the parasite-host relationship in the diagnosis of these.
- Know and understand the different aspects of the parasite-host relationship in order to explain the epidemiology, pathogenesis and prevention of the infections/diseases they cause in domestic animals, animals of veterinary interest and human species (zoonoses).
- Know and use laboratory tools and techniques for use in diagnosis

2.3.Importance of learning goals

These learning results are fundamental to enable students to have a solid base that allows them to face the rest of the more specific modules of the degree in the best conditions, and thus successfully model their professional profile. Concretely: Pathological anatomy, Integrations (of ruminants, birds and rabbits, companion animals, equids, pigs and aquatic and exotic animals). Hygiene, inspection and food control. Zoonoses, preventive medicine and health policy. Clinical Practice in small animals, exotics and equids. Clinical Practice: Production Animals. External supervised internships. End of degree work.

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that has achieved the intended learning outcomes through the following assessment activities

Evaluation of theoretical knowledge. During the official period for conducting assessment tests (June-July and September examination periods scheduled by the center), a written test will be carried out in which students will accredit the acquisition of knowledge, skills and aptitudes indicated in the learning results indicated in the corresponding section. It will consist of 40 short answer questions, with a weighted distribution with respect to the theoretical knowledge imparted (general Parasitology, descriptive and bases for parasitological diagnosis). Each question will be graded 0-1. This part corresponds to 70% of the total score of the subject.

Evaluation of the practice sessions: face to face test in which the student will accredit the acquisition of knowledge, abilities and aptitudes of what is treated in the practical sessions. This assessment will consist of two parts: Written examination of 10 slides seen during the course, both in the practice and theoretical sessions and 3 specimens (micro and/or macroscopic) of parasites seen in the different practical sessions. The knowledge and perception of the morphological details of the different taxonomic types studied in the course will be assessed. The slides will have a maximum rating of 14% of the subject and the parasite specimens 6%.

Practical work: teamwork and oral presentation abilities of the acquired knowledge will be assessed. Students will have to prepare and present an evolutionary cycle of one of the genus of parasites that have been explained on the lectures. The work will be carried out jointly by the practice group that has already been designated. The communication of the topic of the work and the name of the tutor teacher will be done through the ADD.

Based on the evolutionary cycle explained in theory class, the group of students should make an assembly of graphics/photographs and text that points out the most important points of the cycle and readily understandable. In order to

carry out the work, the students will be able to count on the information and iconography published in the ADD of the subject, as well as material from other sources (web pages for example), always indicating the origin. They can (should) also count on the collaboration of the tutor teacher.

The group should make the presentation in Power Point format. The exposition of the work will take place in practice 10, it will be an oral presentation and last 10 minutes.

This activity is compulsory and will carry a maximum of 10% of the total score of the evaluation of the subject.

The clarity of concepts, the realization of the presentation, the exposition of the work and the collaboration between the components of the group will be mainly assessed.

In order to summarize the proposed evaluation of the subject, the following table is included:

Activity	
1. Evaluation of theoretical knowledge	70%
2. Evaluation of the knowledge, skills and abilities obtained in the practical sessions	20%
3. Practical work	10%
Total	**100%**

Valuation criteria and requirement levels

The result of the overall sum of the scores of the three evaluation activities must be equal to or greater than 5, but in addition, in the evaluation of theoretical and practical knowledge at least 50% of the score must be reached, i.e. 3.5 (7) and 1.5 (3).

A pass mark in any of the two parts of the course (theory and practice) will be kept for an academic year, with the mark originally obtained.

Marking system:

According to the national regulation Law 1025/2003, 5th of September which lays down the European system of credits and marking system for the university degree.

0-4,9: FAIL.

5,0-6,9: PASS

7,0-8,9: GOOD (NT).

9,0-10: EXCELLENT (SB).

As the article 158 of the Statutes of the University of Zaragoza lays down, provisional grades will be displayed at least for 7 days and students will be able to review them on the date, time and place provided for that purpose.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The student must demonstrate that has achieved the intended learning outcomes through the following assessment activities

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4.2.Learning tasks

The program offered to the student to help him/her achieve the expected results includes the following activities.

4.3.Syllabus

THEORY

GENERALITIES (4 hours)

Topic 1. Concept of Parasitology. Historical evolution and relationship with other sciences. Parasitism and its relationship with other types of biological associations. Origin and evolution of parasites. Adaptations to parasitism: speciation and Parasitical Specificity.

Topic 2. Classes of parasites. Biology and Physiology of parasites. Biological Cycles. Systematics, Taxonomy and Zoological Nomenclature. General classification of parasites of veterinary interest.

Topic 3. Parasite-Host Relations. Routes of invasion of the hosts. Pathogenic actions of parasites. Host-defense reactions. Parasitic resistance and immunity. Mechanisms of evasion of the parasitic immune response.

Topic 4. Parasite-Host-Environment Relations. Propagation of parasites. Influence of environmental and socio-economic factors.

PROTOZOOS (13 hours)

Topic 5. Subkingdom Protozoa. General characters and taxonomic classification. Phylum Sarcomastigophora Subphylum Mastigophora (flagellates). General characters and classification. Order Kinetoplasty. Family Trypanosomatidae: Genera

Trypanosoma and *Leishmania*.

Topic 6. Order Diplomadida. Family Hexamitidae: Genera *Giardia* and *Hexamita*. Order Trichomonadidae. Family Trichomonadidae: Genus *Trichomonas* and others of interest. Family Monocercomonadidae: Genus *Histomonas*.

Topic 7. Phylum Sarcomastigophora. Subphylum Sarcodine (amoebas). General characters and classification. Order Amoebida. Gender *Entamoeba*.

Topic 8 Apicomplexa (Sporozoa). General characters and classification. Class Sporozoea. Subclass Coccidia. Suborder Adeleina. Genus *Hepatozoon*. Suborder Eimeriina. General characters and classification. Family Eimeriidae: Genera *Eimeria* and *Isospora*. Family Cryptosporidiidae: Genus *Cryptosporidium*.

Topic 9. Suborder Eimeriina (continued). Family Sarcocystidae. General characters and classification. Genres *Toxoplasma, Besnoitia, Neospora* and *Sarcocystis*.

Topic 10. Suborder Haemosporin. General characters and classification. Family Plasmodidae: Genera *Plasmodium, Haemoproteus* and *Leucocytozoon*.

Topic 11. Subclass Piroplasmia. Order Piroplasmide. General characters and classification. Family Babesiidae: Gender *Babesia*. Family Theileriidae: Gender *Theileria.*

Topic 12. Phylum Ciliophora. General characters and classification. Family Balantidiidae: Gender *Balantidium*.

Topic 13. Phylum Microspora. General characters and classification. Order Microsporida. General characters and classification. Genera *Encephalitozoon* and *Nosema*.

Topic14. Phylum Myxozoa. General characters and classification. Class Myxosporea. General characters and classification. Study of genera of veterinary interest.

HELMINTOS (8 + 10 hours)

Topic 15. Helminths. General characters and classification. Phylum Platyhelminthum. General characters and classification. Class Trematoda. General characters and classification. Subclass Monogenea. General characters and classification. Study of genera of veterinary interest.

Topic 16. Class Trematoda (continued). Subclass Digenea. General characters and classification. Family Fasciolidae. Family Dicrocoelidae. Family Paramphistomidae. Family Schistosomatidae. Family Diplostomatidae. Study of genera of veterinary interest.

Topic 17. Class Cestoda General characters and classification. Order Pseudophyllidea. Family Diphyllobotridae. Order Trypanorhyncha. Family Gymnorhynchidae. Study of genera of veterinary interest.

Topic 18. Order Cyclophyllidea. General characters and classification. Family Mesocestoidae. Family Anoplocephalidae. Family Dipylidiidae. Study of genera of veterinary interest.

Topic 19. Family Taeniidae. Genera *Taenia* and *Echinococcus*.

Topic 20. Phylum Nemathelminthum. General characters and classification. Class Nematoda. General characters and classification. Subclass Secernentea. General characters and classification.

Topic 21. Order Rhabditida. Family Rhabditidae. Family Strongyloididae. Order Oxyuride. Family Oxyuridae. Study of genera of veterinary interest.

Topic 22. Order Ascarida. Family Heterakidae. Family Ascaridae. Family Ascaridiidae. Study of genera of veterinary interest.

Item 23. Order Strongylida. Superfamily Matastrongyloidea. Family Metastrongylidae. Family Protostrongylidae. Study of genera of veterinary interest. Family Angiostrongylidae. Family Crenosomatidae. Family Filaroididae. Study of genera of veterinary interest.

Topic 24. Order Strongylida (continued). Superfamily Trichostrongyloidea. Family Dictyocaulidae. Family Trichostrongylidae. Family Ollulanidae. Study of genera of veterinary interest.

Topic 25. Order Strongylida (continued). Superfamily Strongyloidea. Family Strongylidae. Family Chabertiidae. Family Syngamidae. Superfamily Ancylostomatidae. Study of genera of veterinary interest.

Topic 26. Order Spirurida. Superfamily Filarioidea. Family Onchocercidae. Subfamily Onchocercinae. Subfamily Setariinae. Subfamily Dirofilariinae. Study of genera of veterinary interest.

Topic 27. Order Spirurida (continued). Superfamily Habronematoidea. Superfamily Thelazioidea. Family Thelaziidae. Study of genera of veterinary interest. Superfamily Spiruroidea. Family Spirocercidae. Family Gongylonematidae. . Study of genera of veterinary interest.

Topic 28. Subclass Adenophorea. Order Enoplida. Superfamily Trichinelloid. Family Trichinellidae. Family Trichuridae. Study of genera of veterinary interest.

ARTROPODOS (5 hours)

Topic 29. Phylum Arthropoda. General characters and classification. Study of the species of interest as causes of disease and their role as transmitters of diseases (vectors). Class Pentastomide. General characters and classification. Family Linguatulidae. Study of the genres of interest.

Topic 30. Class Arachnida class. General characters and classification. Study of the suborders Prostigmata, Mesostigmata and Astigmata. Study of genera of interest in Veterinary Pathology.

Topic 31. Suborder Metastigmata. Family Ixodidae. Family Argasidae. Study of their role as transmitters or carriers of diseases. Study of the genus of greatest veterinary interest.

Topic 32. Class Insecta General characters and classification. Study of their role as transmitters or carriers of diseases. Study of the genus of greatest veterinary interest.

Topic 33. Order Hemiptera. Order Phtiraptera. Order Coleoptera. Order Siphonaptera. Role they play as carriers of diseases and study of the species of greatest interest.

Topic 34. Order Diptera. General characters and classification. Suborder Nematocera, Brachycera and Cyclorrapha. Study of the genres of greatest interest.

PRACTICAL TEACHING

The practical teaching of the subject of Parasitology is aimed at students acquire the skills and abilities necessary to know how to manage and understand mainly the diagnosis and also the epidemiology, pathogenesis and prevention of diseases produced by parasites (protozoa, helminths and arthropods) in domestic animals and animals of veterinary interest. To do this, the student must know the morphology and structure, taxonomy and systematics of parasite living beings that appear in the theoretical contents of the subject.

They must also know and understand the fundamentals of parasitological diagnostic techniques for later use.

They are structured in 10 sessions of 2 nominal hours each.

1ª. - Study of the fundamentals of parasitological diagnostic techniques. They will be carried out with a computer and other computer tools.

12 groups

2ª. - Study of the morphology of the Protozoa (I). Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools

12 groups

3ª. - Study of the morphology of the Protozoa (II). Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools and with a microscope.

24 groups

4ª. - Study of the morphology of the Cestodes. Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools and with a microscope.

24 groups

5ª. - Study of the morphology of Trematodes. Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools and with a microscope.

24 groups

6ª. - Study of the morphology of the Nematodes (I). Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools and with a microscope.

12 groups

7ª. - Study of the morphology of Nematodes (II). Identification of the different taxonomic groups and the evolutionary stages of each group. They will be made with a computer and other computer tools and with a microscope.

24 groups

8ª. - Study of the morphology of insects. Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools and with a microscope.

24 groups

9ª. - Study of the morphology of Mites. Identification of the different taxonomic groups and the evolutionary stages of each group. They will be carried out with a computer and other computer tools and with a microscope.

24 groups

10ª. - Presentation and evaluation of the practical work. Assessment of knowledge and skills acquired in practical classes

24 groups

4.4.Course planning and calendar

The dates and key milestones of the course are described in detail, along with the rest of the subjects of the second year in the Veterinary Degree, on the website of the Faculty of Veterinary Medicine (link: http://veterinaria.unizar.es/gradovet/plan.php). This link will be updated at the beginning of each academic year.

They will also be available in more detail through the ADD teaching platform (Blackboard 9.0).

4.5.Bibliography and recommended resources

http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=28417