



جامعة الناصر
AL-NASSER UNIVERSITY

Entomology: Understanding the importance of insects

Dr. Ahmed Munir

AUTHORIZED BY AL-NASSER UNIVERSITY'S RESEARCH OFFICE

جميع حقوق النشر محفوظة لمكتب البحوث والنشر بجامعة الناصر

Abstract

The study of insects is called entomology. As a field of study, entomology offers a wide range of diverse topics that can be finely focused or widely dispersed as a study. Insects are amazingly diverse and offer a great range of solutions to everyday problems as well as many negative attributes and impact human life. Beneficial insects, has insects, socially important insects, and insects that we know nothing about are the focus of entomology at the whole. Every day we discover why insects are important in every day we discover new and unusual means to utilize the advantages of insects toward improving human life. The following is an overview of entomology as a course of study. Within the following paragraphs are examples of what insects do, how they benefit us, their role as a pass, and some information on emerging technologies that involve insects.

Taxonomy and the understanding of insects

We often think of insects as bugs, but insects are not just bugs, they are also many other things. In fact, there are about 30 orders of insects that, from a taxonomical point of view help to divide up insects into orders and families. A great example of this is the hemipteran insects, which have the common name of bugs. Scientifically, hemipteran insects are true bugs whereas a beetle, for example, is in the order Coleoptera and not a bug at all. A case of mistaken identity is the lady bug, which is not a bug, but a beetle. Insects play a huge role in lives of man. Without insects, the food choices available to people would be quite limited. Insects represent a great deal interest to those of us who study entomology. Entomology is a vast field that allows students to focus on both specific families of insects or on broader ranged topics.

Insects as pests: It is really a matter of perspective

If you were asked to list one insect that was a pest, what would your answer be? The Illinois Department of Health listed Ants, Asian Tiger Mosquito, Bed Bugs, Bees and Wasps, Clothes Moths and Carpet Beetles, Fleas, Head Lice, House Flies and a whole lot of other organisms as pests. According to online dictionaries an insect pest is an organism that is destructive to crops. The broader sense of the word pest involves an insect that affects human life. An example are the mosquitoes that carry malaria. What a pest insect is defined as often amounts to where you are in the world. In the United States, ants are a huge pest problem, perhaps the greatest pest problem for that nation. This is only true because most American's do not have to deal with Malaria or other pathogens that many people around the world must deal with on a daily basis. This is an area of entomology that crosses over disciplines. Most pest management lines of study involve crop protection. Most disease related entomology

courses focus on the medical and epidemic portion of entomology. A great resource for looking at medical entomology and epidemiology can be found at the river blindness site at the University of Ngaoundere. River blindness is only one disease that is caused by insects. Typhus is a disease that is caused by ticks and lice. Typhus has a historical impact on western civilization because this was a disease that defeated Napoleon, not once, but twice.

When we talk about insects as pests, what we are really talking about is really a matter of perspective. Usually that involves the destruction of crops. This event has shown that destroyed crops offer a benefit within the ecosystem that might prove beneficial to humans. Many times when we see populations of pest insects they are merely a symptom of the situation that was created by humans. If you look at the epidemic of bark boring beetles, that infect many of the Western states within the United States, what we see as the results of this epidemic is a reflection of a flaw within timber management plans. Too many trees allowed to grow too close together limited resources available to each tree. Entomology and the study of beetles has shown us that trees have a defense mechanism that they use to fight off bark boring beetles. By studying trees and the interaction between a tree and bark boring beetles, we have discovered that trees use sap to push beetles out. As a means of maximizing timber harvest humans have allowed trees to grow too close together. This is created a situational, where future user getting enough water to produce adequate levels. Thus, the invitation for beetles is wide open. From one, perspective, we see that the beetles are a pest. They are destroying trees that humans are growing for timber. From a natural perspective, nature is using the beetle to kill off trees so that a healthy population of trees within the forest can exist. By being able to study entomology and other environmental sciences, humans are learning that the role of the pest insect is really a matter of perspective.

Insects as food

Insects have been a food source for many people around the world for generations. Today, there is significant talk about how to grow insects for food. As the world faces food shortages, the study of Entomology offers a viable solution to food security issues. Insects not only breed quickly, they are a great source of protein. The University of Minnesota offers a great blog that not only discusses entomology in depth, but also discusses insects as a food crop. Insects as a source of food for humans is an emerging educational opportunity. We have long known the value of insects in indigenous cultures, but are only just now seriously looking at how to sustainably grow insects as a crop. An example of such two such insects would be grasshoppers and larvae.

One of the problems that humanity faces is the exponential growth of human population. From the beginning of time and till about the mid-1800s, the populations in humans remains fairly flat lined. About the time of the Industrial Revolution in the United States, the human population began to expand rapidly. It is estimated that around 2050 that the human population will achieve the 9 billion people mark. The impact of this is predicted to bring about

the shortage and food. Entomologists are looking closely at how to grow crops of insects for food. Insects as a food source is just one answer to the global problem of food insecurity.

Insects that are beneficial

When we discuss beneficial insects the first role that comes up is usually pollinators. Pollinators, such as bees, are very important in the production of food for humans, but this is just one role that insects play as beneficial to humans. Insects that provide medicines that treat human disease are also very important. Chemical prospecting is an important part of the study of Entomology. A basic cure for localized allergies is found in honey while fireflies offer a potential source for medication that helps to treat cardiac conditions. The science of pharmacology is combining with entomology to look at the potential that insects have in the world of medicine. Entomology has long studied the defensive role of insects, and it is within that role that new medications may be obtained and used to treat human disease. If you want to discuss the role that insects have played in everyday life, we need only look to the contents of your cars radiator. Entomologist who were studying beetle behavior in tundra locations were amazed to discover beetles that were active on snow fields during winter. As it turns out, these beetles produce a natural antifreeze that prevents their body from freezing due to the cold. That discovery led to the invention of antifreeze, which is been a valuable discovery for people who live in colder climates. As a course of study, entomology offers a very wide and diverse feel or people can find a topic of interest and then pursue that topic has a career. Whether we talking about chemical prospecting for potential medications, understanding the reasons behind signs symptoms of insects within an environment, or looking at how insects can be used to solve global problems the role of entomology in the modern world is as important as ever.

Insects that are important to society

Society has a lot of needs, many of which can be addressed using insects. As our populations continue to advance, and more challenges crop up the fields of entomology becomes more and more critical. Entomology programs are offered around the world. As humans become more aware of their environment, and the impact that humanity has on the environment, the ideas of things like biodiversity become very important. Insects play a role across all levels of biodiversity. From the misunderstood role of the cockroach to the critical role that wasps play in maintaining human culture. The role of an insect can almost be determined by looking at what the insect eats. Cockroaches. For instance, each dead and decaying material. In terms of human culture, but cockroach plays a very important role in removing dead organic material that would otherwise lead to human disease. Wasp, on the other hand, our predator words that help to keep insects and other invertebrate populations under control. The benefit that wasp provide to humanity is still not fully understood. The biodiversity of insect populations is critical to the quality of human culture. For those people who are interested insects and the study of entomology, there are many educational opportunities around the world. The reality of the study of entomology is that we know so little

about the role of insects, even though entomology has been an academic field of study for hundreds of years. There is a great opportunity for people who wish to study insects because the needs of the future will be determined by the role that insects play within our society. Museums and universities have collected a lot of insects, but we don't really know much about them. The focus of entomology needs to be on the behavior and the impact or role that insects play within an environment, we have some general ideas of what happens within an environment that we don't have enough information about how insects interact with the environment. What happens when you remove an insect population from the environment? We don't always have these answers yet the answers to these kinds of questions directly impact the quality of human life

Entomologists provide a real service to humanity. The focus is about the relationship between humans, insects, and the environment. The health of the ecosystem is dependent upon the exploration of these relationships. The aspects of entomology include human understanding of agriculture of human and animal health, biology and even criminology in the form of forensic entomology. A professional entomologist is someone who is actively contributing to a better humanity. Not benefit can be improving in the scientific data that we have about disease, the spread of disease, the impact on crops and agriculture, as well as contributing to our understanding of how insects are beneficial to humans. As such, the career opportunities for noon tomorrow is very wide. This allows entomology students to focus on the job that they truly love, whether that be fieldwork or laboratory research there something for everybody in the field of entomology. In closing out this article, I'd like to talk to little bit about the history of entomology. In terms of human interest. One of the most basic impacts that insects have had on humans might be the silkworm. The silkworm is responsible for a great contribution in the economic development of certain communities. Without insects, the ability to develop predictable agriculture, would have been impossible. Without insects, mankind would have had to rely upon plants that were when pollinated. That means that we would not have flowers, we would not have fruit and we would not even have many of the vegetables that we grow today. Without the study of entomology cheers for certain diseases would not exist. A great example would be the black plague which killed off a significant portion of the human population in Europe. If you're looking for career that will certainly impact the quality of human life, then consider the benefits of entomology. Entomology offers a great way to explore the world the cultures of the world and a way to understand the environments and ecosystems of our world. many universities worldwide offer programs in entomology that range from beginning classes all the way to PhD programs. With modern technology and online learning, students from around the world can participate in an entomology program. Take some time in explore all of the programs that are available for entomology. The following resources are partial list of articles and entomology programs offered by various universities from around the world.

Resources:

Pest Management:

- [Entomology and Pest Management](#) Via Illinois Department of Health
- [Journal of Integrated Pest Management](#) Via Entomological Society of America
- [Medical Entomology and Epidemiology](#) Via the University of Ngaoundere

Medical Entomology and Epidemiology

- [List of diseases caused by Insects](#) Via Wikipedia

Insects as Food:

- [University of Minnesota](#) Department of Entomology
- [Edible Insects](#) Via Wiley Online Library
- [The Human Use of Insects as food](#) Via Wisconsin State University.

Entomology Degree Programs:

- [Penn State University](#)
- [Oregon State University](#)
- [University of Nebraska](#) Study Abroad Program
- [University of the Witwatersrand](#), Johannesburg
- [University of Pretoria](#)