Insect Ecology and Behavior

About this module 2022-2023

- Module Code: 409.
- Module Name: Insect Ecology and Behavior.
- Specialty: Entomology and Chemistry.
- Year Group: 4^{th}
- Number of Teaching Units: 4h per week of lecturing and 3h per week of practical.

Teaching Materials and Evaluation

- **Textbook: Price, P.W., R.F. Denno, M.D. Eubanks, D.L. Finke, and I. Kaplan. 2011**. Insect ecology: behavior, populations, and communities. Cambridge University Press, and up to date ecological and entomological literature.
- **Discussions**: There will be scheduled discussion sessions where we will consider historical and current primary literature.
- Students will lead and stimulate each discussion.
- Evaluation and Grading will be emphasized on preparation, engagement, and **quality** of participation (not on **quantity**)
- **Quizzes** : Biweekly 15 minutes (TBA)

Date: / /

Subject:

[1] Terrestrial insects (Soil insects)

1- Collembola sp.

* Taxonomic Position:-

Order : Collembola

Family : Isotomidae (Entomobrygidae)

e.g. : Isotoma sp. (Collembola sp.)

* Comment adaptations of insects in its environment

antennae are present, absence of wings. Feed on leaves, Fungi, bacteria and Soil organic matter so Mouth parts are chewing. in 1st abdominal segment has Collophore and 4th has Furcula.

[2] Aquatic insects

1. Lethocerus niloticus

* Taxonomic Position:-

Order : Hemiptera

Suborder: Heteroptera

Family : Belostomatidae

e.g. : Lethocerus niloticus

* Comment adaptations of insects in its environment

The 1st legs for seizing Prey legs so thy feed on Larvae and small fish as Predator So Thy have piercing and sucking Mouth parts

2nd, 3rd Pairs of legs for swimming.

Date: / / التاريخ: / /

Subject: ..... موضوع الدرس: .....

2. Cybister tripunctatus africanus

* Taxonomic position مرتبته العلمية

Order: Coleoptera

Suborder: Adephaga

Family: Dytiscidae

e.g.: Cybister tripunctatus africanus

* Comment adaptations of insects in it's environment.

Its beetle adapted to living in water, it rise to water surface to take atmospheric air into their tracheal system or take Carry an air bubble between their abdomen and wings and Prevents water From getting into spiracles, they have Fringed, hairy hind Legs adapted for swimming. The beetles are predators, Feeds on Larvae and Small fishes so have Chewing Mouth Parts

3 Domestic insects

1- Periplaneta americana الصرصور الأمريكي

* Taxonomic position

Order: Blattodea

Family: Blattidae

e.g.: Periplaneta americana

* Comment adaptations of insects in it's environment.

Flattened broad body, Mouth parts Mandibulate, antennae: Very Long, Setaceous, wings: Fore wings Tegmina, hind wings membranous Legs: Walking, well developed, abdomen 10 segments.

Feed on Decayed matter

Date: / / التاريخ: / /

Subject: ..... موضوع الدرس: .....

2. Blattela germanica الصرصور الألماني

* Taxonomic position

Order: Blattodea

Family: Blattidae

e.g. : Blattela germanica

* Comment adaptations of insects in its environment

Mouth parts: Mandibulate, antennae: very long and Multiarticulate. walking Legs well developed. forewings Sclerotized, hing wings memberaneous. Small in size.

Feed on Organic matter

3- Musca domestica الذبابة المنزلية

* Taxonomic position

Order: Diptera

Suborder: Brachycera

Family : Muscidae

e.g. : Musca domestica

* Comment adaptations of insects in it's enviroment

- flies are well adapted for aerial movement and typically have short bodie.
- Mouth parts are sponging, often adapted to absorb liquids.

antennae are aristate. hind wings are reduced to small, club-Shaped Structures Called halters, only the memberanous front wings Serve as aerodynamic surfaces. The halters vibrate during flight and work much like agyroscope to help the insect maintain balance.

Date: / /

Subject:

4 Desert insects

1- Schistocerca gregaria الجراد الصحراوي

* Taxonomic position

Order: Orthoptera

Sub order: Caelifera

Family: Acrididae

e.g. : Schistocerca gregaria

* Comment adaptations of insects in it's environment.

- Mandibulate mouth parts, short filiform antennae, forewings tegmina and hind wings membranous. Legs, walking legs with saltatorial (كبيرة) hind legs are elongated for jumping. with strong hearing. Feeding on leaves, flowers, bark and seeds.

5 Insects living in different Habitat through it's life cycle

1- Crocothemis erythraea الرماش الكبير

* Taxonomic position

Order: Odonata

Sub order: Anisoptera

Family: Libellulidae

e.g. : Crocothemis erythraea

* Comment adaptations of insects in it's environment.

they live in different habitat and even found in desert regions where water is present. Strong fliers, Large and robust (ضخم) at all stages. have 2 pairs of nearly similar net-veined wings with pterostigmata. Short walking legs. Catch and eat insect while they are flying including flies, wasps, moths and beetls. Nymph called naiads which are predators and feed on other insects in water. Some large naiads have been known to feed on small fish - so they have chewing M.P.

Date: / / التاريخ: / /

Subject: موضوع الدرس:

6 Agriculture insects

1- Sphodromantis bioculata فرس النبي الكبير

*Taxonomic position

Order: Mantodea

Family: Mantidae

e.g.: Sphodromantis bioculata

* Comment adaptations of insects in its environment.

Chewing mouth parts, with elongated Flexible Prothorax. Fore leg For Seizing Prey legs, 2nd, 3rd legs walking well develafed Mantids are predaceous, feeding on insects and Prey on Small birds, Lizards and amphipians. Fore wings are tegmina and have spot. These insects take the same of green Leaves colours.

2. Gryllotalpa africana

*Taxonomic position

Order: Orthopteta

Suborder: Ensifera

Family: Gryllotalpidae

e.g.: Gryllotalpa africana

* Comment adaptations of insects in its environment

The Mole-Cricket lives under ground. with Chewing Mouth Parts Fore legs modified into digging Legs. anteanae are Lenger than body living is nocturnal. with weak hearing. hind legs elongate for Jumping forewings are tegmina, hind wings are membranous and held folded fan-like under the Fore wings when at rest. Feeding on plant roots.

Date: / /

Subject:

3- Truxalis nasuta

*Taxonomic position

Order: Orthoptera
Suborder: Caelifera
Family : Acrididae
e.g. : Truxalis nasuta

*Comment adaptations of insects in its environment

Mandibulate mouth parts with antennae like lamellate.
Hind Legs modified into jumping legs , strong hearing.
Fore wings are tegmina and hind wings are memberanous.
Feeding on leaves, flowers , bark and seeds.

4- Phaneroptera roseata

*Taxonamic position

Order: Orthoptera
Suborder: Ensifera
Family : Tettigoniidae
e.g. : Phaneroptera roseata

*Comment adaptations of insects in its environment.

antennae are longer than the body, weak hearing.
Long ovipasitor, well-developed walking legs.
fore wings are tegmina and hindwings are membranous.
Feeding on Leaves, flowers, bark and seeds so Mandibulate Mouth parts.

Date: / / التاريخ: / /

Subject: موضوع الدرس:

5- Agrotis ipsilon

* Taxonomic position

Order: Lepidoptera
Family: Noctuidae
e.g. : Agrotis ipsilon

* Comment adaptations of insects in its environment

- 2 pairs of membranous wings that are covered in tiny scales - Pectinate antennae. Weak walking legs. Mouth parts are formed into a sucking tube known as a haustellum. Larvae called caterpillars with chewing mouth parts so they feed on foliage, some burrow into stems or roots, and some are leaf miners.

6- Earias insulana

* Taxonomic position

Order: Lepidoptera
Family: Noctuidae
e.g. : Earias insulana

* Comment adaptations of insects in its environment

2 pairs of membranous wings that are covered with tiny scales. Small in size. Weak walking legs.

Sucking mouth parts. Lepidoptera larvae are herbivores, Some species eat foliage, some burrow into stems or roots, and some are leaf-miners.

7- Sesamia Cretica

* Taxonomic position

Order: Lepidoptera
Family: Noctuidae
e.g.: Sesamia cretica

* Comment adaptations of insects in its environment

- 2 Pairs of membranous wings that are covered in tiny scales. Sucking Mouth Parts Present antennae ; weak walking legs. Cater pillar larvae feed on foliage, Some burrow into stems or roots and some are leaf miners So they have Chewing Mouth Parts.

8- Pieris rapae

* Taxonomic position

Order: Lepidoptera
Family: Pieridae
e.g.: Pieris rapae

* Comment adaptations of insects in its environment

2 Pairs of membranous wings that are covered with tiny scales. Front wings Large, triangular, hind wings fan shaped Sucking Mouth Parts, weak walking legs, Clavate antennae These insects have Dimorphism Phenomena, Femals have 2 spots on it's fore wings but male have 1 spot on it's fore wings. Cater pillar Larvae have Chewing Mouth Parts due to feeding on foliage, Some burrow into stems or roots and some are leaf miners.

Date: / / التاريخ: / /

Subject: موضوع الدرس:

9- Calosoma chlorostictum

* Taxonomic position

Order: Coleoptera
Suborder: Adephaga
Family : Carabidae
e.g. : Calosoma chlorostictum

* Comment adaptations of insects in its environment.

They live under the bark of trees, under logs, among rocks, sand or by the edge of ponds river. filiform antenae. Fore wings are elytra hind wings are membranous. These insects are predators of other invertebrates. feeding on adult so they have chewing Mouth parts.
They have 3 pairs of walking legs well developped.

10- Coccinella undecimpunctata

* Taxonomic position

Order : Coleoptera
Suborder: Polyphaga
Family : Coccinillidae
e.g. : Coccinella undecimpunctata

* Comment adaptations of insects in its environment.

They have bright colours with black head, Legs and antennae, with 11 black spots on their wings. few species considered as pests, but majority are useful insects as thy feed on Thrips, aphid or scale insects in the form of adults or Larvae.

Date: / /

Subject:

11- Paederus alfierii

* Taxonomic position

Order: Coleoptera
Suborder: Polyphaga
Family : Staphylinidae
e.g. : Paederus alfierii

* Comment adaptations of insects in its environment.

They distinguished by their short elytra that leave more than half of their abdomen exposed. It's Called Rove beetles. Larvae and adults are predators of insects and other kinds of invertebrates. Suchas aphid and Thrips.

12- Apis mellifera

* Taxonomic position

Order: Hymenoptera
Suborder: Apocrita
Family : Apidae
e.g. : Apis mellifera

* Comment adaltation of insects in its environment

• Biting and Lapping Mouthparts, Geniculate antennae. 2pairs of membranous wings joined together as one by hamuli The abdomen Contain the Sting apparatus. They feed on nectar and Pollen grains. Also they Play a Crucial role in Plants Pollination Process. The hind legs for Collecting food. Honey bee is Social insects.