PERILAKU SERANGGA

SENSOR SERANGGA

ENTOMOLOGI

Faculty of Agriculture Gadjah Mada University

Prepared by Suput@

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PERILAKU SERANGGA

- **Respon**
  - Menyenangkan
  - Tidak menyenangkan
- **Adaptasi**
  - Perubahan lingkungan

Sistem Endokrin

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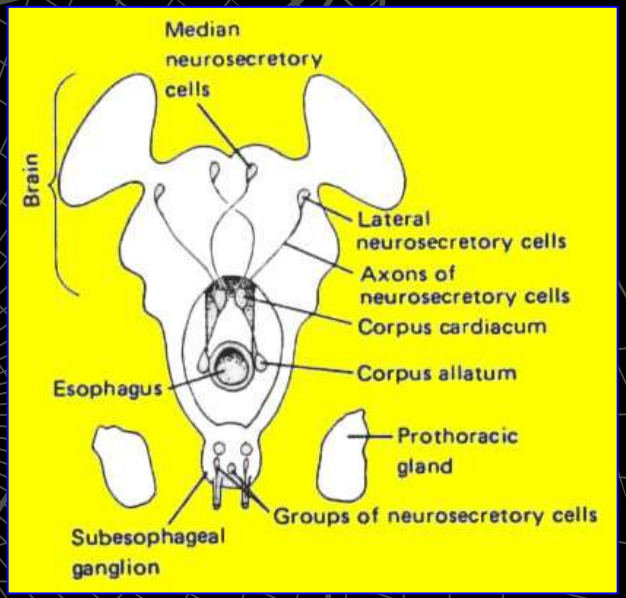
The Endocrine System

A relatively fast internal communication system related to nervous system



Chemical messengers or "hormones" in hemolymph

Hormones secreted by cells, often in the brain

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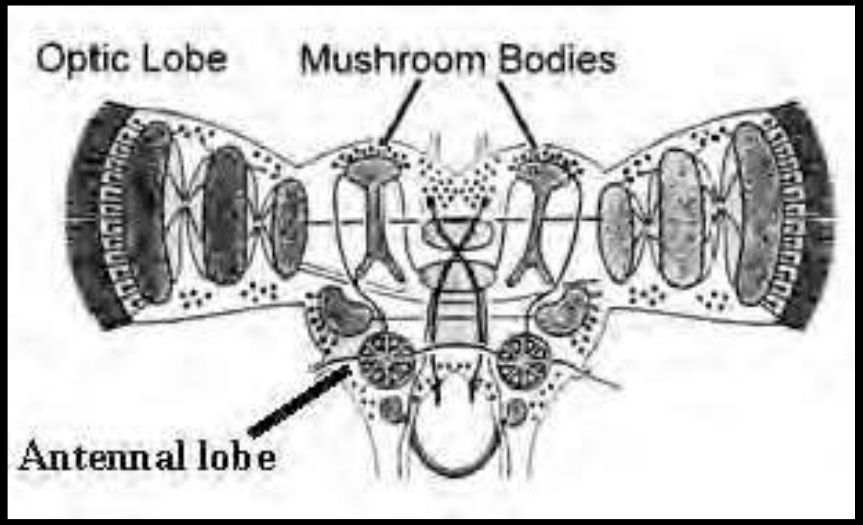
Otak Serangga

- **Protocerebrum**
  - Optic lobes
  - Ocellar lobes
  - Mushroom bodies
- **Deuterocerebrum**
  - Antennal lobes
- **Tritocerebrum**
  - Connections to frontal & subesophageal ganglia



Endocrine Control of:

- Reproductive processes, development, breaking diapause,
- Behavior-defense, mating, egg laying,
- Homeostasis-sugar, fat and protein production and use

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Innate Behavior Serangga

- **Heritable**
  - Generasi ke Generasi
- **Intrinsic**
  - Spesies Terisolasi
- **Stereotypic**
  - Selalu dari Waktu ke Waktu
- **Inflexible**
  - Bukan berdasarkan Pengalaman
- **Consummate**
  - Ekspresi dari awal Pertumbuhan/Perkembangan

Dance flies mating. The female is consuming a nuptial gift.

Can Insects Learn?

Most insect behavior is genetically programmed, or innate. But can an insect change its behavior as a result of its experiences?

In other words, can insects learn?

SENSOR SERANGGA

- **Mechanical stimuli**
  - Tactile mechanoreception
  - Position mechanoreception
  - Sound reception
  - Sound production
- **Termal stimuli**
  - Thermoreception
  - Thermoregulation
- **Chemical stimuli**
  - Chemoreception
  - Semiochemicals: pheromones, kairomones, allomones, synomones
- **Insect vision**
  - Dermal detection
  - Stemmata
  - Ocelli
  - Compound eyes
  - Light production

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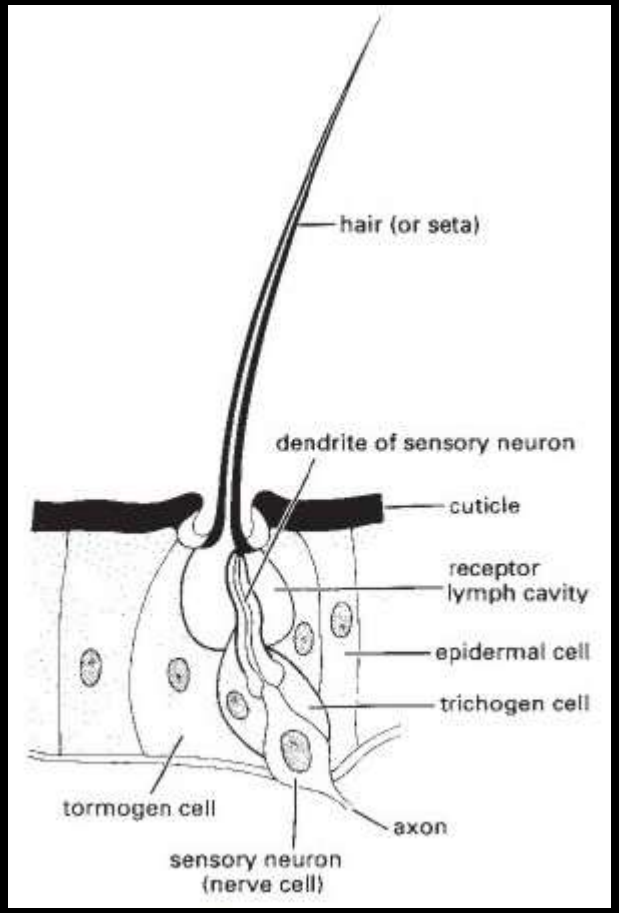
SENSOR SERANGGA

- **Mechanical stimuli**
  - Tactile mechanoreception



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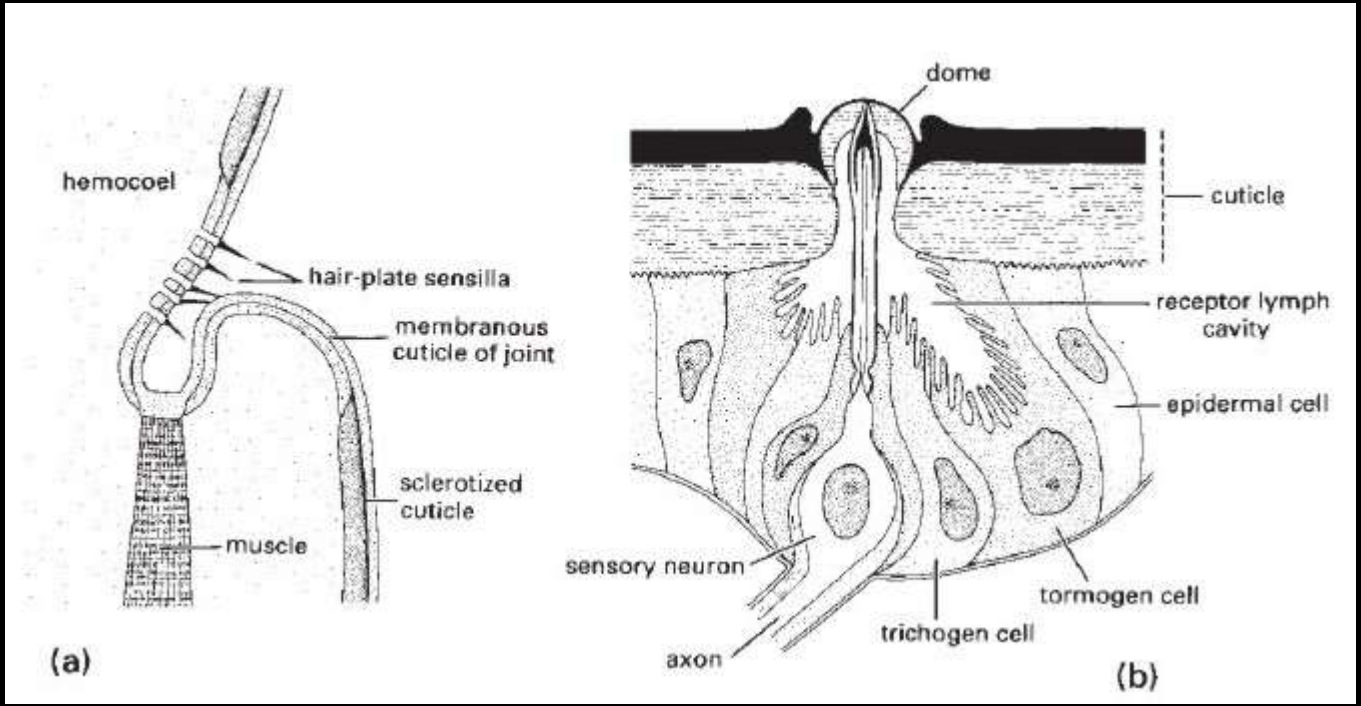

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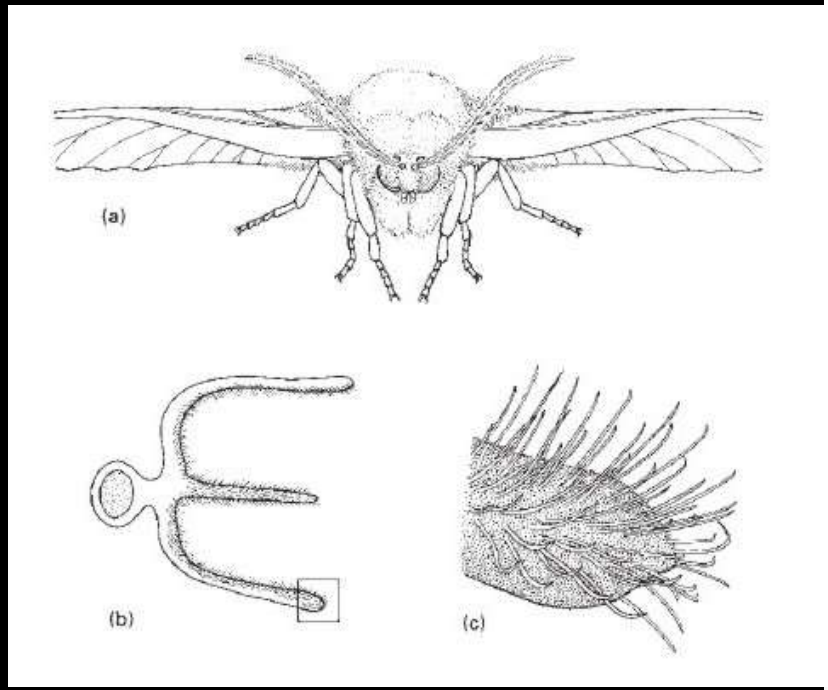

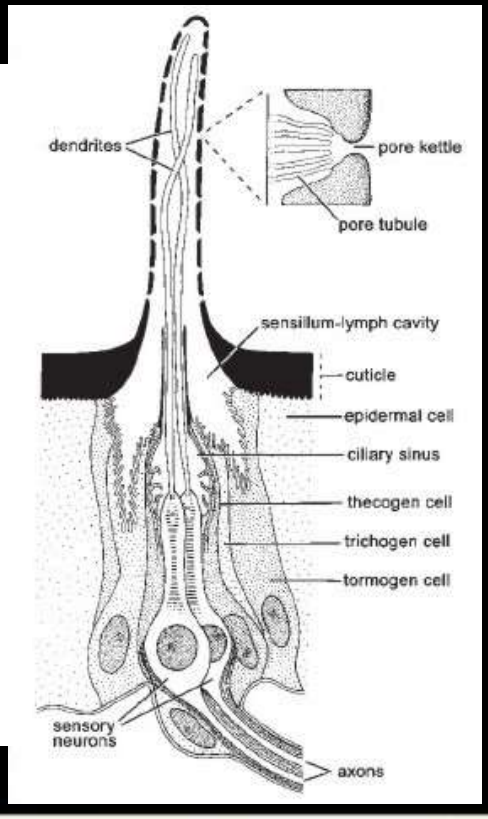

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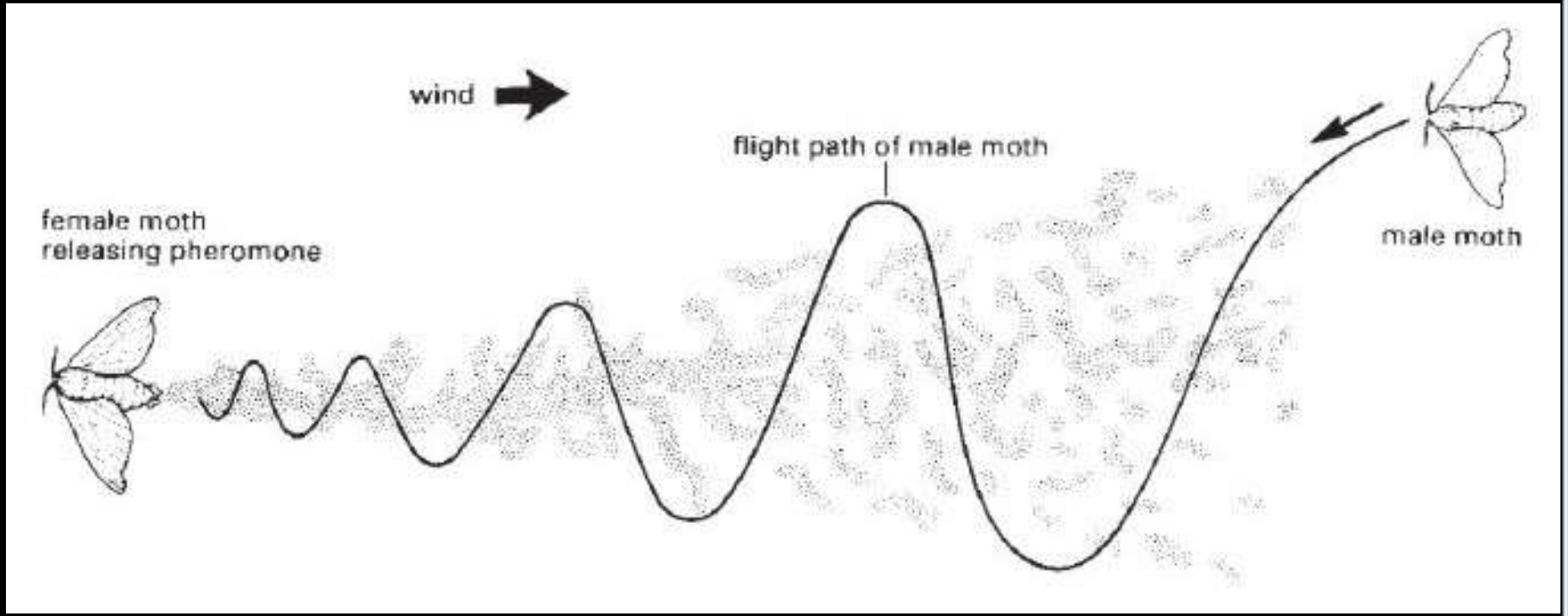

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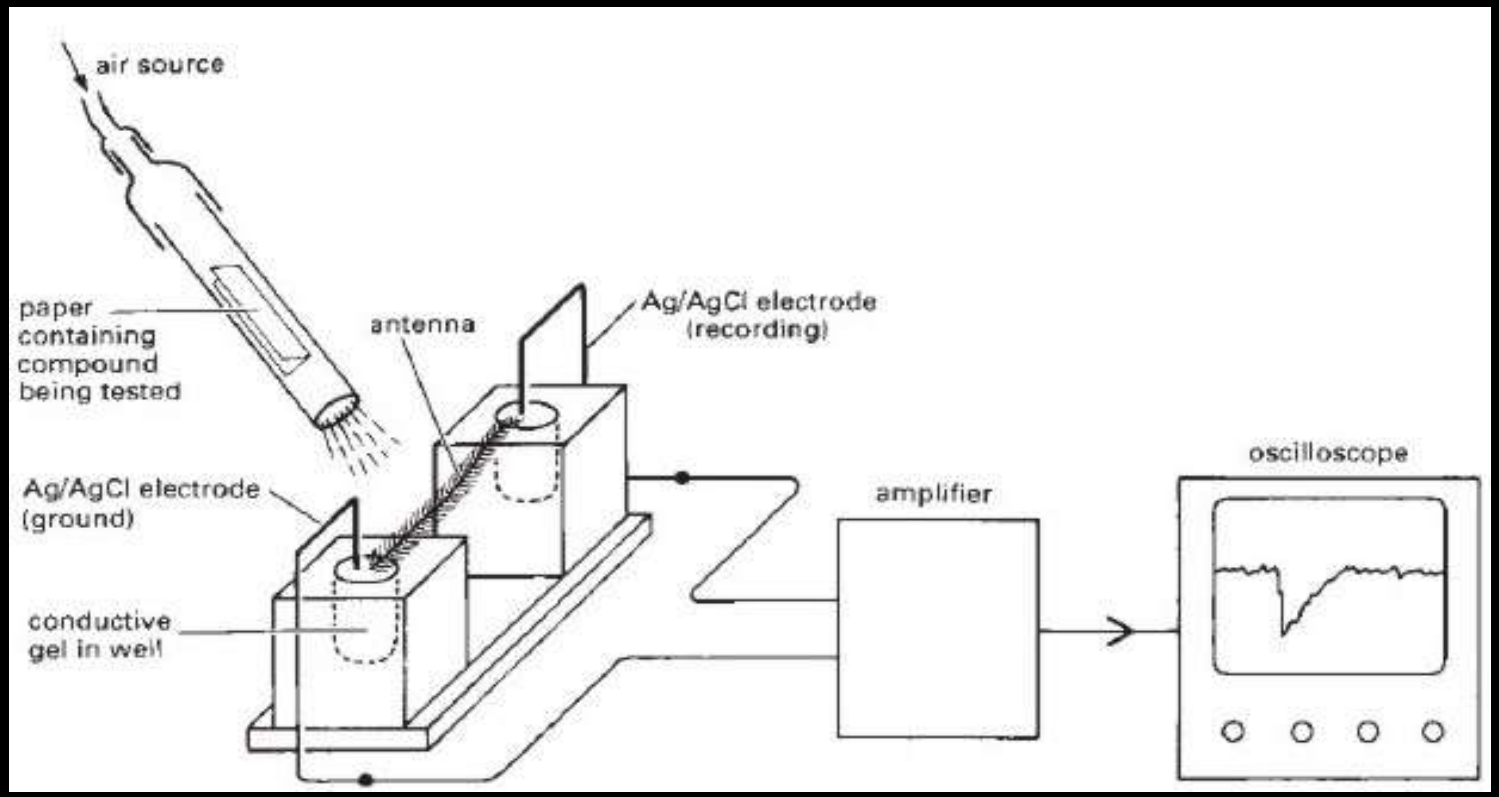

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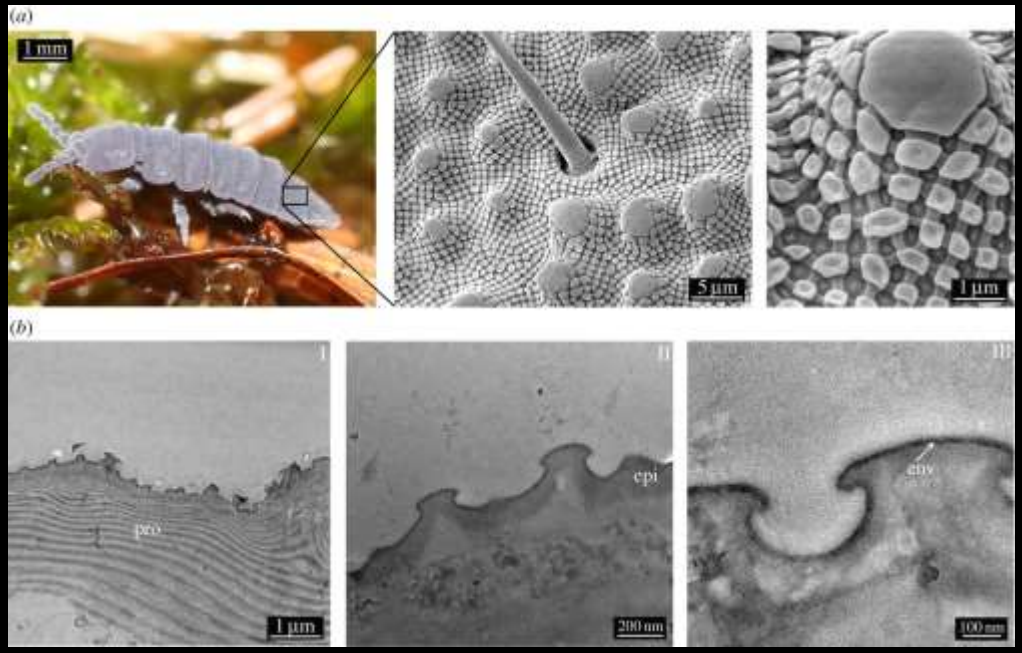
SENSOR SERANGGA

- **Insect vision**
  - Dermal detection

In insects able to detect light through their body surface, there are sensory receptors below the body cuticle but no optical system with focusing structures.



Tetrodontophora bielanensis

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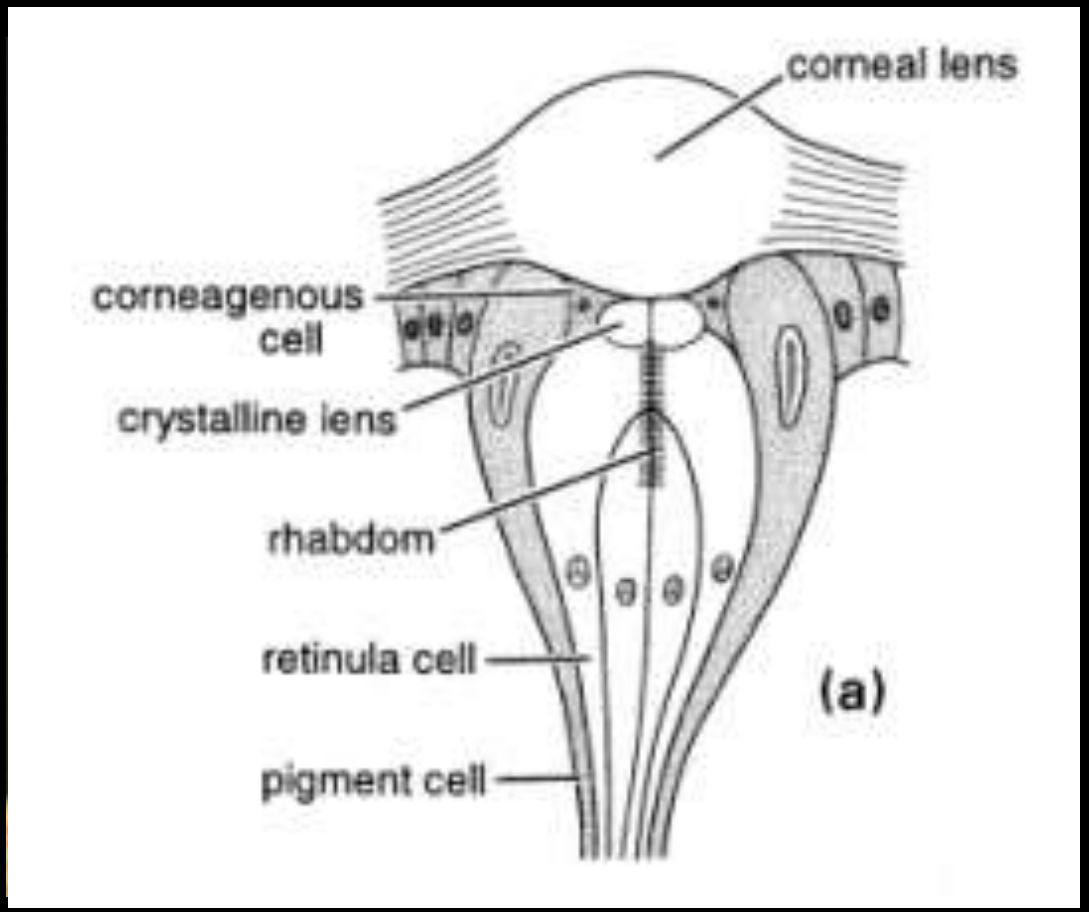
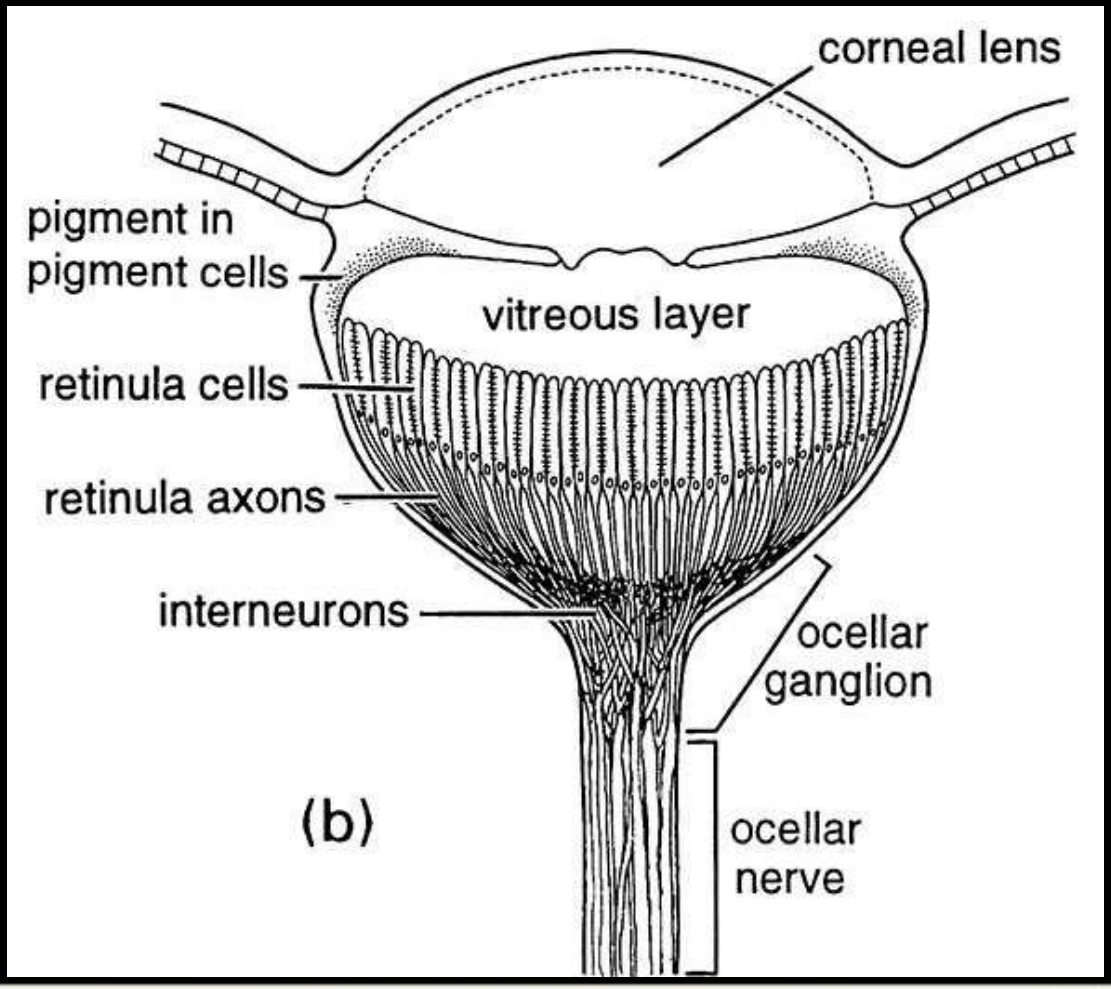
SENSOR SERANGGA

- **Insect vision**
  - Stemmata



SENSOR SERANGGA

- **Insect vision**
  - Ocelli



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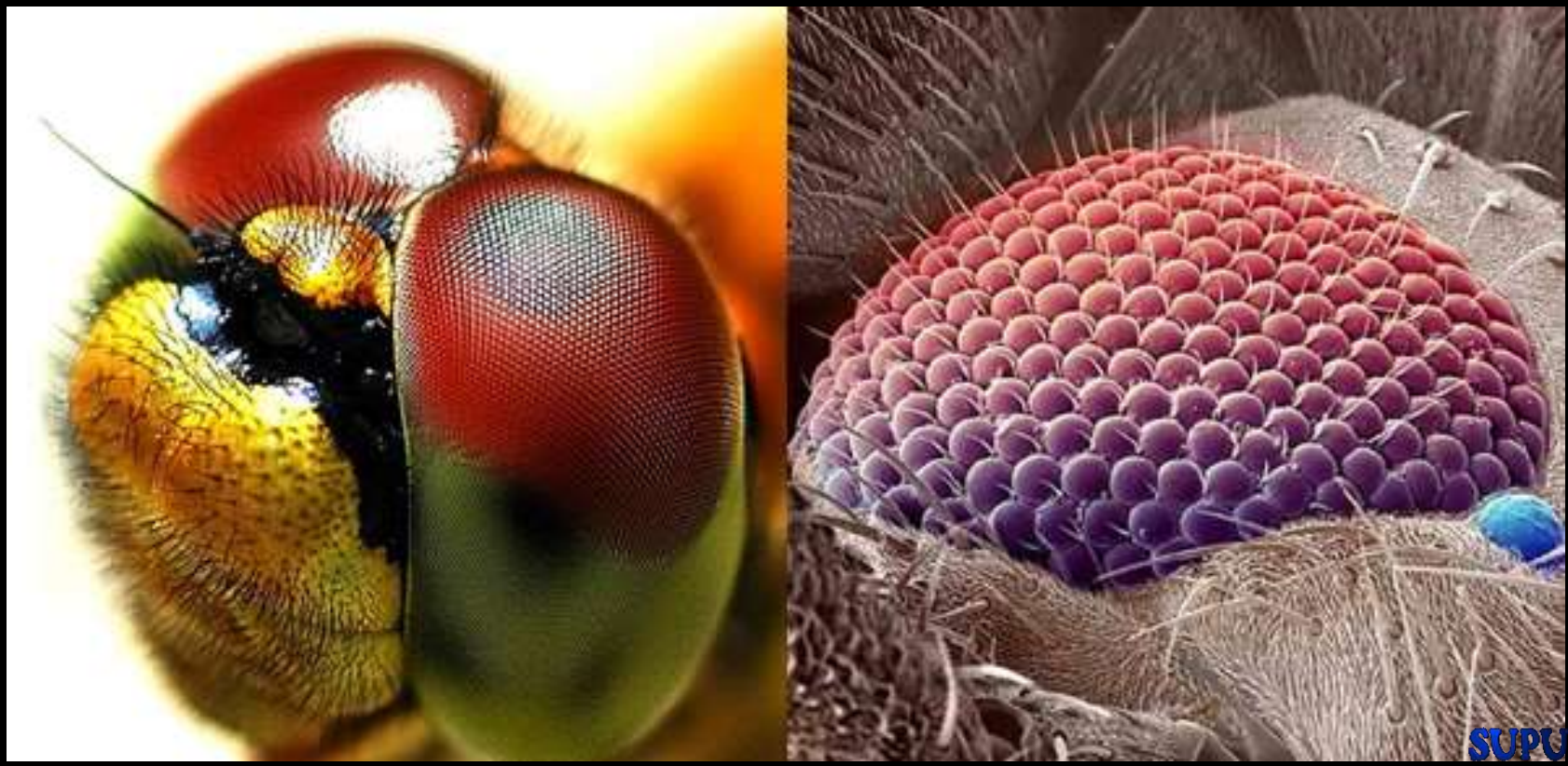
SENSOR SERANGGA

- **Insect vision**
  - Compound eyes



KAIST Prof. Yang Seung-man develops micro-sized insect eye structure

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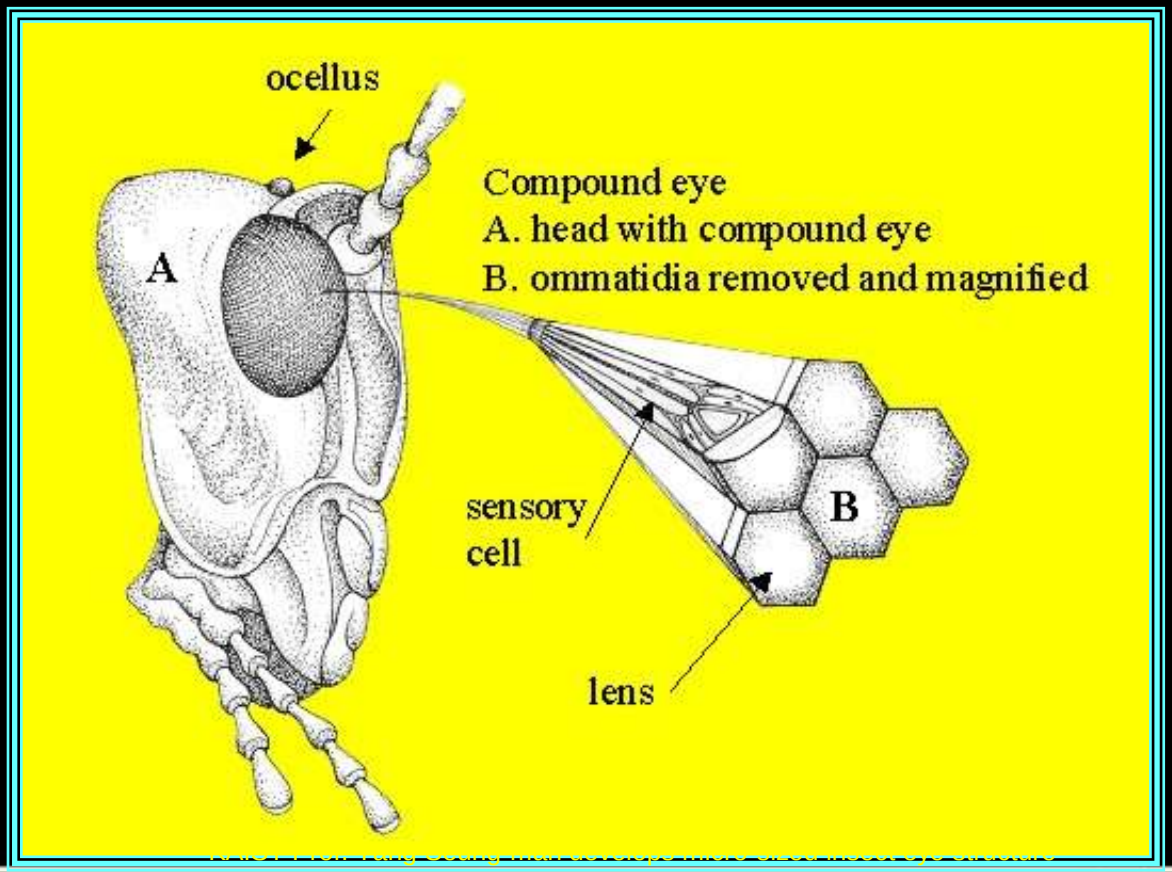

SENSOR SERANGGA

- **Insect vision**
  - Light production

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SENSOR SERANGGA

- **Insect vision**
  - Light production

SENSOR SERANGGA

- **Insect vision**
  - Light production

Arachnocampa luminosa - tiny bioluminescent creatures that produce blue and green light, live exclusively in New Zealand

Pertahanan diri serangga

- merupakan respon yang muncul akibat ancaman musuh pada kelangsungan hidupnya.

Status serangga sebagai pakan serangga lain (predator/parasitoid) atau hewan lain selain serangga (arachnida, pisces, reptil, aves, mamalia)

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PERTAHANAN DIRI SERANGGA

Primer

Sekunder

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PRIMER

- Cryptic
- Aposematism
- Mimicry

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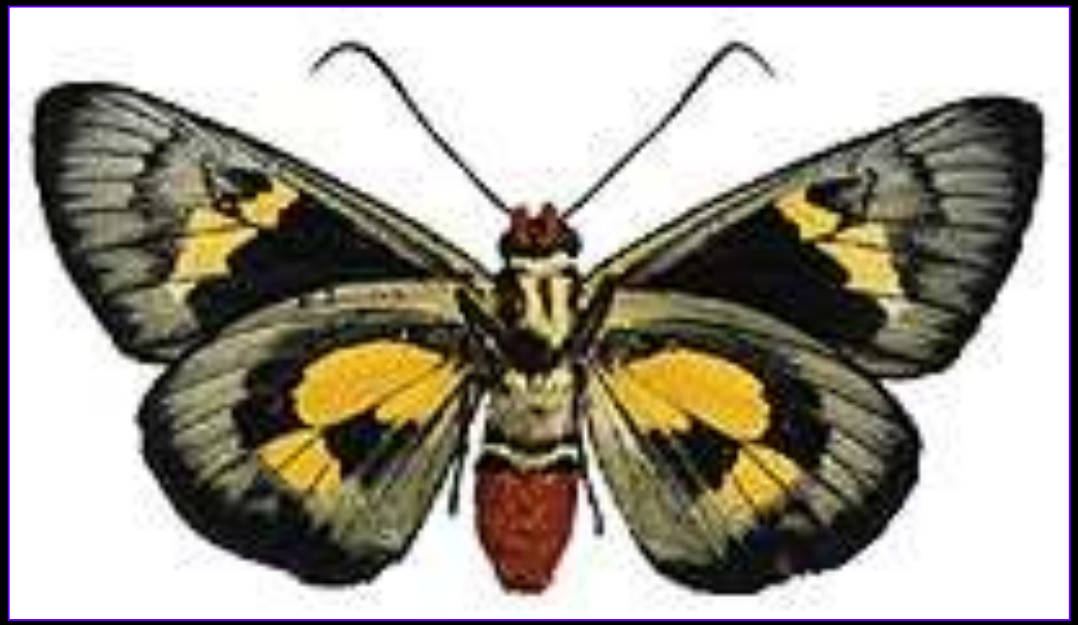
Cryptic

Serangga yang mempunyai kemiripan warna/bentuk dengan benda di sekitarnya (yang dihinggapi)

Aposematism

Spesies serangga yang mempunyai warna mencolok sebagai tanda bahwa serangga tersebut berbisa



Müllerian mimicry

a natural phenomenon in which two or more poisonous or venemous species, that may or may not be closely related and share one or more common predators, have come to mimic each other's warning signals.

Batesian mimicry

a form of mimicry typified by a situation where a harmless species has evolved to imitate the warning signals of a harmful species directed at a common predator.

Mimicry

Danaus plexippus

Limenitis archippus

Batesian mimicry: Monarch *(Danaus)* is poisonous; viceroy *(Limenitis)* is palatable mimic

Heliconius erato

Heliconius melpomene

Heliconius sapho

Heliconius cydno

Müllerian mimicry: two pairs of mimics; all are distasteful

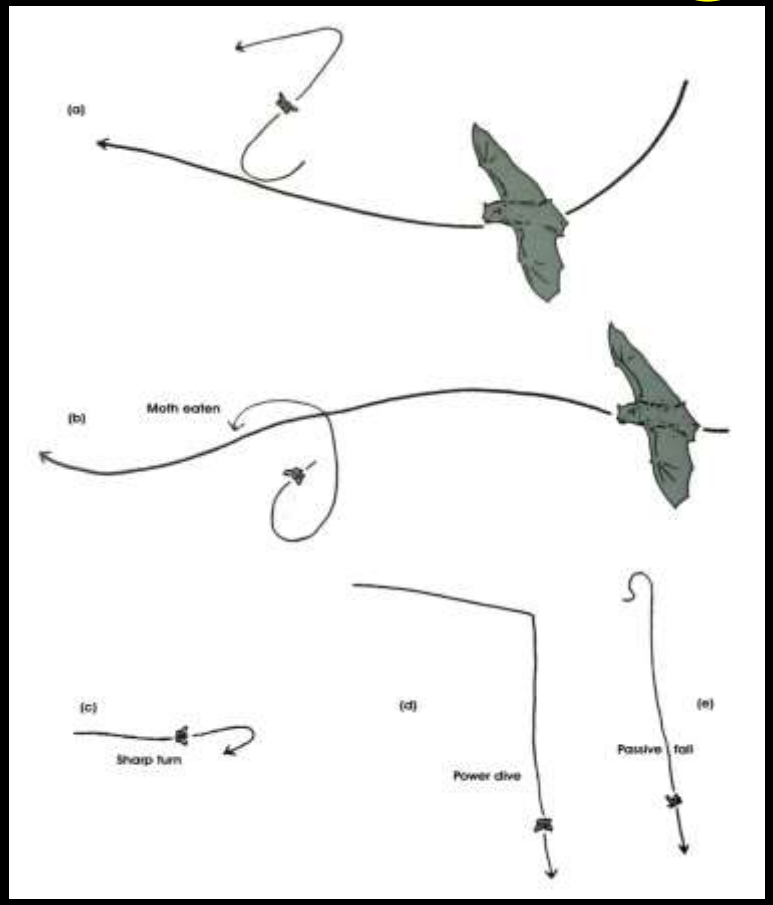
Mimicry

Spesies serangga yang mempunyai kemiripan dengan spesies lain

SEKUNDER

- Pola terbang
- Pura-pura mati
- Menyengat
- Melepaskan bagian anggota tubuh
- Mengelak serangan
- Mengejutkan
- Menggunakan bahan kimia

Pola terbang



Pura-pura mati

Menyengat

Lebah = Pertahanan diri

Tawon = Pertahanan diri & melumpuhkan mangsa

Melepaskan bagian anggota tubuh

Mengelak serangan

Mengejutkan

Menggunakan bahan kimia