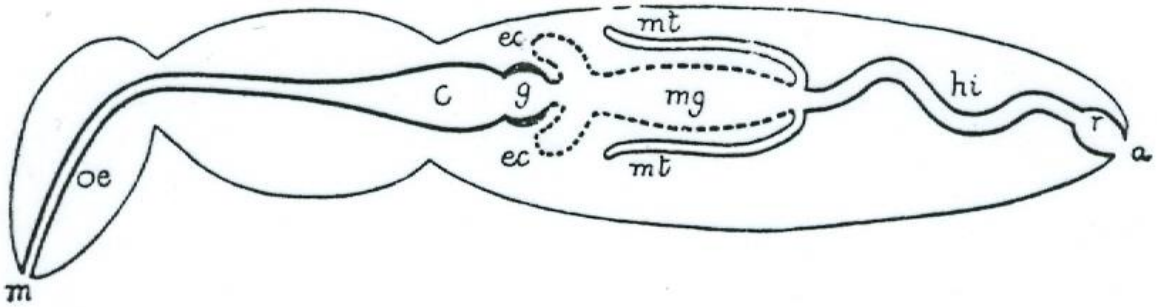
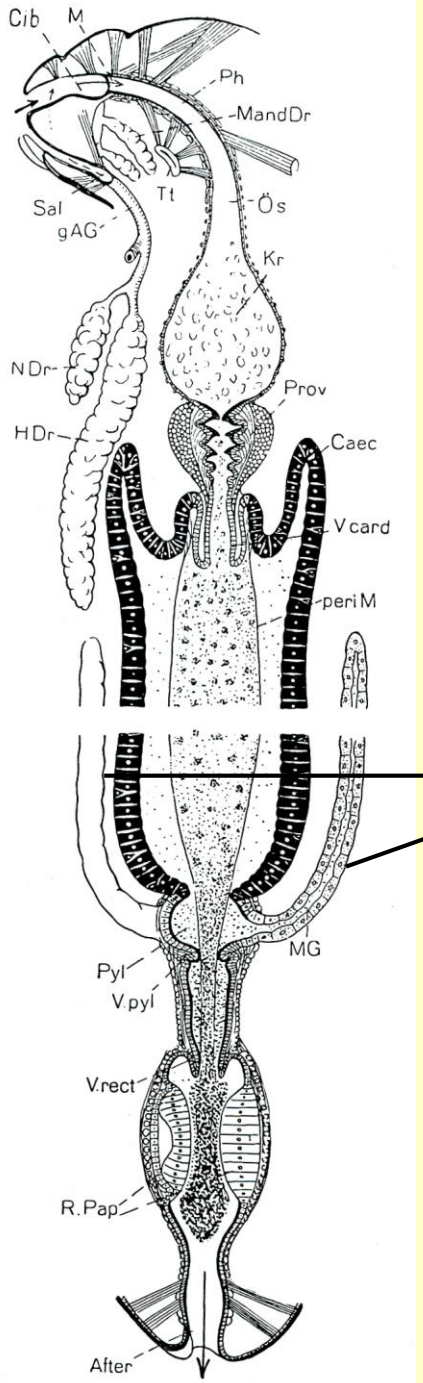
Boşaltım Sistemi

Malpigi tüpleri'nin konumu



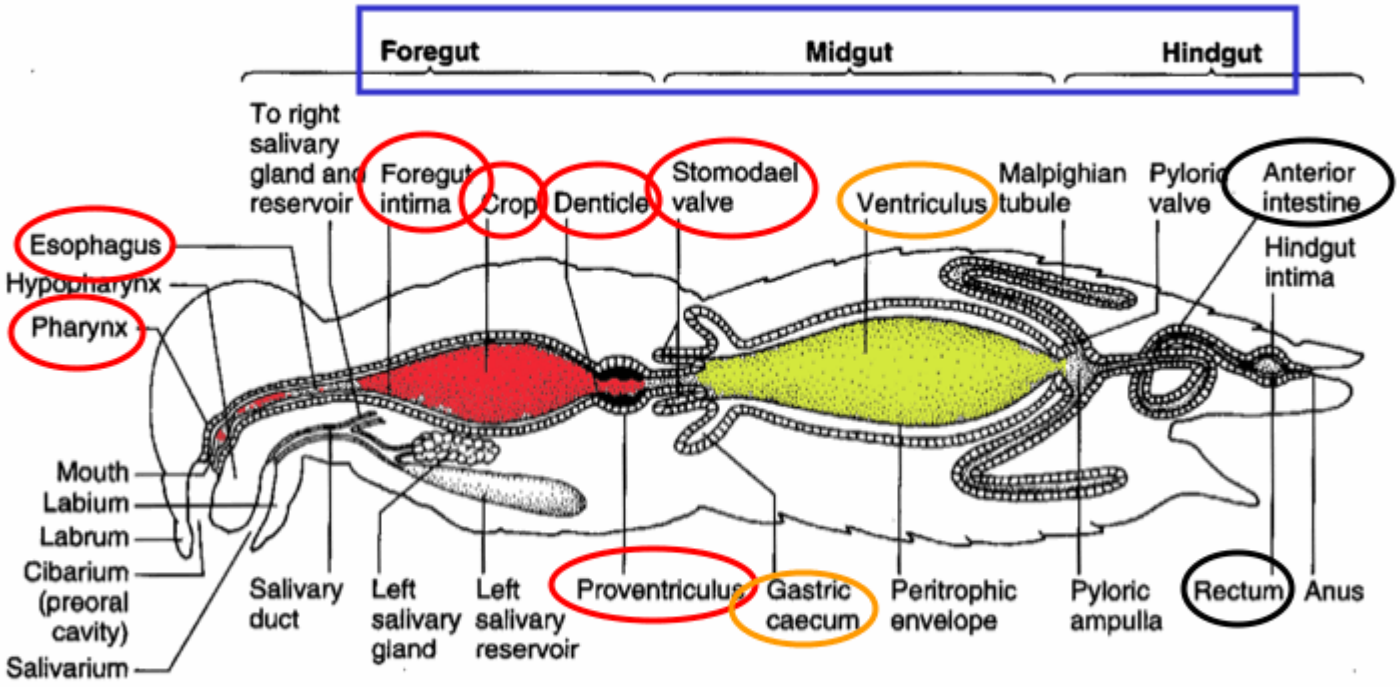
Şekil 54. Böceklerde sindirim sistemi (ektodermal kısımlar kalın çizgiyle, endodermal kısımlar ise kesik çizgiyle gösterilmiştir), (Imms'den).

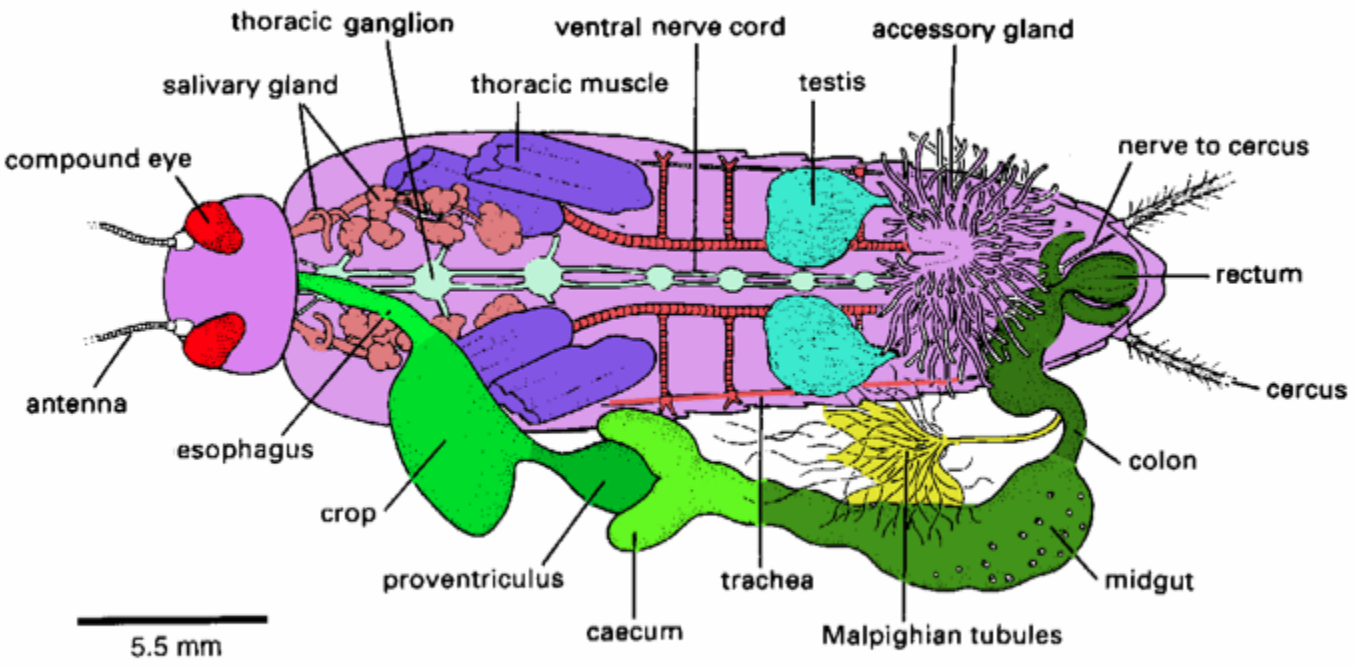
m. ağız, oe. özofagus, c. kursak, g. proventrikulus, ec. enterik çekum, mg. orta barsak (mide), mt. Malpigi tubülleri, hi. arka barsak, r. rektum, a. anüs.



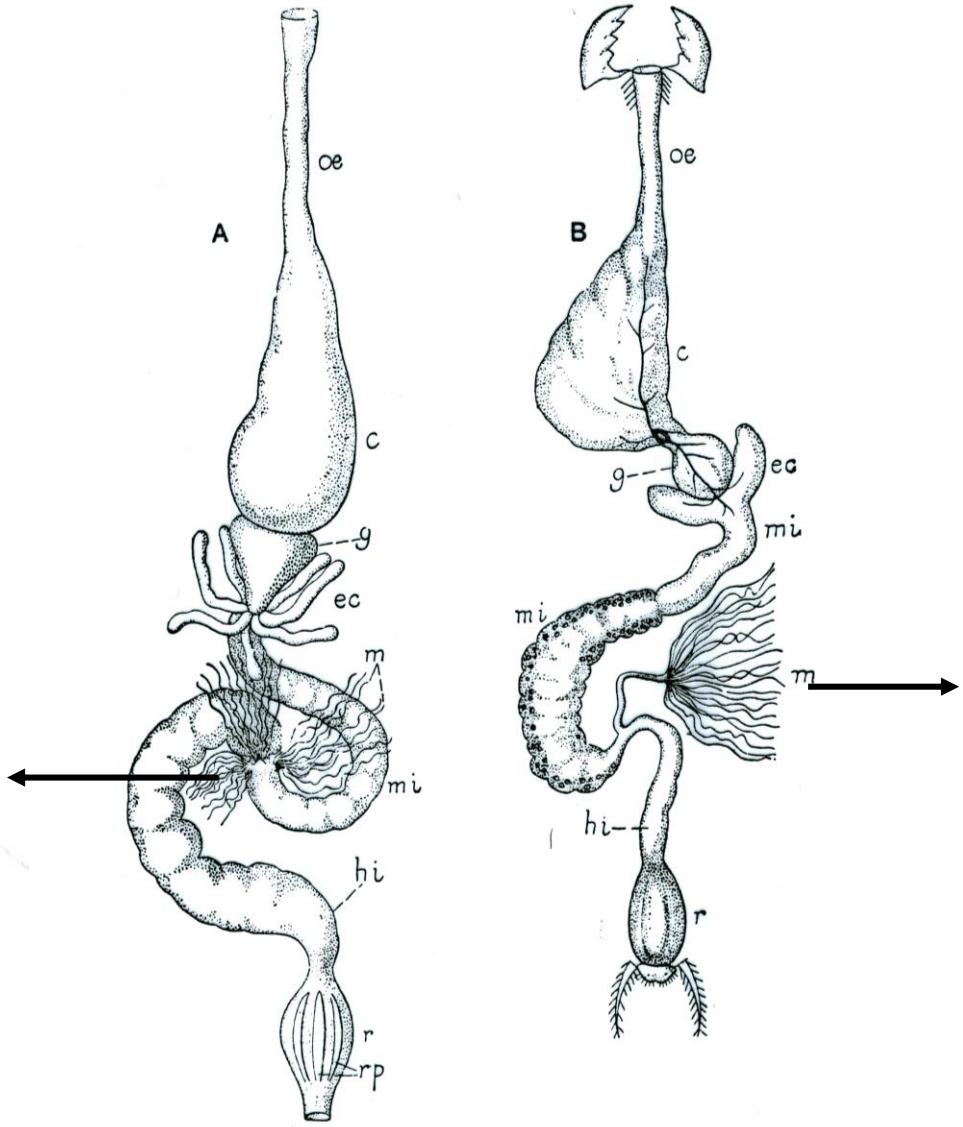
Malpigi tüpleri

Fig. 59: **Typischer Bauplan des Insektendarms,** medianer Längsschnitt. Die Kopfdrüsen der rechten Seite sind (plastisch) mit dargestellt. Mitteldarm schwarz mit weißen Kernen, Kutikula schwarz.
Caec = Caecum, Cib = Cibarium, gAG = gemeinsamer unpaarer Ausführgang der paarigen Labialdrüsen, HDr = deren Hauptdrüse, Kr = Kropf, Mand Dr = Mandibeldrüse, dahinter die Maxillendrüse, MG = Malpighigefäß, M = Mund (Pharynxeingang), NDr = Nebendrüse der Labialdrüse, Ös = Ösophagus, periM = peritrophische Membran, Ph = Pharynx, Prov = Proventriculus, Pyl = Pylorus, R. Pap = Rectalpapille links doppelschichtig hohl, rechts einschichtig), Sal = Salivarium, V. card, pyl, rect = Valvula cardiaca, pylorica, rectalis, Tt = Tentorium. Weitere Erklärungen im Text.


Foregut
Midgut
Hindgut
To right salivary gland and reservoir
Foregut intima
Crop
Denticle
Stomodael valve
Ventriculus
Malpighian tubule
Pyloric valve
Anterior intestine
Hindgut intima
Esophagus
Hypopharynx
Pharynx
Mouth
Labium
Labrum
Cibarium (preoral cavity)
Salivarium
Salivary duct
Left salivary gland
Left salivary reservoir
Proventriculus
Gastric caecum
Peritrophic envelope
Pyloric ampulla
Rectum
Anus


thoracic ganglion
ventral nerve cord
accessory gland
salivary gland
thoracic muscle
testis
compound eye
nerve to cercus
rectum
antenna
cercus
esophagus
colon
crop
proventriculus
trachea
midgut
caecum
Malpighian tubules
5.5 mm

Malpigi tüpleri

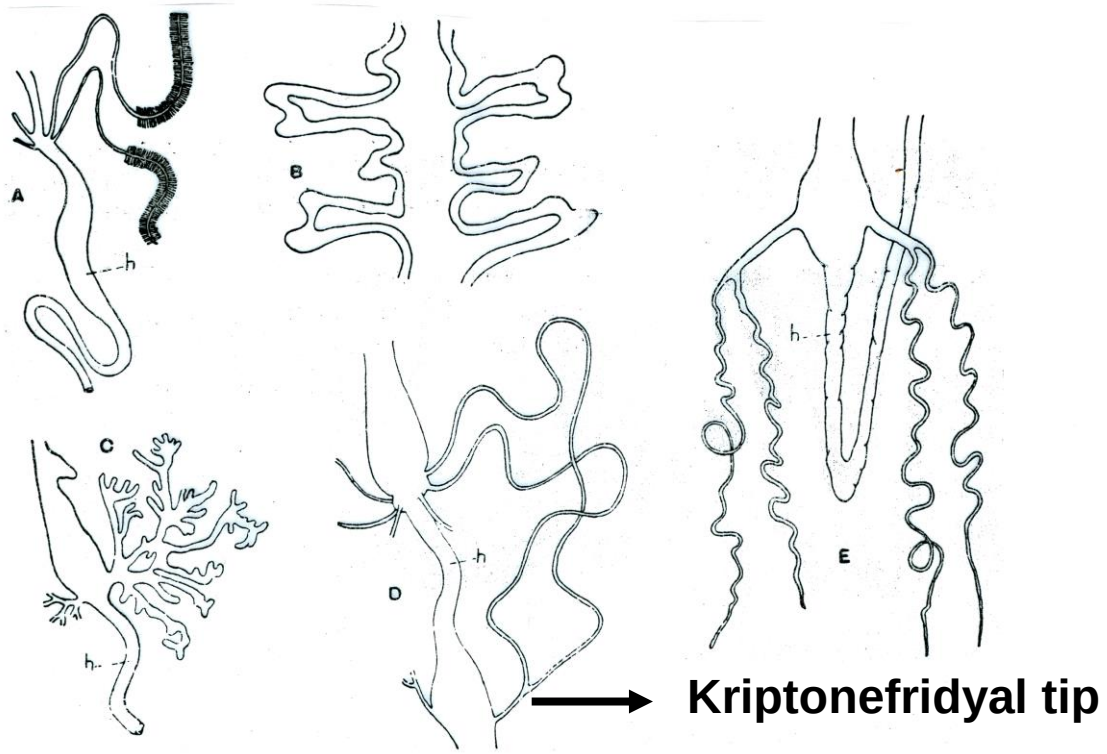


Malpigi tüpleri

Şekil 55. A- Periplaneta americana'da sindirim kanalı, B- Nemobius sylvestris (Gryllidae)'de sindirim kanalı (Bordas'tan).

oe. özofagus, c. kursak, g. proventrikulus, ec. enterik çekum, m. malpigi tubülleri, mi. orta barsak (mide), hi. arka barsak, r. rektum, rp. retal papilla.

Farklı tiplerdeki Malpigi tüpleri

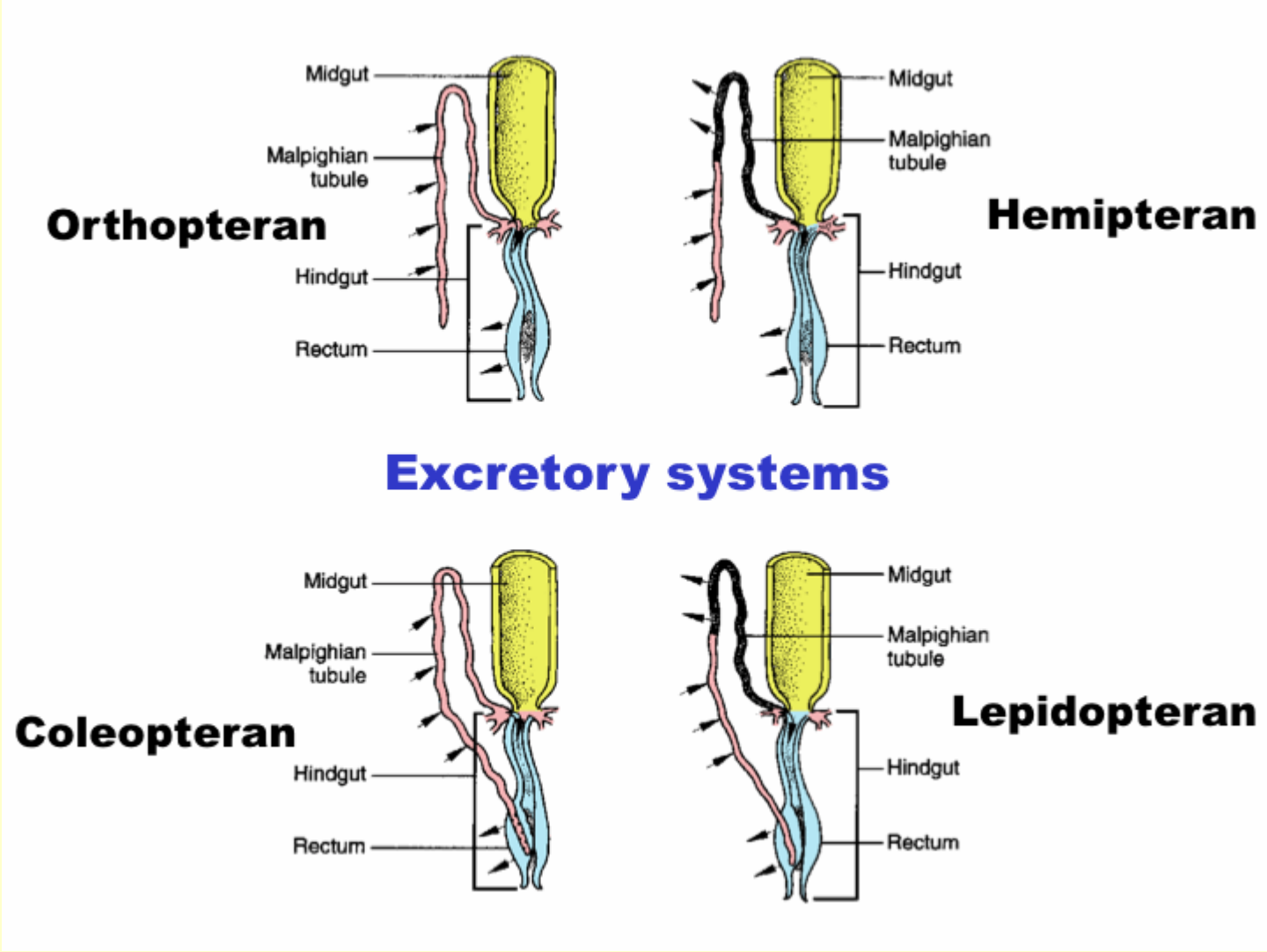


Şekil 67. Malpigi tubülleri.

A- *Melolontha melolontha*, B- Divertikül (kör kese) oluşturmuş malpigi tubüllerinin bir kısmı, C- *Galleria mellonella*, D. *Timarcha tenebricosa*, E- Calliphora (larva)

h. arka barsak (Veneziani ve Redia'dan).

Boşaltım sistem örnekleri



Malpigi tüplerinin hücresel yapısı

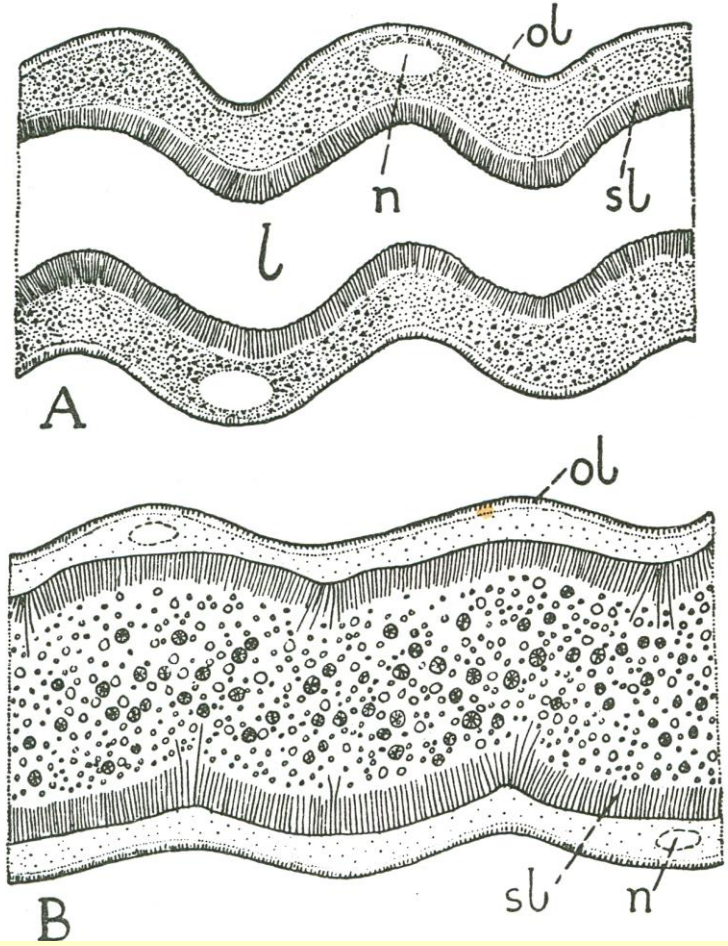
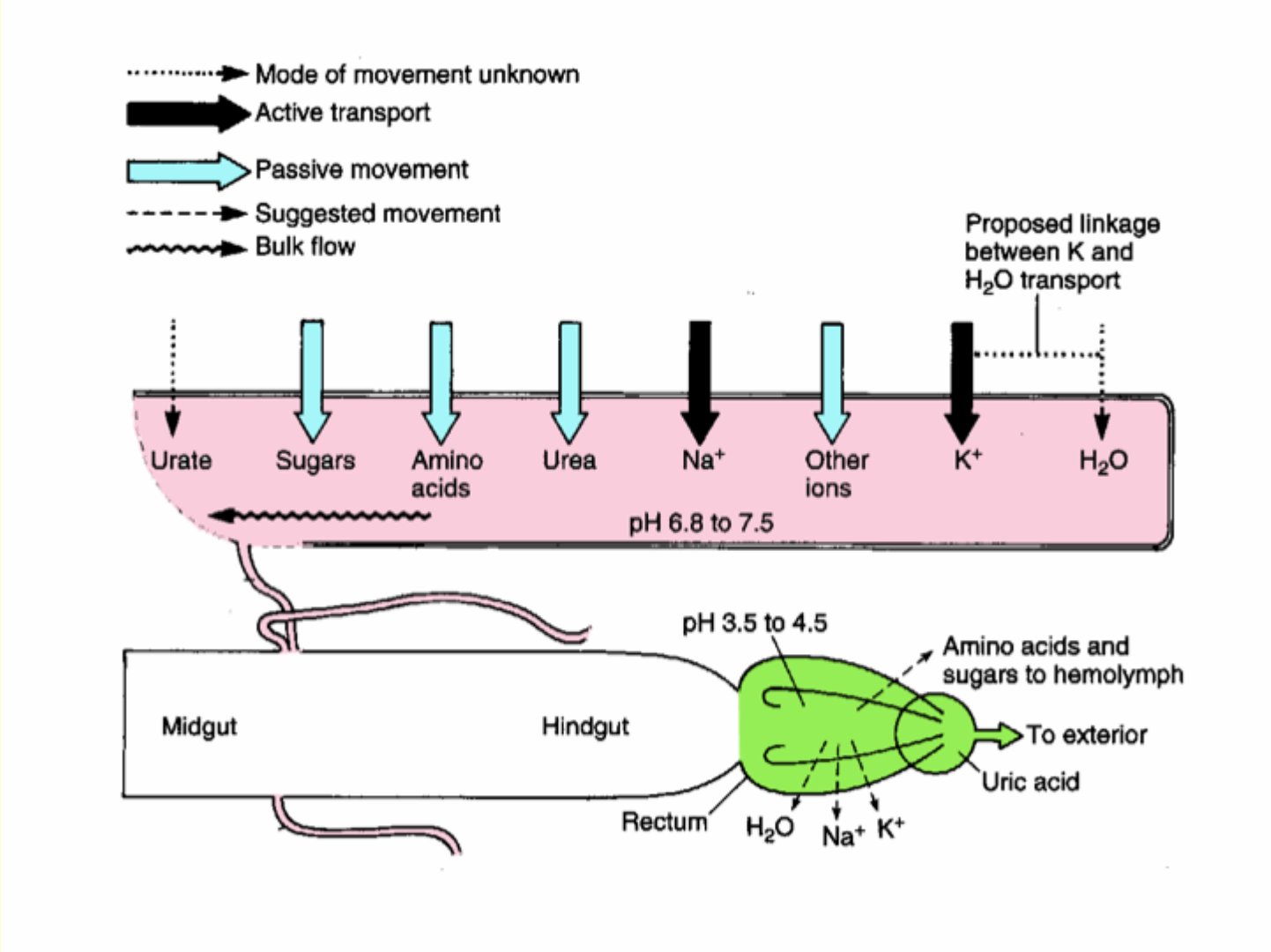


FIG. 124

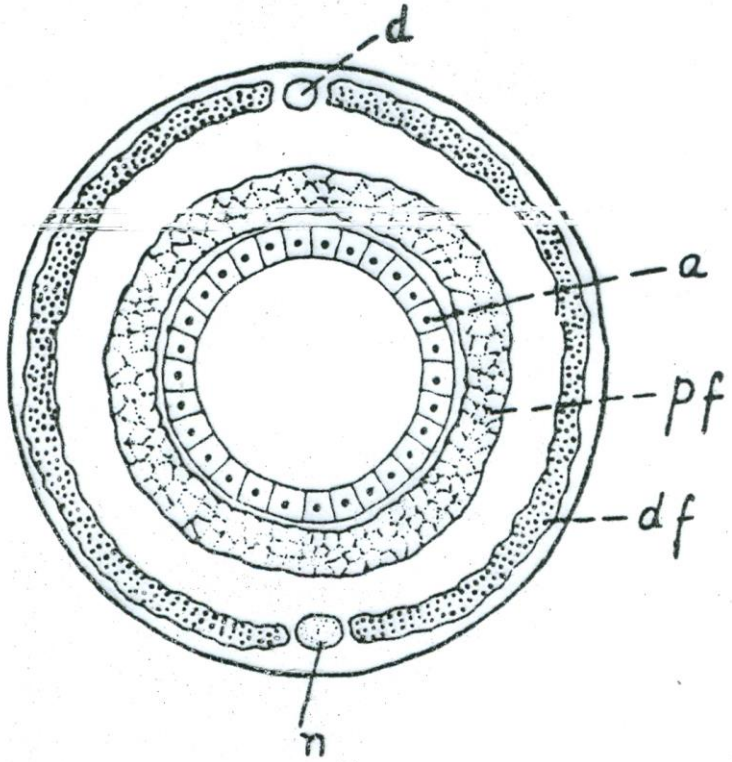
Malpighian tubules of *Rhodnius* (Reduviidae) seen in optical sections of living material. A, upper region of tubule with excretory granules in the cells. B, lower region of tubule with excretory spheres in the lumen

l, lumen; *n*, nucleus of excretory cell; *ol*, outer striated zone; *sl*, inner striated margin (filamentous in B). Adapted from Wigglesworth, *J. exp. Biol.*, 1931.

Malpigi tüplerinde boşaltım ve geri emilim maddeleri



Yağ cismi



Şekil 68. Böcek larvalarında yağ cismi (Şematik enine kesit), (Imms'den).

Yağ cismi

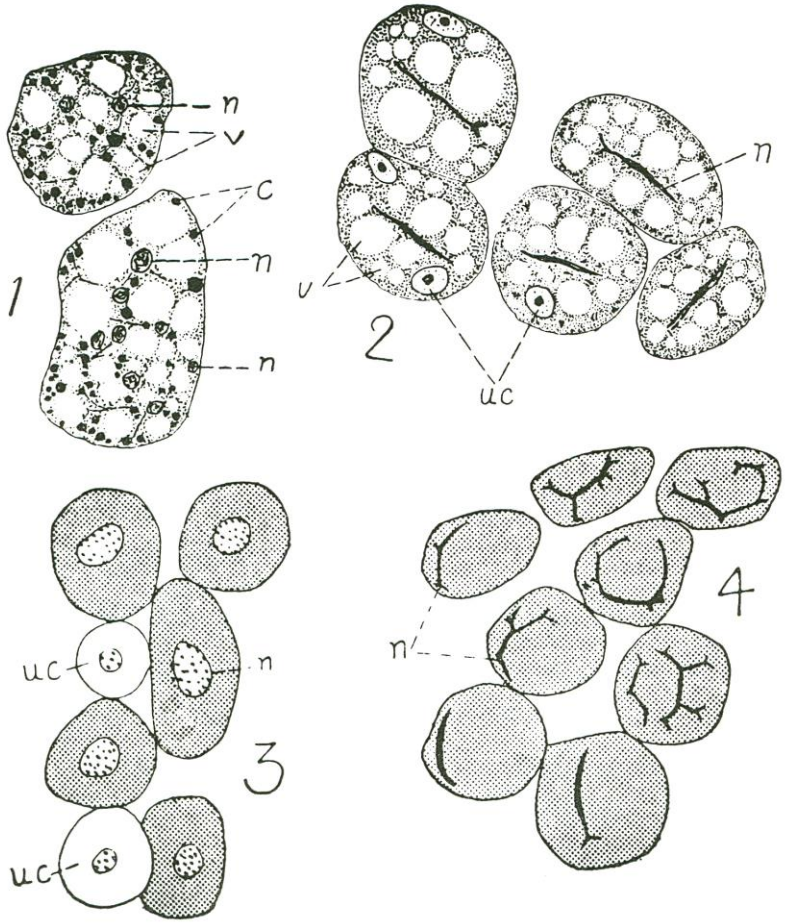
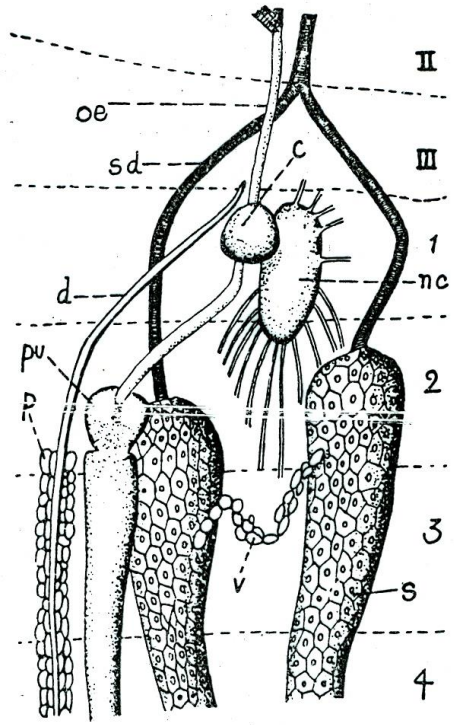


FIG. 126 Fat-body of various insects

1, Adult Termite (soldier); 2, Adult larva of *Caliroa limacina*; 3, Young larva of *Formica rufa*; 4, Adult larva of same; *c*, urate concretions; *n*, nucleus; *uc*, urate cells; *v*, vacuoles filled with fat globules. Nos. 3 and 4 adapted from Pérez, *Bull. Sci. Fr. et Belg.*, 37.

Yağ cismi

Nefrositler



Şekil 69. Phaonia cincta (Anthomyidae-Diptera) larvasının anteriör bölgesinden kesit (Keilin'den).

p. perikardial hücreler, v. ventral nefrositler, II., III. ikinci ve üçüncü torasik segmentler, 1-4. abdominal segmentler, c. serebral ganglion, d. dorsal damar, nc. ventral ganglionik merkez, oe. özofagus, pv. proventrikulus, s. tükrük bezi, sd. tükrük kanalı.

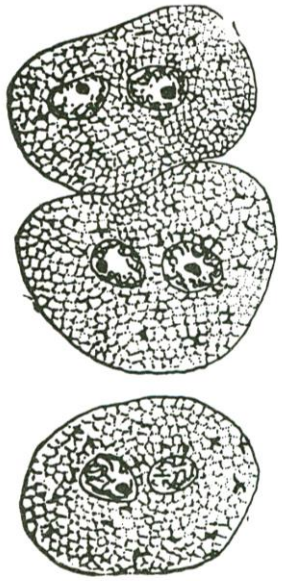
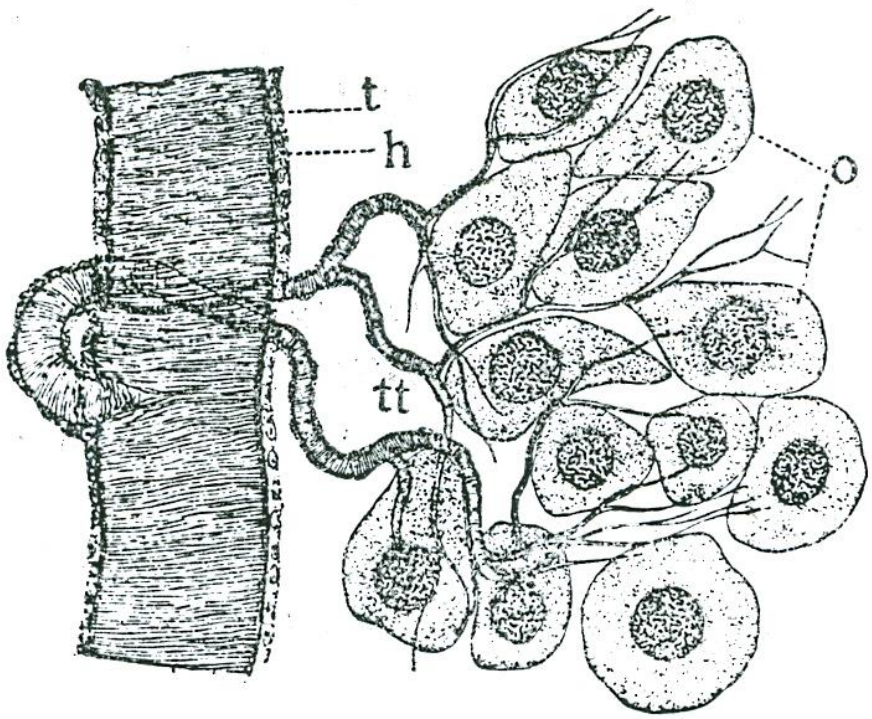


FIG. 127
Three ventral nephrocytes from the larva of *Limnophora riparia*, highly magnified
After Keilin, *Parasitology*, 1917.

Önosit'ler



Şekil 70. Phryganeidae (Trichoptera) larvasında önosit hücre yumağı (Imms'den).

o. önositler, t. trake, t. küçük trake dalları, h. trake epitel hücreleri.