ENVIRONMENTAL MANAGEMENT FOR VECTOR CONTROL

Part B: water-based and water-related vector-borne diseases
GEOGRAPHICAL DISTRIBUTION OF SCHISTOMIASIS DUE TO S. MANSONI AND S. INTERCALATUM (source: WHO)
GEOGRAPHICAL DISTRIBUTION OF SCHISTOSOMIASIS DUE TO S. HAEMATOBILUM AND S. JAPONICUM (source: WHO)

Global distribution of schistosomiasis due to Schistosoma haematobium and S. japonicum, 1985
Distribution mondiale de la schistosomiase due à Schistosoma haematobium et S. japonicum, 1985
<table>
<thead>
<tr>
<th>SNAIL GENUS</th>
<th>LIFECYCLE</th>
<th>PARASITE</th>
<th>TYPE OF DISEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oncomelania</td>
<td>semi-aquatic</td>
<td>S. japonicum</td>
<td>intestinal</td>
</tr>
<tr>
<td>Biomphalaria</td>
<td>aquatic</td>
<td>S. mansoni</td>
<td>intestinal</td>
</tr>
<tr>
<td>Bulinus</td>
<td>aquatic</td>
<td>S. haematobium</td>
<td>urinary</td>
</tr>
</tbody>
</table>
Slide b4
Slide b5
THE LIFECYCLE OF A SCHISTOSOME

ADULT WORMS
Adult worms live inside human veins. The inset illustration shows the fatter male worm holding the thinner female worm within the fold in his body wall.

CERCARIAE
The cercariae swim about freely in the water. If they do not reach the human host within 48 hours, they die.

EGGS
Eggs contain the larvae which are passed with the urine and faeces of an infected person.

MIRACIDIUM
The miracidium larva hatches from the egg in water. After a free life of about six hours it seeks out and enters an aquatic snail.

SPOROCYST
The miracidium develops into a sporocyst. After a time, fork-tailed larvae or cercariae are produced within the sporocysts, from which they ultimately break out.
To interrupt the lifecycle of Schistosoma parasites,

- the man-water contact has to be minimized
- no faeces or urine should enter water
- the number of snails has to be diminished
SNAIL HABITATS

- Optimum temperature range between 24° to 28° C
- Moderate light penetration and partial shade from plants giving also protection
- Little turbidity, water velocities less than 0.3 - 0.5 m/s
- Slight pollution with excreta and rotting plant material
MAJOR MOSQUITO BORNE DISEASES

- MALARIA
- FILARIASES
  - Wuchereria bancrofti
  - Brugia malayi
  - Brugia timori
  - Onchocerciasis
- JAPANESE ENCEPHALITIS
- DENGUE FEVER
- YELLOW FEVER
MAIN DISTINGUISHING FEATURES OF ANOPHELINES AND CULICINES

ANOPHELINES

CULICINES

EGGS

LARVA

PUPA

FEMALE ADULT

ANOPHELES

Aedes

Culex

a.f. sp. p.h. n.o. br. h.h. 8.sg th. w.s. tr. e. th. ab. th. an. pa. pr. e. th. 8.sg 1.sg th. tr. e. an. br. w.s. sp. si.
Water is an essential component of the mosquito environment. The characteristics of the aquatic habitat, whether it is running or standing, clean or polluted, sweet or brackish, shaded or sunlit, permanent or intermittent, is the predominant factor determining which species of mosquito breed in it.
Mosquitoes as a group breed in an almost infinite variety of sizes and types of water bodies. Most disease transmitting species, however, breed only in a restricted range of habitats, while few species breed readily in a wide range of habitats.
GEOGRAPHICAL DISTRIBUTION OF MALARIA
GEOGRAPHICAL DISTRIBUTION OF WUCHERERIA BANCROFTI, BRUGIA MALAYI AND B. TIMORI
GEOGRAPHICAL DISTRIBUTION OF ONCHOCERCIASIS IN AFRICA

Geographical distribution of Onchocerciasis in Africa and Arabian Peninsula

- **Endemic onchocerciasis**
- **OCP treated area**
- **Onchocerciasis reported but autochthonous transmission uncertain**
THE LIFECYCLE OF SIMULIUM DAMNOSUM

ADULT
Note to broad, clear wings, short hornlike antenna and humped thorax

EGGS
Laid on stones, vegetation, debris, in streams and rivers

LARVA
Note the "figure of eight" outline, large mouthbrushes, prothoracic leg and anal sucker

COCON AND PUPA