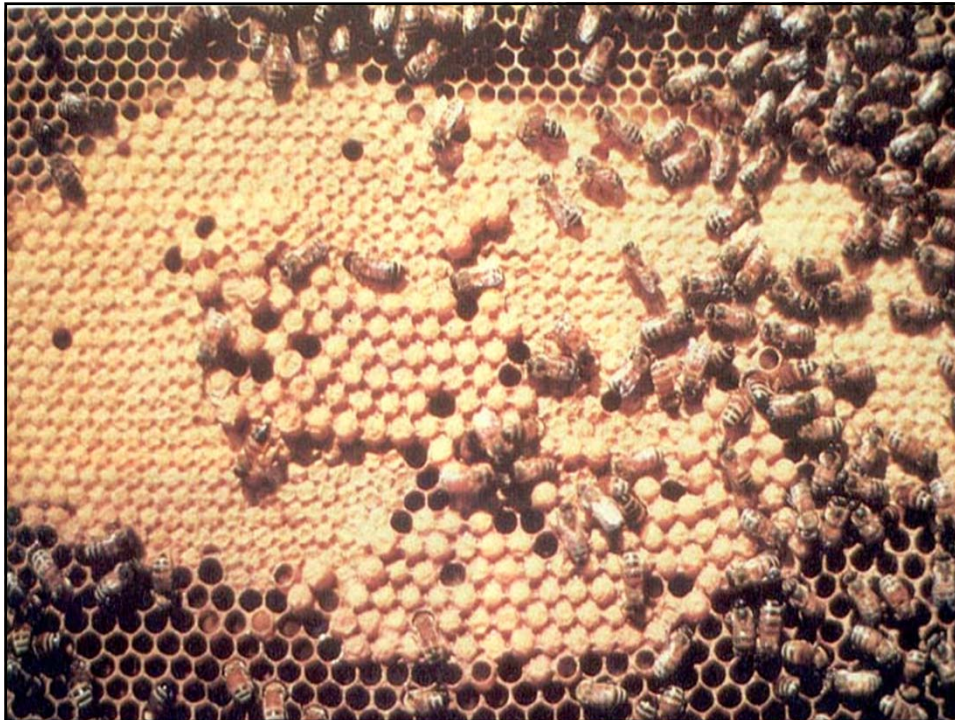
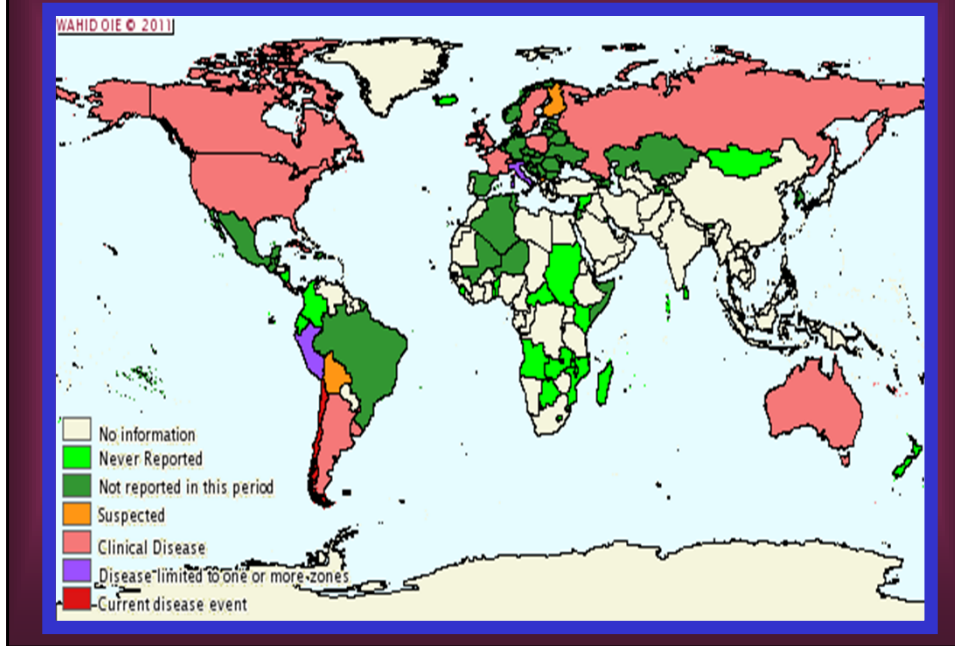


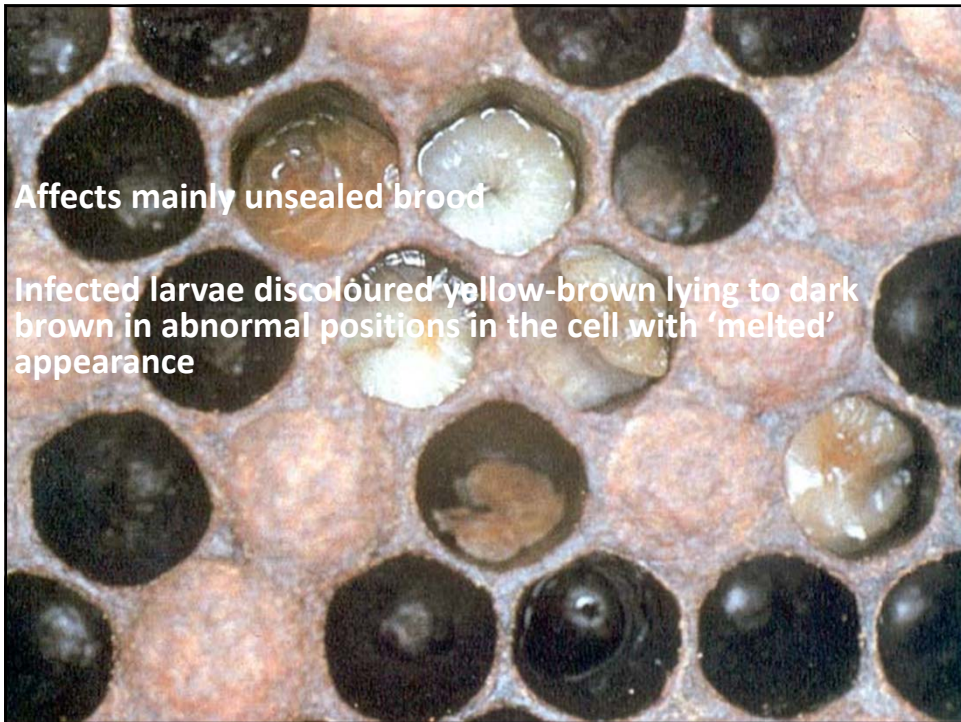
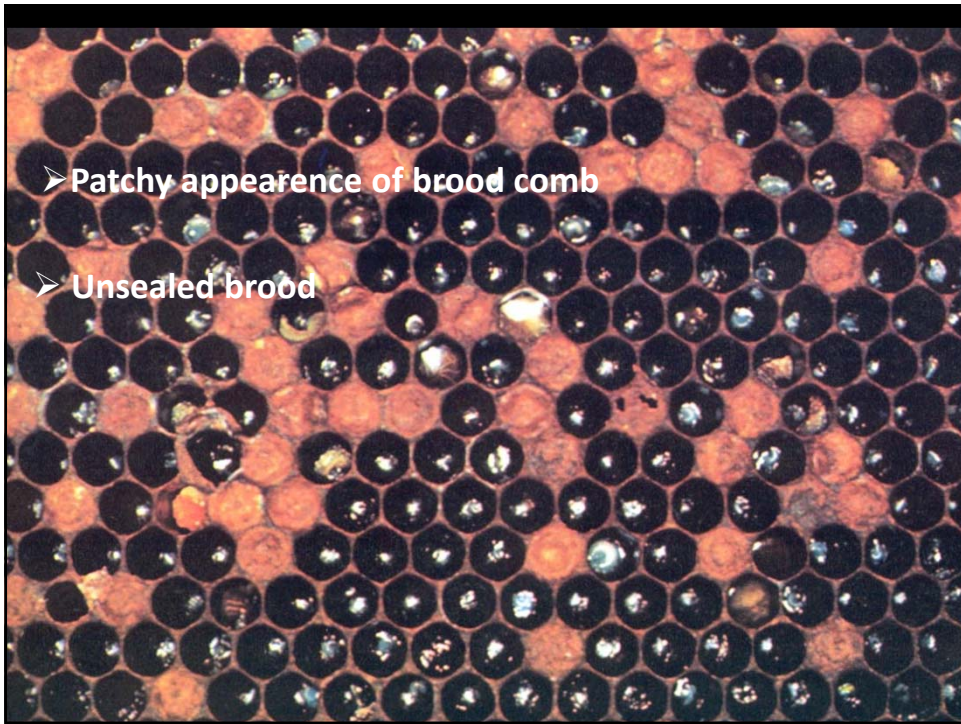


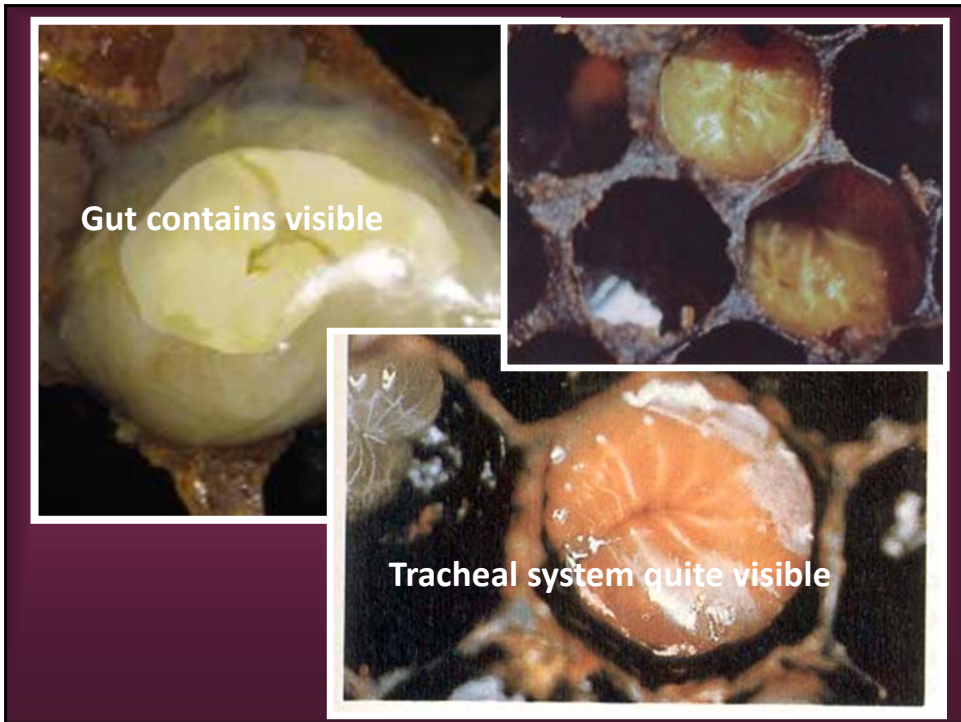
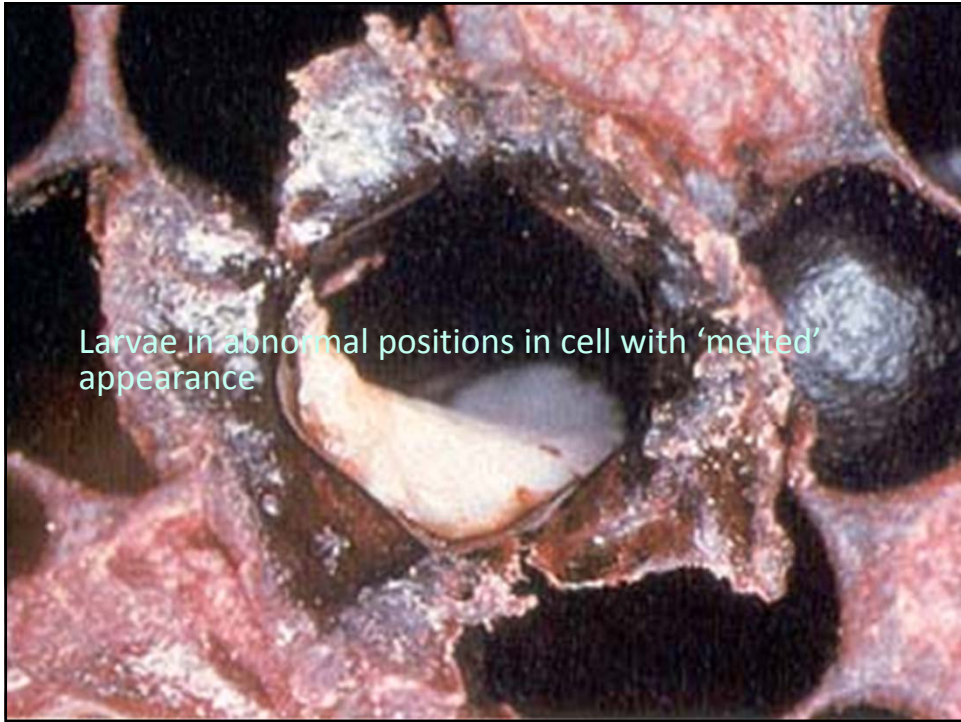
EFB

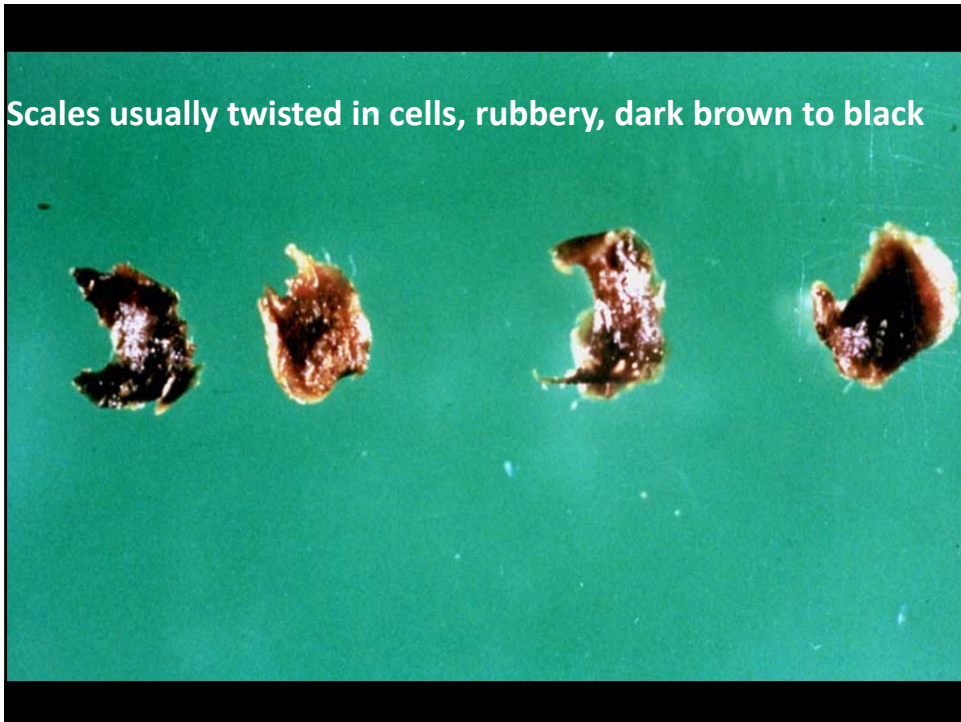
- EFB is not considered a serious disease by most beekeepers
- Affects larvae of several *Apis mellifera* subspecies (*Apis mellifera mellifera* – *A.m. ligustica* – *A.m. carnica* – *A. m. scutellata*) and also *Apis cerana* and *A. laboriosa*
- In some areas and under certain conditions causes severe losses in brood resulting in lower honey yields
- Particularly problematic in colonies deficient in proteins and those used for pollination
- The disease arises in mid to late spring when colonies are building up to a maximum population

EFB is worldwide distributed with the exception of New Zealand and some African and South American Countries









Main characteristics

- ❑ Affects mainly unsealed brood
- ❑ Infected larvae discoloured yellow-brown lying to dark brown in abnormal positions in cell with 'melted' appearance
- ❑ Dead brood consistency watery to pasty, granular
- ❑ Some dark sunken cappings may be present, but cell contents will not form a 'rope'
- ❑ Sour odour
- ❑ Scales usually twisted in cells, rubbery, dark brown to black

INFECTIOUS CYCLE

- Often, the disease arises in mid to late spring, when colonies are building up to a maximum population.
- Larvae are contaminated by consuming food with *M. plutonius*, bacteria multiply in the midgut competing for food with its host. (infected during the first 2 days after hatching).
- Larvae are susceptible at any stage but young larvae are more susceptible.
- By the time the larva is 5 days old, the area in the midgut that should be occupied by the food mass is occupied by bacteria.
- As bacteria and larvae compete for food, the appetite of infected larvae increases, and nurse bees usually eject larvae with abnormal food demands. In this way a strong colony can eliminate diseased larvae and keep EFB under control.
- However, if the ratio of nurse bees to larvae is high, even infected larvae receive enough attention to stay alive, thus prolonging the disease.

➤ When nectar flows begins, brood quantity increases, nurse bees are enrolled to foraging duties, larvae receive less individual attention, and infected larvae show EFB symptoms and die.

➤ As long as bees clean out dead and infected larvae, the disease usually goes away on its own.


➤ Some infected larvae may survive and pupate and bacteria are discharged with the faeces and deposited on the cells, mainly at the base and on the cappings. These survival larvae produce pupae of subnormal weight, because the bacteria have assimilated much of their food.

EFB

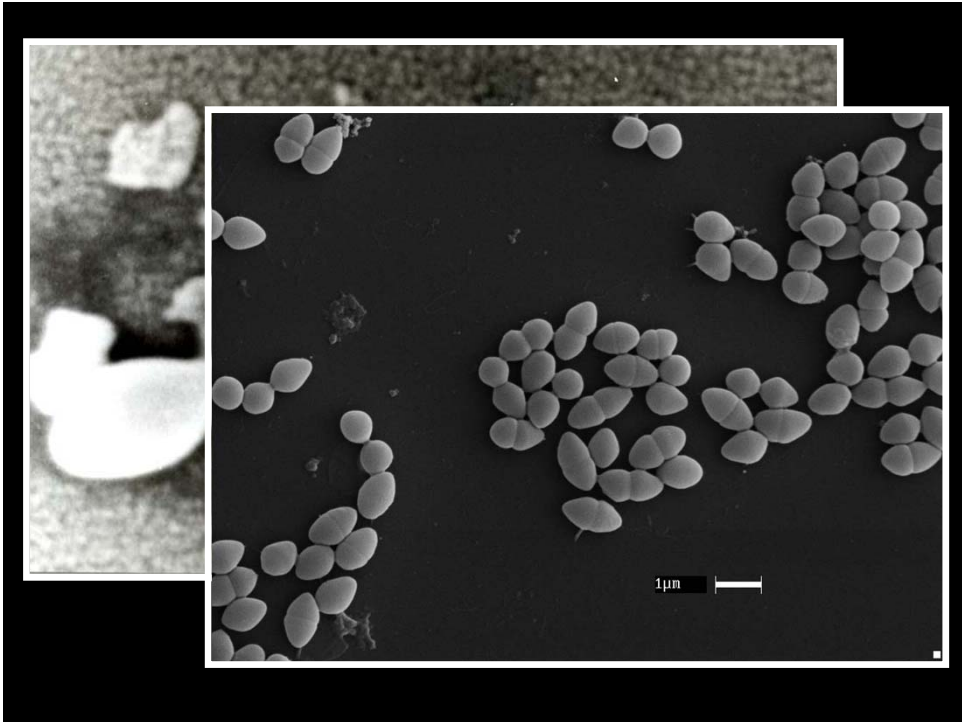
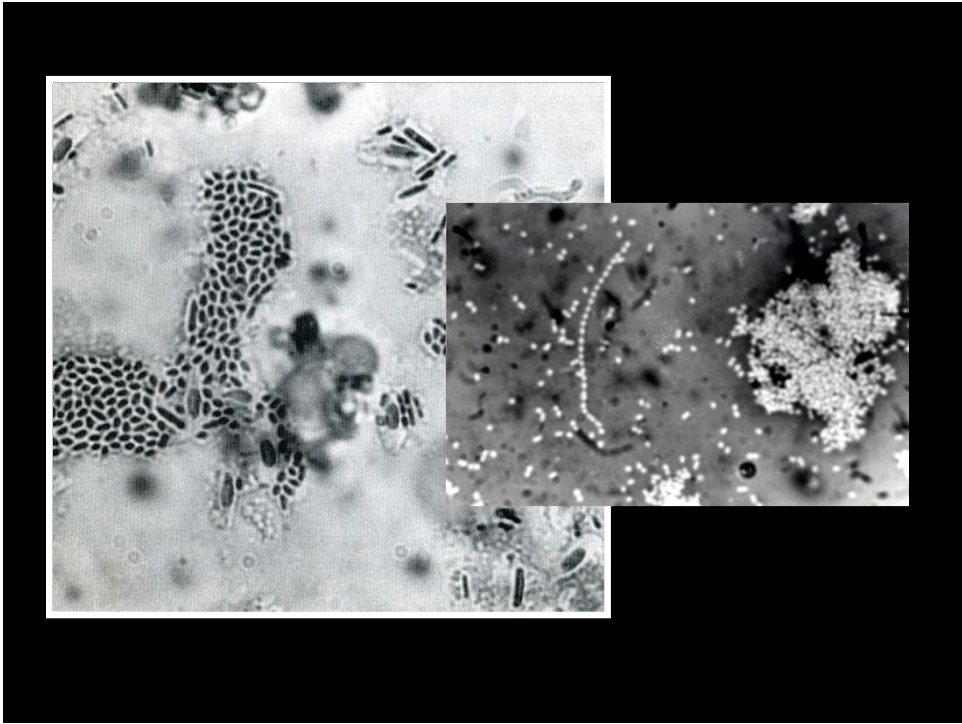
▶ *Melissococcus plutonius* Causal agent
Melissococcus pluton Syn *Streptococcus pluton*
= *Bacillus pluton*

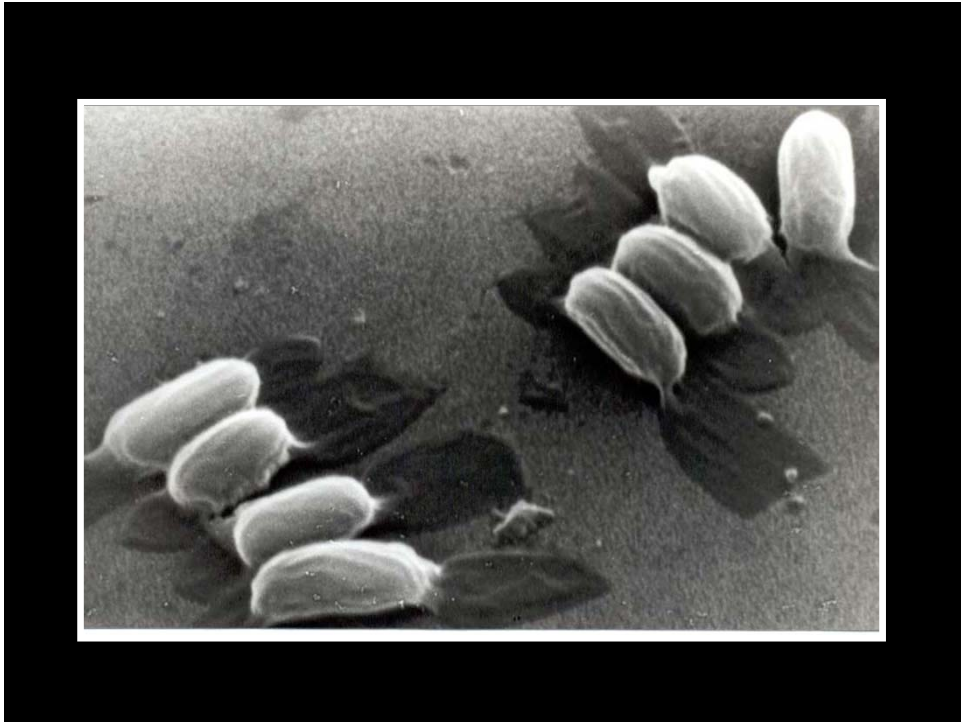
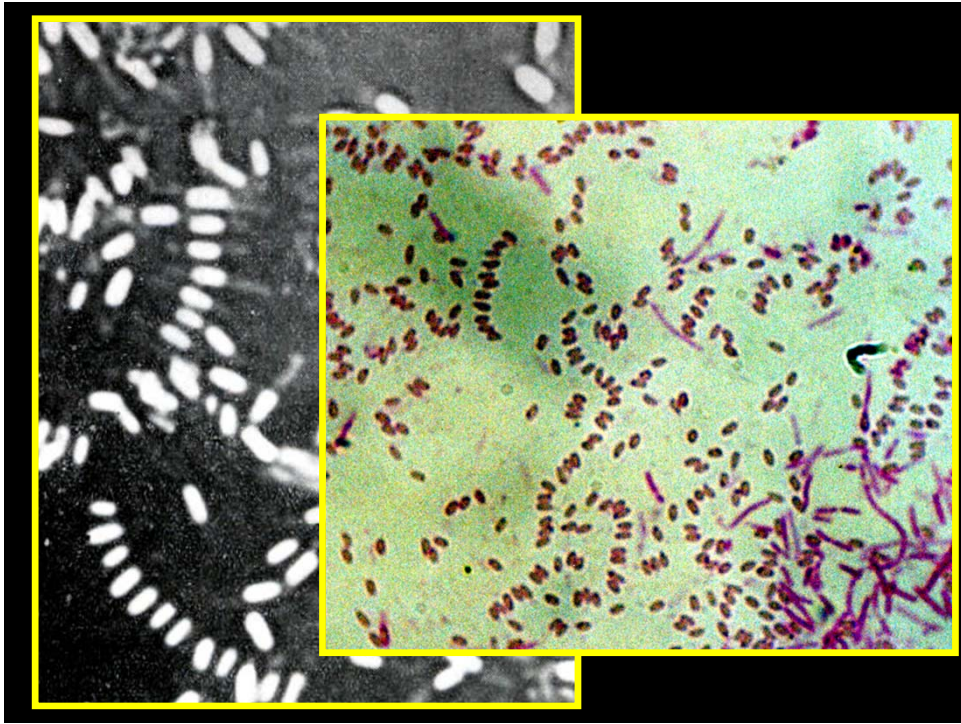
Other bacterial species:

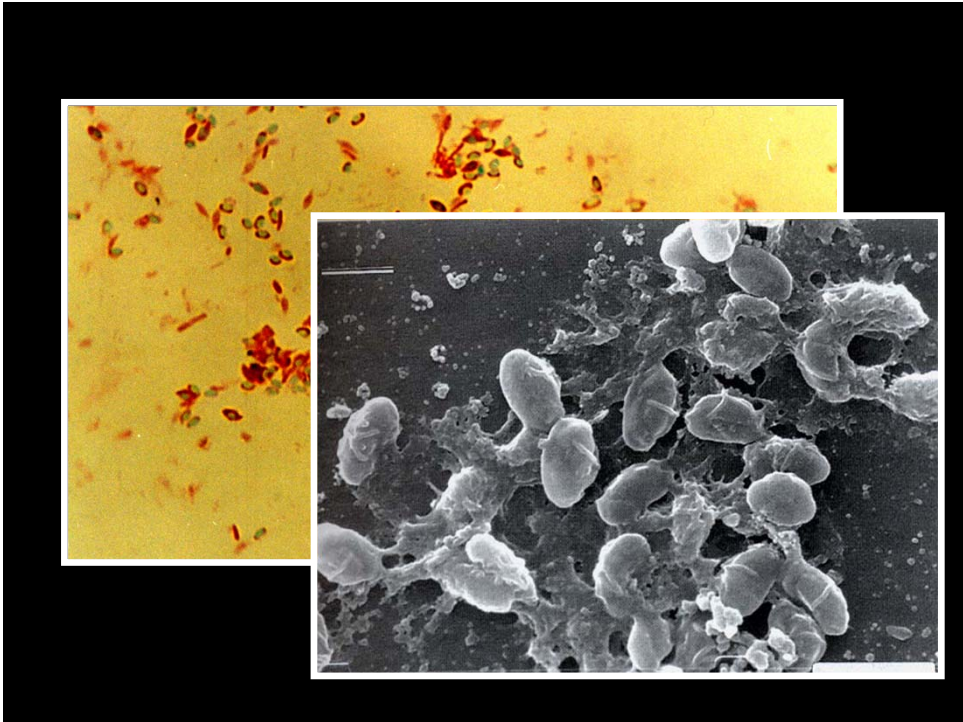
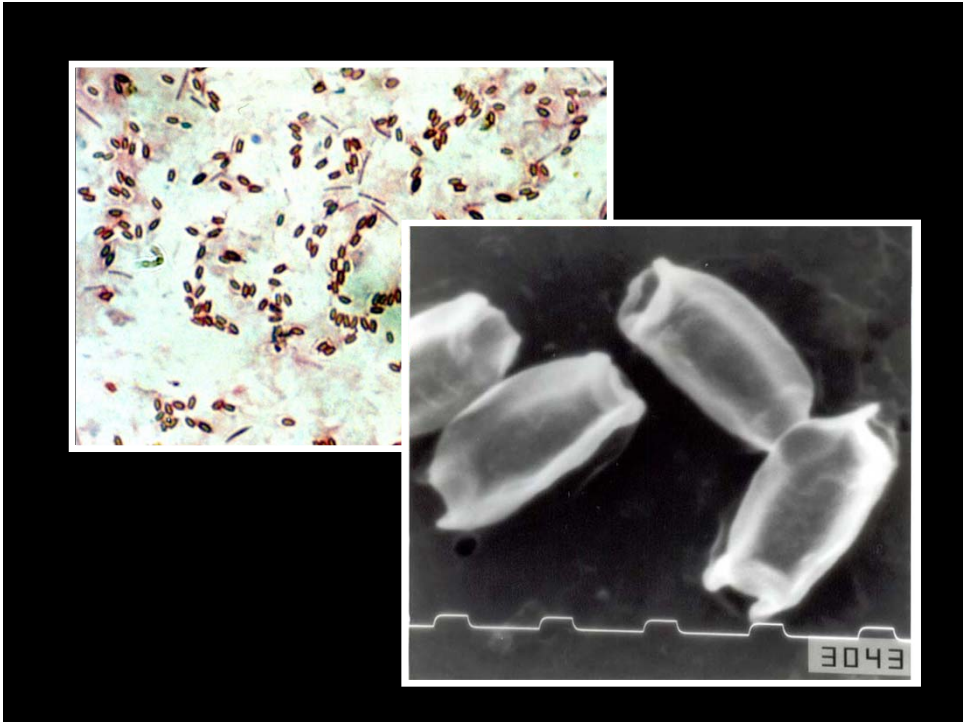
▶ *Paenibacillus alvei*
▶ *Brevibacillus laterosporus*
▶ *Paenibacillus apiarius*
▶ *Enterococcus faecalis*
▶ *Lactobacillus euridyce*

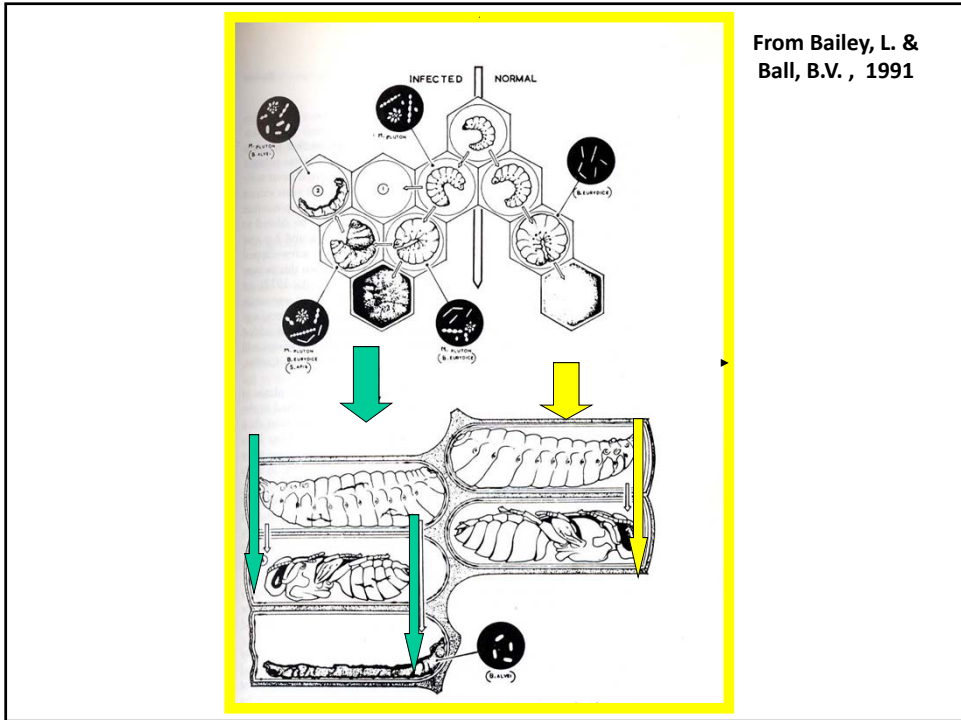
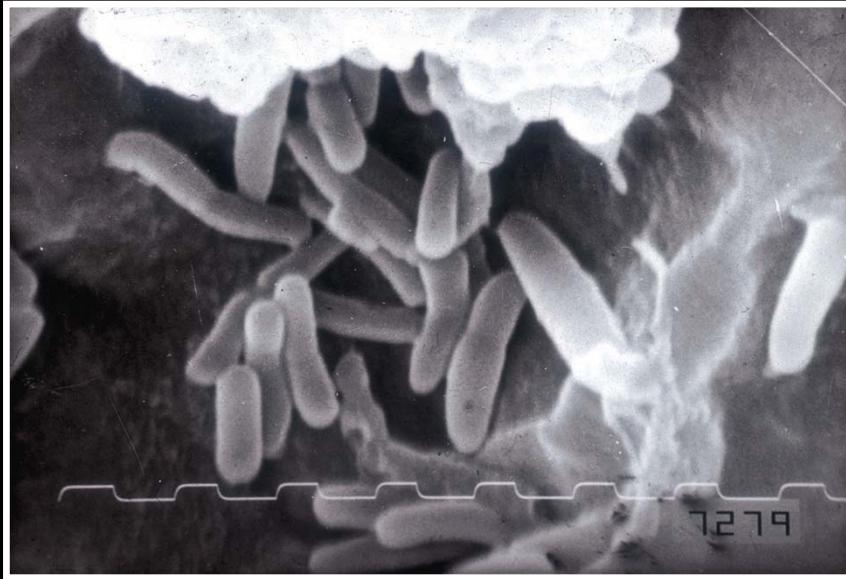


apiarian sources
commonly found
secondary invaders
saprophytic









Diagnosis

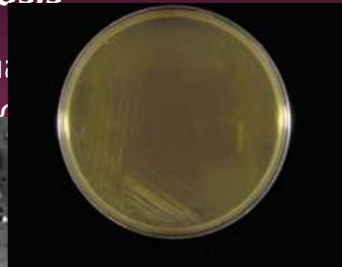
✓ Field diagnosis based on visual signs and detection of infected plants

✓ Microscopic examination of infected tissues with Gram stain, fuchsin or nigrosine

✓ Laboratory diagnosis: PCR, sequencing, and interaction studies

✓ Production of specific antibodies for detection of *M. plutonius*

✓ Selective media with supplementary substances for cultivation of *M. plutonius*



Thank you for your attention !!!!