

Le principali malattie delle api: caratteristiche e diagnosi

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Corso: Efficacia clinica dei medicinali veterinari per le api e loro uso in campo

Roma, 19 dicembre 2017

Peste americana

Paenibacillus larvae

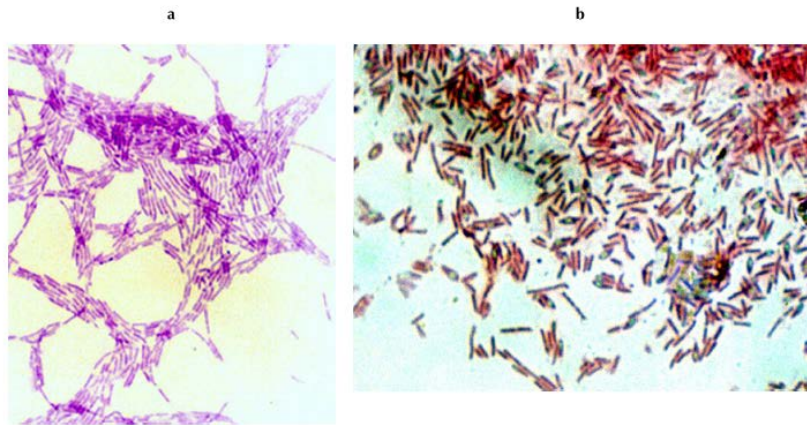
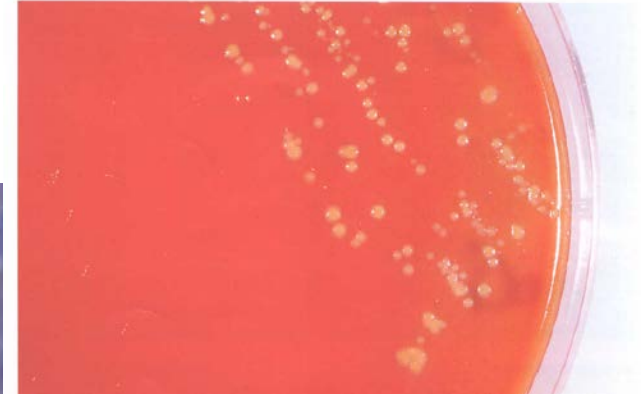


Fig. 5. Microscopic examination of *Paenibacillus larvae*, the causative organism of American foulbrood: a) Gram stain reveals Gram-positive rods, occurring singly and in chains (magnification: $\times 1000$); b) Schaeffer & Fulton's spore stain reveals that sporangia (stained red) are swollen by the spores (stained green), which are central to terminal (magnification: $\times 1000$). Photos: A.M. Alippi.

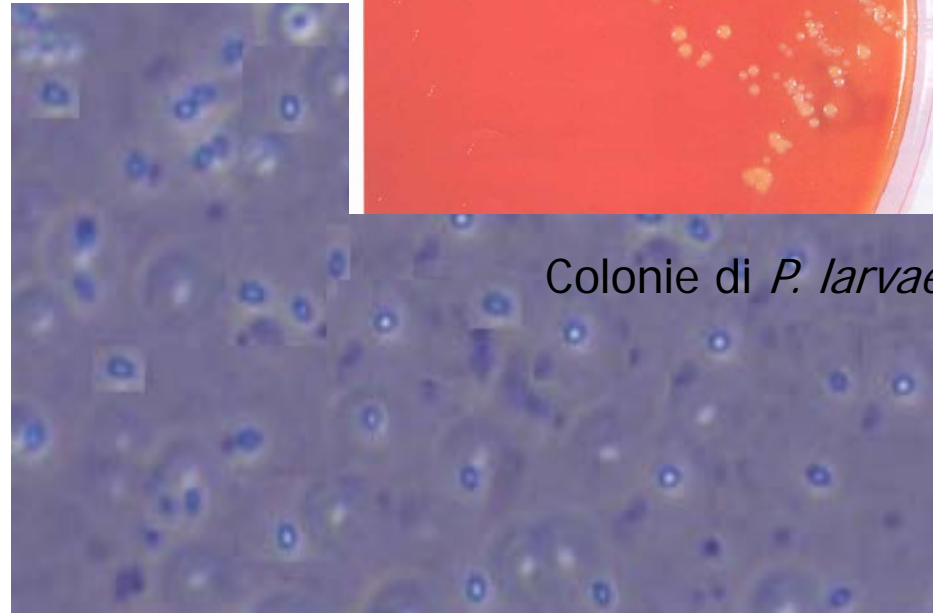


forme vegetative

Colonie di *Bacillus larvae* in terreno Agar Columbia + 5% di sangue di montone.



Colonie di *P. larvae*

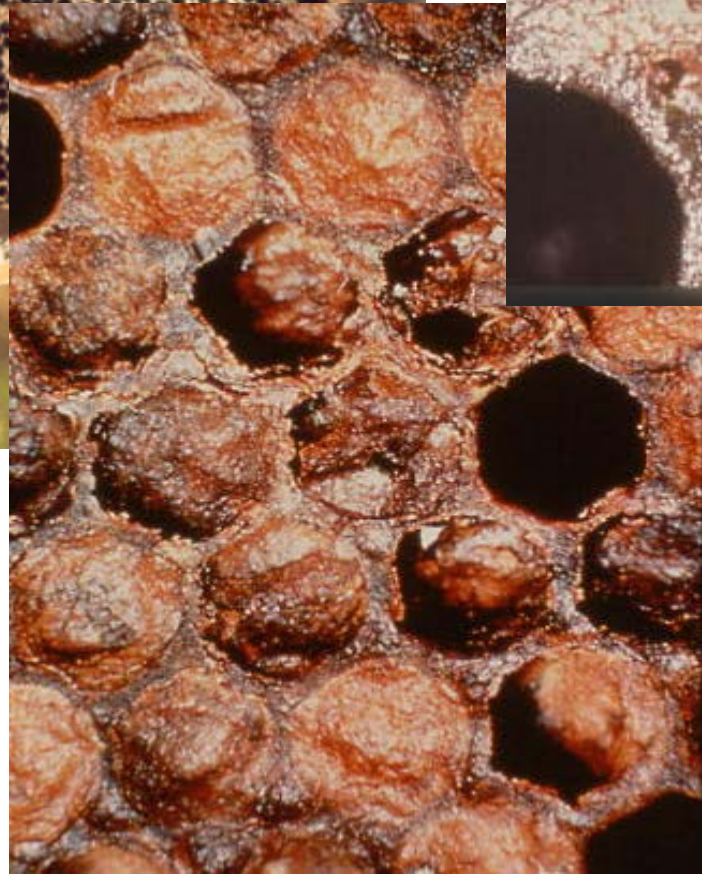
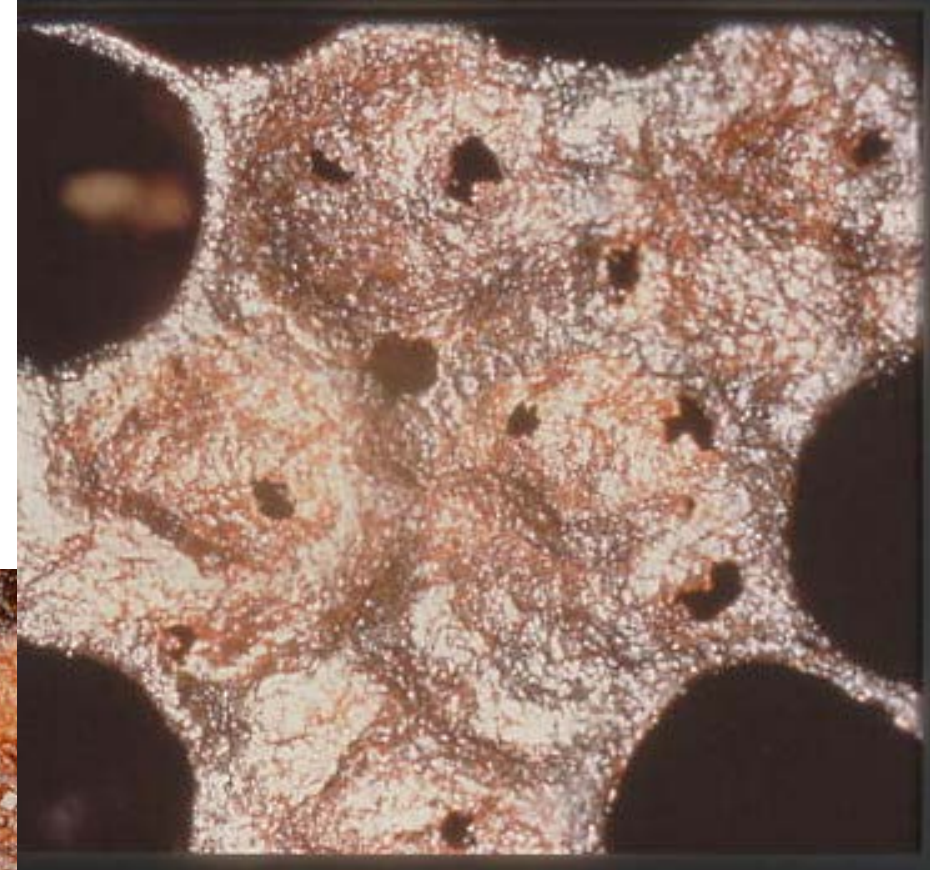


spore

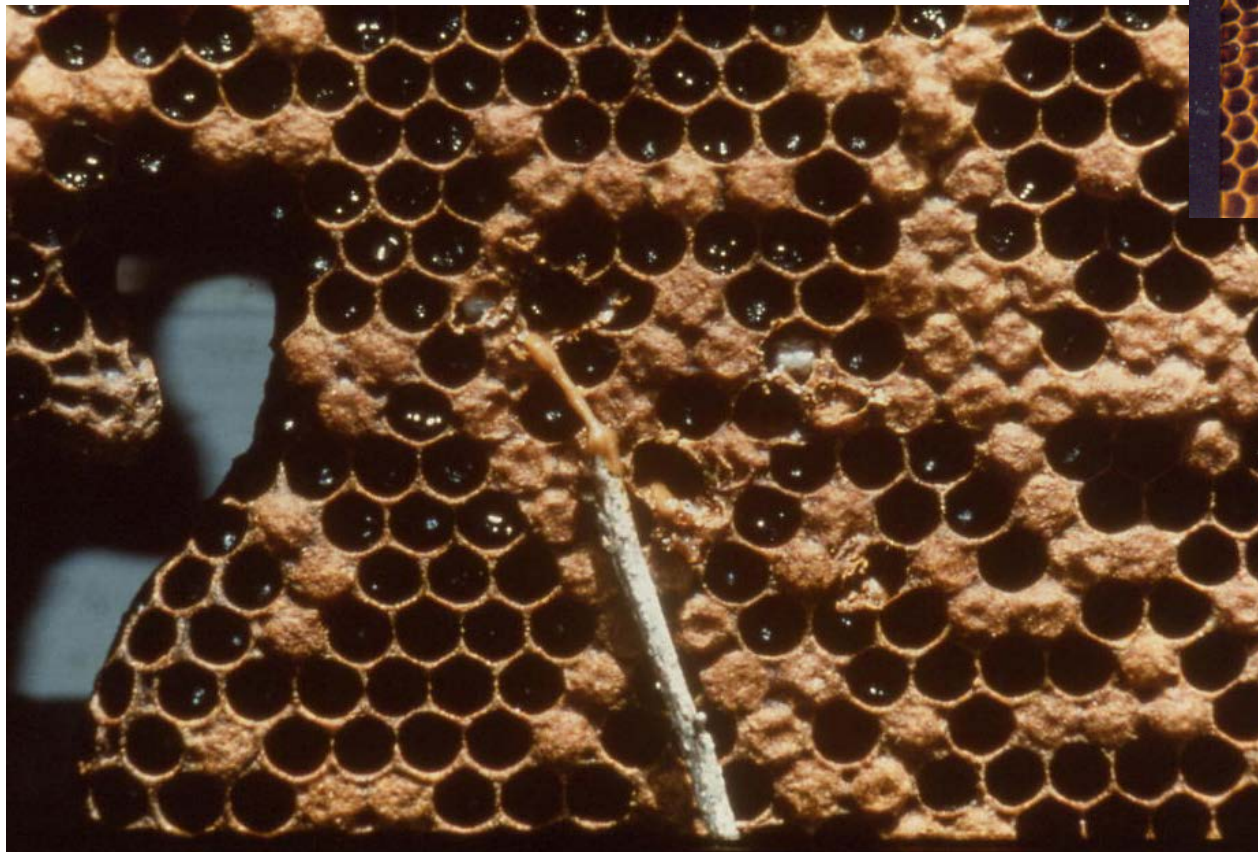
Colpisce solo la covata.
L'infezione si trasmette alle larve mediante
l'alimento contaminato dalle spore



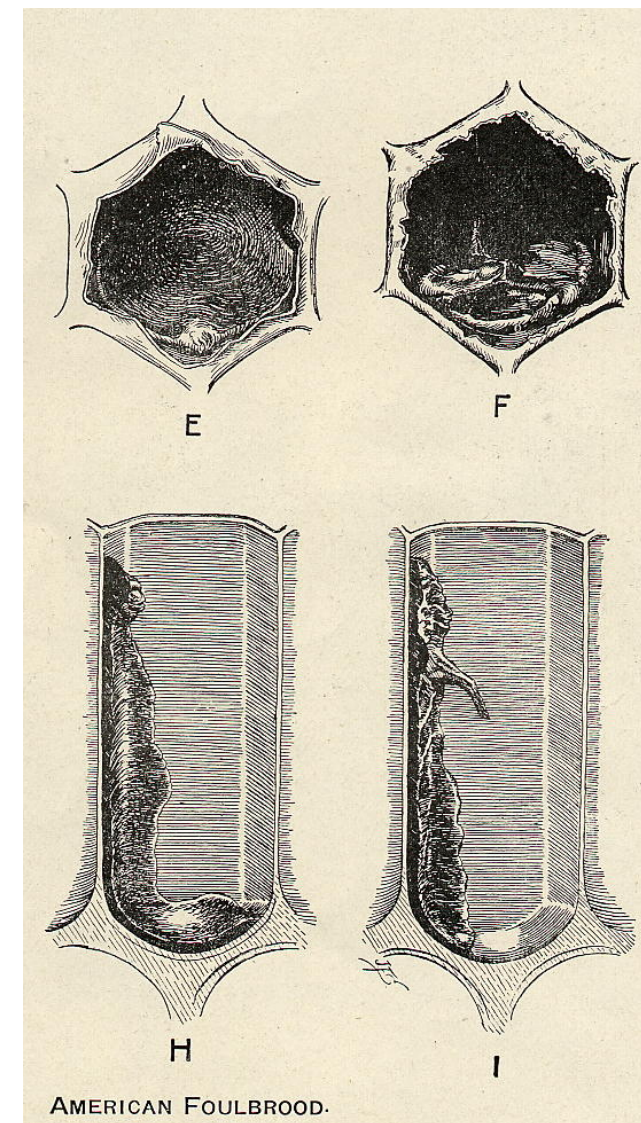
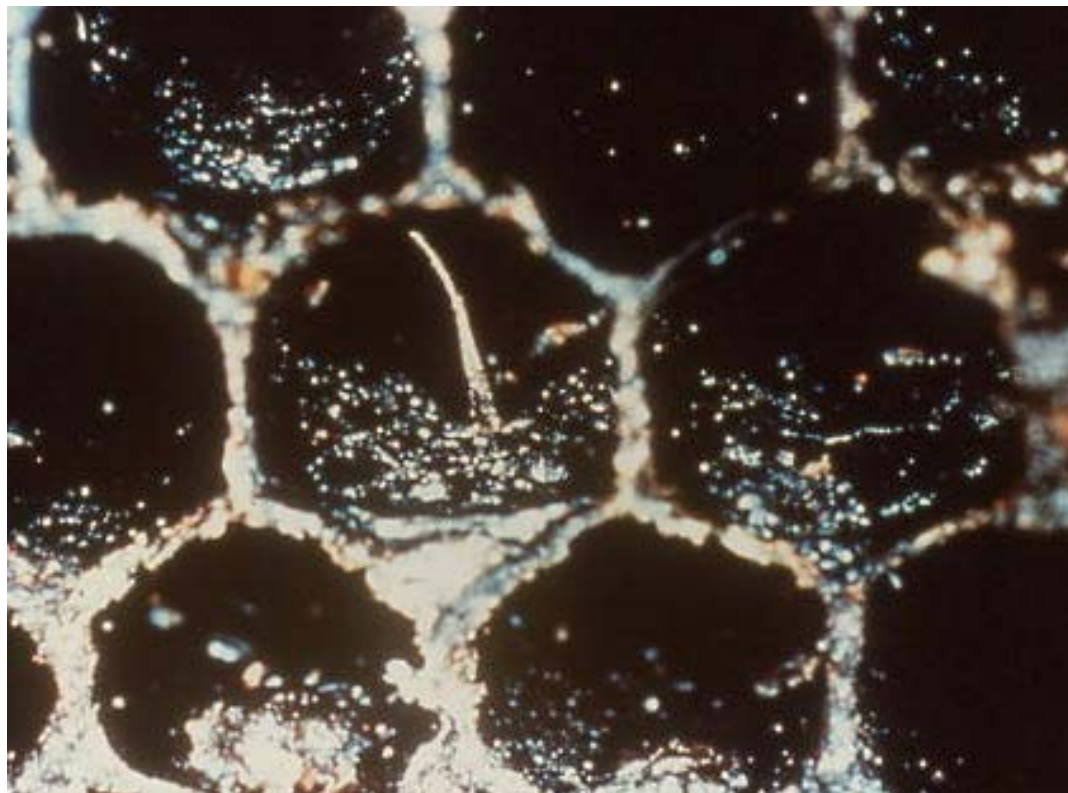
Sono suscettibili le larve fino a 48 h di età, con massima
sensibilità a 24-28 h ($LD_{50} = 8,5$ spore)



Consistenza viscosa, filante
3-4 settimane dalla morte



Scaglia, 6-7 settimane dalla morte



Peste americana, *Paenibacillus larvae*

B. DIAGNOSTIC TECHNIQUES

Table 1. Test methods available for the diagnosis of American foulbrood and their purpose

Method	Purpose					
	Population freedom from infection	Individual hive freedom from infection prior to movement	Contribute to eradication policies	Confirmation of clinical cases	Prevalence of infection – surveillance	Immune status in individual animals or populations post-vaccination
Agent identification ¹						
Bacterial isolation	+++	+++	+++	+++	+++	n/a
Microscopy	++	++	++	+++	+++	n/a
Antigen detection	++	++	++	++	++	n/a
Conventional PCR	+++	+++	+++	+++	+++	n/a
Real-time PCR	+++	+++	+++	+++	+++	n/a
Mass spectrometry	n/a	n/a	n/a	++	n/a	n/a

Key: +++ = recommended method, validated for the purpose shown; ++ = suitable method but may need further validation; + = may be used in some situations, but cost, reliability, or other factors severely limits its application; – = not appropriate for this purpose; n/a = purpose not applicable. PCR = polymerase chain reaction.

Peste americana, *Paenibacillus larvae*

Table 2. Phenotypic characteristics of *Paenibacillus larvae* ERIC genotypes.
All genotypes have ellipsoidal spores and are pathogenic for honey bees (data based on Genersch et al., 2005)

Characteristic	ERIC I	ERIC II	ERIC III	ERIC IV
Pigmented colonies	—	+	+	Variable
Spore surface (as seen by SEM)	Smooth	Convolutated	With ridges	With ridges
Growth in nutrient broth	—	+	+	+
Fermentation of mannitol	—	+	+	+
Fermentation of salicin	+	—	—	—
Alkaline phosphatase	+	—	+	+
Acid phosphatase	+	—	+	+
Catalase	—	—	Weak, delayed +	Weak, delayed +

Peste americana, *Paenibacillus larvae*

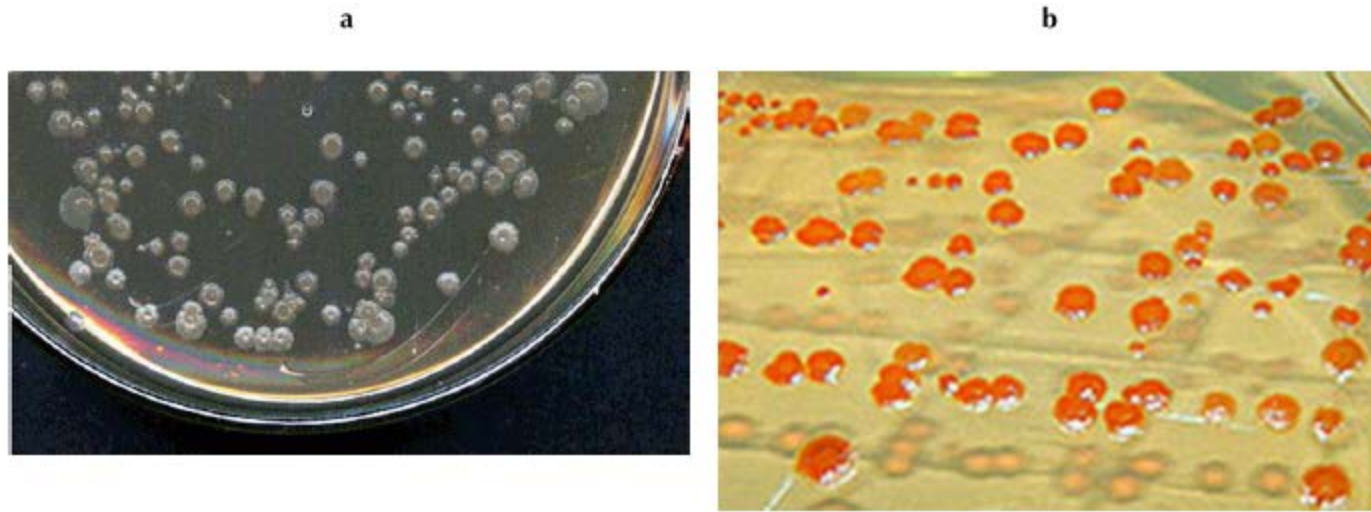


Fig.3: Appearance of *P. larvae* colonies cultivated on MYPGP agar plates: (a) Reference strain ATCC 9545^T (ERIC I) and (b) Strain PL SAG m290 (ERIC II). Photos: A.M. Alippi

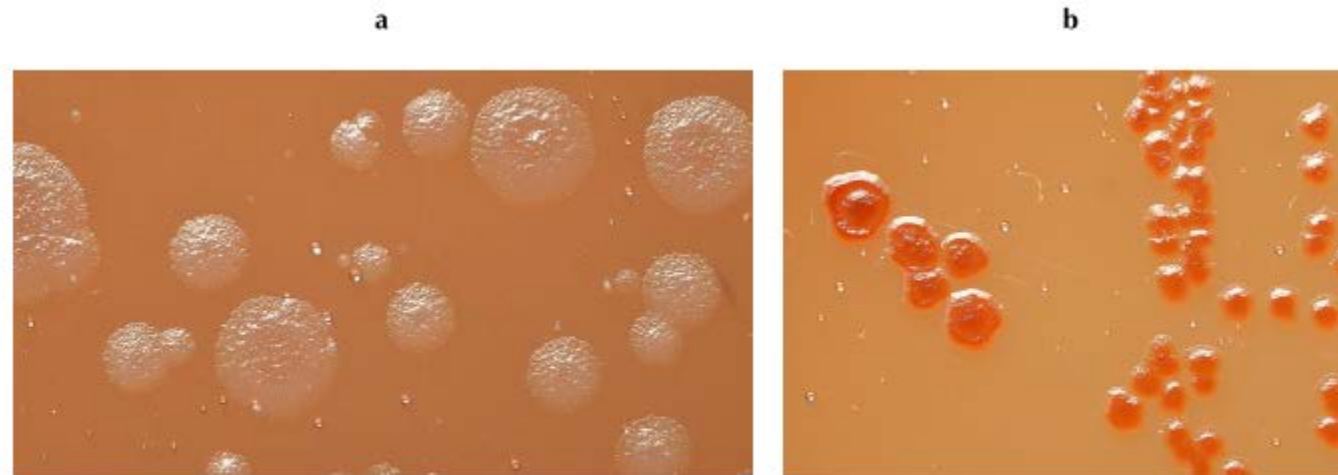


Fig.4: Characteristic colony morphology of *P. larvae* cultivated on Columbia sheep blood agar plates: (a) Reference strain ATCC 9545^T (ERIC I) and (b) Strain PL SAG m290 (ERIC II). Photos: A.M. Alippi

(OIE, 2017)

Trattamento del materiale infetto

- Raschiatura e soda caustica (2-6% a 60°C)/fiamma
- Ipoclorito di sodio 1% (immersione per 30')
- Paraffina (immersione per 10' a 160°C): efficacia attorno all'80%
- Sterilizzazione con radiazioni gamma: unico sistema di bonifica avente efficacia del 100%

Batterio sporigeno,
no terapia,
distruzione degli alveari infetti



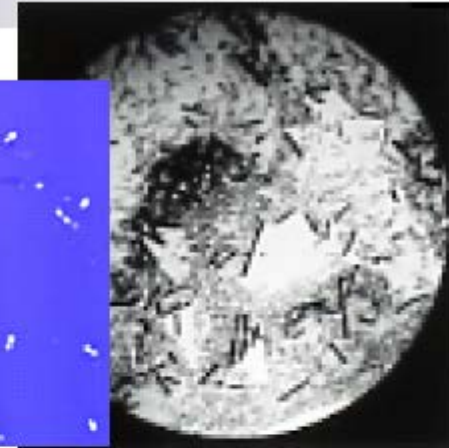
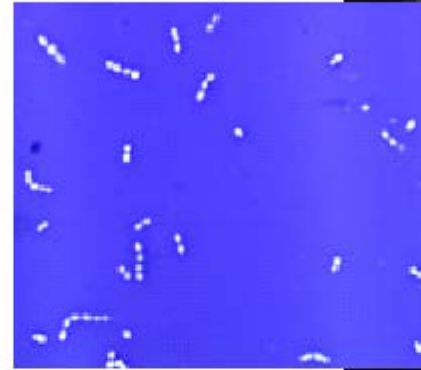
Peste europea

Eziologia

Infezione batterica

Agente primario:

Melissococcus plutonius



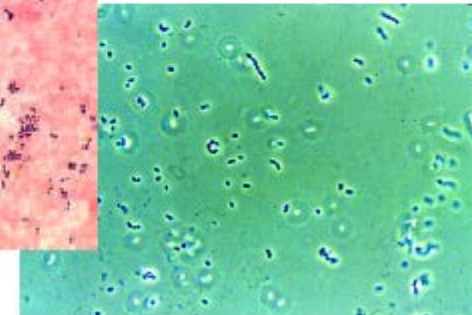
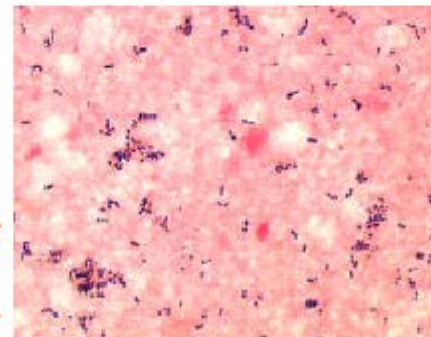
Agenti secondari:

Enterococcus faecalis

Paenibacillus alvei ...

Achromobacter eurydice

Brevibacillus laterosporus

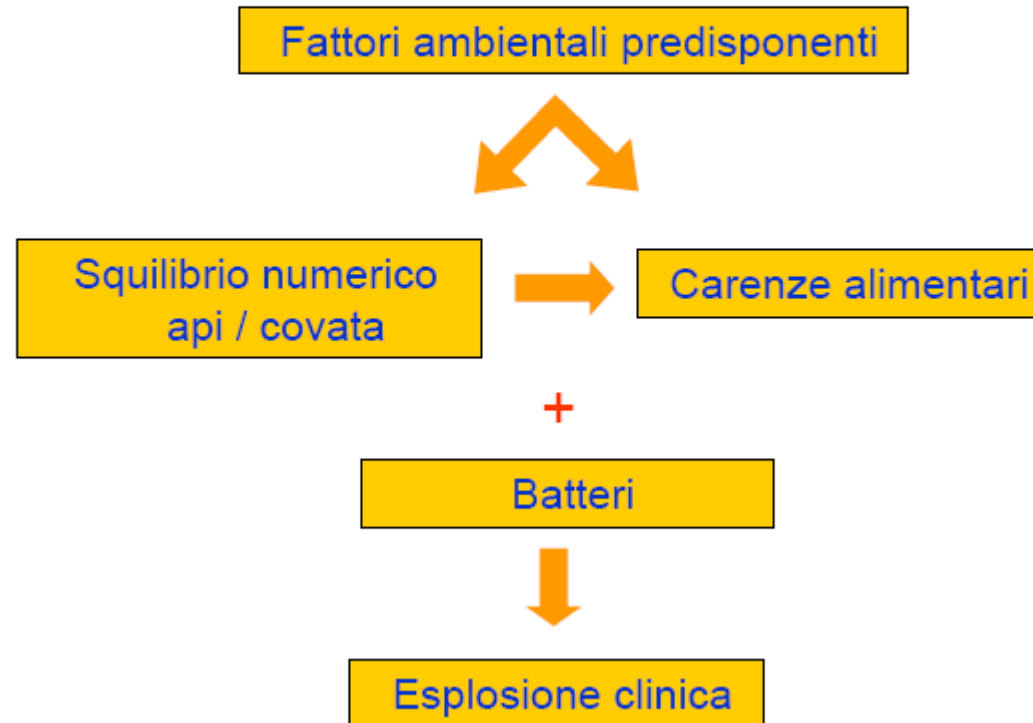


(Dr. Carpana)

Peste europea



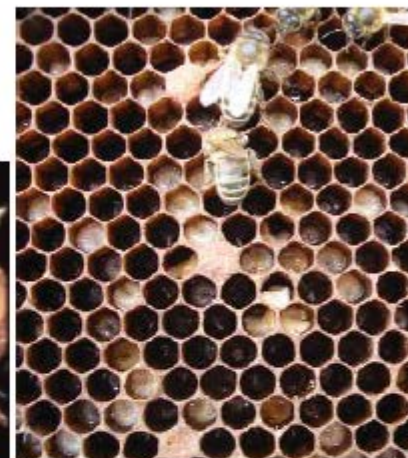
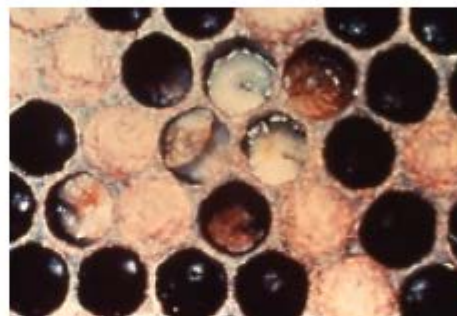
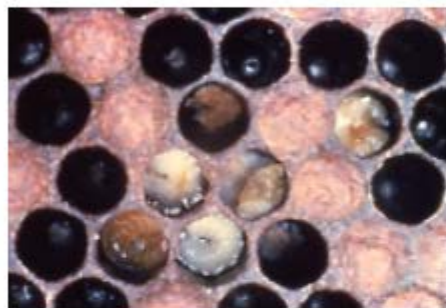
Dall'infezione alla malattia



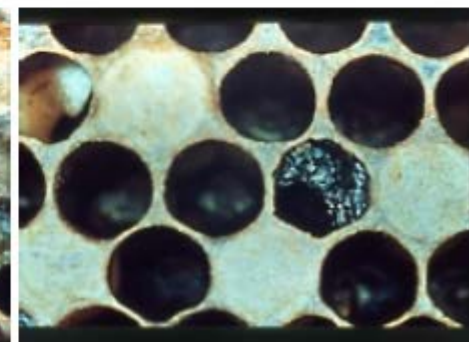
Peste europea

Sintomatologia

Larve infettate con alimento contaminato



Mortalità di solito
1-2 giorni prima
dell'opercolatura



Peste europea

Consistenza flaccida –
semiliquida – scaglia
Colore: biancastro – giallo –
bruno
Posizione irregolare
Odore: aspro, acido, putrido,
nessuno



EFB infected larva

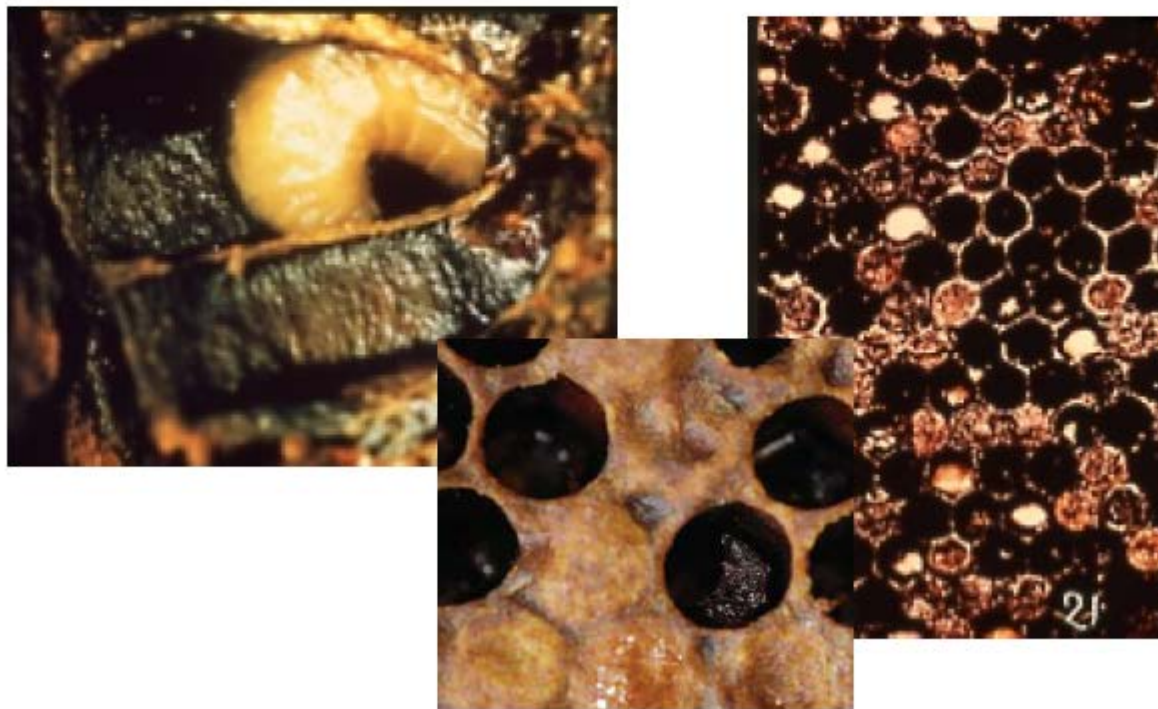


Melted down larvae

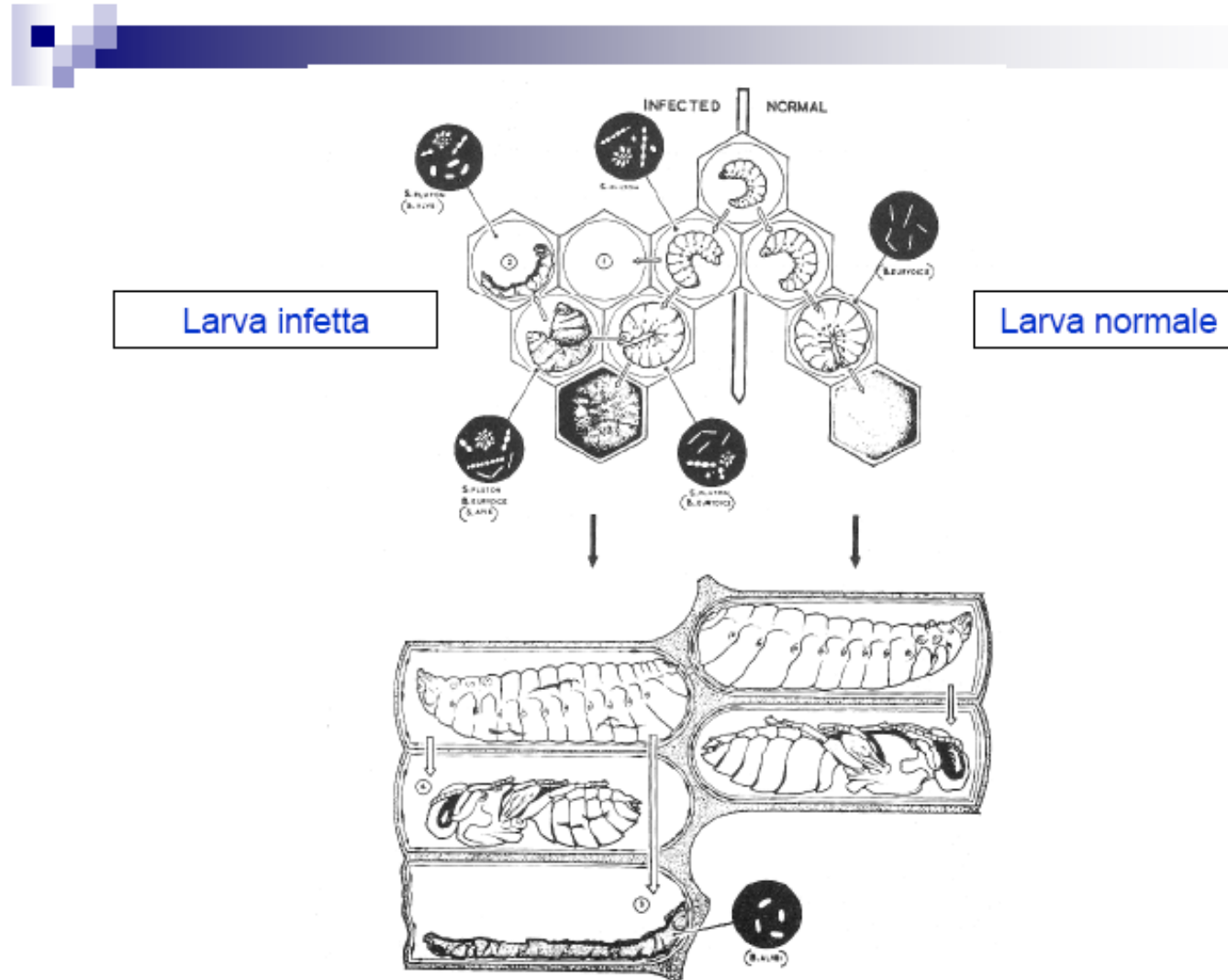
Peste europea

Sintomatologia

Mortalità anche poco dopo l'opercolatura)



Peste europea



Peste europea

Diagnosi

In campo:

- esame clinico
- test con kit diagnostico
- **Prelievo campione e invio al laboratorio**

In laboratorio:

- **Esame microscopico contenuto intestinale**
- **Isolamento e identificazione *Melissococcus plutonius* e/o batteri secondari**

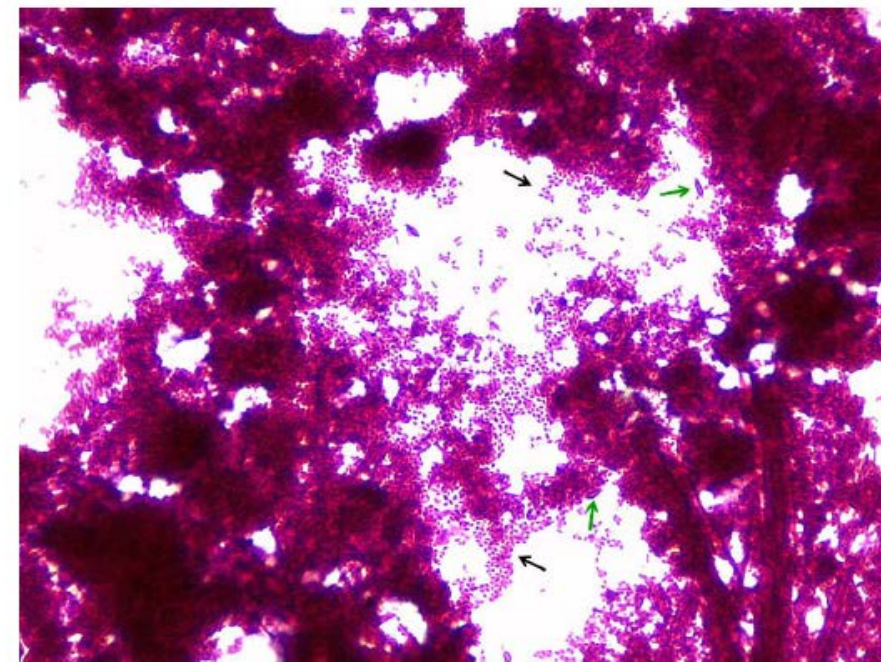
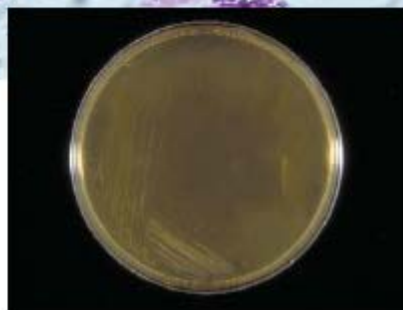
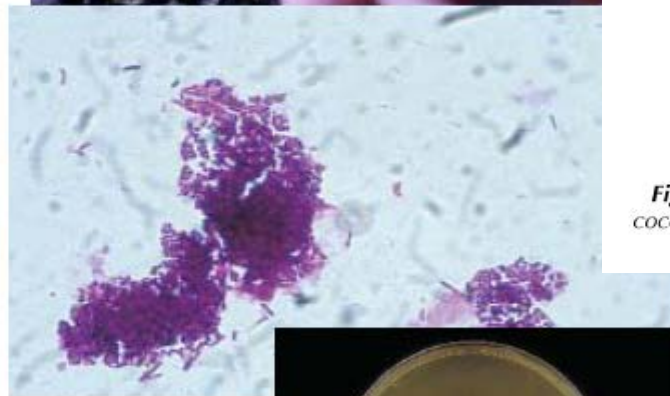


Fig. 4. Smear prepared from disease brood stained with carbol fuchsin. Black arrows indicate a mass of coccoid/lanceolate *Melissococcus plutonius* organism. Green arrows indicate the presence of spores of the secondary invader *Paenibacillus alvei*. Photo by A. M. Alippi.

Peste europea

B. DIAGNOSTIC TECHNIQUES

Table 1. Test methods available for the diagnosis of European foulbrood and their purpose

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Agent identification ¹						
Bacterial isolation	+++	+++	++	+++	+++	n/a
Antigen detection	++	++	++	++	++	n/a
Microscopy	++	++	++	+++	+++	n/a
PCR	+++	+++	+++	+++	+++	n/a
Real-time PCR	+++	+++	+++	+++	+++	n/a

Key: +++ = recommended method, validated for the purpose shown; ++ = suitable method but may need further validation; + = may be used in some situations, but cost, reliability, or other factors severely limits its application; – = not appropriate for this purpose; n/a = purpose not applicable. PCR = polymerase chain reaction.

Nosemiasi

- ✓ Classe: Microsporidi
- ✓ Famiglia: Nosematidi
- ✓ Genere: Nosema

Parassiti intracellulari obbligati di eucarioti: insetti, pesci, mammiferi (uomo incluso)

In passato classificato come protozoo



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Short communication

Nosema ceranae, a new microsporidian parasite in honeybees in Europe

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PATHOLOGY

www.elsevier.com/locate/jip

Widespread dispersal of the microsporidian *Nosema ceranae*, an emergent pathogen of the western honey bee, *Apis mellifera*

Julia Klee ^{a,*}, Andrea M. Besana ^a, Elke Genersch ^b, Sebastian Gisder ^b, Antonio Nanetti ^c,
Dinh Quyet Tam ^d, Tong Xuan Chinh ^d, Francisco Puerta ^e, José María Ruz ^e, Per Kryger ^f,
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Received 12 October 2006; accepted 23 February 2007

Experimental infection of *Apis mellifera* honeybees with *Nosema ceranae* (Microsporidia)

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Received 29 August 2006; accepted 1 November 2006

APIDOLOGIE 38 (2007) 558–565

NOSEMA CERANAE HAS INFECTED *APIS MELLIFERA* IN EUROPE SINCE AT LEAST 1998 AND MAY BE MORE VIRULENT THAN *NOSEMA APIS*

ROBERT J. PAXTON, JULIA KLEE, SEPPO KORPELA AND INGEMAR FRIES

Higes et al., 2008

How natural infection by *Nosema ceranae* causes honeybee colony collapse. *Environ Microbiol.* 10: 2659–2669, 2008

Journal of Invertebrate Pathology 103 (2010) 573–579



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PLoS one

Nosema ceranae in European honey bees (*Apis mellifera*)

Ingemar Fries ^{*}

Department of Ecology, Swedish University of Agricultural Sciences, Box 7046, 75007 Uppsala, Sweden

Exposure to Sublethal Doses of Fipronil and Thiacloprid Highly Increases Mortality of Honeybees Previously Infected by *Nosema ceranae*

Nosemiasi

- Malattia delle api adulte a carattere contagioso
- Causata da un fungo (Sina et al., 2005) unicellulare che può comportare sintomatologia differente a seconda della specie coinvolta:
 - *N. apis* sindrome enterica/diarroica
 - *N. ceranae* spopolamento (tipo C)

Nosemiasi - sintomi



Malattia di *A. mellifera* diffusa e consolidata

- in 85 su 90 paesi (IBRA)
- in 43% dei paesi apistici (OIE)

Agente: *Nosema apis*

Infezione via canale alimentare

Organo bersaglio: mesointestino o ventricolo



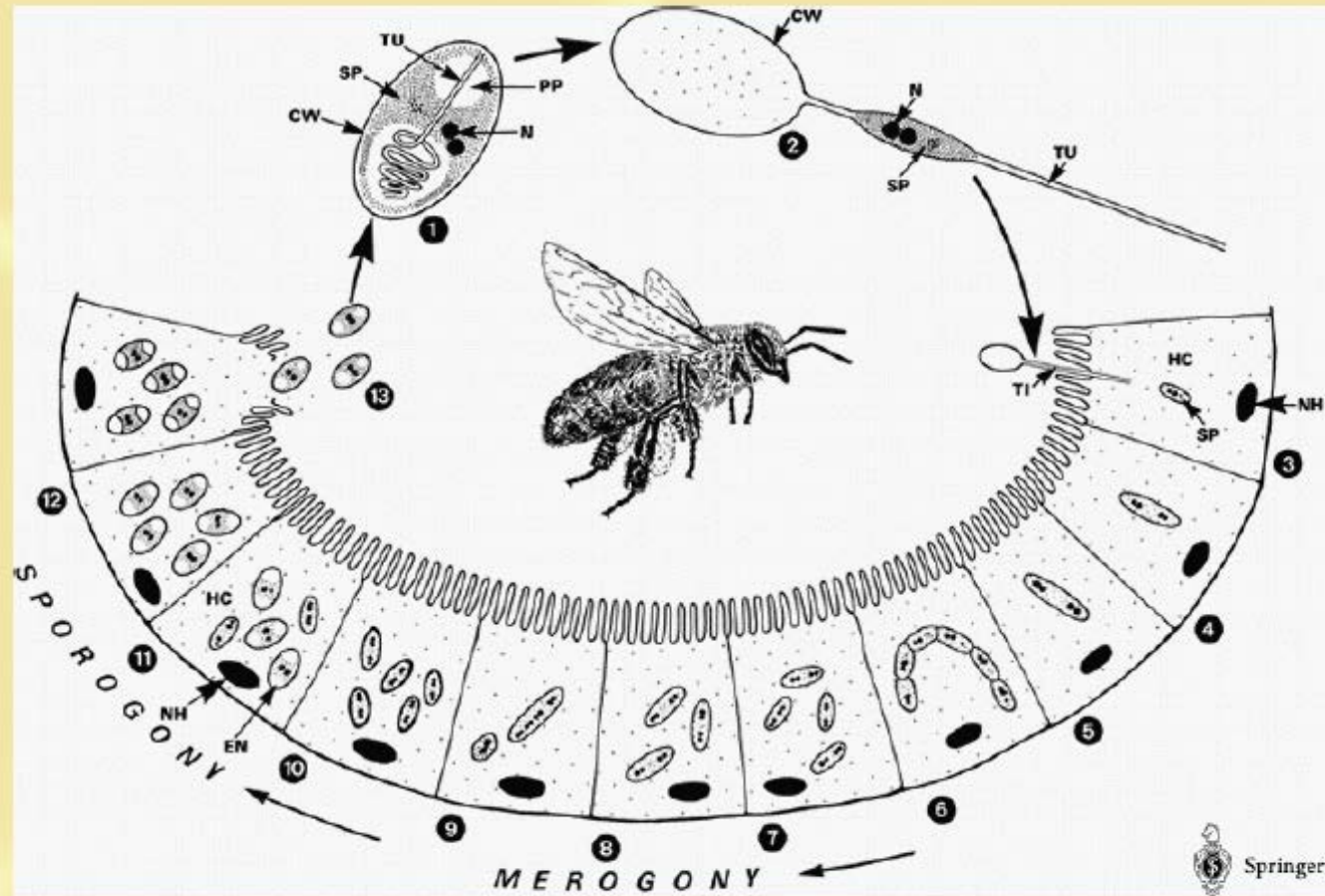
Optimum termico:	30-35 °C
Inizio moltiplicazione:	24 h dopo l'infezione
Nuove spore durevoli:	entro 48-60 h
Infezione piena:	30-50 milioni di spore
Con retto pieno:	200 milioni di spore
Dose Infettiva 50:	20-90 spore

➔ *N. ceranae* è sensibile alle basse temperature; le spore conservate a +4 /-20°C perdono la loro infettività

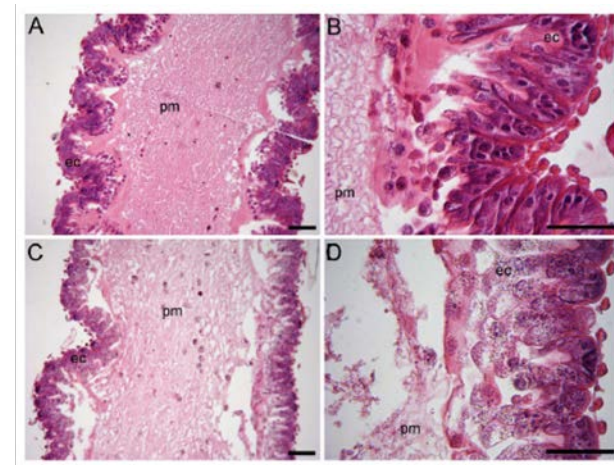
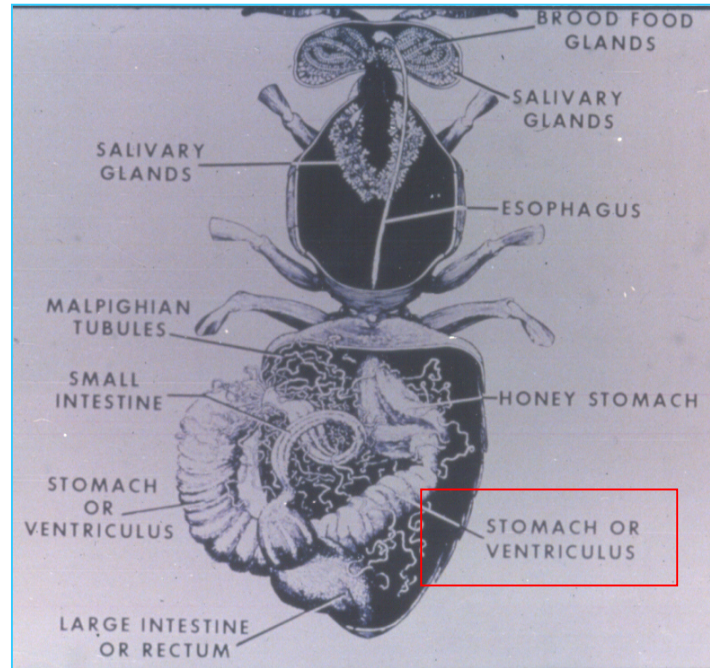
(Fries e Forsgren, 2008)

Ciclo biologico

CICLO BIOLOGICO di *Nosema sp*



N. ceranae - Sintomatologia



Dussaubat et al., 2012

N. apis - Sintomatologia



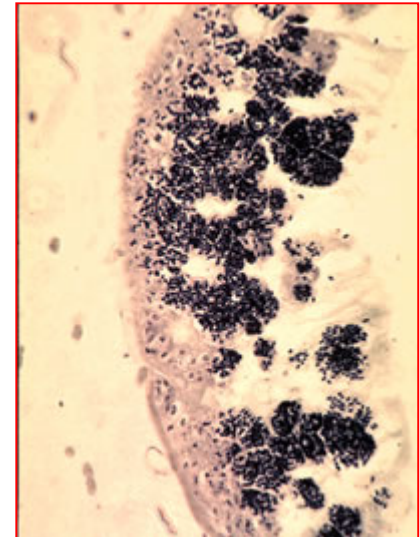
Higes *et al.*, 2008

How natural infection by *Nosema ceranae* causes honeybee colony collapse

Environ Microbiol. 10: 2659-2669, 2008

Sintomi – *N. apis*

- ✓ Malassorbimento
- ✓ Diarrea
- ✓ Danneggiamento delle gh. ipofaringee
- ✓ Ridotta longevità
- ✓ Accelerato invecchiamento
- ✓ Infezioni secondarie (*Malpighamoeba mellificae*)
- ✓ Atrofia ovarica
- ✓ Sostiruzione della regina



Diagnosi – esame microscopico (400x)

Spore di *Nosema ceranae*
più piccole: 4,4 x 2,2 µm

Spore di *Nosema apis*
5-7 x 3-4 µm

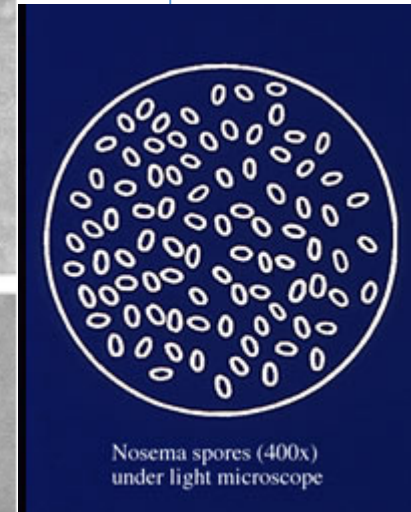
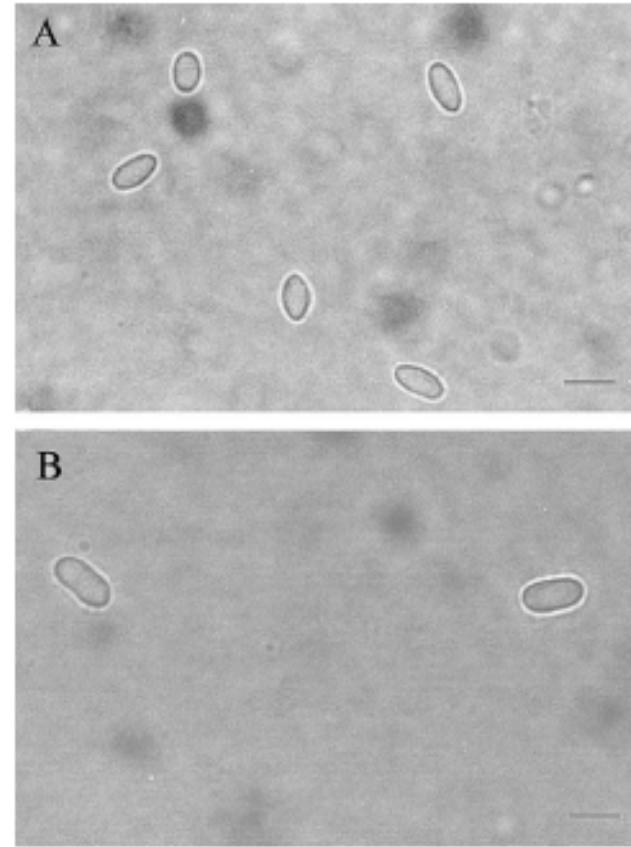
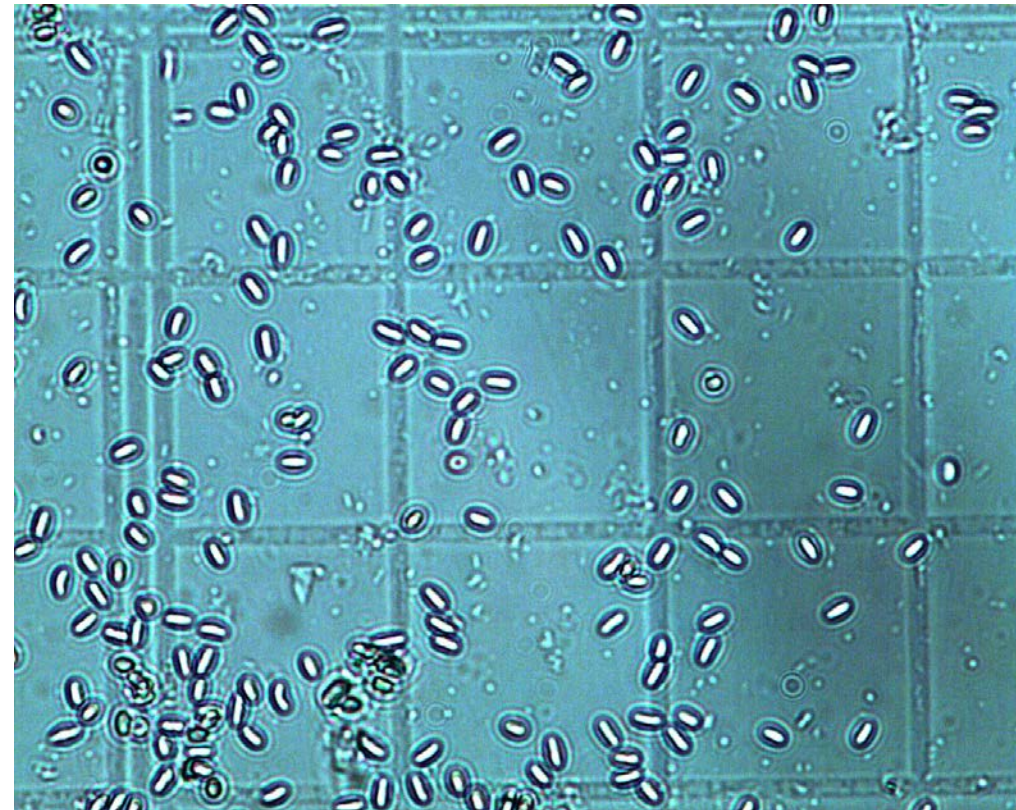


Fig. 1. Spores of *N. ceranae* (A) are distinctly smaller than spores of *N. apis* (B). Nevertheless, they can be hard to distinguish by light microscopy, in particular where mixed infections occur. Bars = 5 µm. (From Fries et al. 2006a).

Esame microscopico quantitativo

Effettuando una conta mediante camera contaglobuli si risale al numero di spore/ape di *Nosema* spp.



Diagnosi – microscopia elettronica

In grado di differenziare le due
specie in base al numero di
eliche del filamento polare

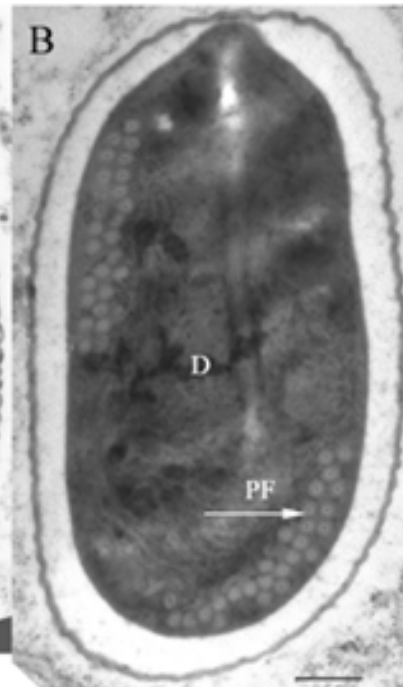
N.ceranae: 20 – 23

N.apis: > 30

N. ceranae



N. apis



Identificazione di specie mediante tecniche di biologia molecolare

Diagramma schematico di un processo di identificazione di specie.

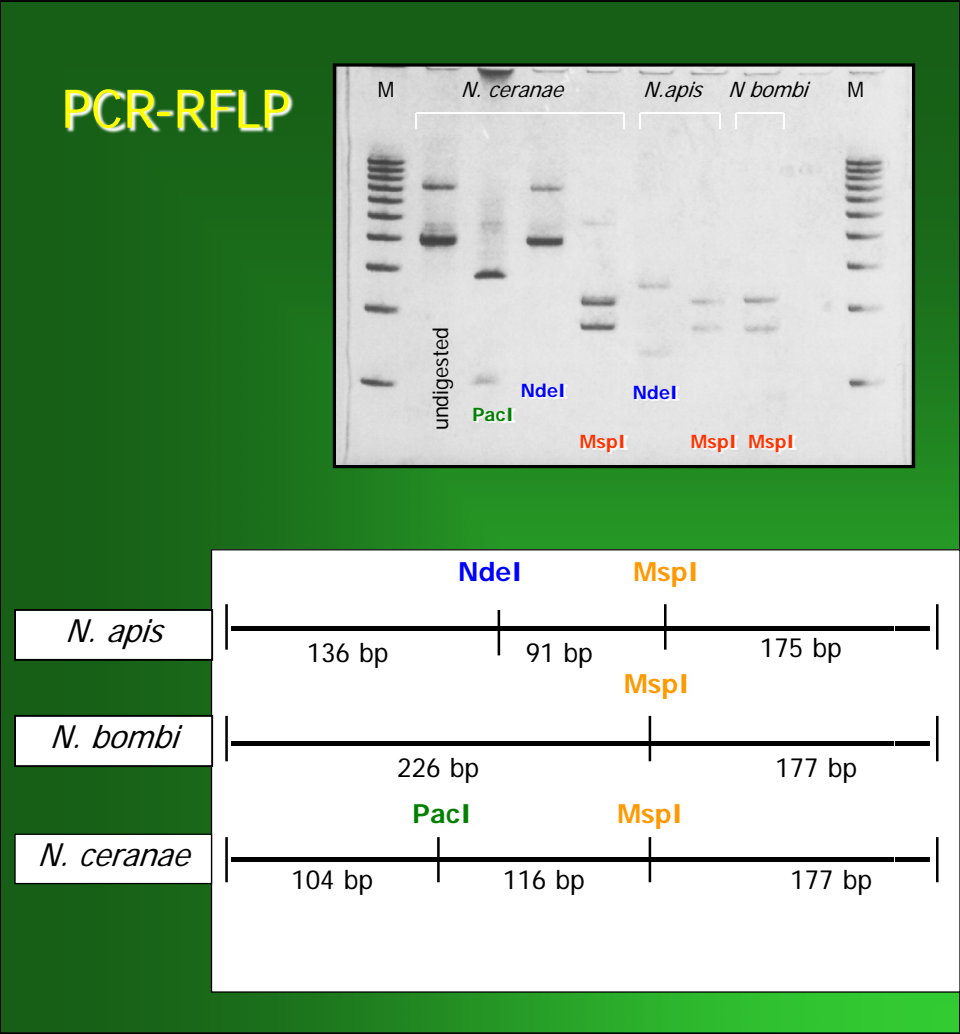
PCR - RFLP (Klee et al., 2007; Tapaszti et al., 2009)

Real-Time PCR (Cox-Foster et al., 2007; Chen et al., 2009; Bourgeois et al., 2010)

Uniplex PCR con primer specie-specifici (Chen et al., 2008)

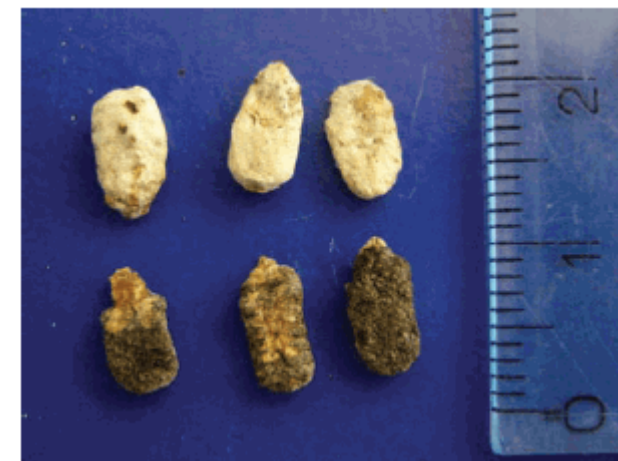
Multiplex PCR (Martin-Hernandez et al., 2007), raccomandato dall'OIE

Identificazione di specie mediante tecniche di biologia molecolare



Covata calcificata

Ascosphaera apis



Summarized comparison of taxa from *A. mellifera*

Lotmaria passim Schwarz, 2014



Crithidia mellifica Langridge & McGhee, 1967



Flagellated morphotype

promastigote (lanceolate)

choanomastigote (ovoid)

broad, shallow groove

narrow, deep grooves

length = 7.4 μ m ; width = 3.2 μ m

length = 6.6 μ m ; width = 3.3 μ m

Adherent morphotype

spheroids ; diameter 3-4 μ m

spheroids ; diameter = est. 4 μ m*

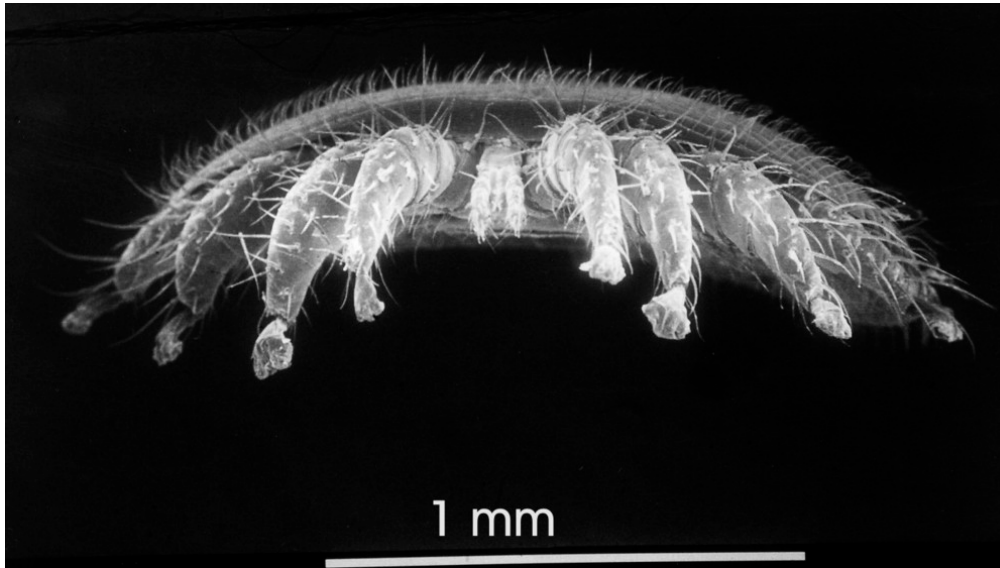
primary niche = posterior ileum – rectum

primary niche = posterior ileum - rectum

Based on R. Schwarz et al. 2015. *J. Euk. Microbiol.* and D. Langridge and R. McGhee 1967. *J. Protozool.* *Estimate only

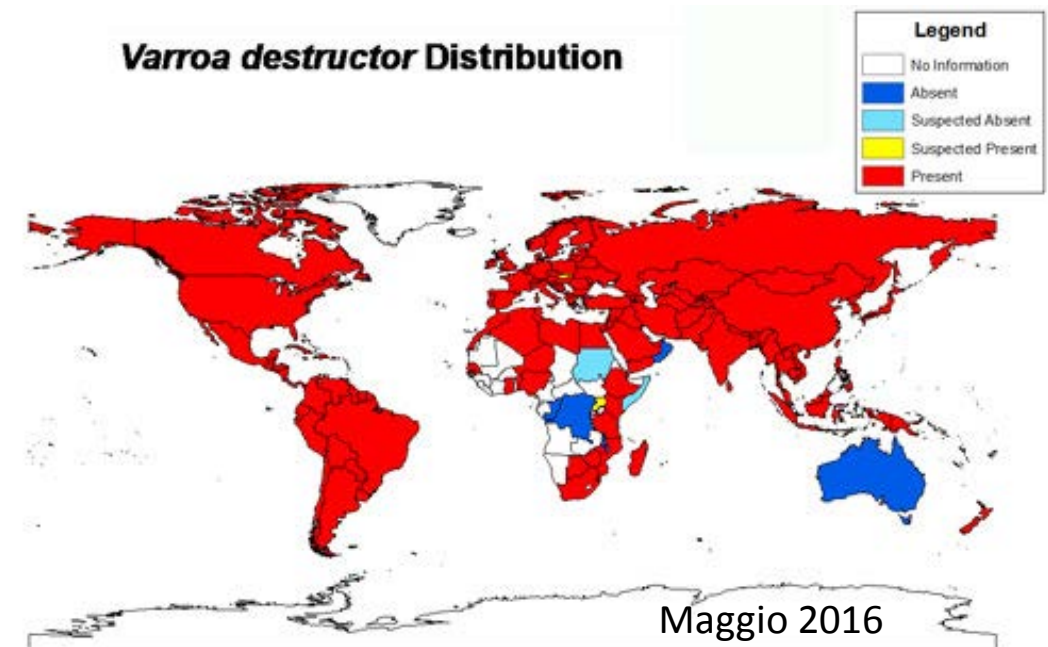
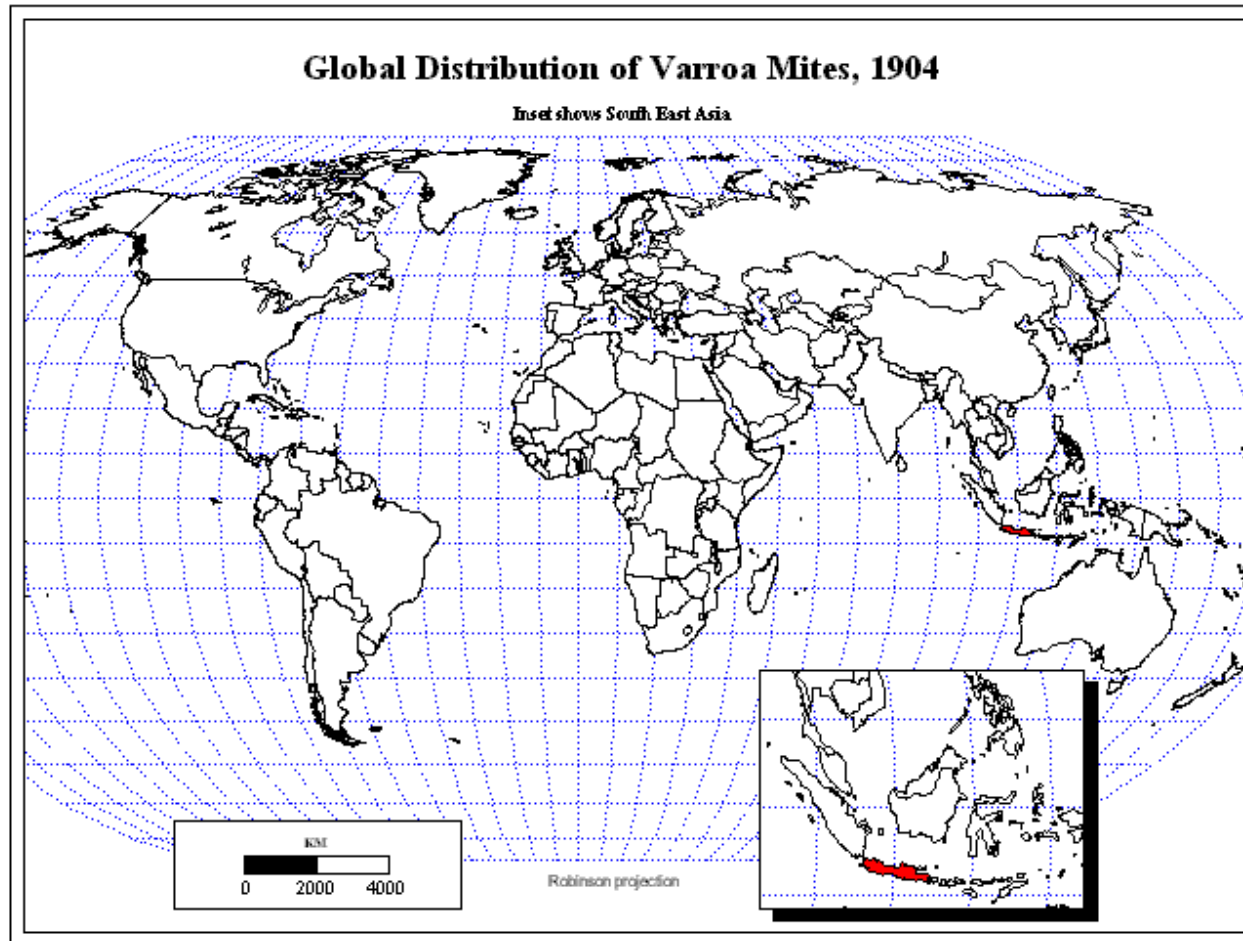
Varroatosi

- *Varroa destructor*
- (Acari: Mesostigmata: Varroidae)

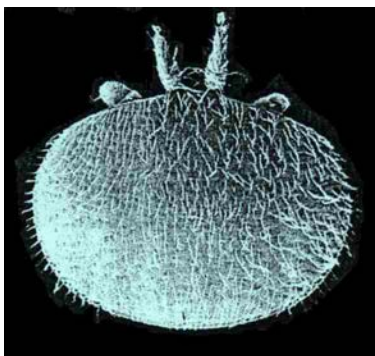


Patologie apistiche

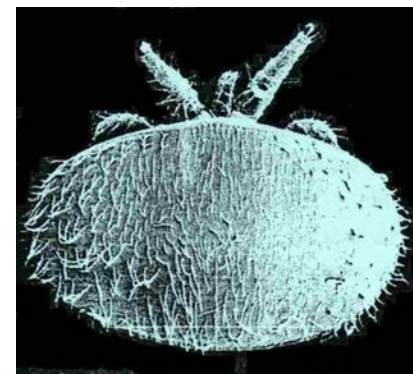
La varroa nel mondo



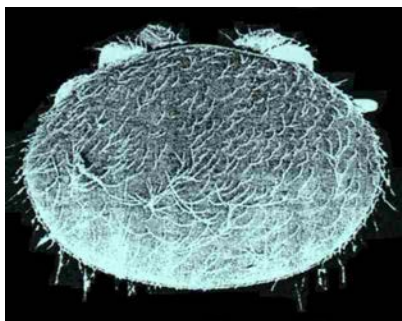
Genere *Varroa*



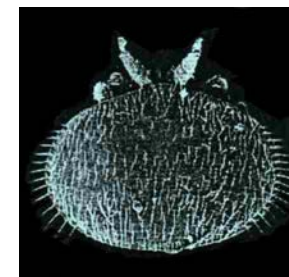
Varroa jacobsoni



Varroa destructor



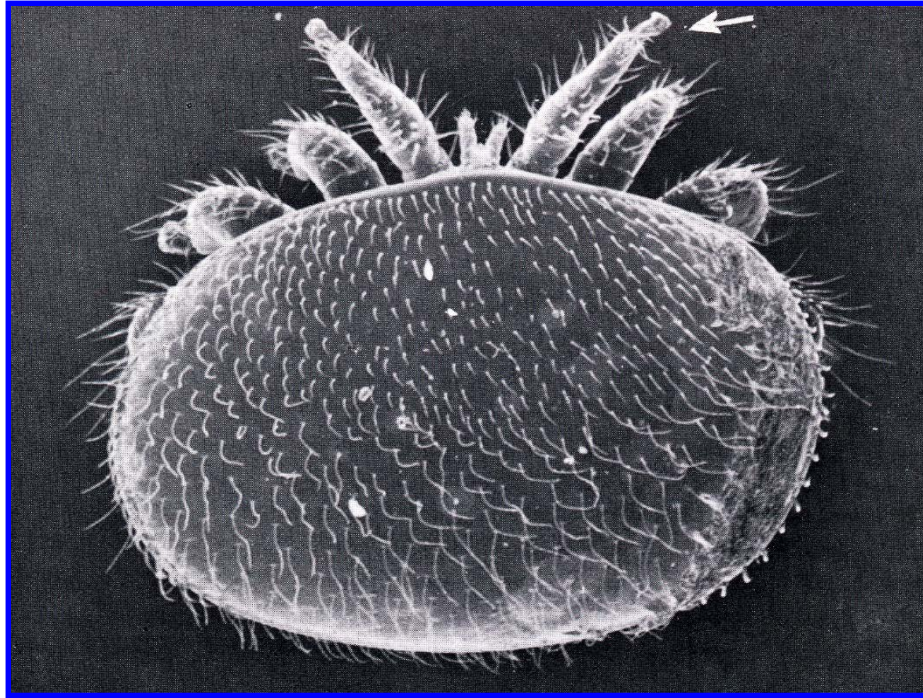
Varroa rindereri



Varroa underwoodi

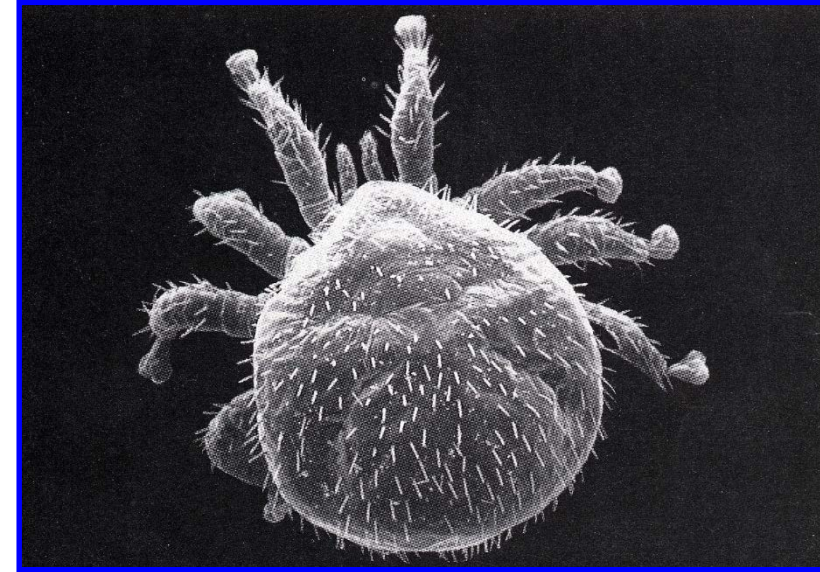
(D. Anderson)

Dimorfismo sessuale



FEMMINA

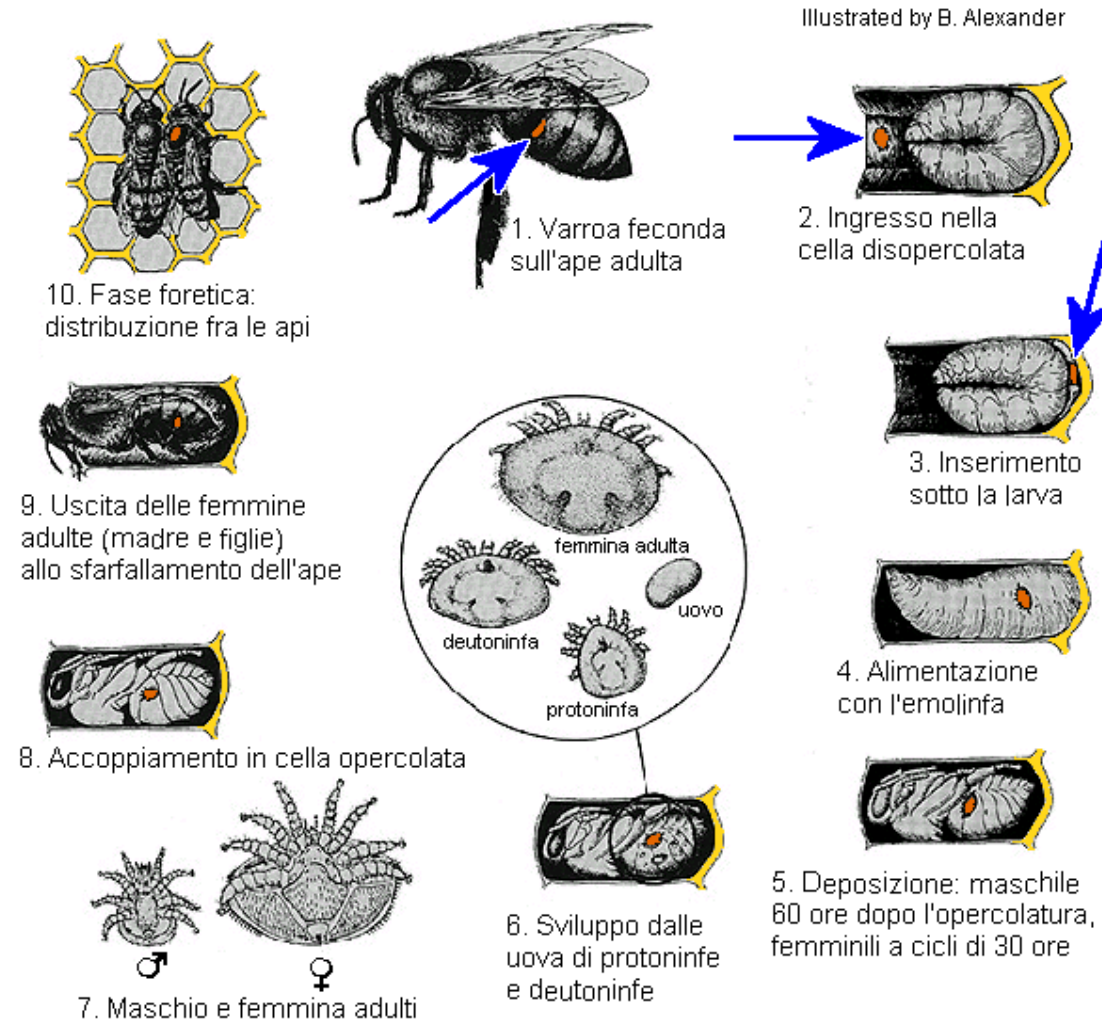
- 1,1-1,3 x 1,5-1,8 mm
- tegumento sclerificato, bruno-rossiccio



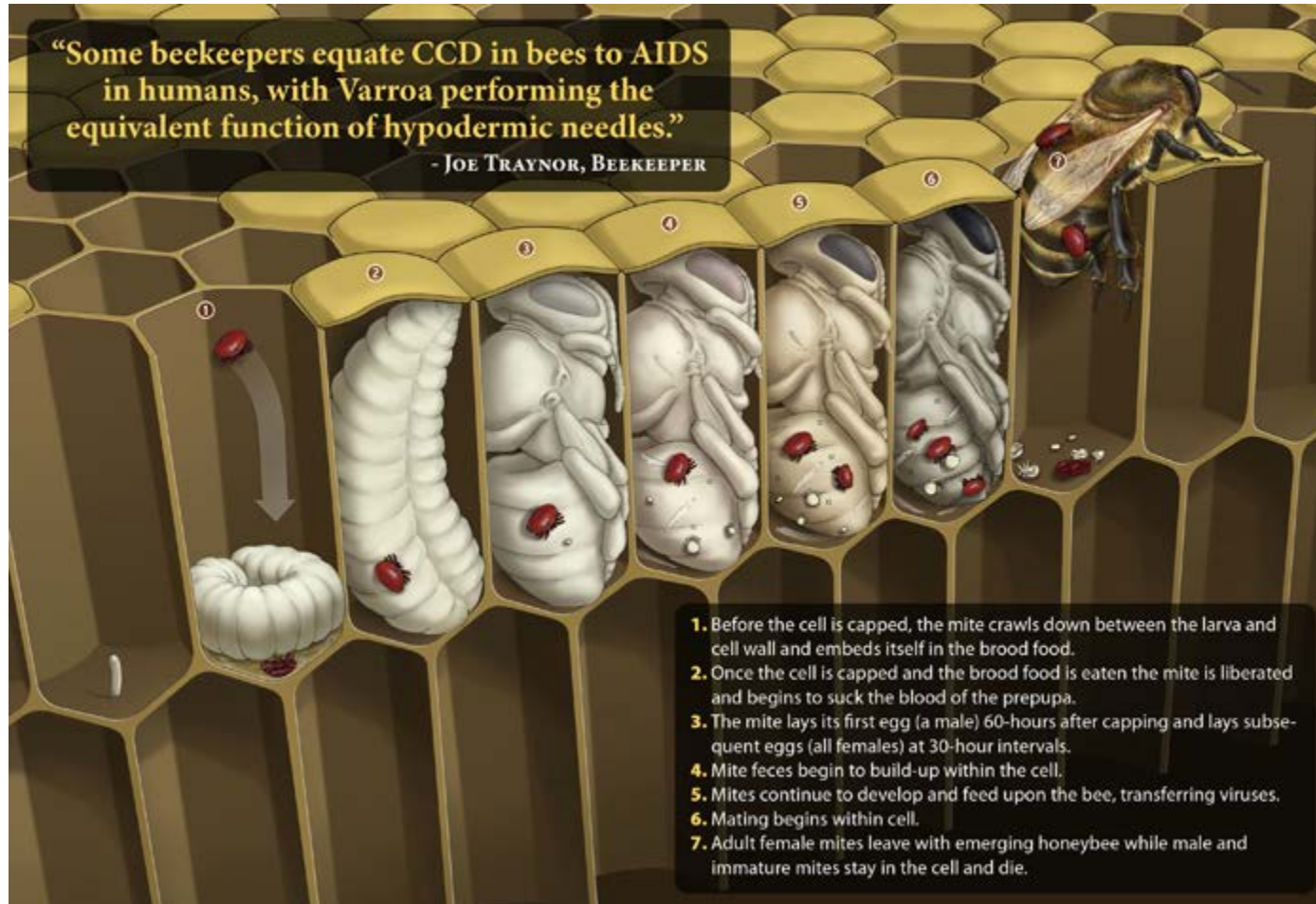
MASCHIO

- 0,75 x 0,80 mm
- tegumento poco sclerificato, chiaro

Ciclo biologico di *Varroa destructor*



Varroa destructor



Le varroe raddoppiano ogni mese

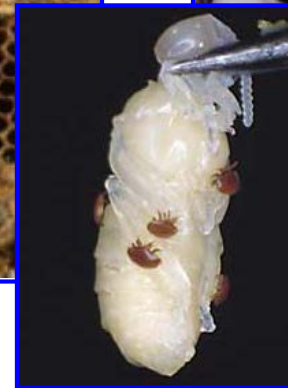
Febbraio	10	50	100
Marzo	20	100	200
Aprile	40	200	400
Maggio	80	400	800
Giugno	160	800	1600
Luglio	320	1600	3200
Agosto	640	3200	6400

Grado d'infestazione

Nelle api



Nella covata



- Difficoltà:
 - Rappresentatività dei campioni
 - Dispersione delle varroe (età delle api, aggregazione)

Determinazione del livello di infestazione in apiario



Fig. 6. Collecting mites with icing sugar: *a.* a heaped table spoon of powdered sugar is poured on 300 honey bees kept in a jar through the lid equipped with a mesh.

Photo by V. Dietermann



Fig. 6. *c.* the jar is turned upside down and shaken to dislodge the mites.

Photo by V. Dietermann



Fig. 6. *d.* mites (2 darker points) and sugar fallen through the mesh on the paper.

Photo by V. Dietermann



Fig. 6. *b.* rolling the jar on its side ensures that bees are covered with the sugar.

Photo by V. Dietermann

5. Place the mites collected in a mite-tight container with a humidity source to prevent the mites desiccating.

Pros: fast and allows for several hundreds of mites to be collected in a short time.

Cons: effect on lifespan of mites unknown; this can be a problem if they need to be used for long lasting experiments. The treatment is not bee-friendly since many can die during the process.

3.1.4. Collecting mites from brood

3.1.4.1. Collecting mites from L5 larvae

Mites at a similar physiological stage can be collected from recently capped brood cells (after Chiesa et al., 1989)

1. Remove a brood comb with L5 larvae ready to be capped in the evening of the day preceding the experiment.

Determinazione del livello di infestazione in laboratorio



Fig. 6. a. the mites and sugar collected are placed in a sieve over which saline solution is poured to rid the mites from sugar particles.

Photo by V. Dietsmann



Fig. 6. f. the mites are placed on an absorbing paper to accelerate their drying.

Photo by V. Dietsmann

Pros: easy collection, all mites are at the same physiological stage.

Cons: there is no knowledge of the mite's age and of how many reproductive cycles she already performed.

3.1.4.2. Collecting mites from capped cells

3.1.4.2.1. Opening each cell

Brood mites can be picked up by hand from their host with a fine bristle brush or a small mouth aspirator after opening the cells they infest and removing the pupa. To obtain mites at a given time during the reproductive cycle, the collection can be made from brood of known age (see the section 'Obtaining brood and adults of known age' in the *BEEBROOD* paper on miscellaneous methods (Humen *et al.*, 2013)). For this the queen is caged on an empty frame at the necessary date (see also section 4.6. 'Breeding mites in colonies').

1. Uncap the cell with fine forceps or scalpel.
2. Push away the cell walls to free the developing larva or pupa.
3. With soft forceps pull the larva or pupa out.
4. Carefully look on the larva or pupa and on the cell walls for mites.
5. Place the mites collected in a mite-tight container.
6. Place a source of humidity in the container to prevent the mites desiccating.

Pros: This is the less damaging collection method for the mite.

Cons: It is the most time consuming collection method.

3.1.4.2.2. Opening large number of cells and washing the brood

A quicker method for collecting large numbers of live mites from capped brood cells it to uncap large quantities of brood and force the mites out by knocking them out of the cells or by washing them off the brood. For this:

1. Uncap a large number of cells.
2. Remove all developing bee brood.
These two steps can be done at once using an uncapping fork used for honey extraction.
3. Turn the comb upside down over a sheet of white paper.
4. Tap on its upper surface to dislodge mites from the cells.

Danni alla colonia

- Api deformi e disvitali
- Covata morta in vari stadi
- Malattie secondarie (virosi)
- Poche api e covata
- Abbandono del nido
- Morte della colonia



Varroosi

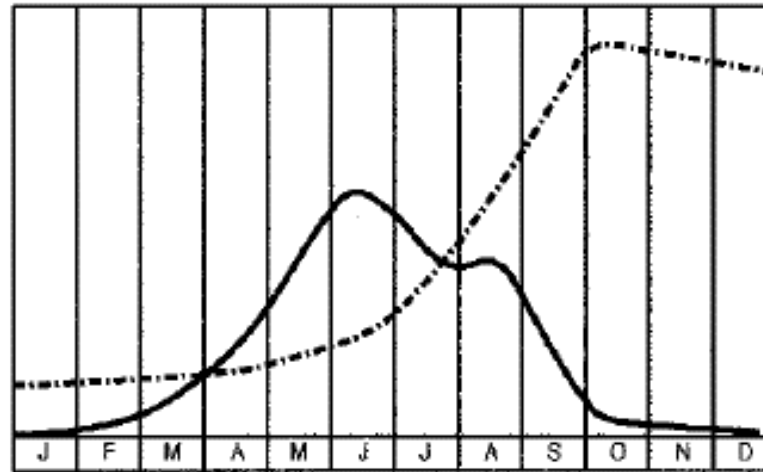


Fig. 4. Graph of populations of bees and mites over 1 year in a temperate Northern Hemisphere climate: brood numbers (solid line); mite numbers (broken line).

(OIE, 2017)



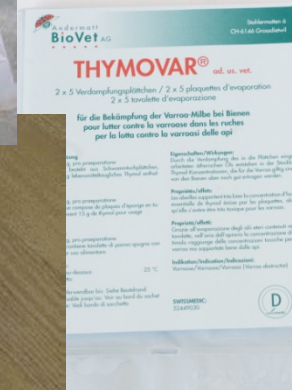
Trattamenti in presenza di covata



Trattamenti in assenza di covata

Farmaci autorizzati in Italia

- ✓ Apilifevar
- ✓ Apiguard
- ✓ Thymovar
- ✓ Apistan
- ✓ Polyvar
- ✓ MAQS
- ✓ Varterminator
- ✓ Apifor60
- ✓ Varromed
- ✓ Api-Bioxal
- ✓ Oxuvar
- ✓ Oxybee
- ✓ Apitraz
- ✓ Apivar



Infezioni virali in *Apis mellifera*

- Una ventina di tipi virali identificati dal 1963
- Molto comuni le infezioni multiple e inapparenti
- Colpiscono tutti gli stadi di sviluppo dell'ape
- Effetti diversi per tipo e intensità con scarsi indicatori sintomatologici
- Evoluzione dipendente dal contesto (altre patologie, fattori ambientali ...)

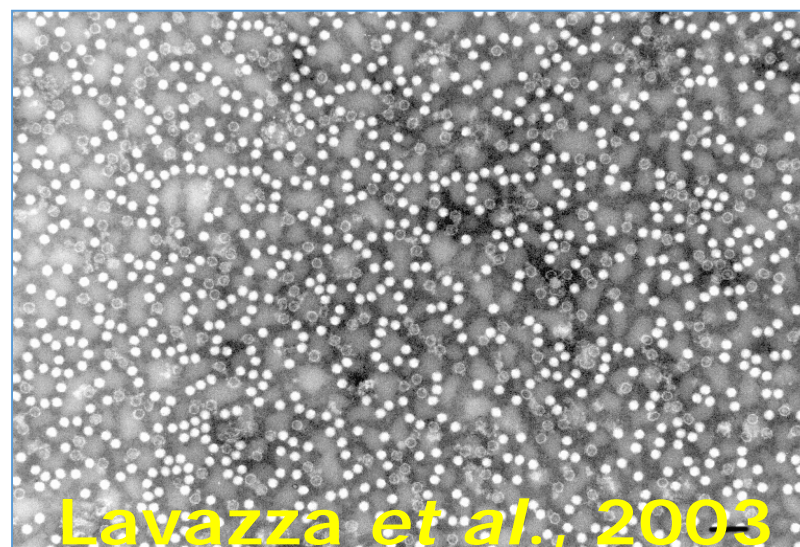
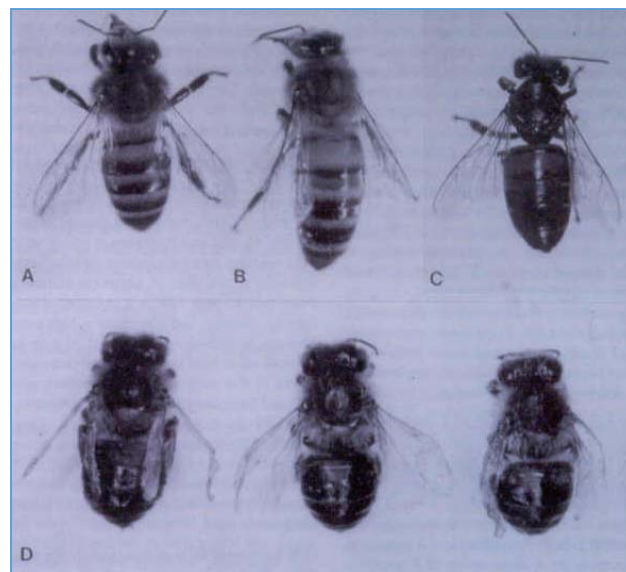
• Paralisi cronica (CPV)	30 nm
• Covata a sacco (SBV)	30 nm
• Paralisi acuta (APV)	30 nm
• Virus associato alla paralisi cronica (CPVA)	17 nm
• Virus della paralisi lenta (SPV)	30 nm
• Virus delle ali deformi (DWV)	30 nm
• Virus delle ali opache (CWV)	17 nm
• Virus della cella reale nera (BQCV)	30 nm
• Kashmir bee virus (KBV)	30 nm
• Virus X	35 nm
• Virus Y	35 nm
• Virus egiziano	30 nm
• Virus filamentoso (FV)	150 nm
• Virus iridescente (AIV)	150 nm
• Arkansas Bee virus (ABV)	
• Berkeley Bee Picornavirus (BBPV)	

Malattie da virus

- Correlazione fra varroasi e malattie da virus
- Diagnosi (metodi immunoenzimatici, microscopia elettronica, PCR)
- No trattamenti



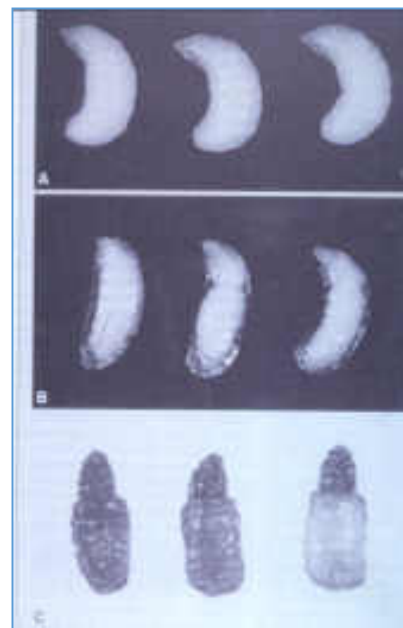
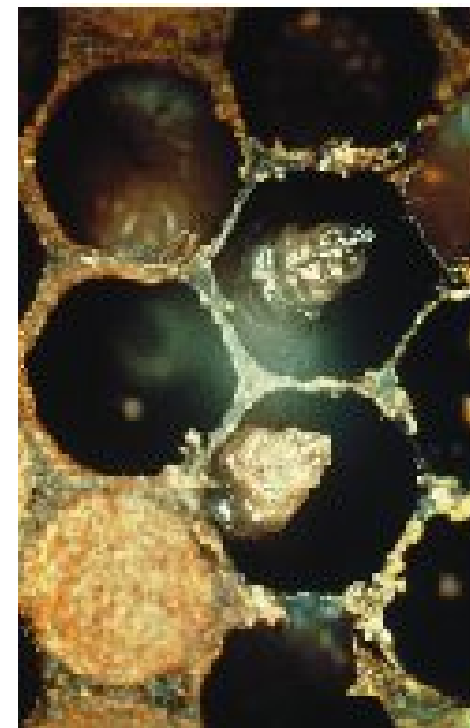
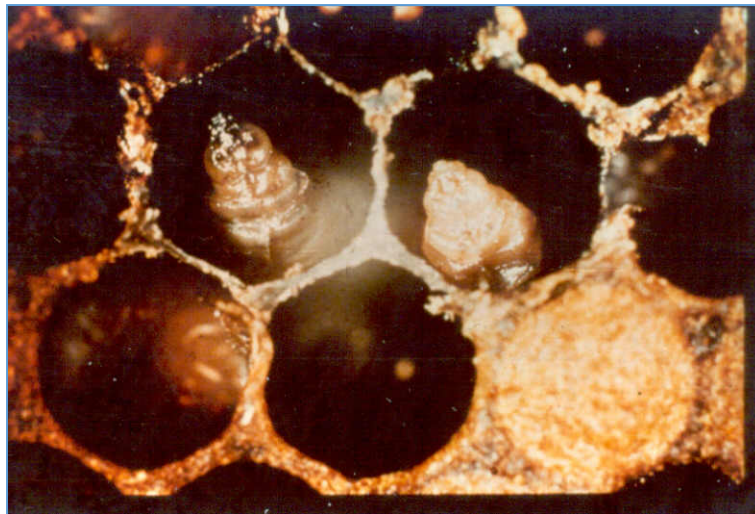
Virus delle ali deformi



Virus della paralisi cronica



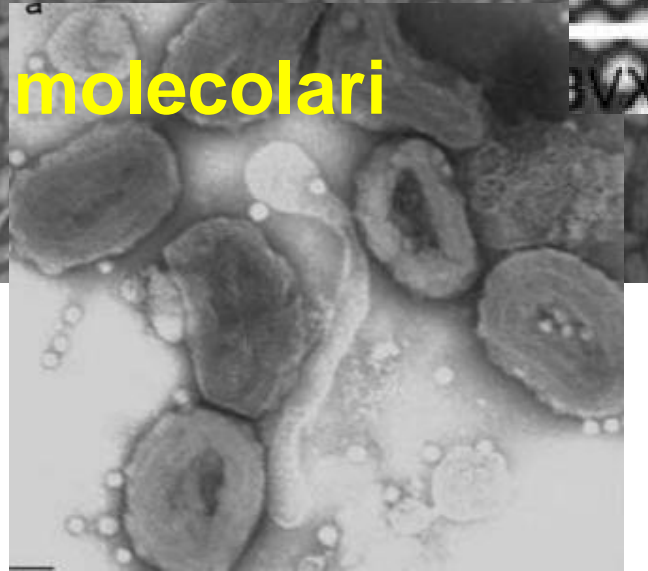
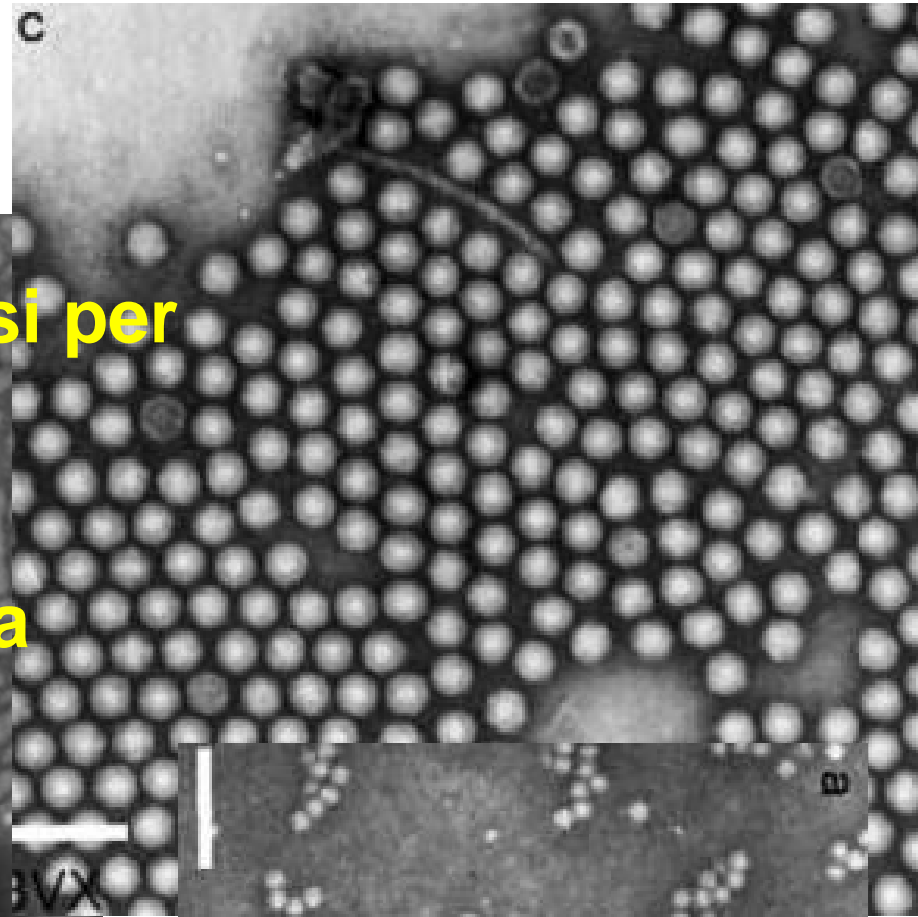
Virus della covata a sacco



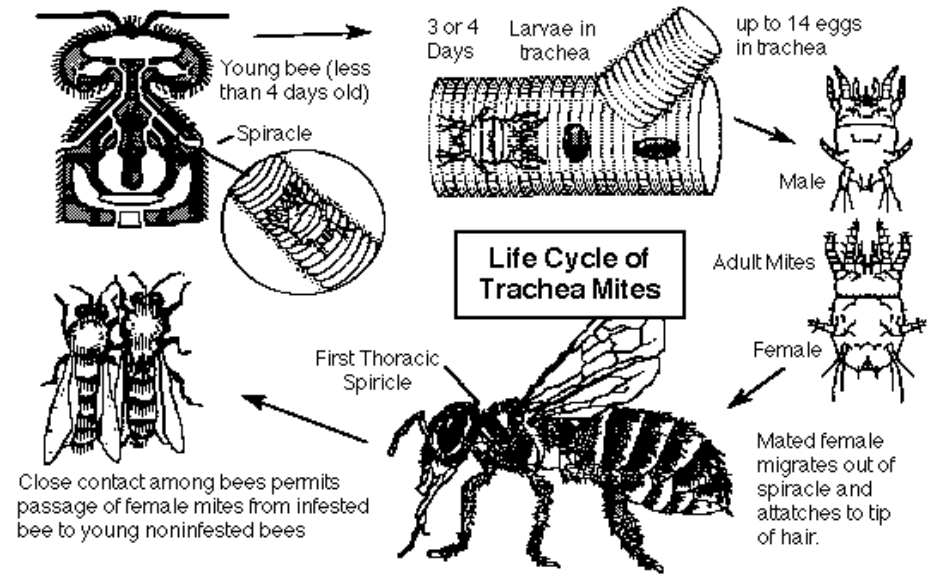
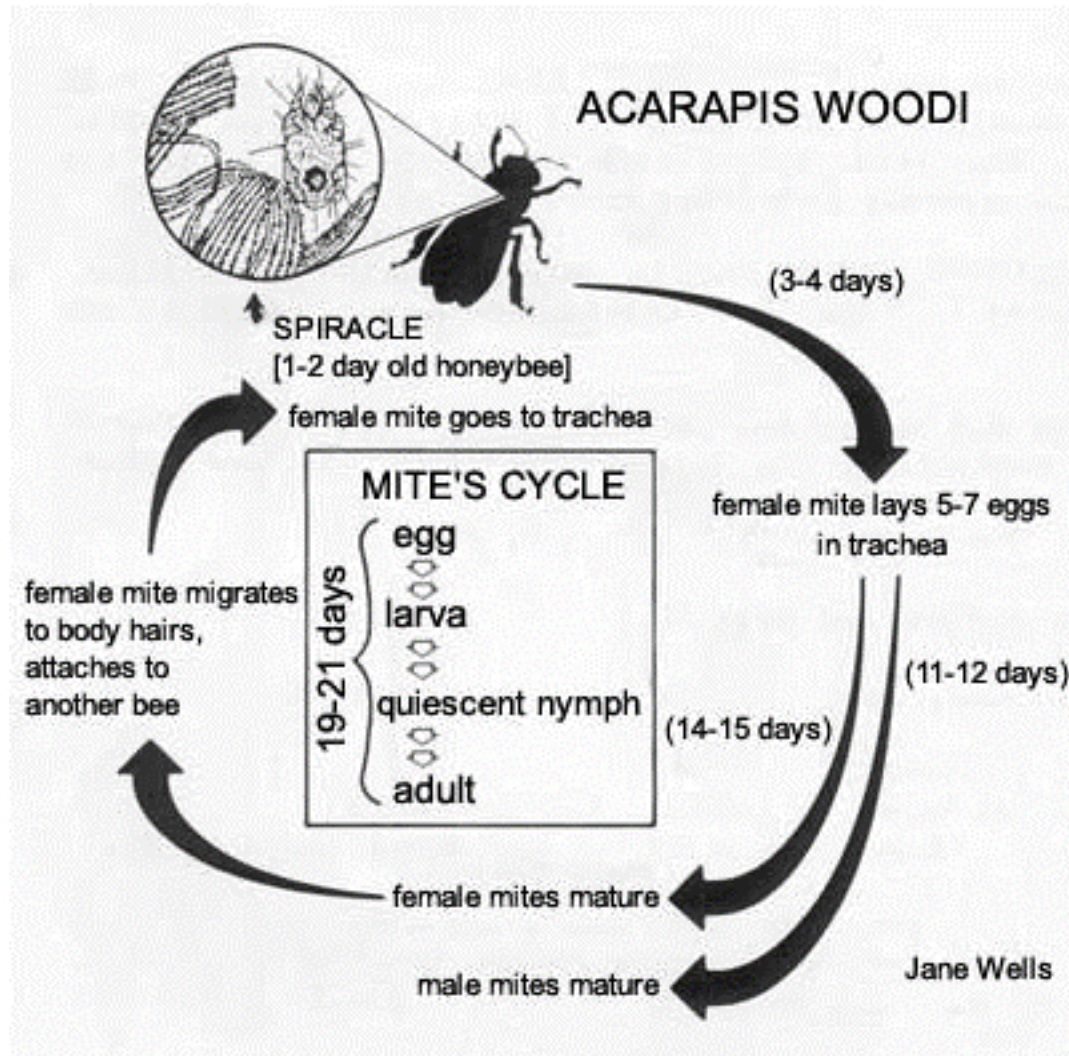
Identificazione dei virus

Metodi diagnostici diversi per sensibilità e specificità

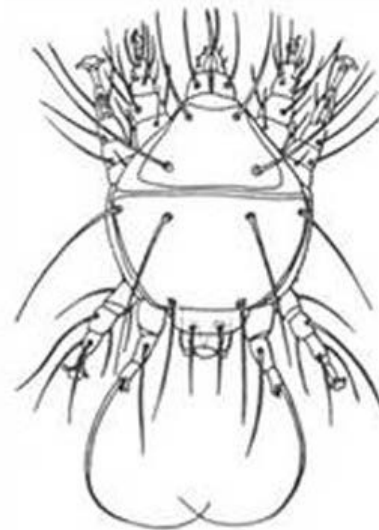
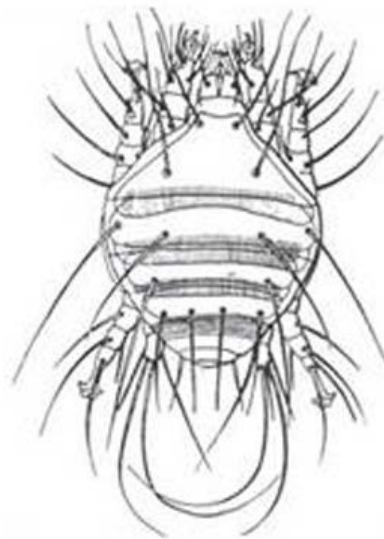
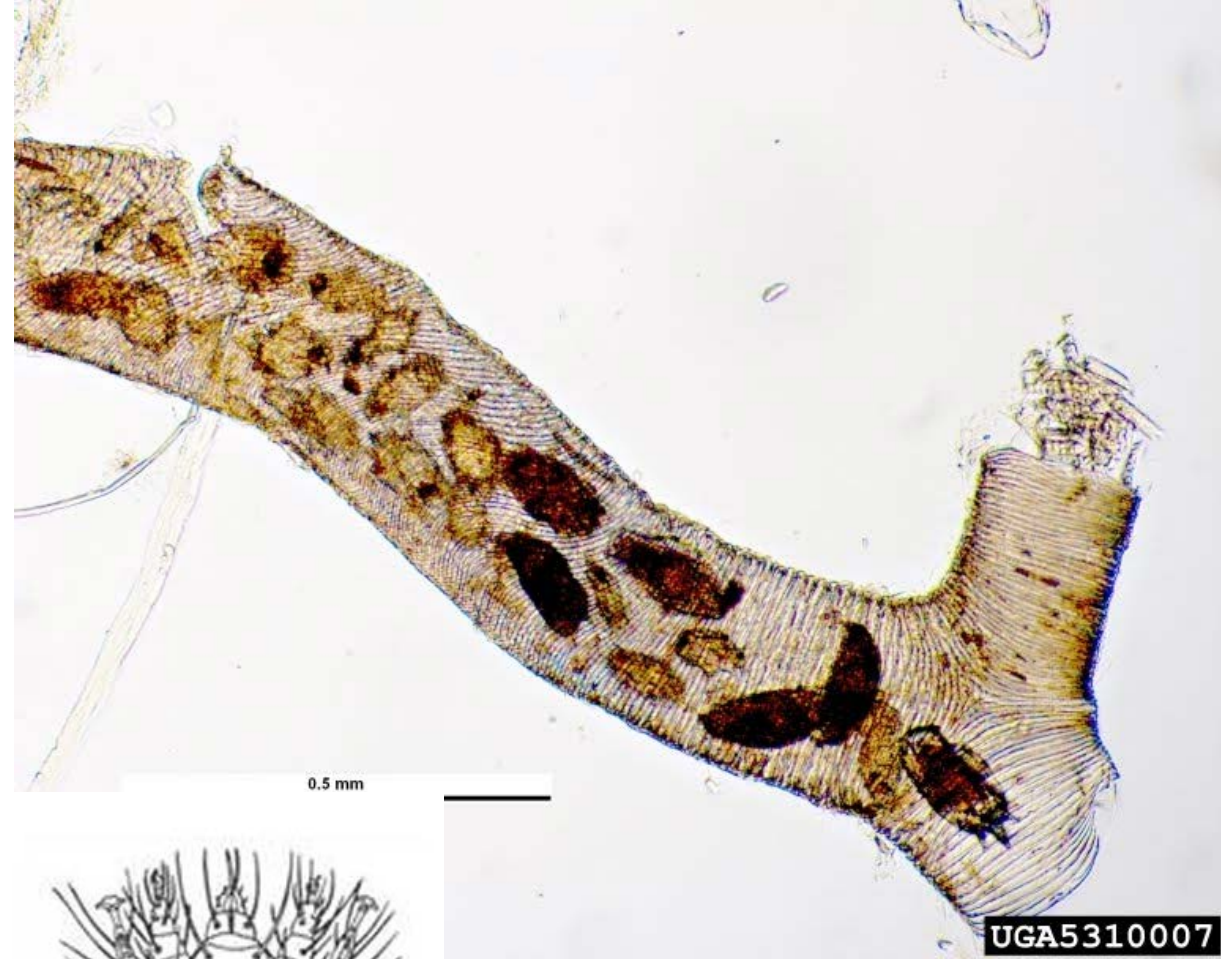
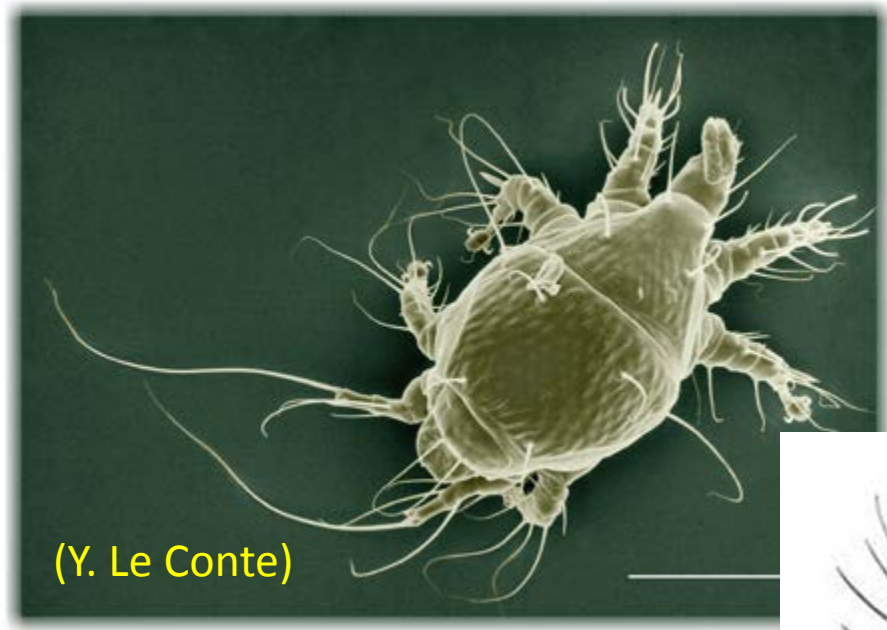
- **Microscopia elettronica**
- **Metodi immunologici**
- **Metodi molecolari**



Acarapis woodi

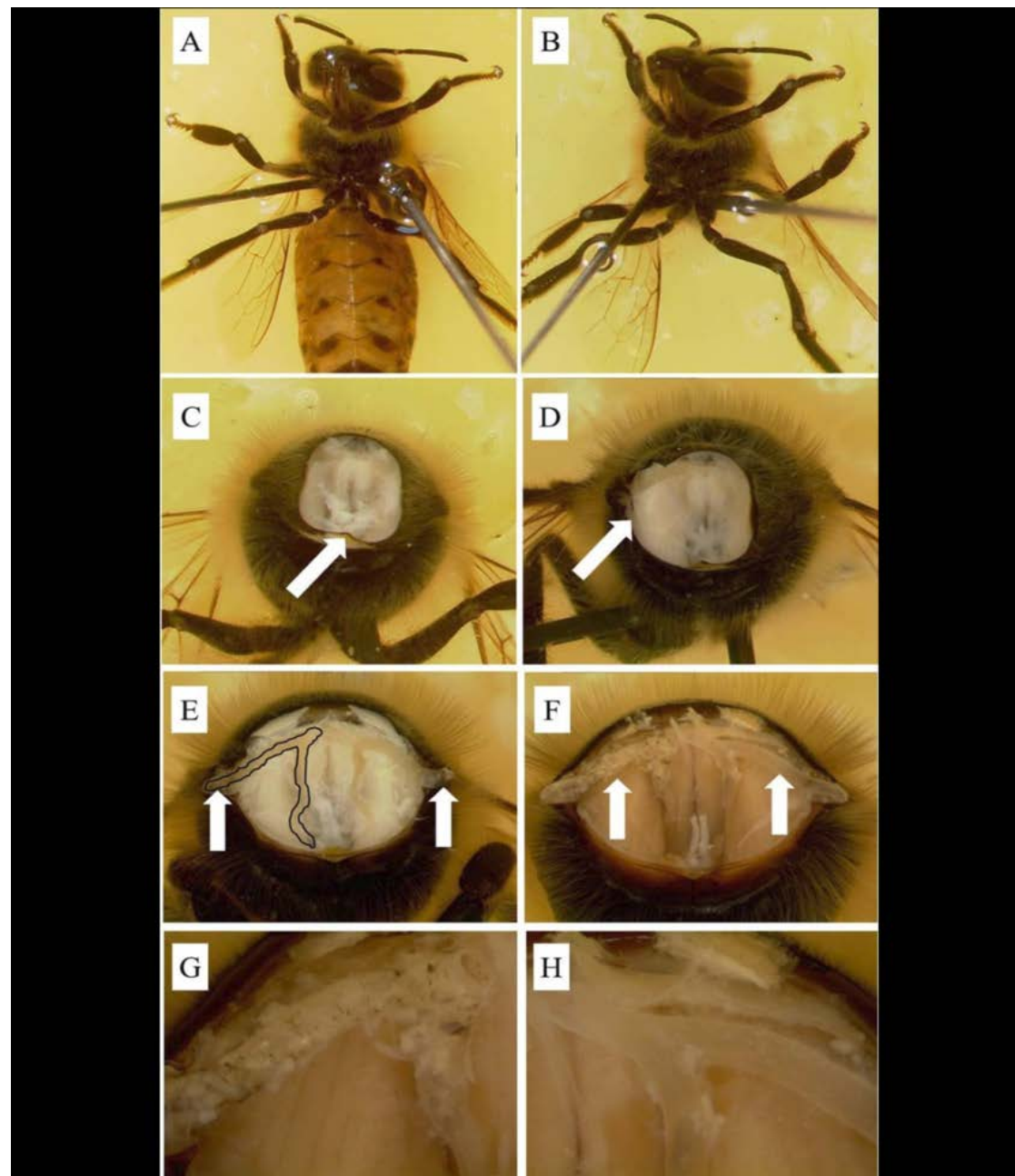


Acarapis woodi



Acarapis woodi

- Diagnosi



Aethina tumida Murray (1867)

Piccolo coleottero dell'alveare (Small hive beetle)

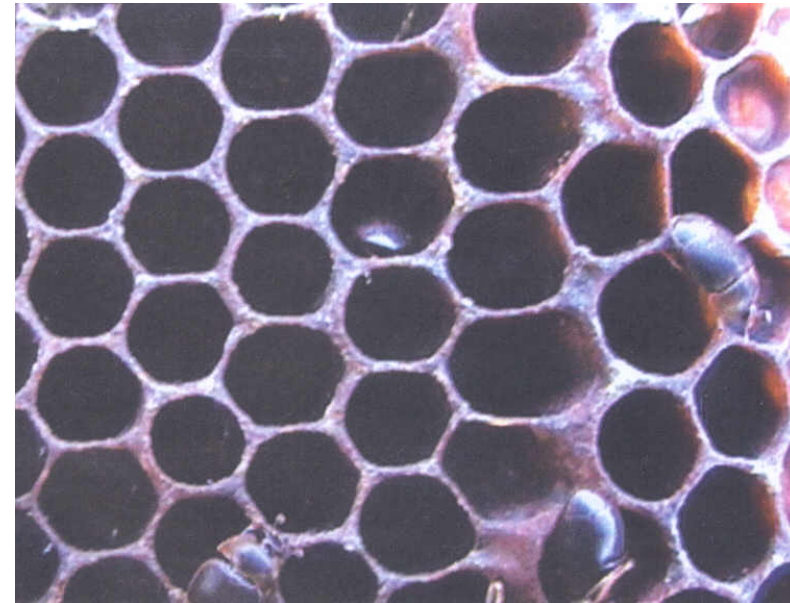
Phylum Arthropoda

Classe Hexapoda

Ordine *Coleoptera*

Famiglia *Nitidulidae*

Origine: Sud Africa

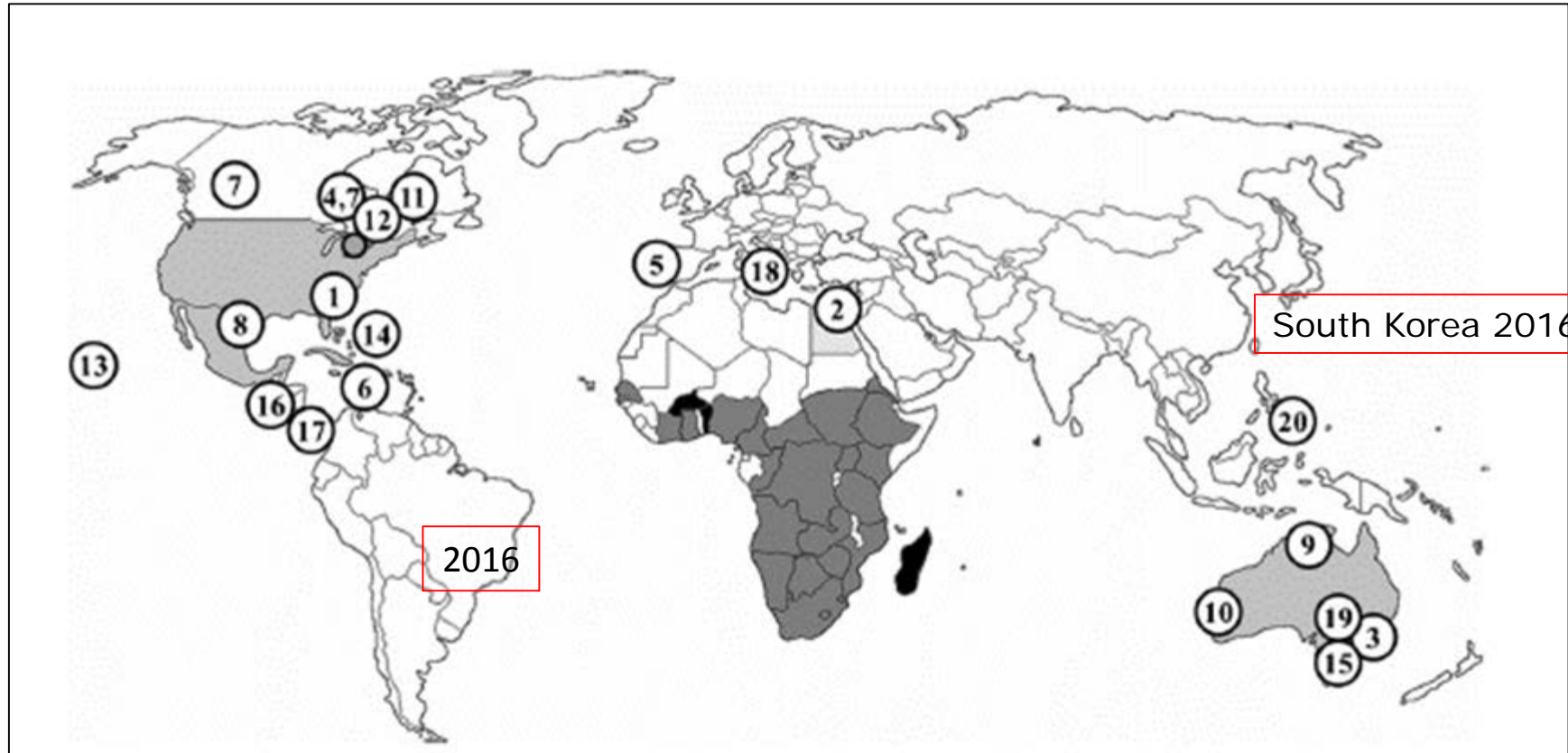


Aethina tumida

Adulti

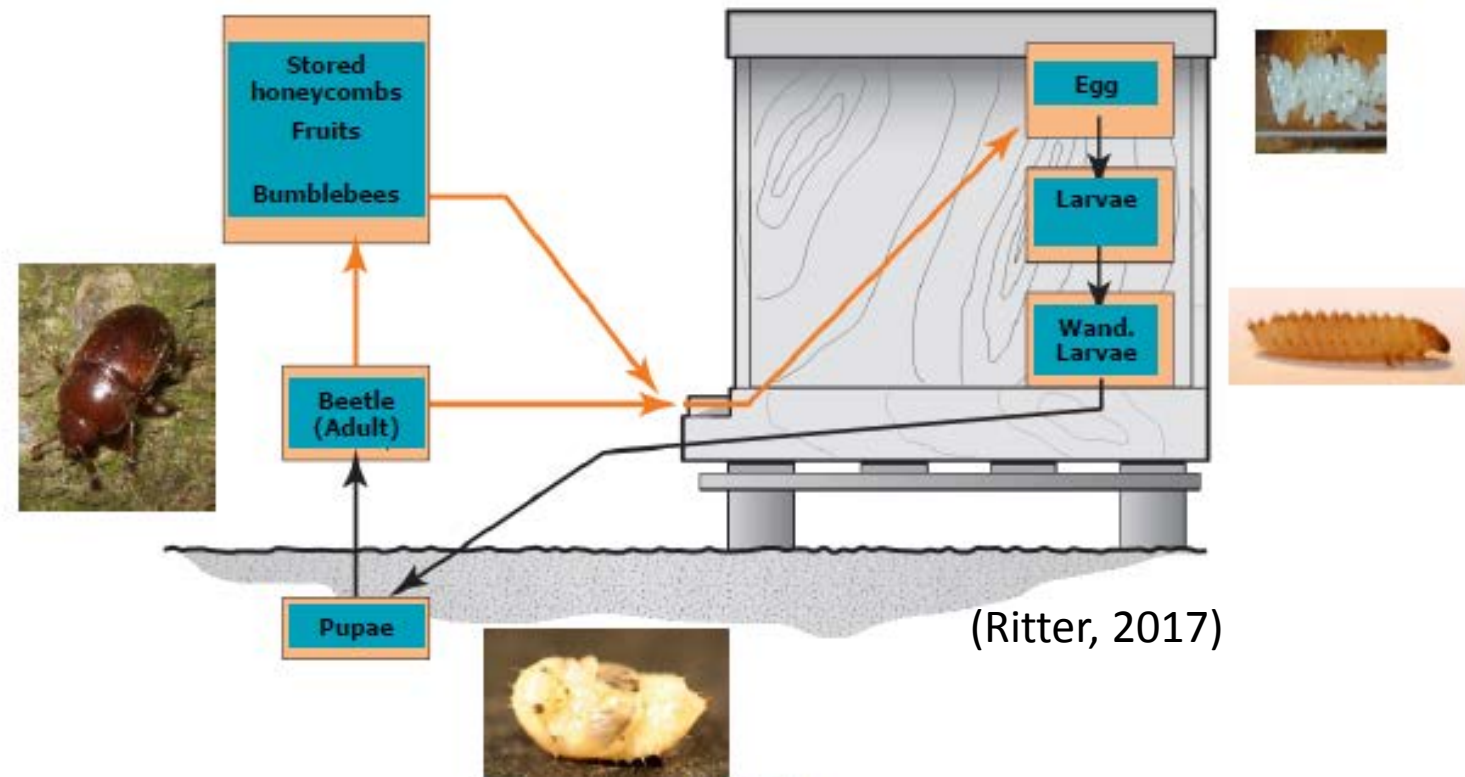


Distribuzione di *Aethina tumida*



(Neumann et al., 2016)

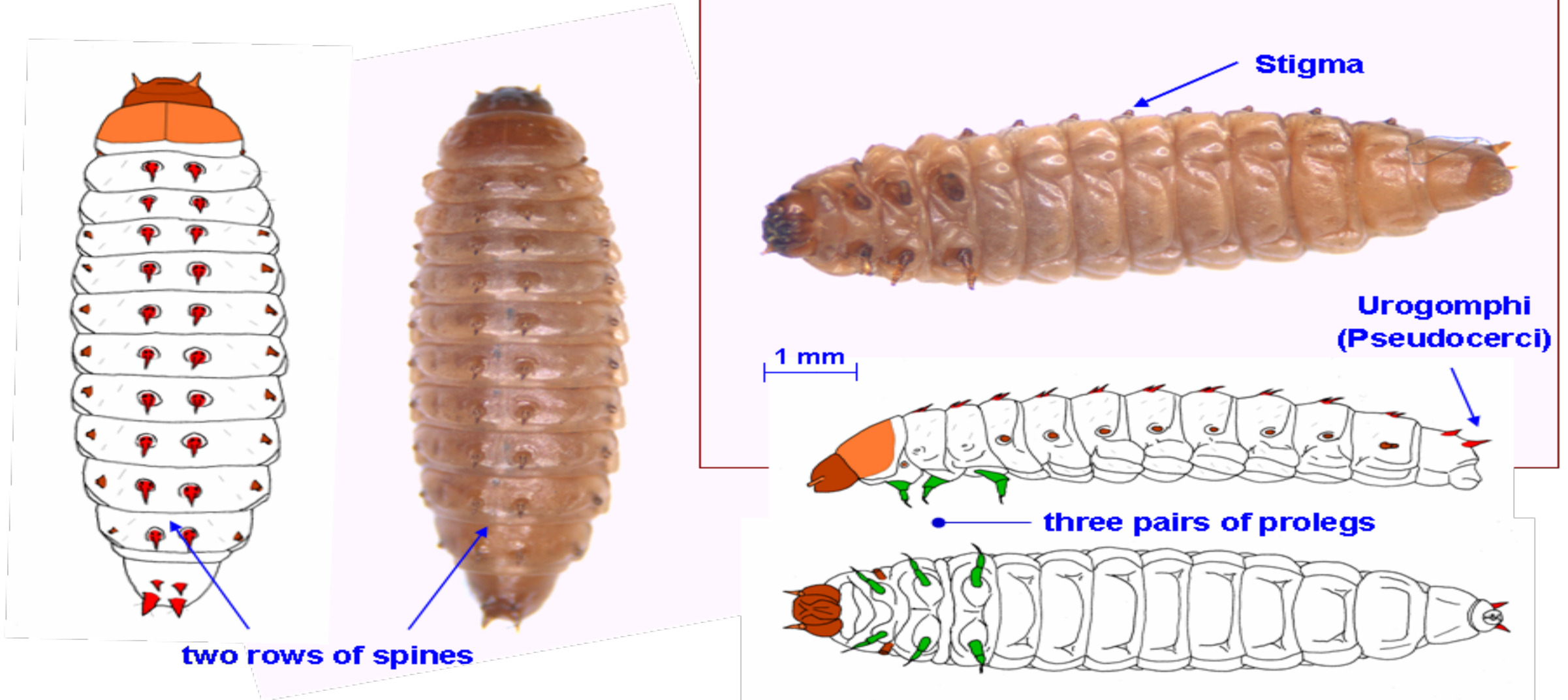
Aethina tumida



Ciclo biologico

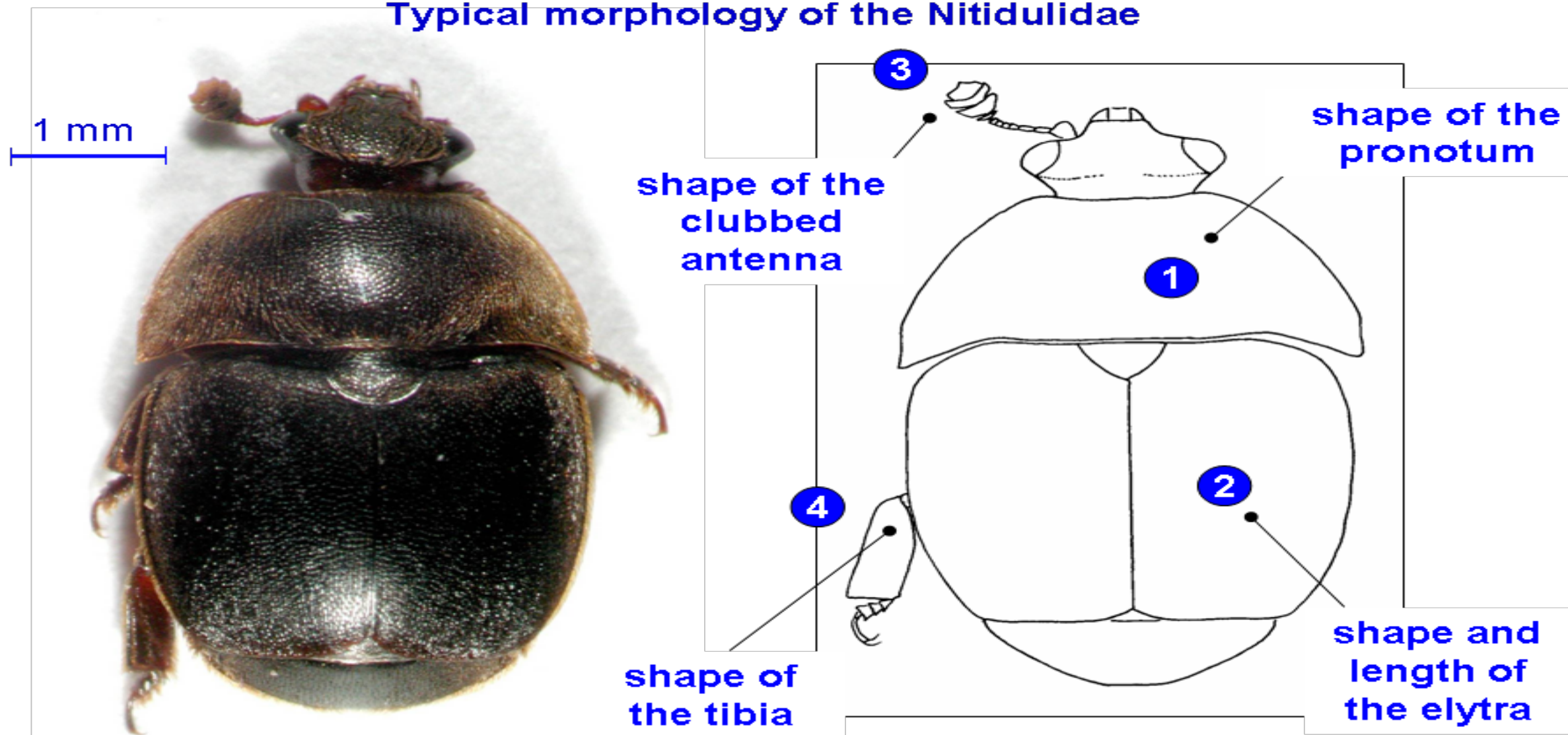
27 - 79 giorni (da uovo ad adulto)

The small hive beetle larva *Aethina tumida* (Murray 1867)



The small hive beetle *Aethina tumida* (Murray 1867)

Typical morphology of the Nitidulidae

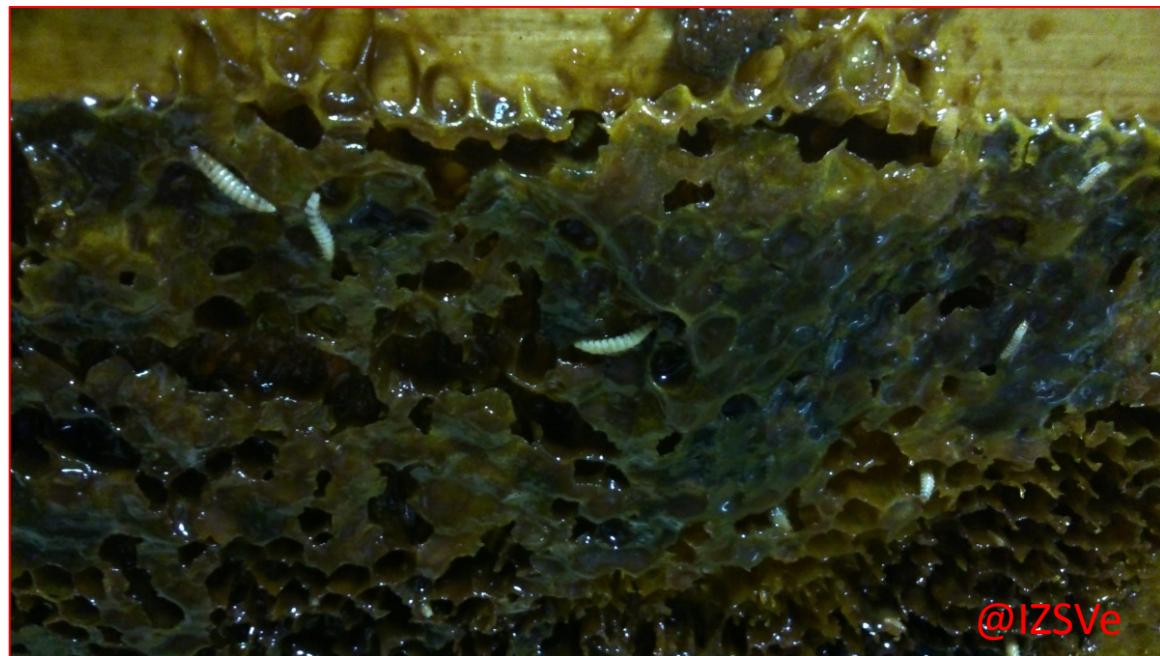


Visita in apiario



Aethina tumida

Larve sul favo



Diagnosi



Better Beetle Blaster



Aethina tumida – diagnosi differenziale

STELIDOTA GEMINATA



CARPOPHILUS SPP.



COLOPTERUS ABDOMINALIS



EPURAEA OCULARIS



CARPOPHILUS NEPOS



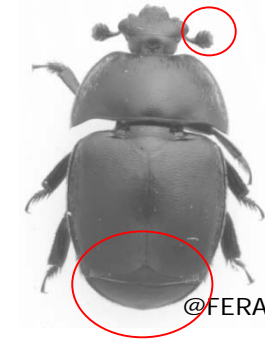
CARPOPHILUS MUTILATUS



EPURAEA
LUTEOLA



UROPHORUS HUMERALIS



Calabria: Dicembre 2014 – Gennaio 2015, luglio 2015: coleotteri raccolti su agrumi in decomposizione, non è mai stata trovata *A. tumida*

(Mutinelli et al., 2015)

OIE Manual

B. DIAGNOSTIC TECHNIQUES

Table 1. Test methods available for diagnosis of infestation with *Aethina tumida* and their purpose

Method	Purpose					
	Population freedom from infestation	Individual animal or bee nest freedom from infestation prior to movement	Contribute to eradication policies	Confirmation of clinical cases	Prevalence of infestation – surveillance	Immune status in individual animals or populations post-vaccination
Agent identification						
Morphology	+++	+++	+++	+++ (adults) + (larvae)	+++	n/a
Real-time PCR	++	++	++	++	+	n/a

Key: +++ = recommended method, validated for the purpose shown; ++ = suitable method but may need further validation;
+ = may be used in some situations, but cost, reliability, or other factors severely limits its application;
– = not appropriate for this purpose; n/a = purpose not applicable.
PCR = polymerase chain reaction,

Tropilaelaps sp.

Tropilaelaps clareae Delfinado e Baker
Tropilaelaps mercedesae

Tropilaelaps thai

Tropilaelaps koenigerum

Ordine *Mesostigmata*, Famiglia *Laelaptidae*

Origine: Asia

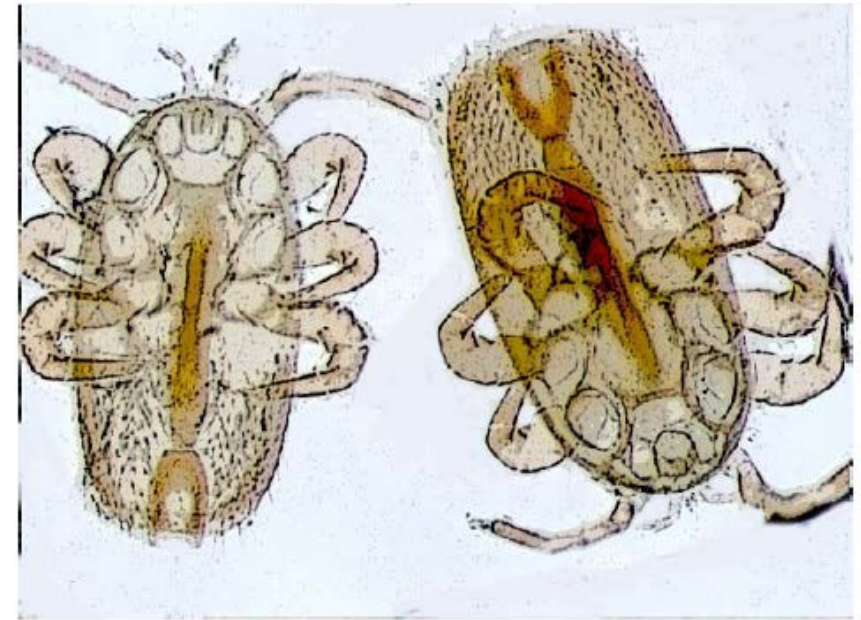


Fig. 1. *Tropilaelaps clareae*. Photo by J. Waddell.



Fig. 2. *Tropilaelaps* on *Apis dorsata* larvae. Photo by D. Anderson.

Tropilaelaps sp.

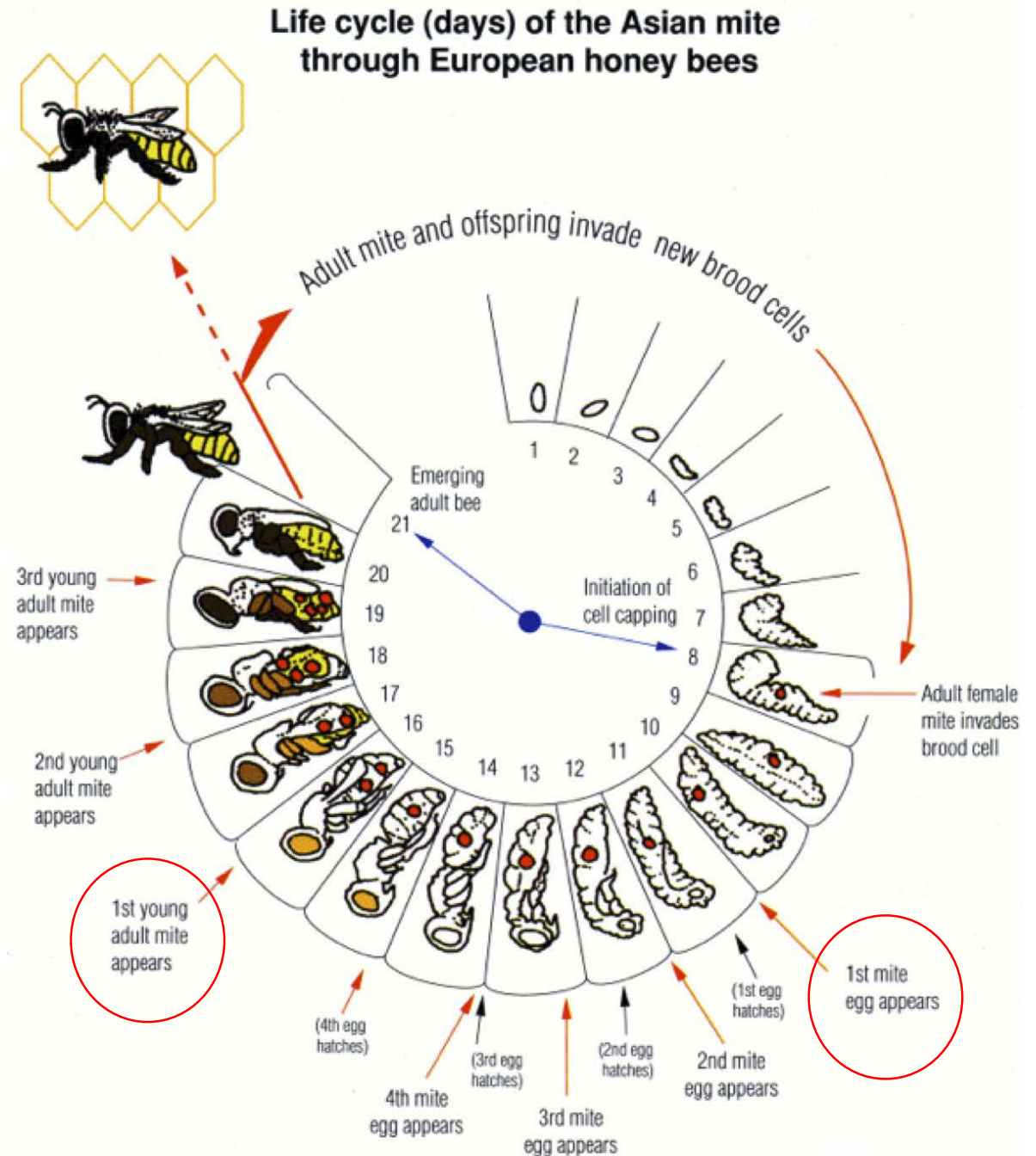


Fig. 9. Life cycle of *T. mercedesae* on *A. mellifera*. Diagram was constructed from data reported by Saleu (1994).

Tropilaelaps clareae

Larva infestata da *Varroa* e
T. clareae

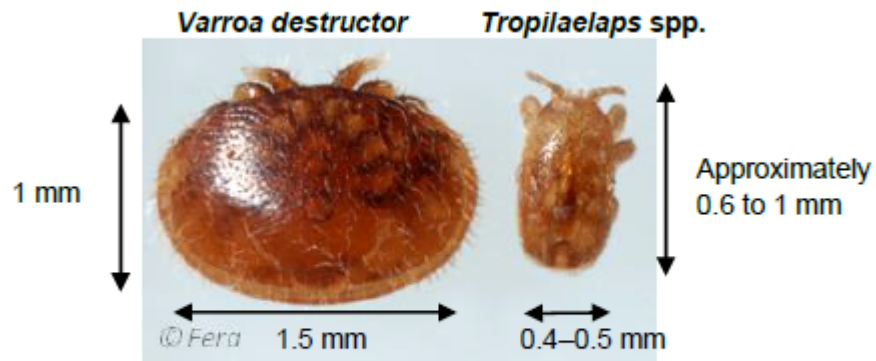
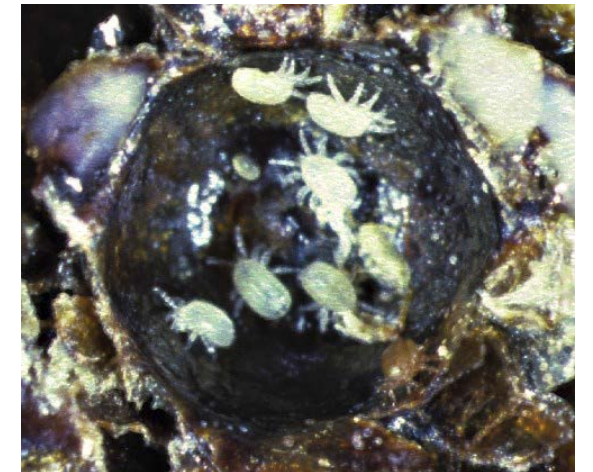


Fig. 1. *Varroa destructor* and *Tropilaelaps spp.* (dorsal view).
Photo supplied by APHA Bee Unit, York. UK Crown Copyright.



Damage caused by *T. mercedesae*
to *A. mellifera* brood.

Photo: Denis Anderson



Tropilaelaps sp.

B. DIAGNOSTIC TECHNIQUES

Table 1. Test methods available for diagnosis of infestation with *Tropilaelaps spp.* and their purpose

Method	Purpose					
	Population freedom from infestation	Individual animal freedom from infestation prior to movement	Contribute to eradication policies	Confirmation of clinical cases	Prevalence of infestation – surveillance	Immune status in individual animals or populations post-vaccination
Agent identification						
Morphology	+++	+++	+++	+++	+++	n/a
Conventional PCR	++	++	++	++	+	n/a

Key: +++ = recommended method, validated for the purpose shown; ++ = suitable method but may need further validation;

+ = may be used in some situations, but cost, reliability, or other factors severely limits its application;

– = not appropriate for this purpose; n/a = purpose not applicable.

PCR = polymerase chain reaction

Campionamento per analisi di agenti di malattia

Peste americana – Peste europea – Covata calcificata

- ✓ Porzione di favo (10 x 10 cm) con covata sintomatica
- ✓ Singole larve con sintomi (Peste americana, covata calcificata)
- ✓ refrigerazione
- ✓ congelamento
- ✓ Esame microscopico, colturale, PCR

Campionamento per analisi di agenti di malattia

Nosema

- ✓ Almeno 60 api raccolte dal predellino (dai bordi di un favo se non fossero presenti api sul predellino)
- ✓ 70% etanolo
- ✓ congelamento
- ✓ Esame microscopico, PCR

Campionamento per analisi di agenti di malattia

Varroa

- ✓ Almeno 300 api raccolte dalla superficie del favo (con questa quantità si può dare un'indicazione del livello di infestazione)
- ✓ 70% etanolo
- ✓ congelamento
- ✓ Lavaggio in alcol, setacciatura e raccolta parassiti, esame allo stereomicroscopio

Campionamento per analisi di agenti di malattia

Virus

- ✓ Api sintomatiche: 100-200 (almeno)
- ❖ I principali virus, DWV, SBV, ABPV, CBPV, BQCV sono presenti nelle api sane, asintomatiche
- ❖ congelamento (-20°C)
- ✓ 70% etanolo

Campionamento per analisi di contaminanti chimici

0016168-31/07/2014-DGSAF-COD_UO-P



Ministero della Salute

DIREZIONE GENERALE DELLA SANITA' ANIMALE E DEI FARMACI VETERINARI

Ufficio II ex DGSA - Sanità animale ed anagrafi:
Viale Giorgio Riboni, 5 - 00144 Roma

Registro - Registro - classif. L.1.a.e/2014/7

Allegati : 1

0016168-31/07/2014-DGSAF-COD_UO-P

Trasmissione elettronica
N. prot. DGSAF in DocsPa/PEC

Regioni e Province autonome
Assessorati sanità
II.ZZ.SS
Loro sedi
Centro di riferimento per l'apicoltura
IZS delle Venezie
Sede di Padova
Trasmissione via PEC

OGGETTO: Linee guida per la gestione delle segnalazioni di moria o spopolamento degli alveari connesse all'utilizzo di agrofarmaci.

La salute delle api può essere compromessa non solo da malattie infettive e infestive ma anche dall'azione acuta o cronica di alcuni fitofarmaci che possono determinare fenomeni di moria o spopolamento di alveari. A tale riguardo diversi studi hanno già evidenziato connessioni tra i fenomeni prima citati e l'azione di particolari prodotti.

Sulla base di queste premesse e anche in considerazione delle frequenti segnalazioni di moria che pervengono dagli apicoltori in determinati periodi dell'anno, si ritiene opportuno che le Regioni adottino un approccio più sistematico nei confronti della gestione delle morie di api in cui vi sia la sospetta azione di fitofarmaci. Fino ad oggi infatti le segnalazioni sono state gestite a livello regionale con procedure non sempre uniformi e in maniera disomogenea sul territorio nazionale per cui i dati raccolti non sono rappresentativi né esaustivi mentre si riteneva opportuno intensificare le indagini conoscitive su questi fenomeni.

A tal proposito questa Direzione ha redatto specifiche linee guida per la gestione delle suddette segnalazioni di moria con l'intento di fornire istruzioni di intervento che comunque potranno essere adattate alle realtà organizzative e alle priorità individuate da ciascuna Regione o Provincia autonoma. In particolare preme sottolineare che gli interventi risulteranno tanto più efficaci quanto più sarà rapido e contestuale il coinvolgimento di tutte le figure interessate, tenuto conto che spesso i principi attivi ricercati sono soggetti a una rapida degradabilità. I sopralluoghi effettuati dalle figure preposte non dovranno trascurare approfondite analisi cliniche in apiario per escludere che i fenomeni segnalati non siano stati dovuti a eventuali cause di origine infettiva o infestiva.

Ciò premesso si forniscono in allegato le Linee guida per la gestione delle segnalazioni di moria o spopolamento degli alveari connesse all'utilizzo di agrofarmaci.

Si ringrazia per l'attenzione e si resta a disposizione per ogni chiarimento.

IL DIRETTORE GENERALE
(d.ssa Gaetana Ferri)
* F.to Gaetana Ferri

✓ Api: 250 (almeno)

✓ Miele: 250 g

✓ Cera: 25 g, 1/2 favo nido, 1 favo melario

✓ Conservare a basse temperature (-20°C) e al riparo della luce

Come riconoscere *Vespa velutina*?

Imenotteri, Vespoidei, Vespidi



“Vespe”

Generi *Polistes*, *Vespula* e *Dolichovespula*

“Calabroni”

Genere *Vespa*



V. crabro



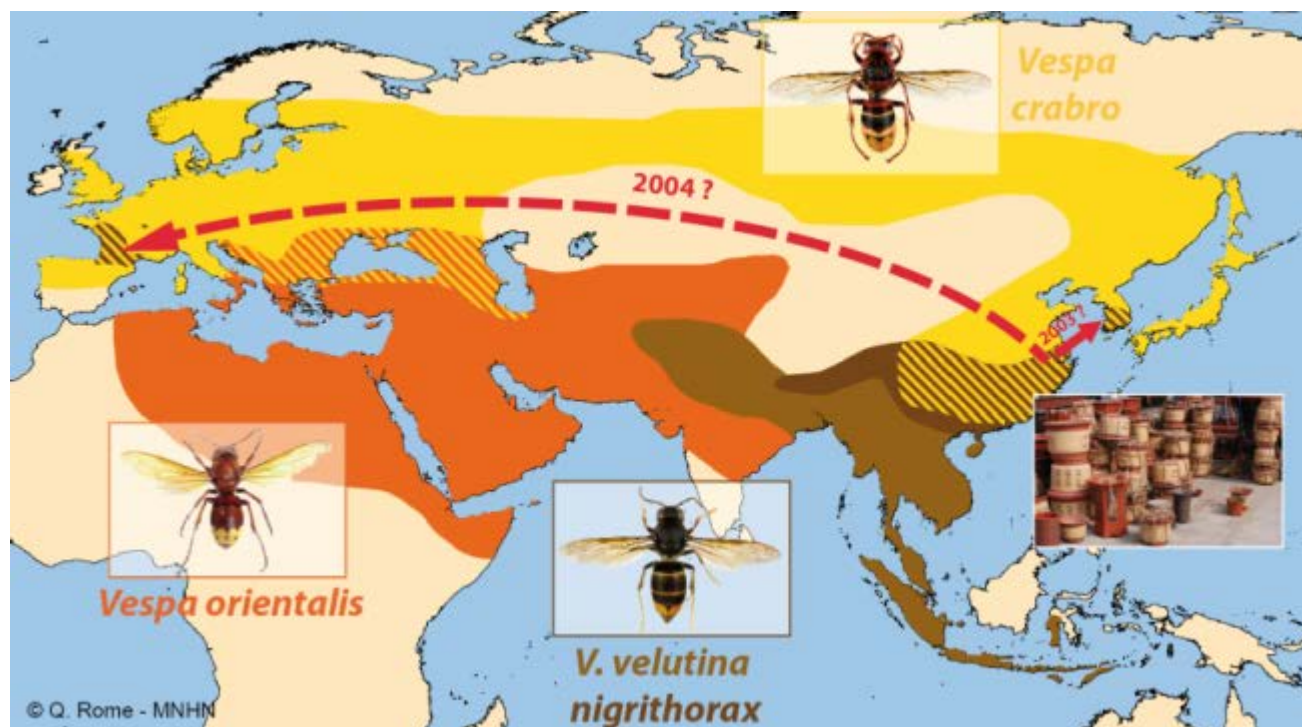
V. velutina



V. orientalis

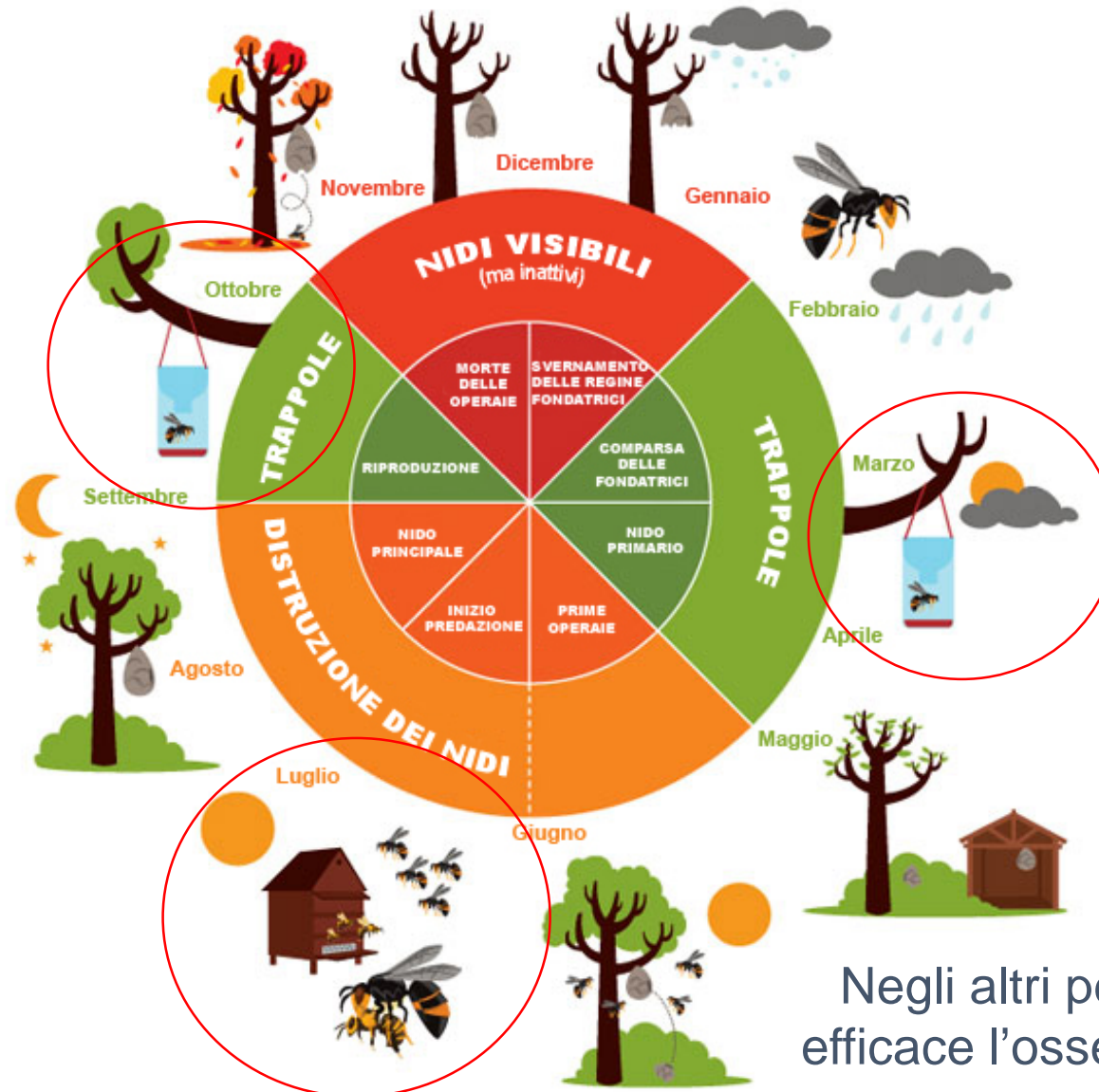
(Dr.ssa Laura Bortolotti)

Vespa velutina



Areale asiatico di *V. velutina*

Bottiglie trappola: quando metterle?



Negli altri periodi (giugno-agosto) è più efficace l'osservazione diretta degli alveari

Vespa velutina – nido secondario





Grazie per l'attenzione

www.izsvenezie.it