Stato sanitario in apicoltura

Franco Mutinelli

Istituto Zooprofilattico Sperimentale delle Venezie, CRN per l'apicoltura

Normativa in materia di sanità animale

REGOLAMENTO DELEGATO (UE) 2018/1629 DELLA COMMISSIONE

del 25 luglio 2018

che modifica l'elenco delle malattie figuranti all'allegato II del regolamento 2016/429 del Parlamento europeo e del Consiglio relativo alle malattie animali trasmissibili e che modifica e abroga taluni atti in materia di sanità animale («normativa in materia di sanità animale»)

«ALLEGATO II

ELENCO DELLE MALATTIE ANIMALI

— Infestazioni da *Varroa* spp. (varroasi)

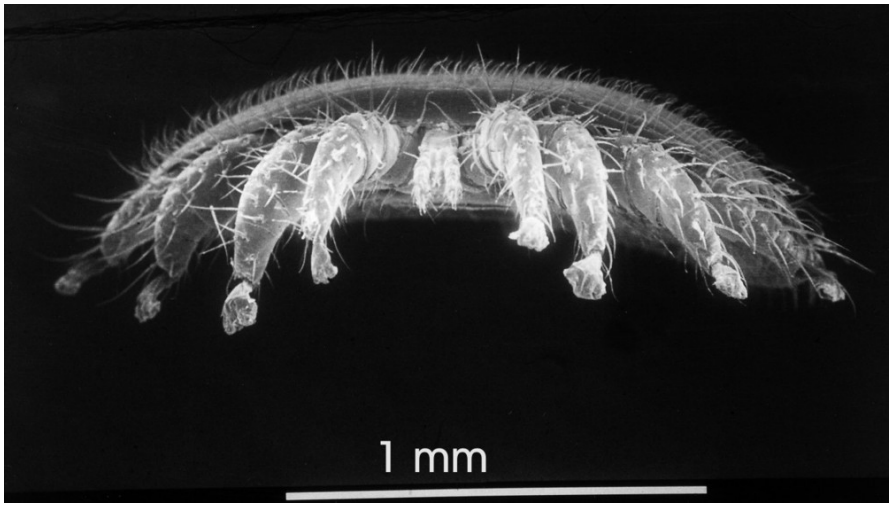
— Infestazioni da piccolo coleottero dell'alveare (*Aethina tumida*)

— Peste americana

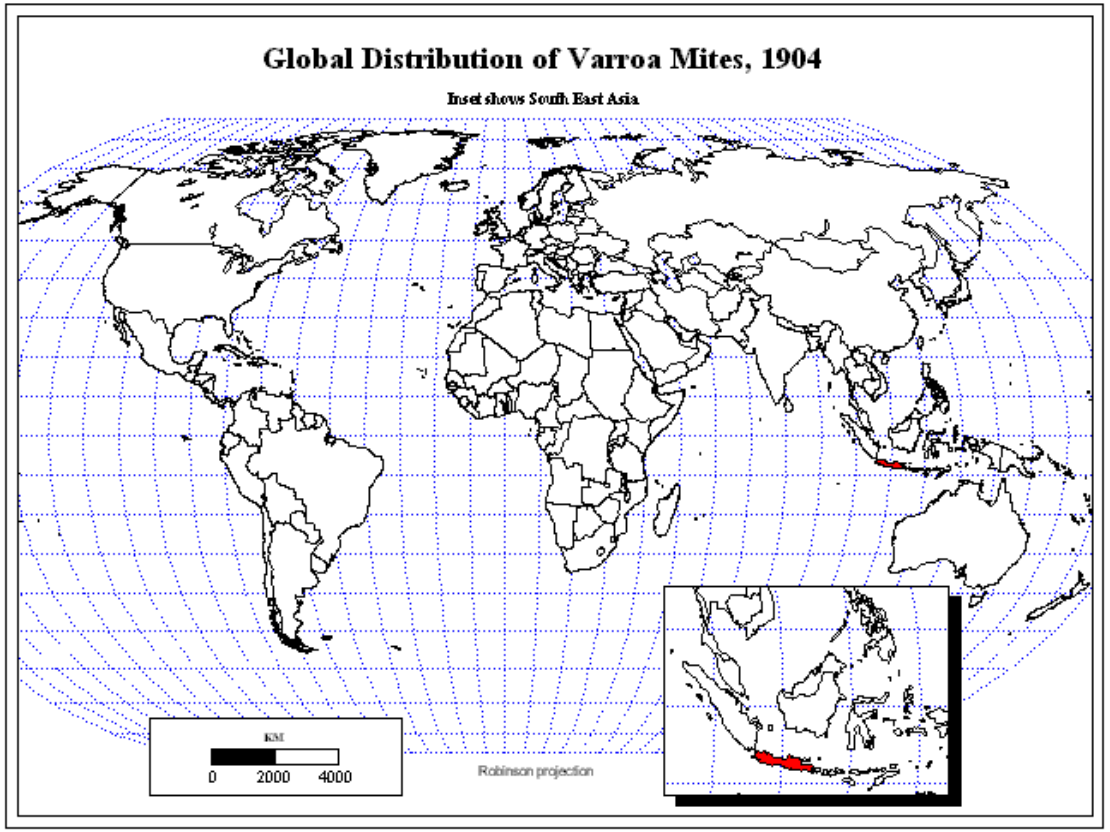
— Infestazione da *Tropilaelaps* spp.

Varroatosi

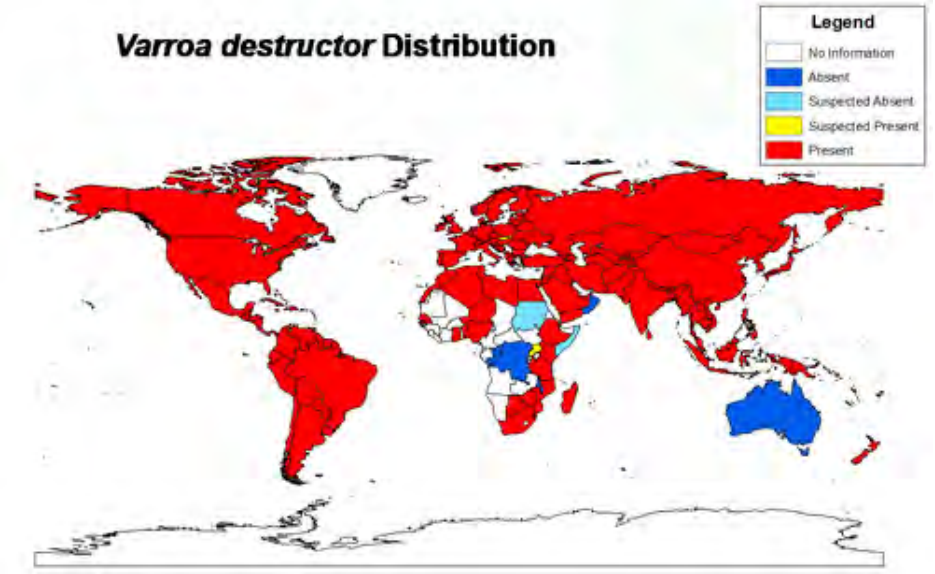
- *Varroa destructor*
- (Acari: Mesostigmata: Varroidae)



Varroa destructor nel mondo

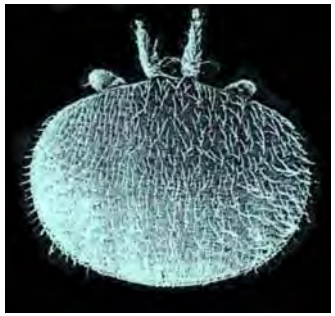


D. Sammataro (http://agspsrv34.agric.wa.gov.au/Ento/bee7.htm)

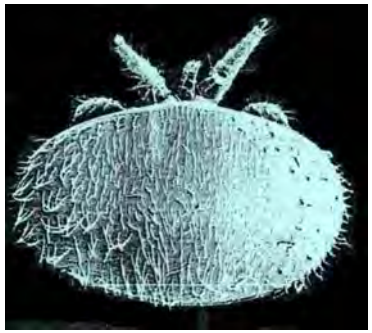


http://entnemdept.ufl.edu/creatures/misc/bees/varroa_mite.htm

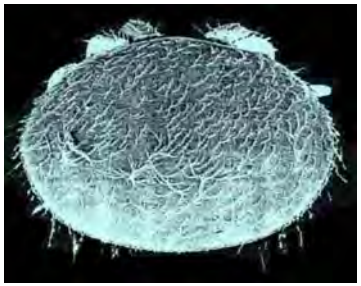
Genere *Varroa*



Varroa jacobsoni



Varroa destructor

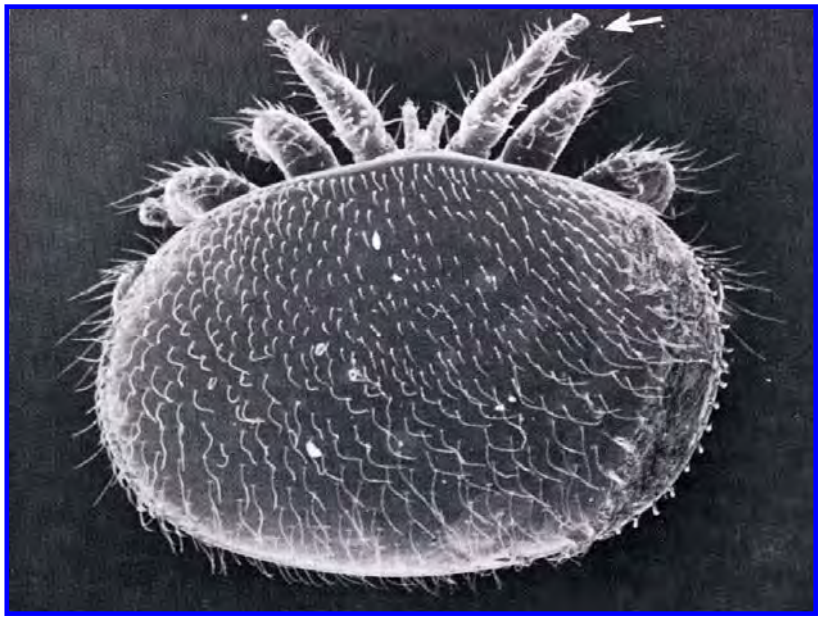


Varroa rindereri

Varroa underwoodi

(D. Anderson)

Dimorfismo sessuale



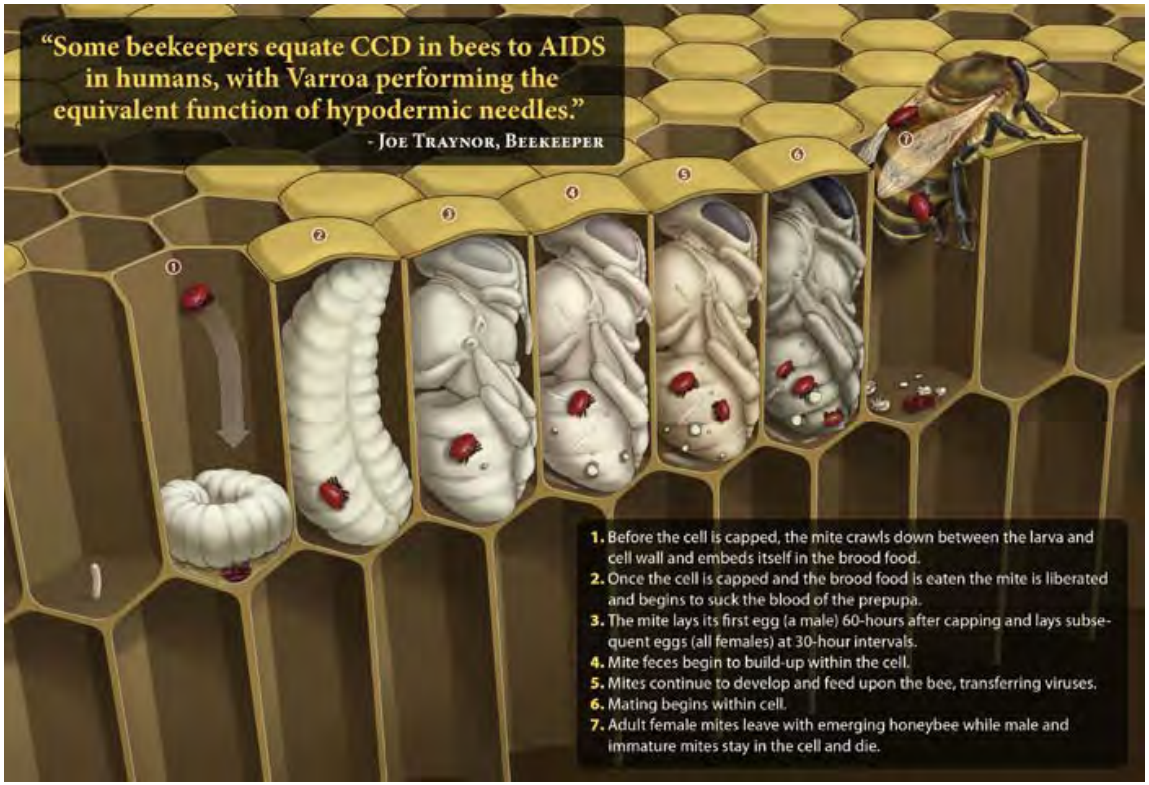
FEMMINA

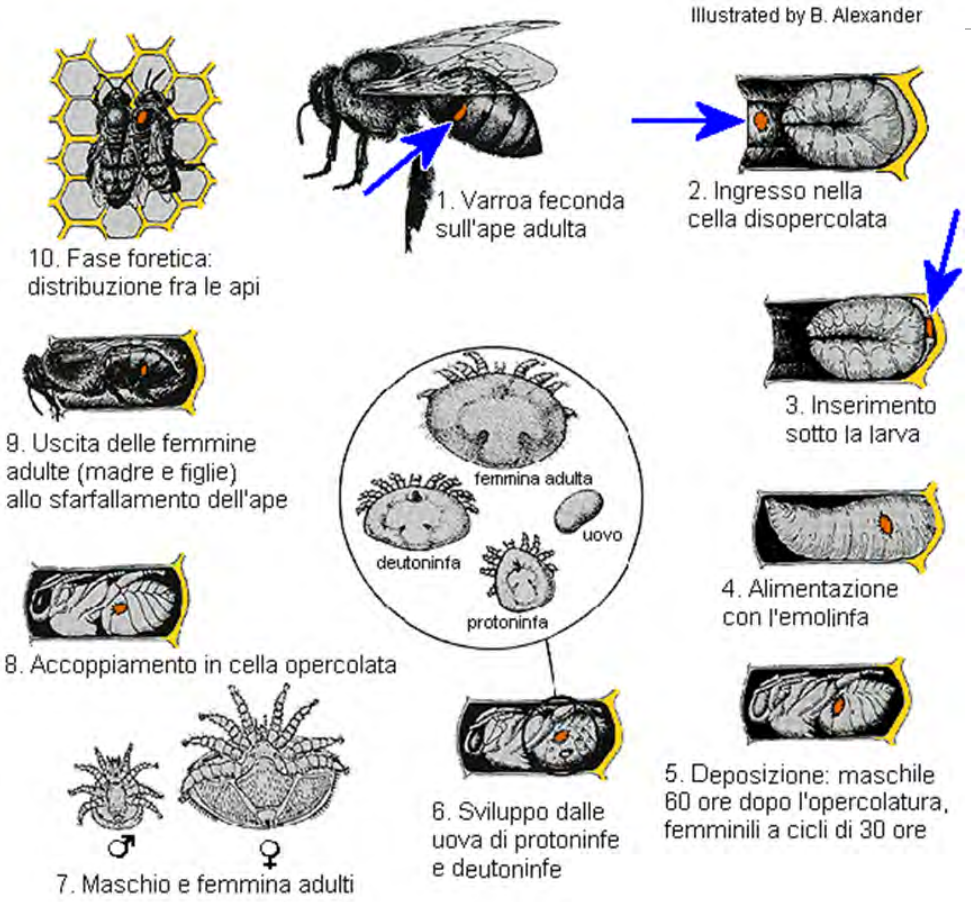
- 1,1-1,3 x 1,5-1,8 mm
- tegumento sclerificato, bruno-rossiccio

MASCHIO

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

Varroa destructor





Istituto Zooprofilattico Sperimentale delle Venezie

1792–1801 | PNAS | January 29, 2019 | vol. 116 | no. 5 www.pnas.org/cgi/doi/10.1073/pnas.1818371116

Varroa destructor feeds primarily on honey bee fat body tissue and not hemolymph

Samuel D. Ramsey[a,1], Ronald Ochoa[b], Gary Bauchan[c], Connor Gulbronson[d], Joseph D. Mowery[c], Allen Cohen[e], David Lim[a], Judith Joklik[a], Joseph M. Cicero[f], James D. Ellis[f], David Hawthorne[a], and Dennis vanEngelsdorp[a]

[a]Department of Entomology, University of Maryland, College Park, MD 20742; [b]Agricultural Research Service, Systematic Entomology Laboratory, United States Department of Agriculture, Beltsville, MD 20705; [c]Agricultural Research Service, Soybean Genomics & Improvement Laboratory, Electron and Confocal Microscopy Unit, United States Department of Agriculture, Beltsville, MD 20705; [d]Agricultural Research Service, Floral and Nursery Plant Research Unit, Electron and Confocal Microscopy Unit, United States Department of Agriculture, Beltsville, MD 20705; [e]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695; and [f]Entomology and Nematology Department, University of Florida, Gainesville, FL 32611

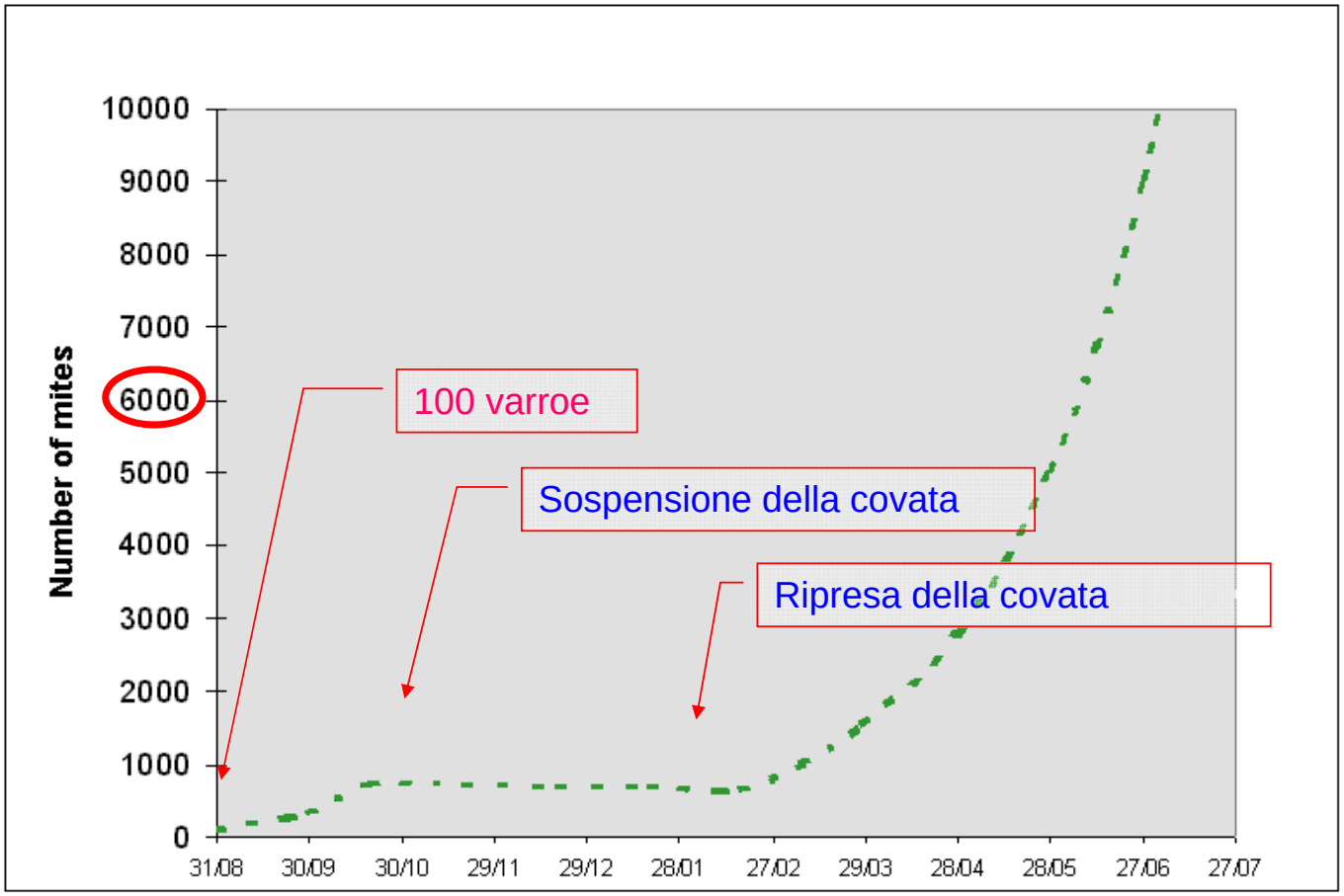
Edited by Gene E. Robinson, University of Illinois at Urbana–Champaign, Urbana, IL, and approved December 6, 2018 (received for review October 26, 2018)

Mites fed fat body survived longer and produced more eggs than those fed hemolymph, suggesting that fat body is integral to their diet when feeding on brood as well. Collectively, these findings strongly suggest that *Varroa* are exploiting the fat body as their primary source of sustenance: a tissue integral to proper immune function, pesticide detoxification, overwinter survival, and several other essential processes in healthy bees. These findings underscore a need to revisit our understanding of this parasite and its impacts, both direct and indirect, on honey bee health.

Significance

Varroa destructor causes considerable damage to honey bees and subsequently the field of apiculture through just one process: feeding. For five decades, we have believed that these mites consume hemolymph like a tick consumes blood, and that *Varroa* cause harm primarily by vectoring viruses. Our work shows that they cause damage more directly. *Varroa* externally digest and consume fat body tissue rather than blood. These findings explain the failure of some previous attempts at developing effectively targeted treatment strategies for *Varroa* control. Furthermore, it provides some explanation for the diverse array of debilitating pathologies associated with *Varroa* that were unexplained by hemolymph removal alone. Our work provides a path forward for the development of novel treatment strategies for *Varroa*.

Dinamica di popolazione



(A. Nanetti)

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

Reinfestazione

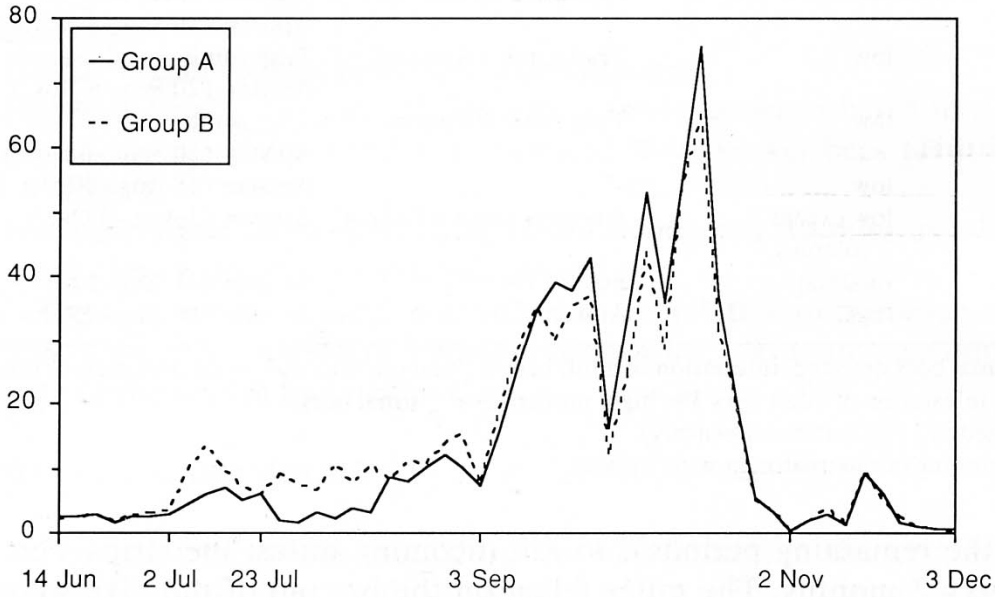
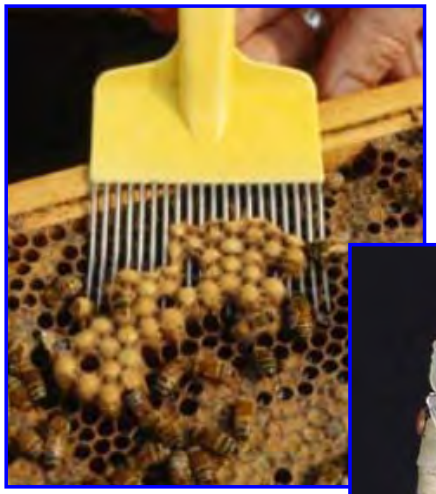


Fig. 1. Number of mites (average per colony and per day) imported into experimental colonies and killed by acaricide treatments.

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/in laboratorio

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. Dietemann

Fig. 6. c. the jar is turned upside down and shaken to dislodge the mites. Photo by V. Dietemann

Fig. 6. d. mites (2 darker points) and sugar fallen through the mesh on the paper. Photo by V. Dietemann

Fig. 6. b. rolling the jar on its side ensures that bees are covered with the sugar. Photo by V. Dietemann

6. 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 it 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.

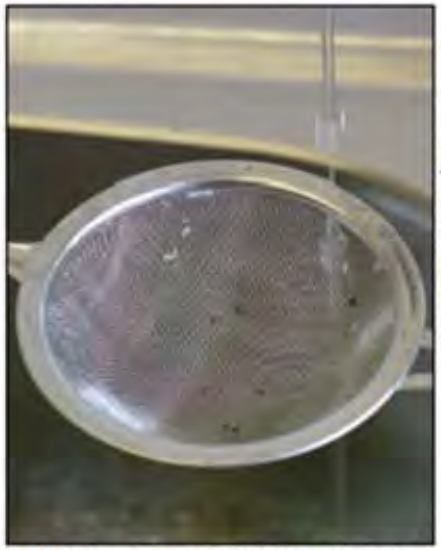


Fig. 6. e. the mites and sugar collected are placed in a sieve over which saline solution is poured to rid the mites from sugar particles. Photo by V. Dietemann

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

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 *BEEBOOK* paper on miscellaneous methods (Human *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.

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Danni alla colonia

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

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Selezione per la tolleranza nei confronti di *Varroa destructor*

Apidologie 41 (2010) 393–408
© INRA/DIB-AGIB/EDP Sciences, 2010
DOI: 10.1051/apido/2010011

Available online at:
www.apidologie.org

Review article

Breeding for resistance to *Varroa destructor* in Europe*

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[2] Bayerische Landesanstalt für Weinbau und Gartenbau, Fachzentrum Bienen, An der Steige 15, 97209 Veitshöchheim, Germany
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Received 27 October 2009 – Revised 29 January 2010 – Accepted 30 January 2010

Abstract – The rich variety of native honeybee subspecies and ecotypes in Europe offers a good genetic resource for selection towards *Varroa* resistance. There are some examples of mite resistance that have developed as a consequence of natural selection in wild and managed European populations. However, most colonies are influenced by selective breeding and are intensively managed, including the regular use of miticides. We describe all characters used in European breeding programs to test for *Varroa* resistance. Some of them (e.g., mite population growth, hygienic behavior) have been implemented in large-scale selection programs and significant selection effects have been achieved. Survival tests of pre-selected breeder colonies and drone selection under infestation pressure are new attempts to strengthen effects of natural selection within selective breeding programs. Some perspectives for future breeding activities are discussed.

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0013022-09/06/2020-DGSAF-MDS-P

Ministero della Salute

DIREZIONE GENERALE DELLA SANITA' ANIMALE E DEI FARMACI VETERINARI
Ufficio 3
Sanità animale e gestione operativa del Centro nazionale di lotta ed emergenza contro le malattie animali e unità centrale di crisi

Regioni e Province autonome
Assessorati sanità
Servizi veterinari

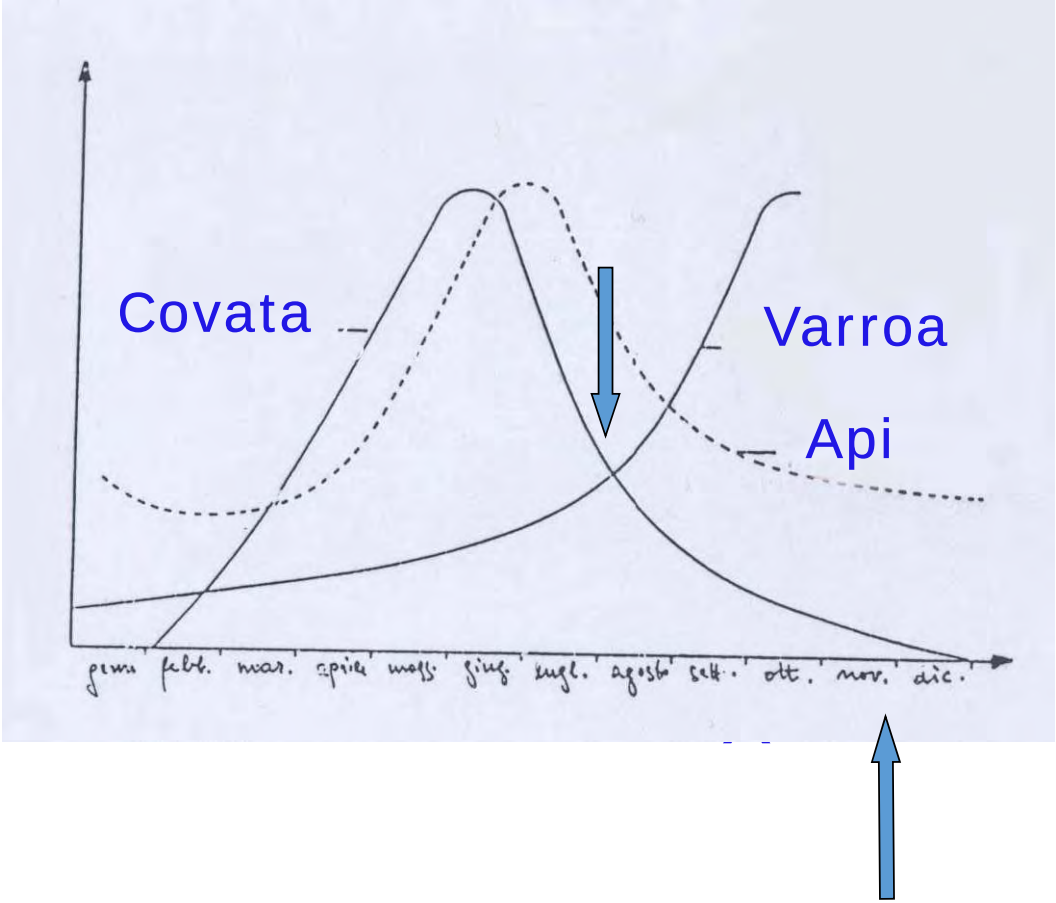
E, per conoscenza:
Centro di referenza nazionale per l'apicoltura
IZS delle Venezie
Padova

Registro – Classif: P-I.1.a.e/2020/8

Allegati: 2

OGGETTO: Piano nazionale di sorveglianza dell'*Aethina tumida* e piano controllo della Varroa – anno 2020

Lotta integrata alla varroosi

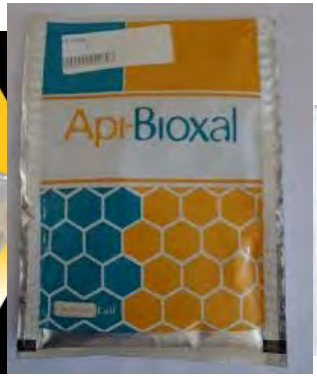


Trattamenti in presenza di covata

Trattamenti in assenza di covata

Farmaci autorizzati in Italia

- ✓ Apilifevar
- ✓ Apiguard
- ✓ Thymovar
- ✓ Apistan
- ✓ Polyvar
- ✓ MAQS
- ✓ Varterminator
- ✓ Apifor60
- ✓ Varromed
- ✓ Api-Bioxal (polvere, liquido)
- ✓ Oxuvar
- ✓ Oxybee
- ✓ Apitraz
- ✓ Apivar



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Blocco di covata o confinamento della regina in periodo estivo

Api-Bioxal: 5 ml/spazio occupato da api

Farmaco veterinario

https://www.salute.gov.it/imgs/C_17_opuscoliPoster_336_allegato.pdf

Farmaco veterinario

Decreto Legislativo 6 aprile 2006, n. 193 "Attuazione della direttiva 2004/28/CE recante codice comunitario dei medicinali veterinari“

Gazzetta Ufficiale n. 121 del 26 maggio 2006 - Supplemento Ordinario n. 127

Nuova normativa sul farmaco veterinario

REGOLAMENTO (UE) 2019/6 DEL PARLAMENTO EUROPEO E DEL CONSIGLIO

dell'11 dicembre 2018

relativo ai medicinali veterinari e che abroga la direttiva 2001/82/CE

Articolo 1

Oggetto

Il presente regolamento stabilisce norme in materia di immissione sul mercato, fabbricazione, importazione, esportazione, fornitura, distribuzione, farmacovigilanza, controllo e impiego dei medicinali veterinari.

Articolo 160

Entrata in vigore e applicazione

Il presente regolamento entra in vigore il ventesimo giorno successivo alla pubblicazione nella *Gazzetta ufficiale dell'Unione europea*.

Esso si applica a decorrere dal 28 gennaio 2022.

Altre patologie

- Nosema
- Virus
- Peste americana
- Peste europea
- *Aethina tumida*
- Acariasi
- *Tropilaelaps* spp.
- Morie/spopolamenti

Nosema spp.

- Malassorbimento
- Diarrea (*N. apis*)
- Danneggiamento delle gh. ipofaringee
- Ridotta longevità
- Accelerato invecchiamento
- Infezioni secondarie (Malpighamoeba mellificae)
- Atrofia ovarica
- Sostituzione della regina
- Spopolamento (*N. ceranae*)

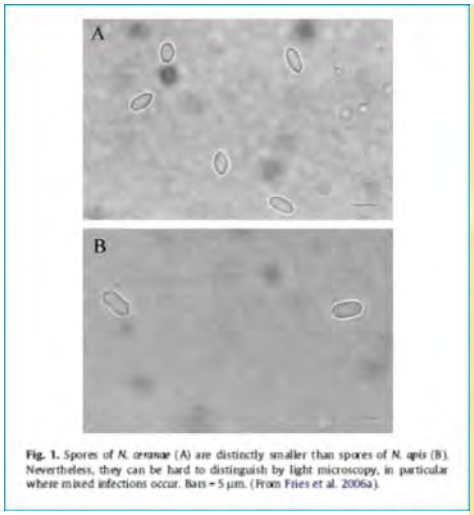
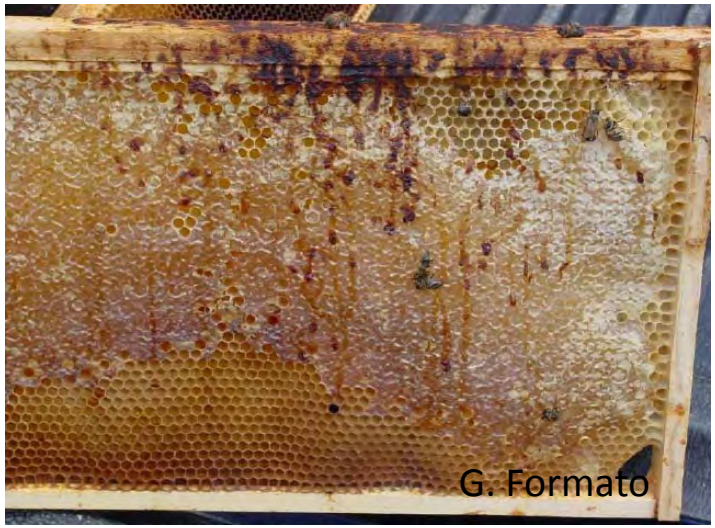
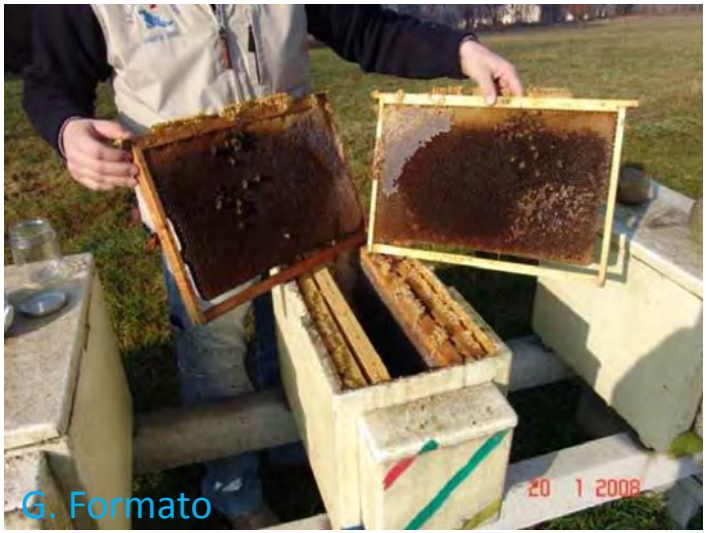


Fig. 1. Spores of *N. ceranae* (A) are distinctly smaller than spores of *N. apis* (B). Nevertheless, they can be hard to distinguish by light microscopy, in particular where mixed infections occur. Bars = 5 µm. (From Fries et al. 2006a).


G. Formato

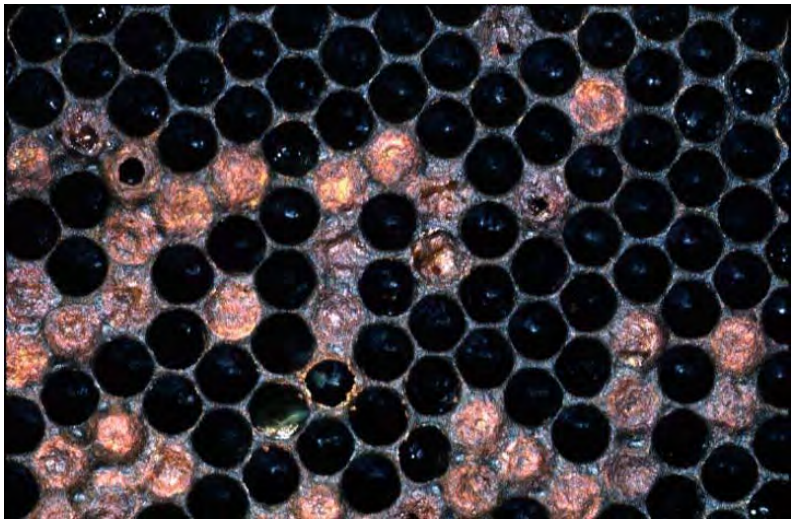


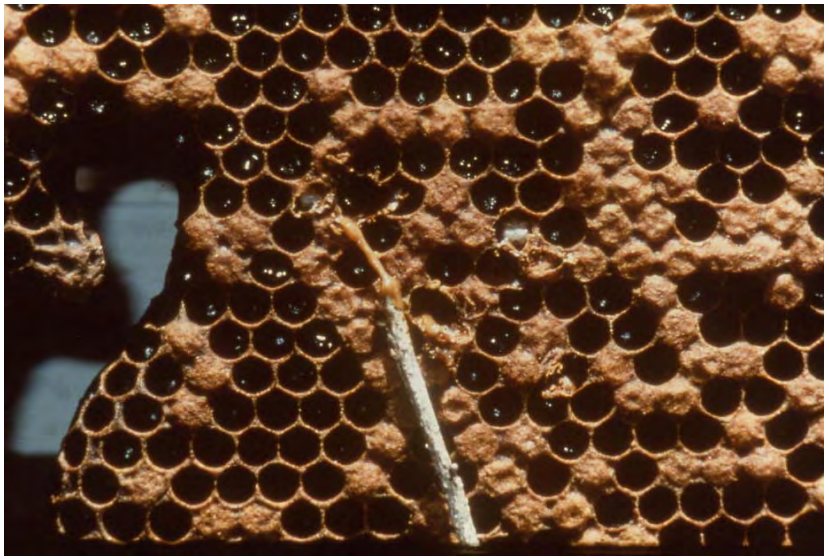
Virus

Virus	Distribuzione nella UE
Acute Bee Paralysis Virus (ABPV)	+
Kashmir Bee Virus (KBV)	+
Israeli Acute Paralysis Virus (IAPV)	+
Black Queen Cell Virus (BQCV)	+
Deformed Wing Virus (DWV)	+
Varroa destructor Virus 1 (VDV-1)	+
Sacbrood Virus (SBV)	+
Slow Bee Paralysis Virus (SBPV)	+
Chronic Bee Paralysis Virus (CBPV)	+
Cloudy Wing Virus (CWV)	+
Bee Virus X (BVX)	+
Bee Virus Y (BVY)	+
Arkansas Bee Virus (ABV)	?
Berkeley Bee Virus (BBPV)	?
Macula-like Virus (MLV)	+
Fliamentous Virus (AmFv)	+
Apis Iridescent Virus (AIV)	?
Aphid Lethal Paralysis virus (ALPV)	?
Big Sioux River virus (BSRV)	?
Lake Sinaï Virus 1 (LSV1)	?
Lake Sinaï Virus 2 (LSV2)	?
Egypt Bee Virus	?
Kakugo Virus	?
Moku virus	?

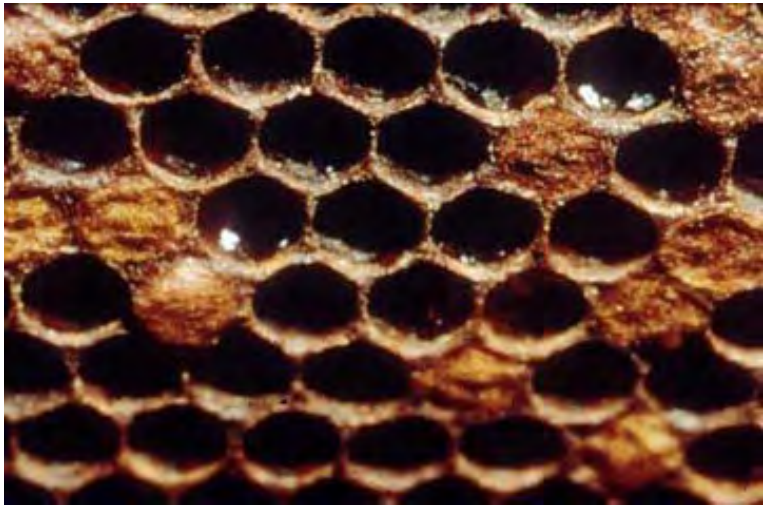
Da «Patologia e avversità dell'alveare» **di E. Carpana, M. Lodesani, 2014**

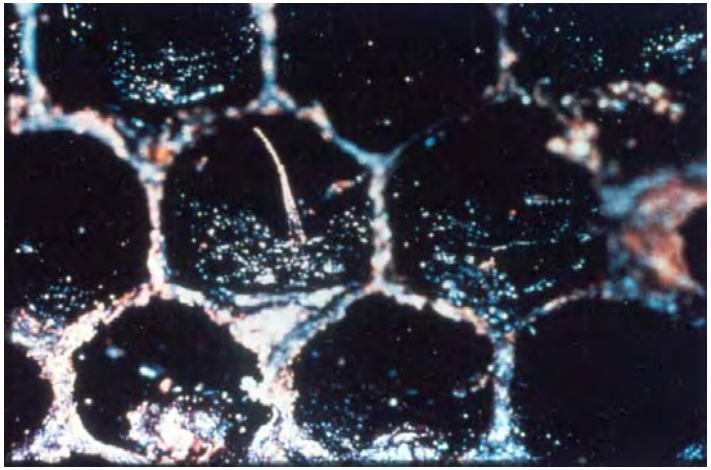
Peste americana – *Paenibacillus larvae*





Anno	n. casi P.A.	n. casi P.E.
2015	35	3
2016	37	5
2017	51	7
2018	40	3
2019	48	5



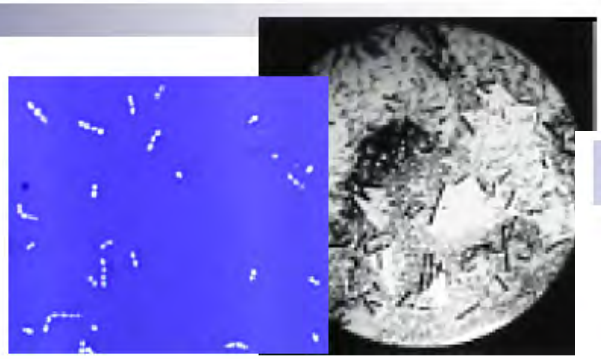


Peste europea

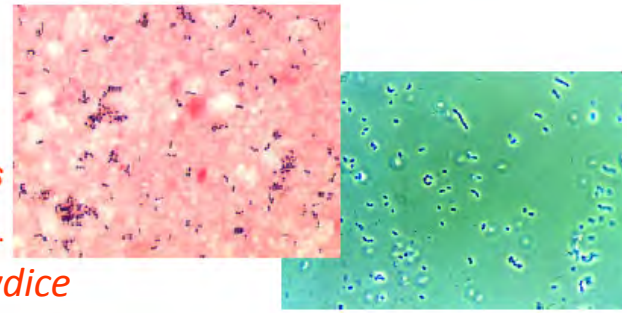
Anno	n. casi P.A.	n. casi P.E.
2015	35	3
2016	37	5
2017	51	7
2018	40	3
2019	48	5

Eziologia

Infezione batterica



Agente primario:
Melissococcus plutonius



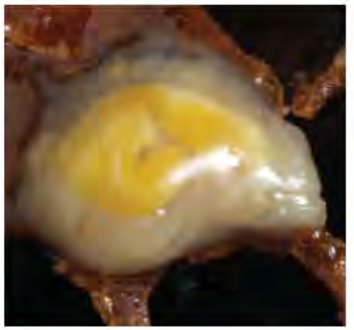
Agenti secondari:
Enterococcus faecalis
Paenibacillus alvei …
Achromobacter eurydice
Brevibacillus laterosporus

Consistenza flaccida – semiliquida – scaglia

Colore: biancastro – giallo – bruno

Posizione irregolare

Odore: aspro, acido, putrido, nessuno



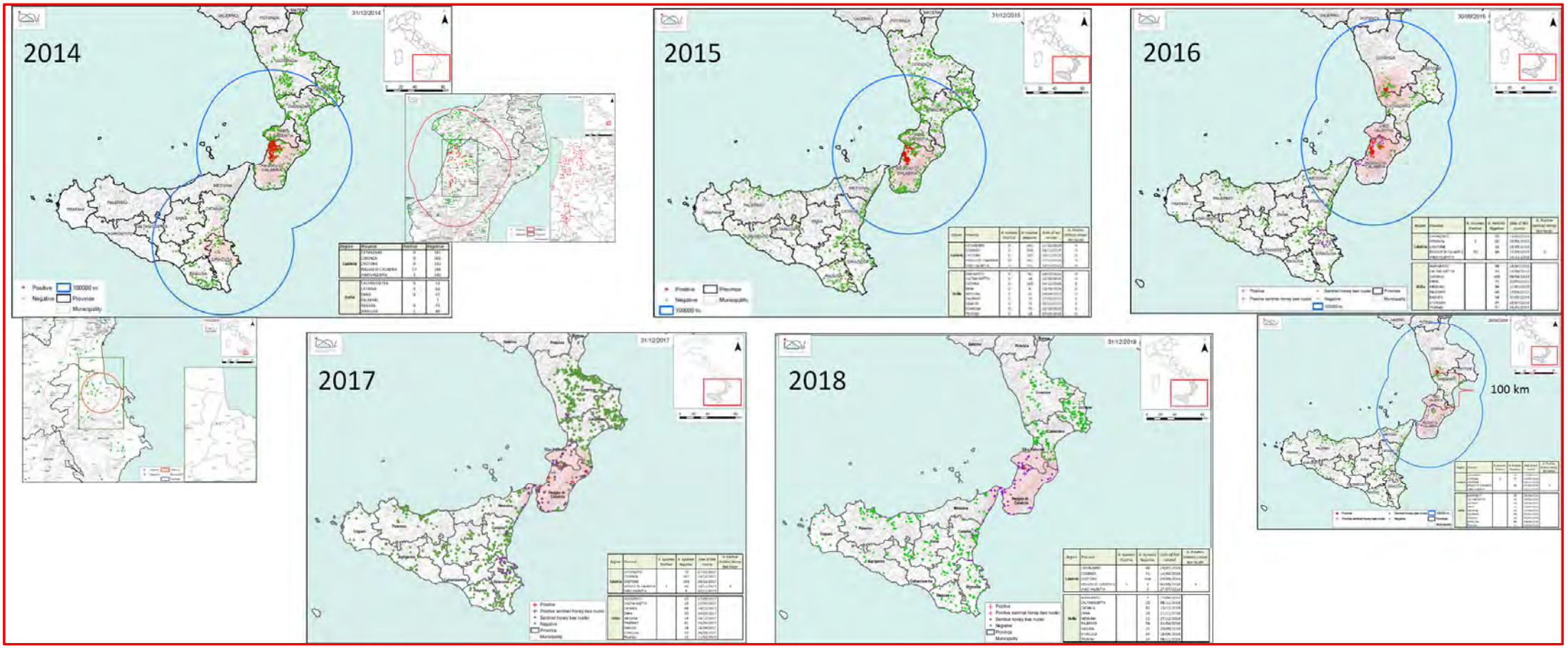
EFB infected larva

Melted down larvae

(E. Carpana)

Aethina tumida in Italia

Aethina tumida in Calabria e Sicilia: la storia

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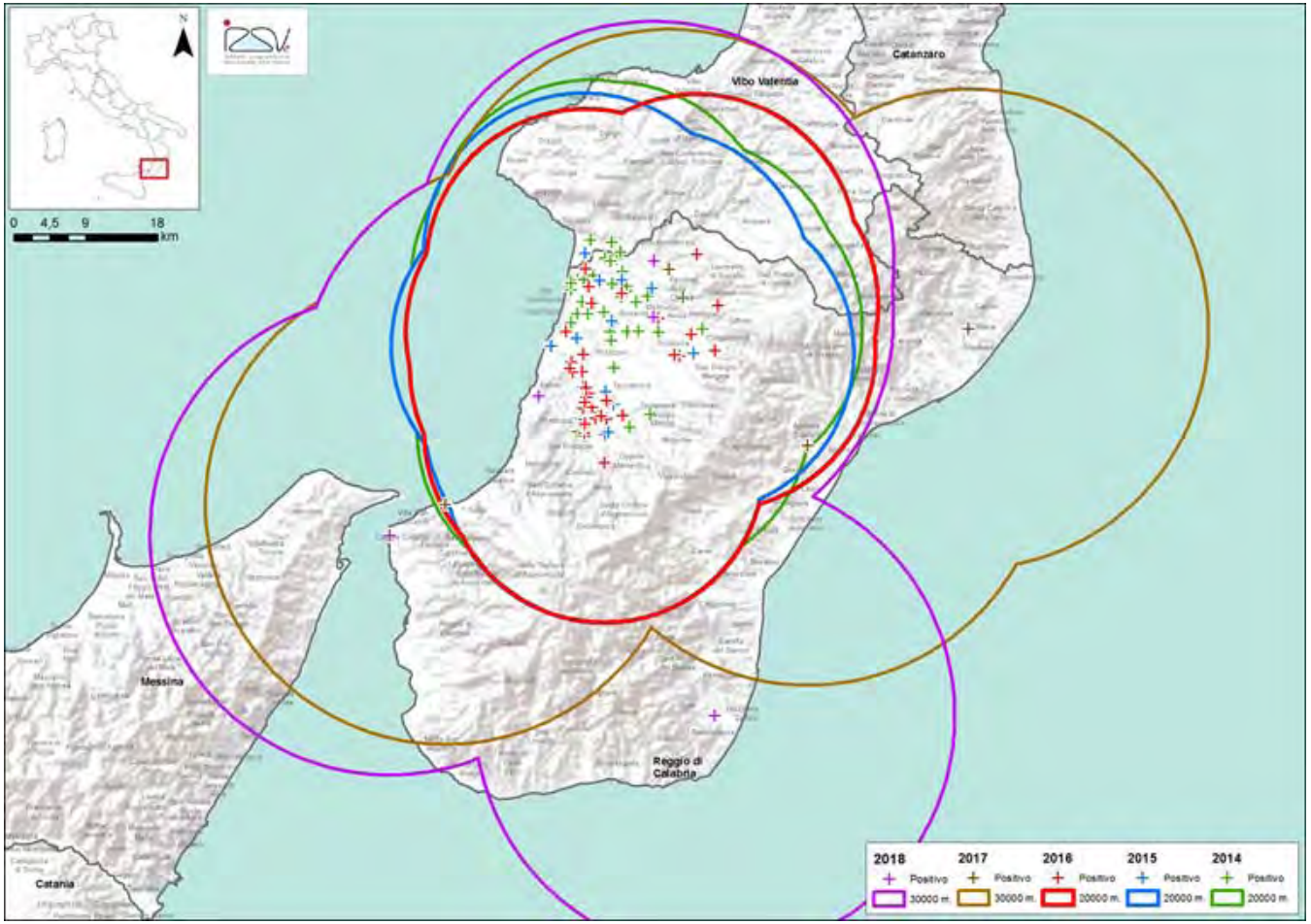
Confronto tra gli apiari infestati nel 2014 (verde), 2015 (blu), 2016 (rosso), 2017 (bruno) e 2018 (violetto



Situazione epidemiologica - dicembre 2020

Anno	2014	2015	2016	2017	2018	2019	2020	Totale
CALABRIA	**60**	**29**	**41**	**11**	**5**	**4**	**9**	**159**
APIARIO	57	29	40	3		1		130
COLONIA NATURALE	1		1	2	1	1	1	7
SENTINELLA	2			6	4	2	8	22
SICILIA	**1**					**1**		**2**
APIARIO	1					1		2
TOTALE	**61**	**29**	**41**	**11**	**5**	**5**	**9**	**161**

Piano nazionale di sorveglianza

Piano nazionale di sorveglianza 2015 – 2020
apiari stanziali selezionati random

Piano nazionale di sorveglianza 2015 - 2020
apiari nomadi (basato sul rischio)

Piano di sorveglianza 2015 - 2020
Calabria e Sicilia

Tropilaelaps spp.

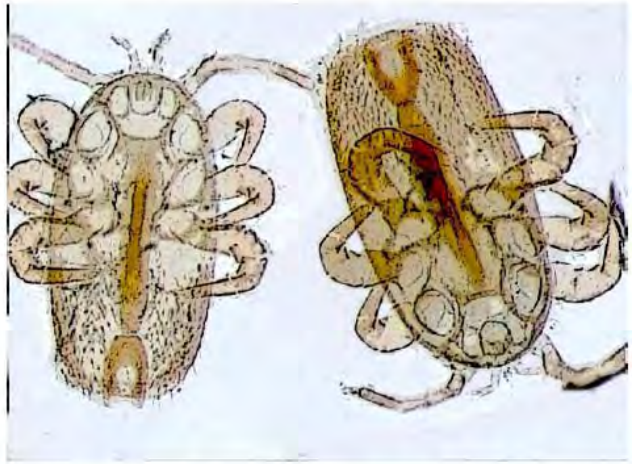
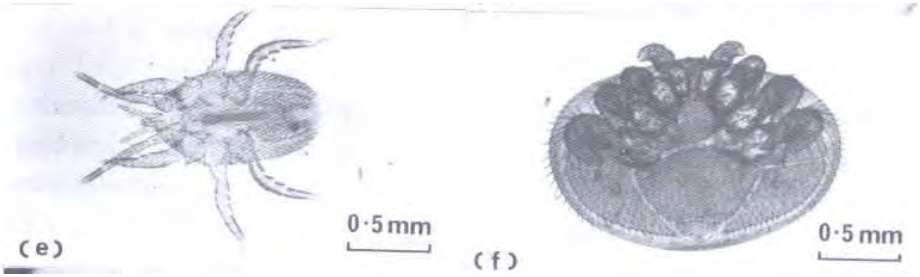


Fig. 1. Tropilaelaps clarea. Photo by J. Waddell.



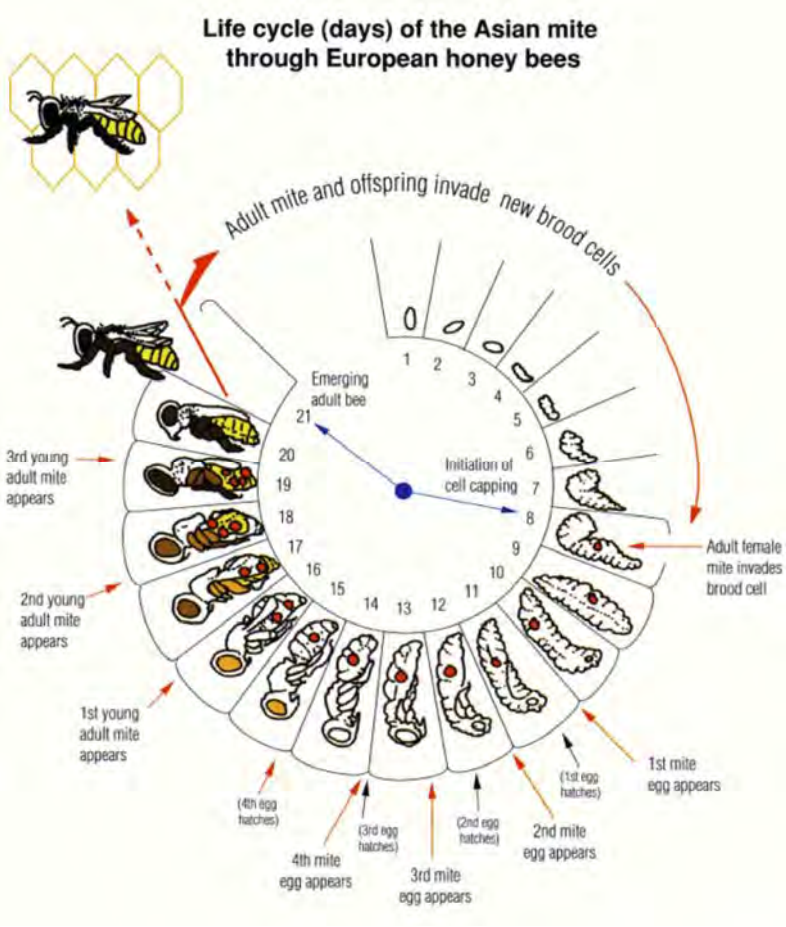


Fig. 9. Life cycle of *T. mercedesae* on *A. mellifera*. Diagram was constructed from data reported by Saleu (1994). Photo: Denis Anderson.

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Article

A Survey from 2015 to 2019 to Investigate the Occurrence of Pesticide Residues in Dead Honeybees and Other Matrices Related to Honeybee Mortality Incidents in Italy

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