



CONSIDERAZIONI SULL'IMPIEGO DEL LISOZIMA IN APICOLTURA



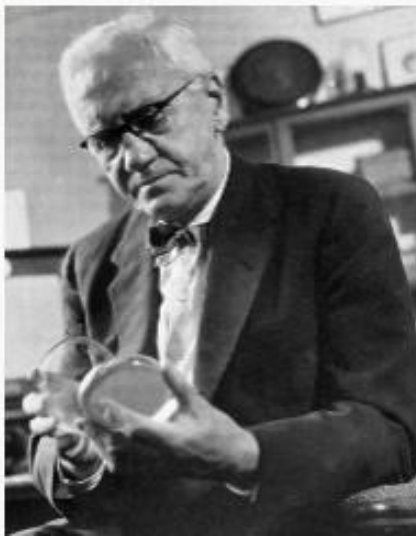
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Montefiascone (VT), 10/02/2023

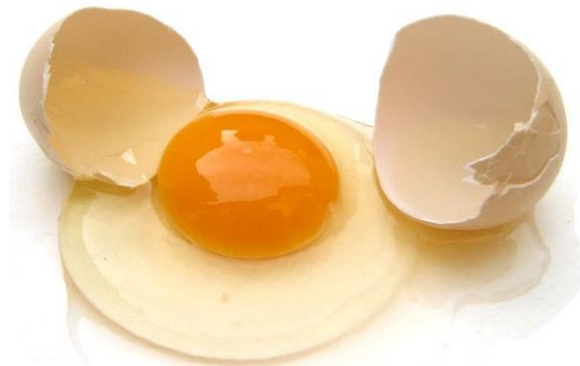


Lisozima



<https://www.treccani.it/enciclopedia/sir-alexander-fleming/>

A. Fleming, 1922





Suddiviso in diverse classi
(***Chicken type*** maggiormente conosciuto)

Tipo C



Tipo G

Tipo H

Tipo V



Tipo I

Tipo B

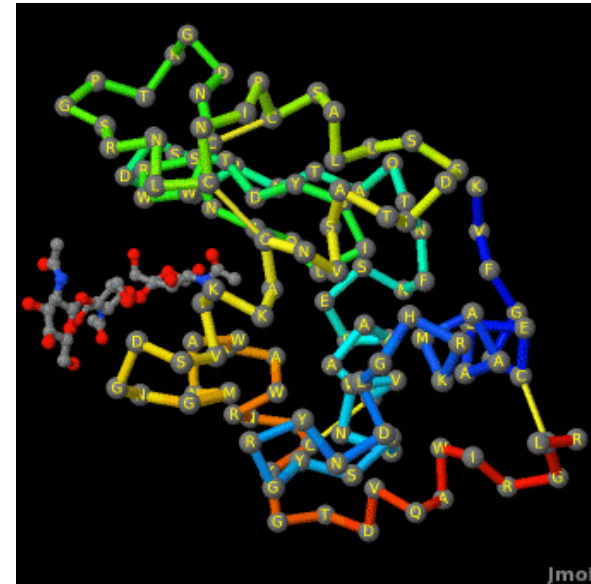


LISOZIMA

- Appartiene alla famiglia delle glicosidasi



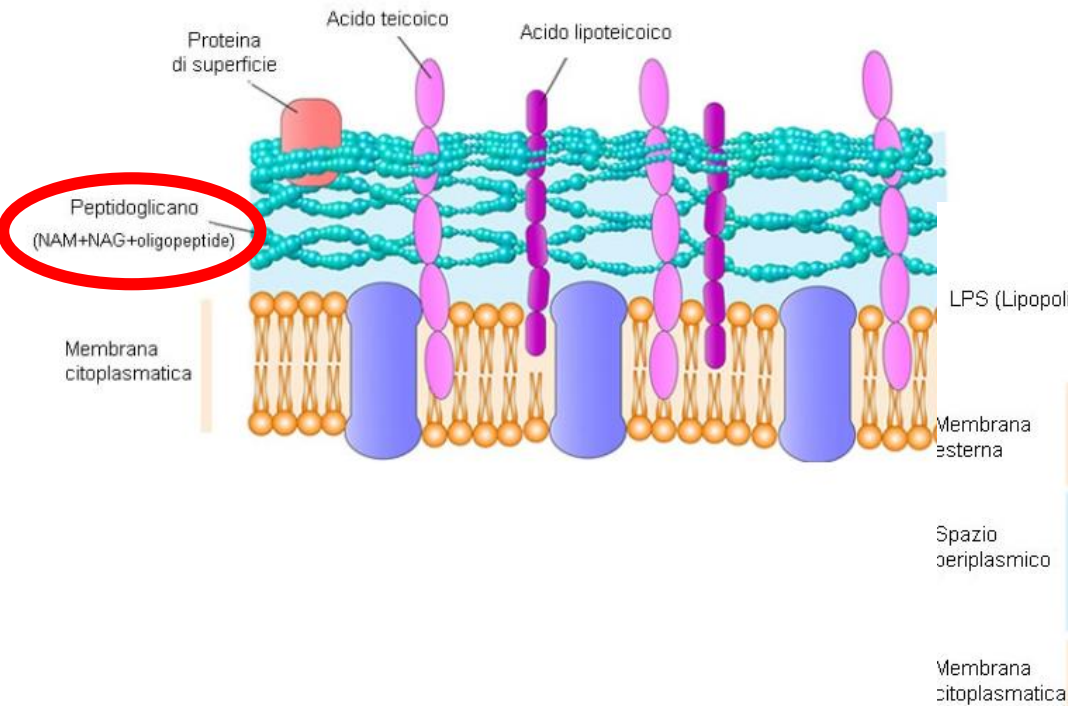
Proprietà
antimicrobiche



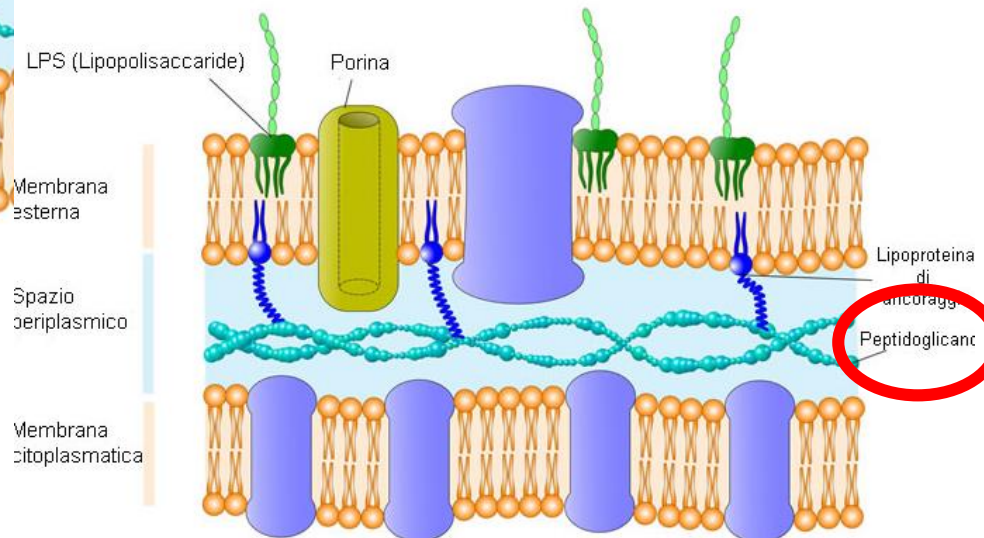


Attività antimicrobica

PARETE CELLULARE BATTERI GRAM POSITIVI

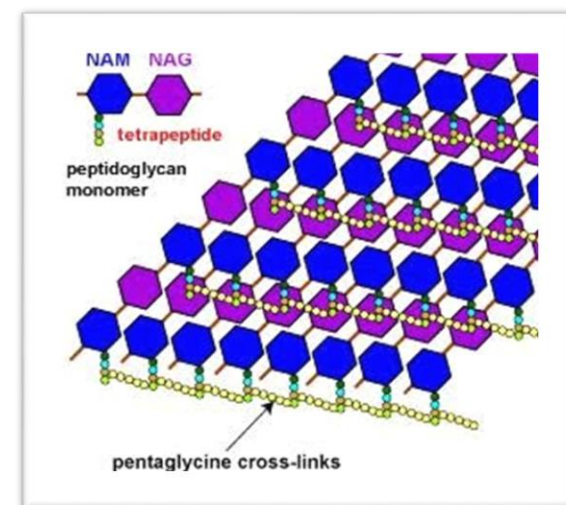
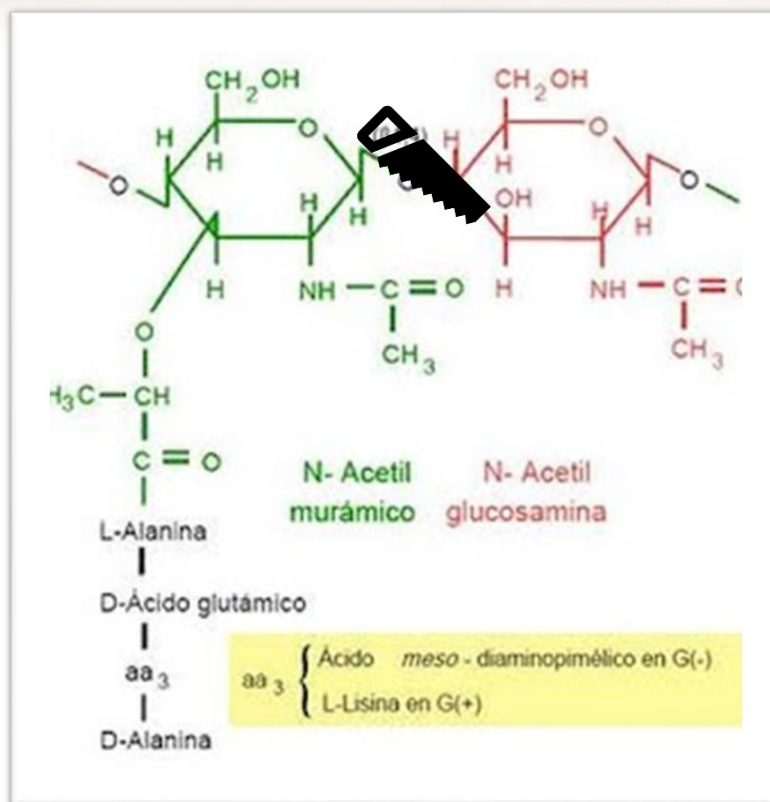


PARETE CELLULARE BATTERI GRAM NEGATIVI





Attività antimicrobica





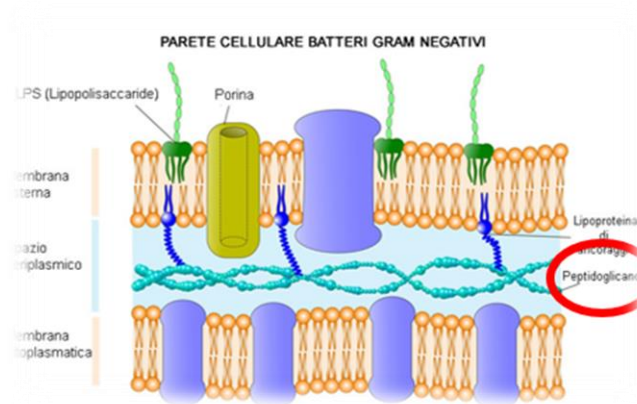
Attività antimicrobica

Ulteriore effetto antibatterico su base NON enzimatica

Idrofobicità

Lipofilia

Molecola cationica





Alcuni meccanismi di resistenza dei Gram +

O-acetilazione
(Lattobacilli e *S. aureus*) e/o N
deacetilazione
(Bacilli e
streptococchi)
dei residui di
esosamina dei
polisaccaridi di
membrana

Produzione di una
proteina inibitoria
del lisozima
(Streptococchi)



GRAM +

Peste americana



<https://www.izslt.it/apicoltura/peste-americana/>



<https://europepmc.org/article/pmc/pmc4976278>

Peste europea



<https://www.izslt.it/apicoltura/peste-europea>



<https://www.tandfonline.com/doi/pdf/>

In the battle of the disease: a transcriptomic analysis of European foulbrood-diseased larvae of the Western honey bee (*Apis mellifera*)

Oleg Lewkowski , Anja Poehlein, Rolf Daniel & Silvio Erler 

BMC Genomics 23, Article number: 837 (2022) | [Cite this article](#)

BMC Genomics



Research article

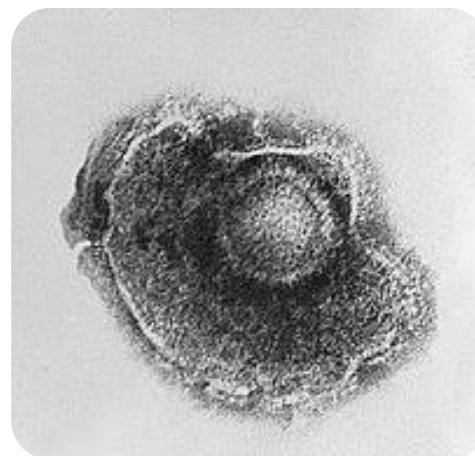
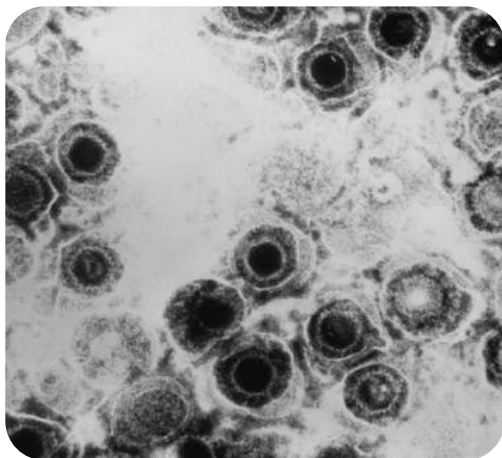
[Open Access](#)

The innate immune and systemic response in honey bees to a bacterial pathogen, *Paenibacillus larvae*

Queenie WT Chan¹, Andony P Melathopoulos², Stephen F Pernal² and Leonard J Foster^{*1}



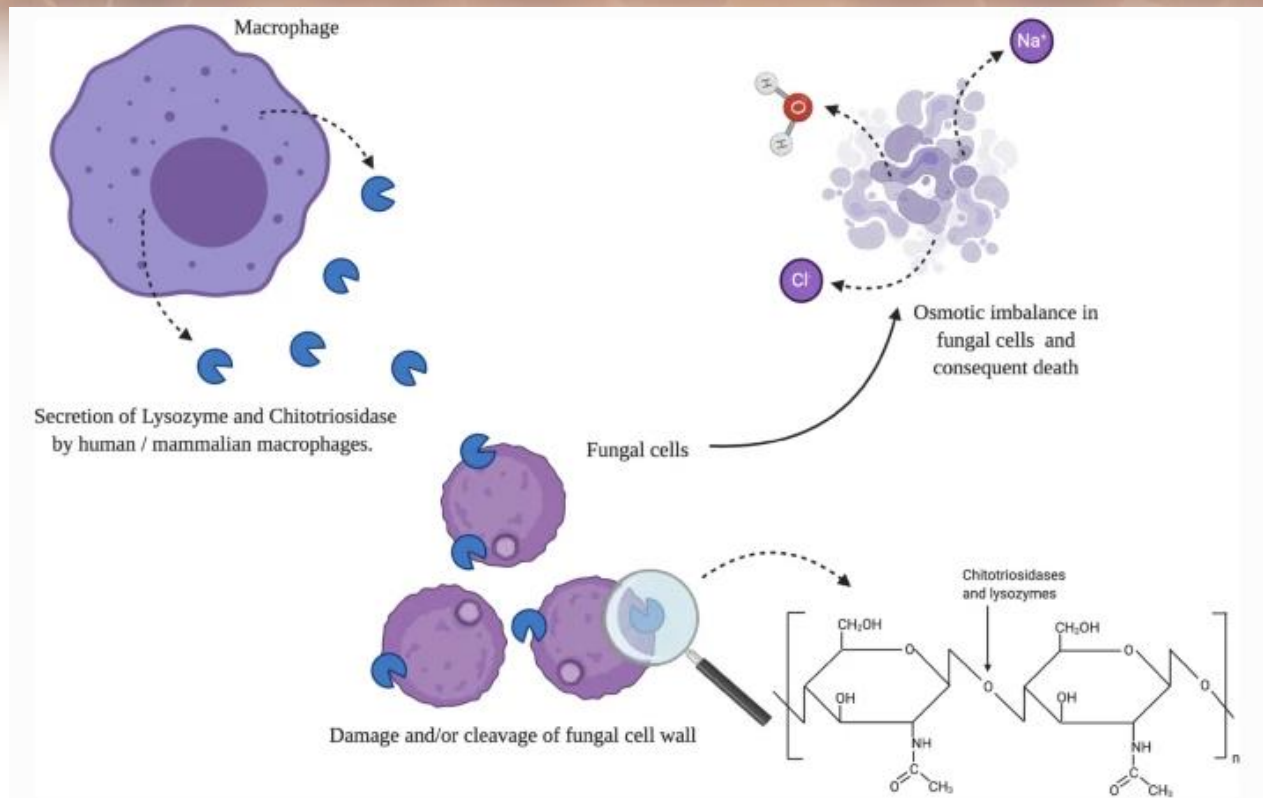
- Descritta anche attività **ANTIVIRALE**



https://it.wikipedia.org/wiki/Herpes_zoster

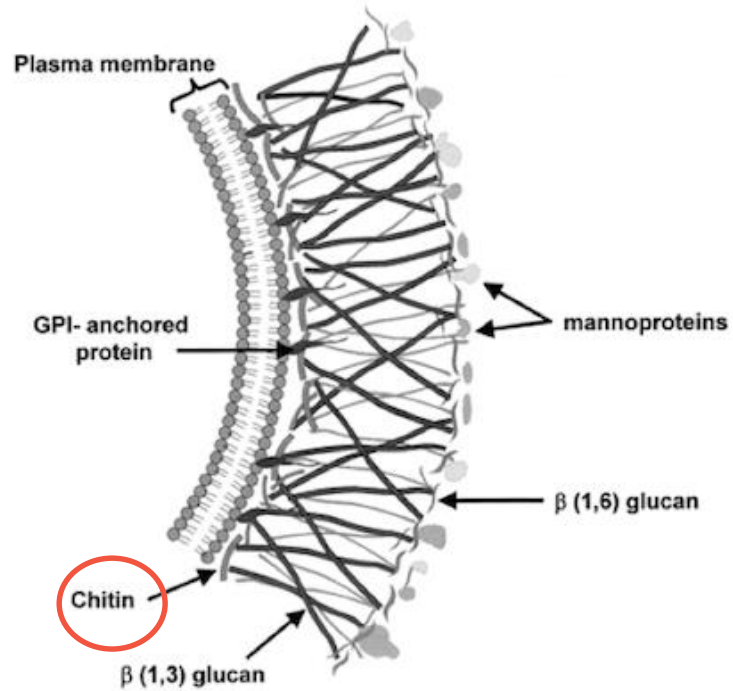


Attività antimicotica





Attività antimicotica



Parete cellulare funghi



LISOZIMA E API

- Ruolo nella RI
- Ghiandole salivari
- Emolinfa di larve e adulti
- Stimolo infiammatorio «trigger»
- Resistenza infezioni fungine insieme alla fagocitosi



STUDY THE CONTENT OF LYSOZYME AND TOTAL PROTEIN IN THE HAEMOLYMPH OF HONEY BEES (*APIS MELLIFERA L.*) FROM BEE COLONIES WITH DIFFERENT HYGIENIC BEHAVIOUR

Ivanka Zhelyazkova^{1*}, Svilen Lazarov¹, Delka Salkova², Kalinka Gurgulova³

EXPRESSION AND ACTIVITY OF LYSOZYME IN *APIS MELLIFERA CARNICA* BROOD INFESTED WITH *VARROA DESTRUCTOR*

Ewa A. Zaobidna^{*}
Krystyna Żółtowska
Elżbieta Łopieńska-Biernat



Ascosphaera apis

- Fungo ascomicete
- «Covata calcifica»
- Famiglie indebolite sono più vulnerabili

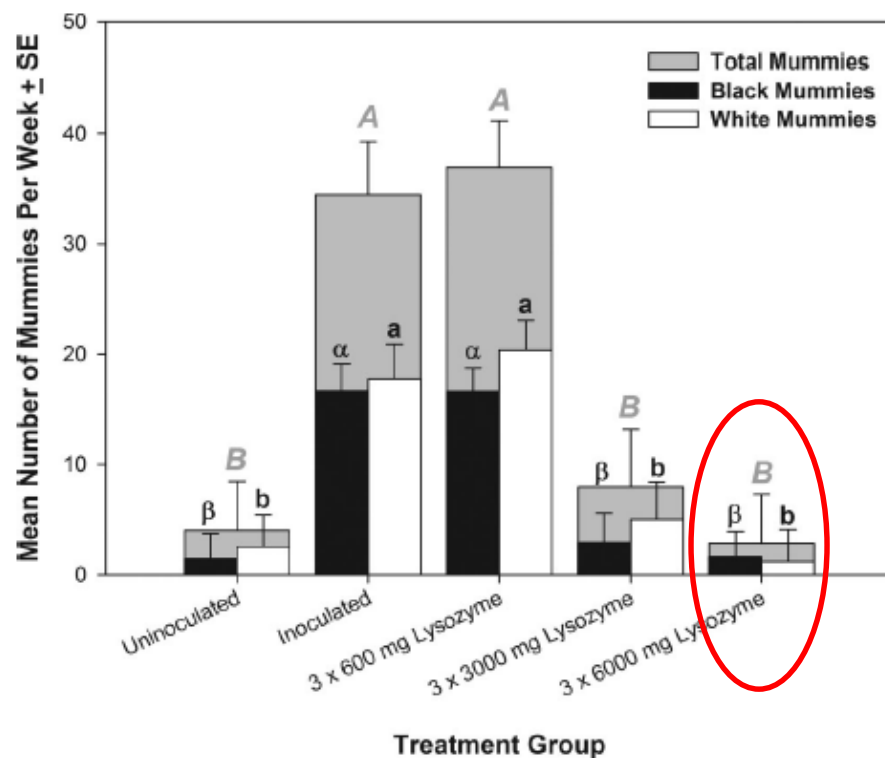




Ascosphaera apis

Evaluation of Lysozyme-HCl for the Treatment of Chalkbrood Disease in Honey Bee Colonies

A. VAN HAGA,^{1,2,3} B. A. KEDDIE,² AND S. F. PERNAL³

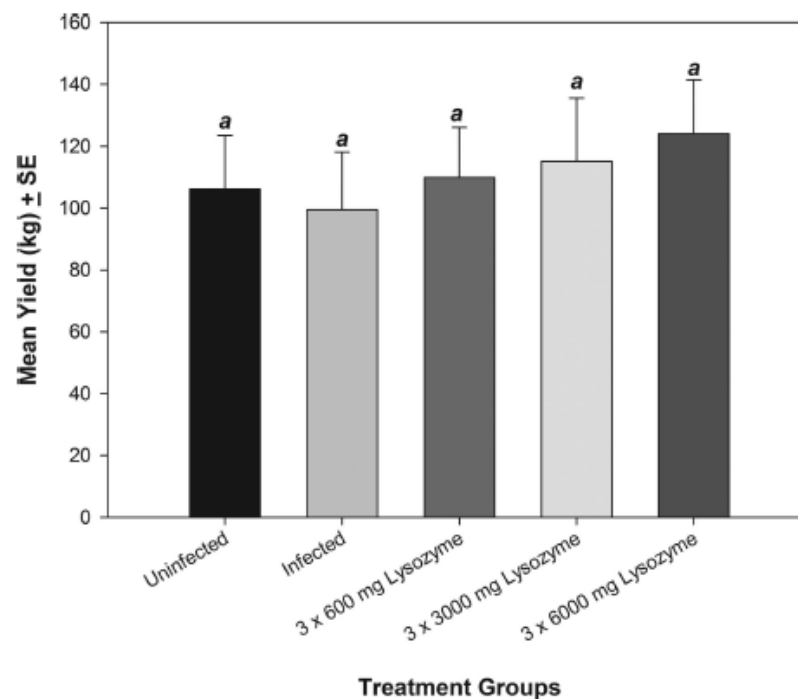




Ascosphaera apis

Evaluation of Lysozyme-HCl for the Treatment of Chalkbrood Disease in Honey Bee Colonies

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Incremento produzione 18-24 kg rispetto alle arnie non trattate

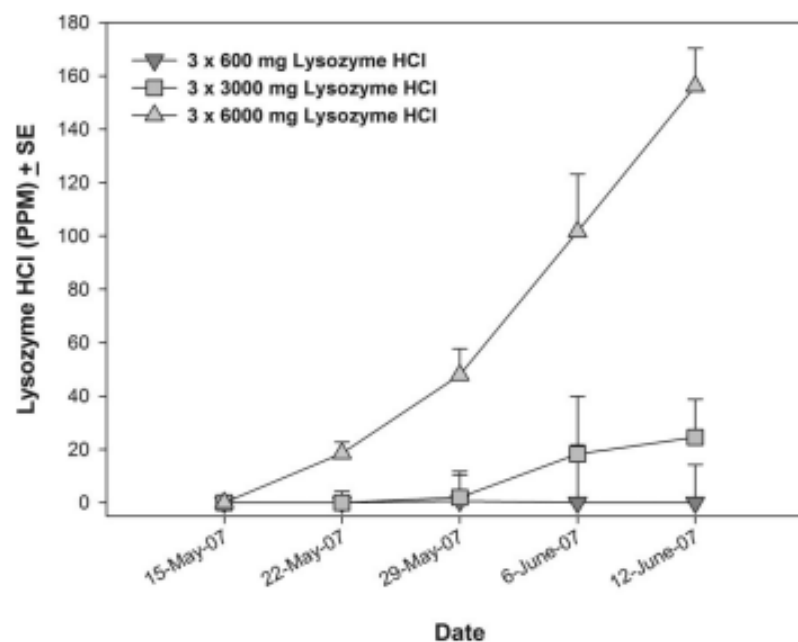
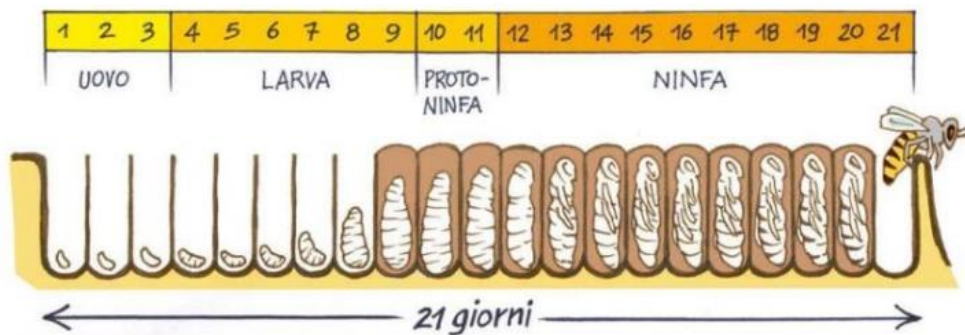


Fig. 7. The mean amount (parts per million, ppm) of lysozyme-HCl detected in the stored food collected from the outer edges of three brood frames of each colony compared among treatment groups that were administered three dosages of lysozyme-HCl. Colonies were sampled before the first treatment was applied and then weekly for 4 wk afterwards.

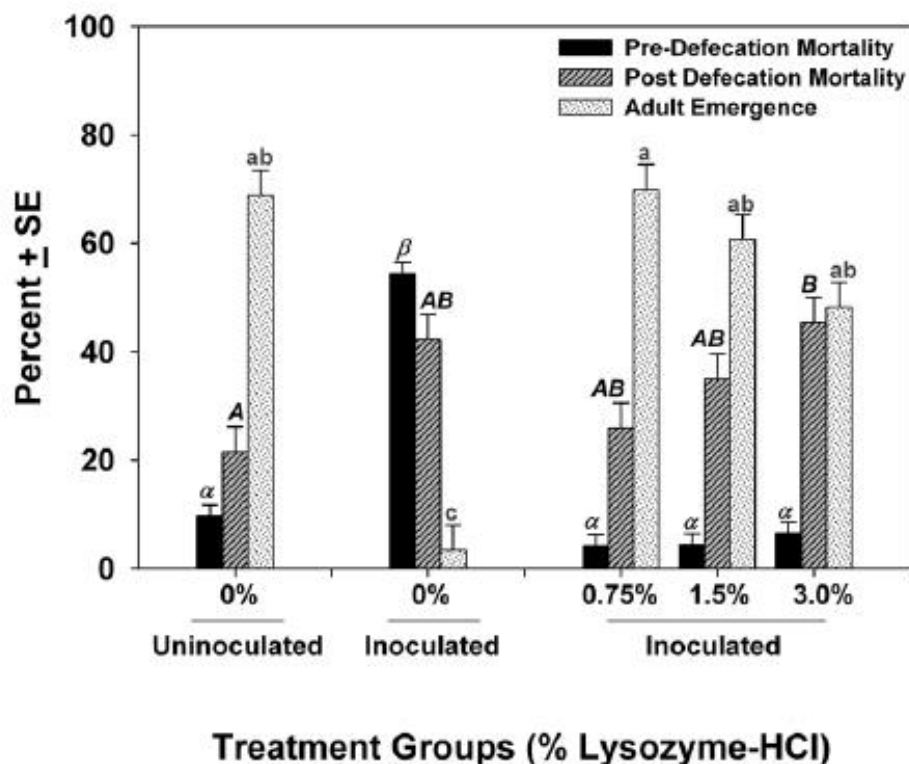


Dopo 21 giorni dalla nascita





Tossicità nelle api



Compound	Time (h)	Intercept		Slope		LD ₅₀ (95% CI) (μg/bee)
		Estimate	χ^2 (P> χ^2)	Estimate	χ^2 (P> χ^2)	
Dimethoate	24	-1.98	203.79 (0.0001)	6.74	216.32 (0.0001)	0.29 (0.27-0.32)
Dimethoate	48	-2.06	201.95 (0.0001)	7.53	222.02 (0.0001)	0.27 (0.25-0.29)
Dimethoate	72	-2.02	191.48 (0.0001)	7.84	220.55 (0.0001)	0.26 (0.24-0.28)
OTC	24	-5.35	98.39 (0.0001)	6.97E-04	81.22 (0.0001)	3448 (3027-4046)
OTC	48	-1.00	73.63 (0.0001)	3.82E-04	32.80 (0.0001)	2626 (2105-3517)
OTC	72	-0.47	18.46 (0.0001)	4.19E-04	35.26 (0.0001)	1130 (739-1536)
Lysozyme-HCl	24	-5.35	47.66 (0.0001)	-1.69E-05	0.0032 (0.9546)	> 6400
Lysozyme-HCl	48	-4.87	56.56 (0.0001)	-1.44E-04	0.22 (0.6378)	> 6400
Lysozyme-HCl	72	-4.64	71.74 (0.0001)	-2.32E-05	0.012 (0.9126)	> 6400
Nisin	24	-2.40	207.36 (0.0001)	3.62E-04	3.59 (0.0581)	> 6400
Nisin	48	-4.98	145.78 (0.0001)	2.14E-04	1.61 (0.2048)	> 6400
Nisin	72	-4.40	234.73 (0.0001)	4.67E-04	28.75 (0.0001)	> 6400

Test of H₀; parameter = 0

University of Alberta

The Use of Lysozyme-HCl and Nisin to Control the Causal Agent of Chalkbrood Disease (*Ascosphaera apis* (Maassen ex Clausen) Olive and Spiltoir) in Honey Bees (*Apis mellifera* L.)

by

Amanda Louise Van Haga



PROSPETTIVE FUTURE

- Economicità trattamento
- Facilità somministrazione
- Procedure di corretta prassi imprescindibili
- Potenziale utilizzo prevenzione/trattamento patologie dell'alveare





Lisozima e sicurezza alimentare





Lisozima e sicurezza alimentare

MAESTRI GRANA PADANO DOP
Stagionato oltre 16 mesi

G
GRANA
PADANO
P

OLTRE 16 MESI

Valori nutrizionali medi \varnothing /100g	
Energia	1654kJ/398 kcal
Grassi	29 g
di cui acidi grassi saturi	18 g
Carboidrati	0 g
di cui zuccheri	0 g
Proteine	33 g
Sale	1,5 g

Ingredienti: latte, sale, caglio, conservante: lisozima da uovo

Reg. UE 1332/2008

Reg. UE 1129/2011

Reg. UE 1169/2011



BEE STRONG!!!