

Lund University

(In southern Sweden)



LUND
UNIVERSITY
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2006.06.22 13

Novel Lactic acid bacteria from the honey stomach of honey bees – the answer to the beneficial properties of honey, bee pollen and bee bread



2009-11-23

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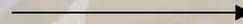
Lactobacilli & Bifidobacteria

- fermented food – yoghurt, olives
- fermented beverages – beer, wine
- humans & animals – as protectors in the gut, vagina, mouth
- honey bees



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Discovery



**Naturally occurring
Lactic acid bacteria
(LAB)
within honeybees
and their products**

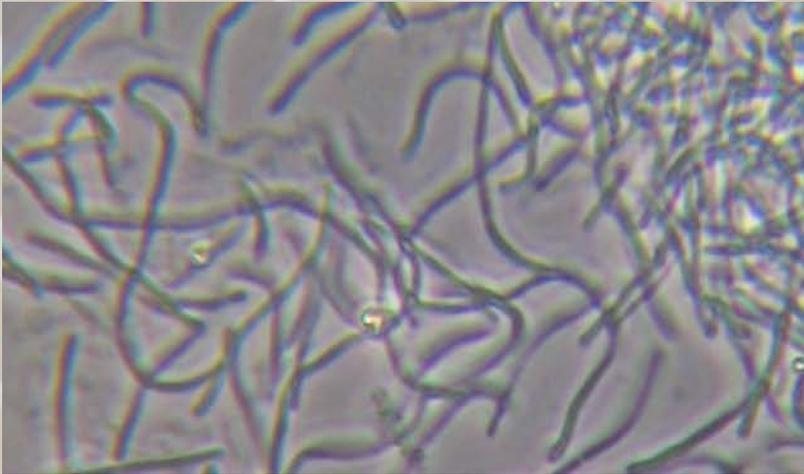
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The discovered LAB flora

European and American honey bees

– *A. mellifera*



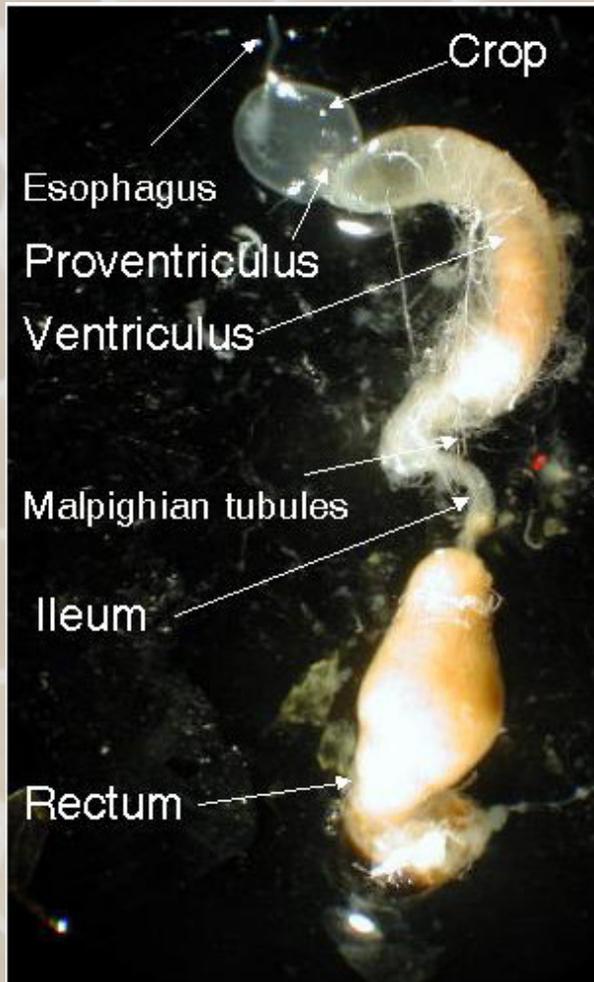
***Lactobacillus* spp. (9)**



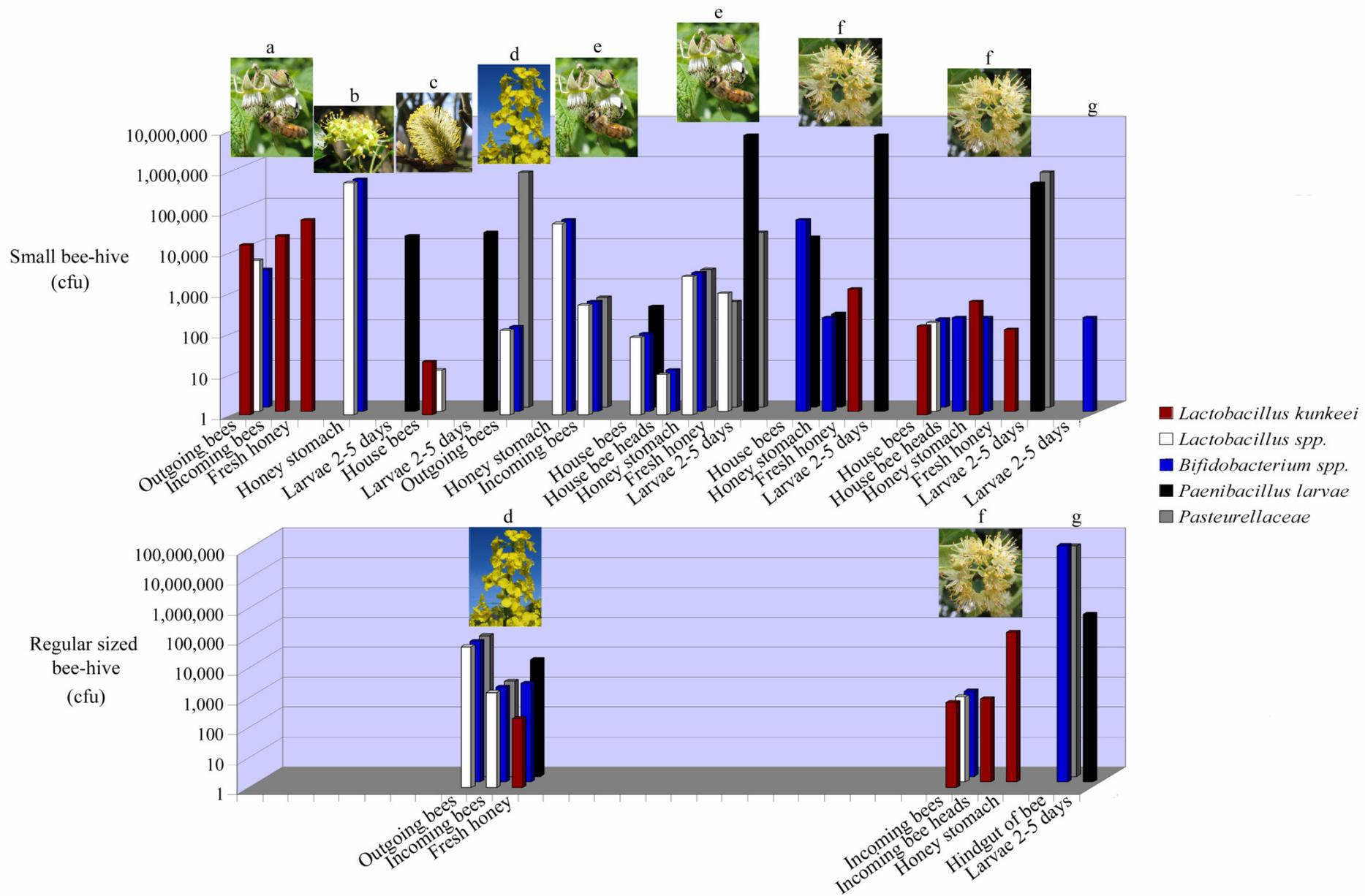
***Bifidobacterium* spp. (4)**

Vásquez, A., Olofsson, T. C. & Sammataro, D.
Apidologie DOI:10.1051/apido:2008063 (2009).

The Honey Stomach



Home of the beneficial bacteria

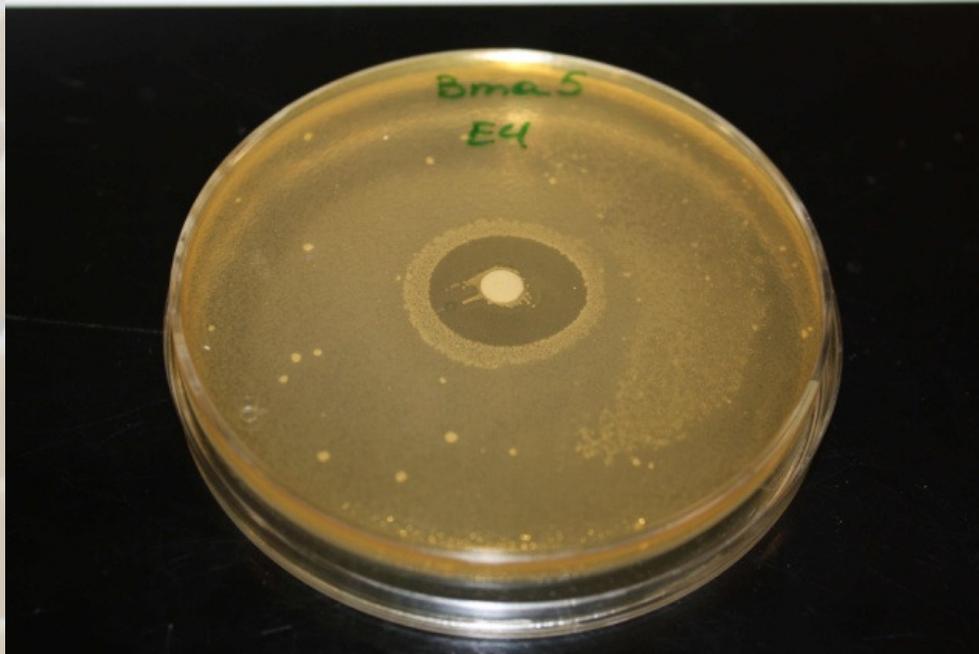


LAB-antibacterial compounds

Lactic acid, acetic acid, formic acid, hydrogen peroxide, antibiotics etc.
are all produced by these beneficial bacteria

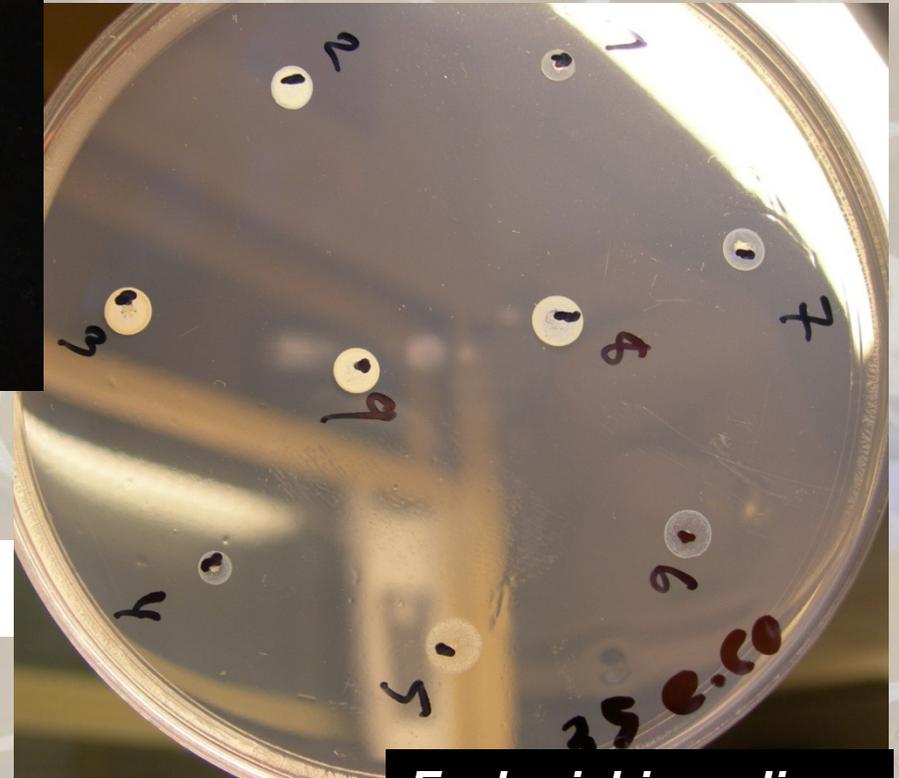
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Antimicrobial properties



Paenibacillus larvae

Forsgren, E., Olofsson, T. C., Vásquez, A. & Fries, I. In press, *Apidologie*.



Escherichia coli

How many?

- **13** different types of lactobacilli & bifidobacteria
- 1 000 000 bacteria of each type in one honey stomach → **13 000 000 in total**
- **1 300 000 bacteria/g in fresh honey - *A. mellifera***

→ FUNTIONAL FOODS AND ADDITIVES



- A fermentive food?
- A natural synbiotic food product?
- A natural probiotic food product?



- The novel LAB flora is consumed viable in honey daily



2009-11-23

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The secret of bee bread

All honey stomach bacteria involved in bee bread!



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BENEFICIAL BACTERIA
in honey stomach



Bee bread

Honey

Bee pollen

Defense against
American foul brood

Antimicrobial
compounds

Organic acids



Health of the entire colony