



Honeybee - flying pharmacy

Janko Božič

University of Ljubljana, Biotechnical faculty - Department of biology

Večna pot 111. 1000 Ljubljana, Slovenia

e-mail: janko.bozic@bf.uni-lj.si

<http://www.bf.uni-lj.si/jbozic/>





[Honey & Bee]

- Collection of nectar, honeydew, pollen, resins, water

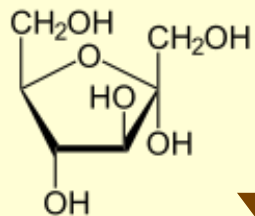
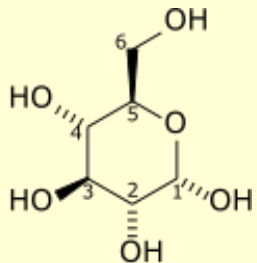


- Processing: food exchange, repining



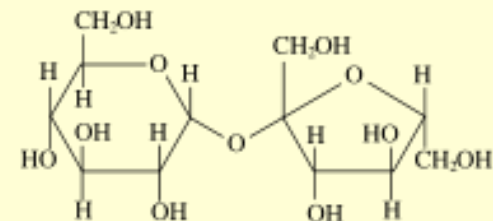
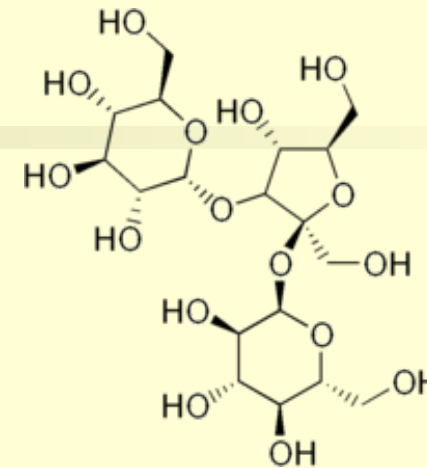
Food source

- Sweet sugar solution



➔ *NECTAR & HONEYDEW*

Sugars: fructose, glucose, sucrose,
several oligosaccharides
+ other org. & inorganic compounds.



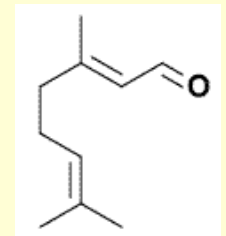


[Nectar]



Plant derived attractants:

- behavior releasers: sucrose → arousal and feeding response,
- conditioned stimuli: learning by bees shapes, colors and volatiles of food source,
- some volatile compounds imitate bee pheromone (geraniol, citral) → instinctive attractants.





Honeydew



- lack of special visual stimulation (like flower colors and shapes)
- limited chemical stimulation
- sucrose reward

Sucrose reduced due to synthesis of oligosaccharides by enzymes derived from honeydew producers

→ prebiotic value.





[Pollen, resins, ...

- Fat content in pollen – quality perception by bees (AA ?)
- General receptor for flavonic type of compounds?







[Forage selection by bees]

- Sucrose reward
- Communication



- Value of “minor” foragers



[Sucrose reward]

- General arousal

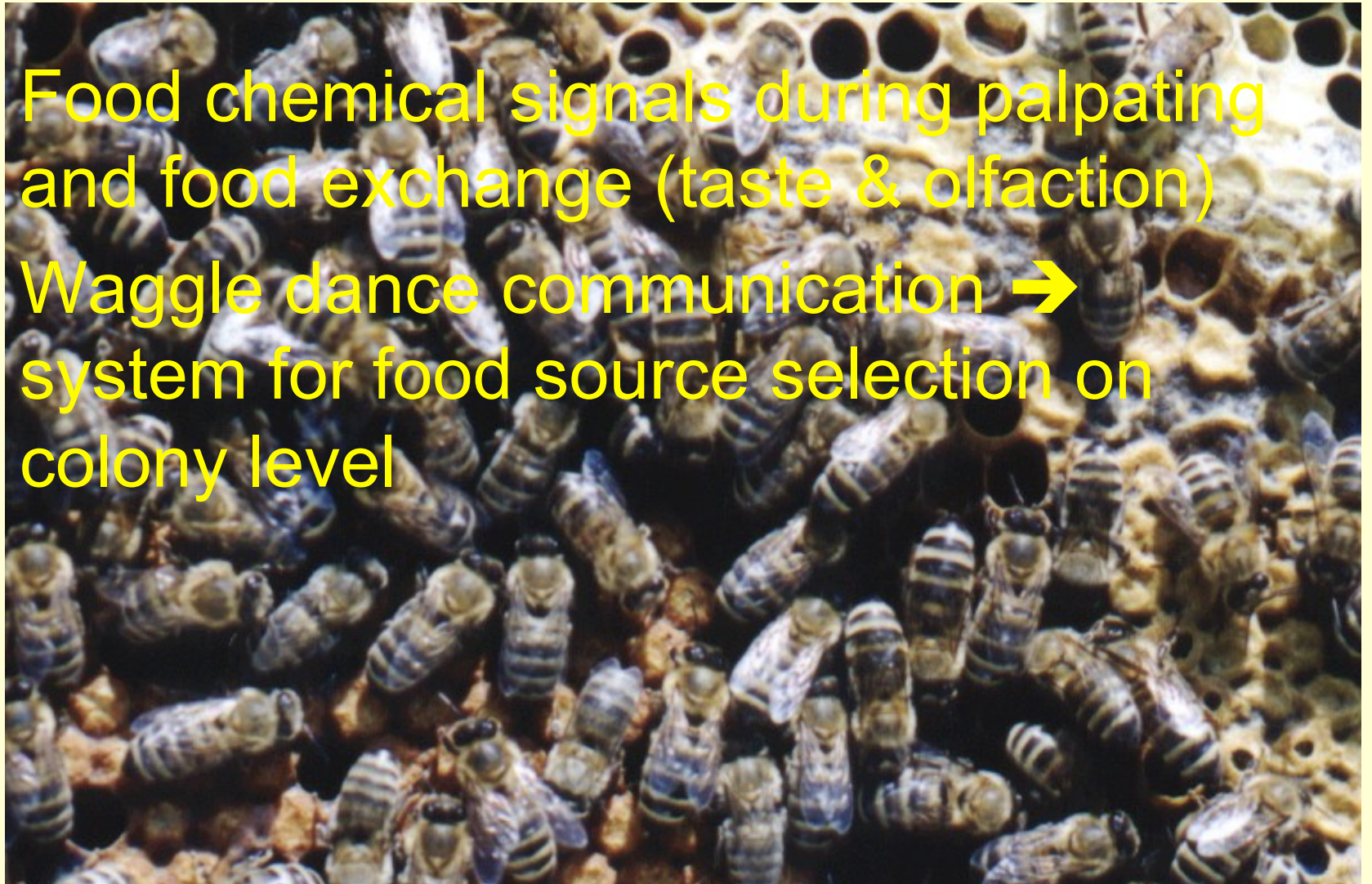
- Feeding response

- Low sensitivity and discrimination



[Communication]

- Food chemical signals during palpating and food exchange (taste & olfaction)
- Waggle dance communication → system for food source selection on colony level



[Palpating and food exchange]

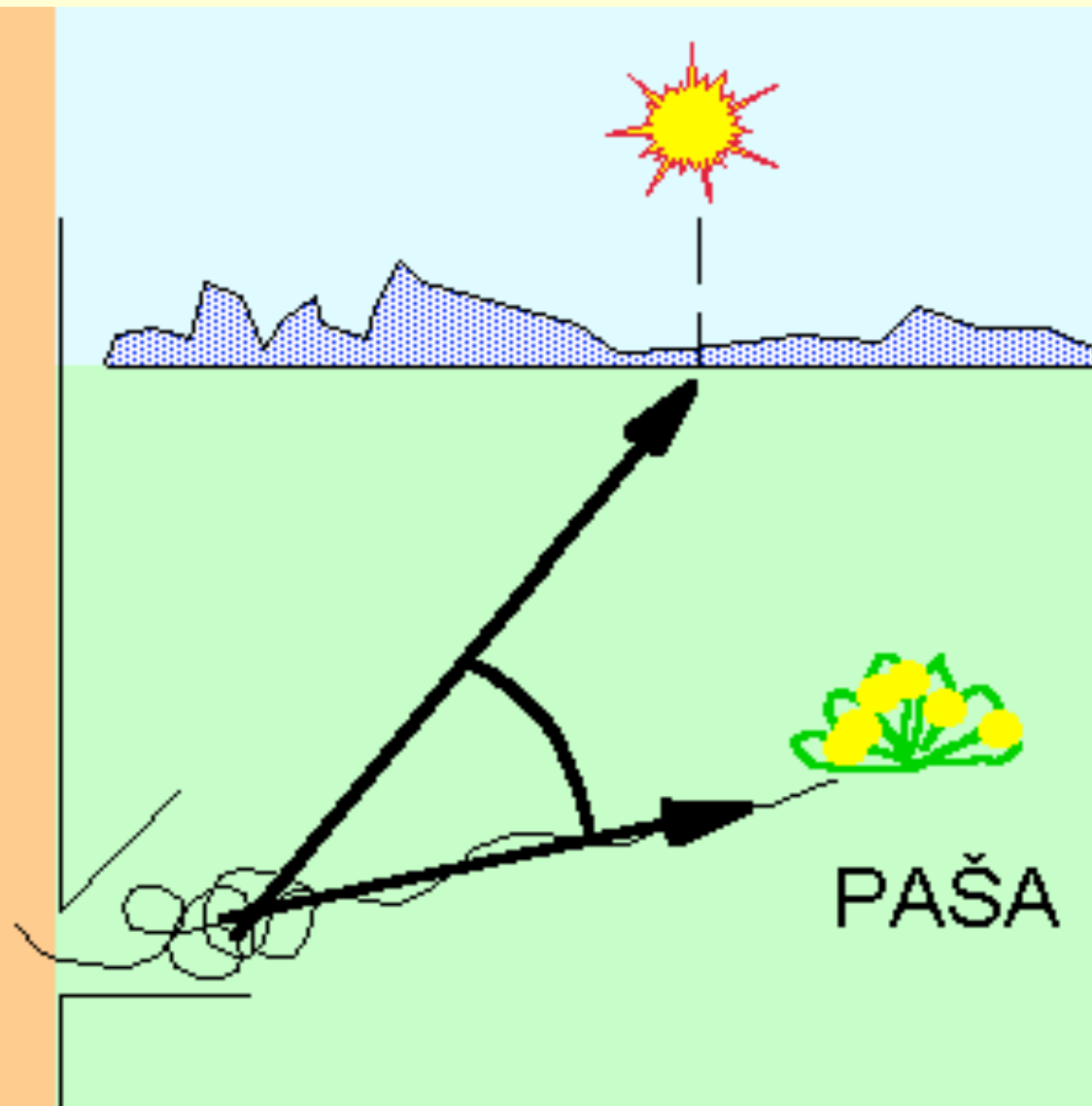
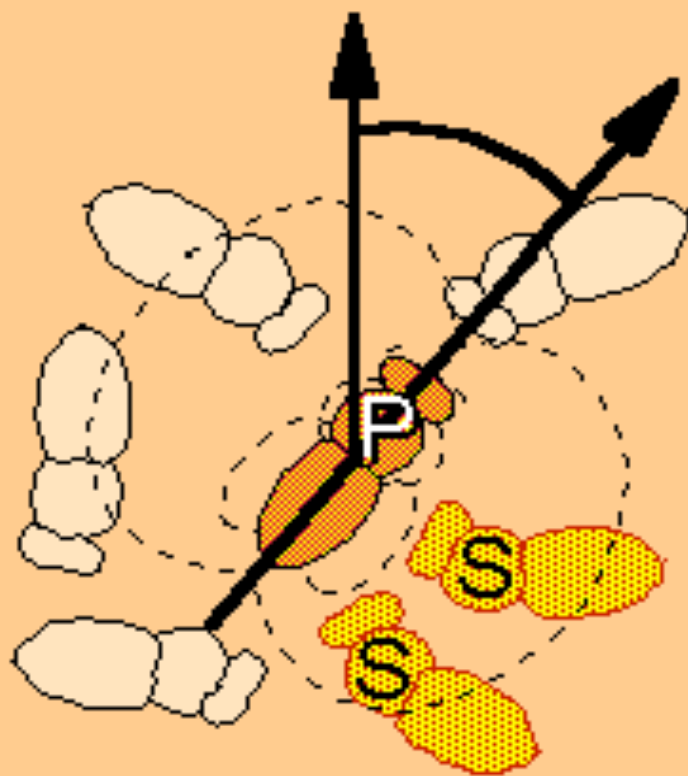


[Waggle dance communication]



Waggle dance communication

PLES V PANJU





[Dance video



 Impossible d'afficher l'image. Votre ordinateur manque peut-être de mémoire pour ouvrir l'image ou l'image est endommagée. Redémarrez l'ordinateur, puis ouvrez à nouveau le fichier. Si le x rouge est toujours affiché, vous devrez peut-être supprimer l'image avant de la réinsérer.



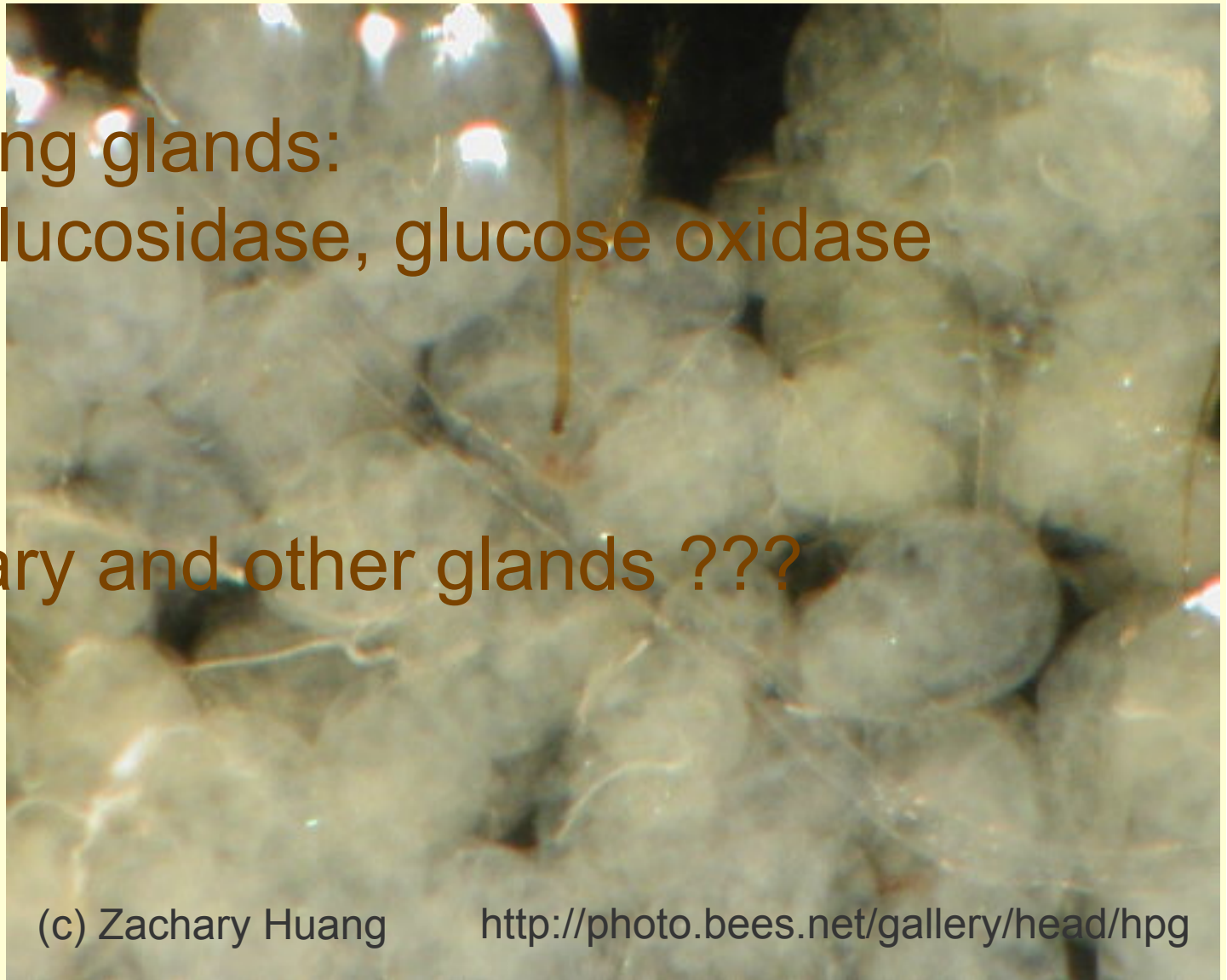
[Honey repining]

- Bee enzymes
- Food exchange
- Hive “air conditioning”



[Bee enzymes]

- Feeding glands:
alfa-glucosidase, glucose oxidase
- Salivary and other glands ???



(c) Zachary Huang

<http://photo.bees.net/gallery/head/hpg>

[Food exchange]



Enzymes and other secrets delivered into honey

[Hive “air conditioning”]

- Evaporation of water
- Temperature for enzymes activity





[Future perspectives]

- forage perception in “minor” foragers and pollen foragers
- bee glands contribution to honey Q
- food exchange & technology solutions
- selection of bees for:
 - (1) food selection,
 - (2) high quality of gland secretions,
 - (3) behavior – food exchange specialization.

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Thanks !

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Janko Božič, e-mail: janko.bozic@bf.uni-lj.si

Special thanks to: friend Nika

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- Undergraduate students studied honeybee behavior
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