MYRMICA ANTS ARE TALKATIVE WHEN YOUNG

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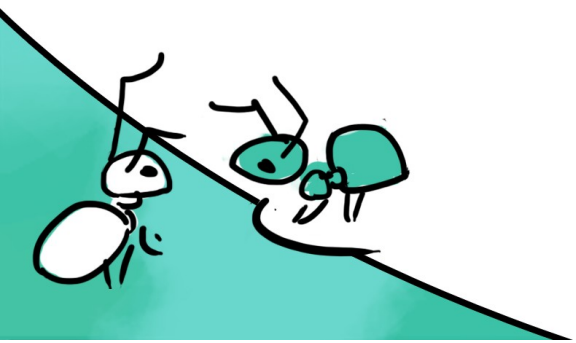
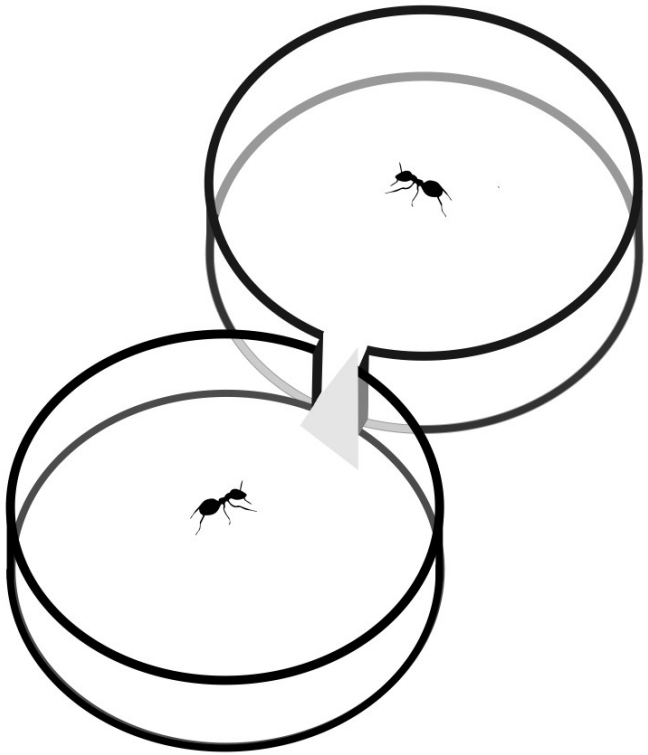
Psammetichus'
"Language experiment":
The first word from babies reared in isolation, after a stage of bubbling, was "bèkos".

How do ants develop communication?

Does their "bubbling" depend on social experience?



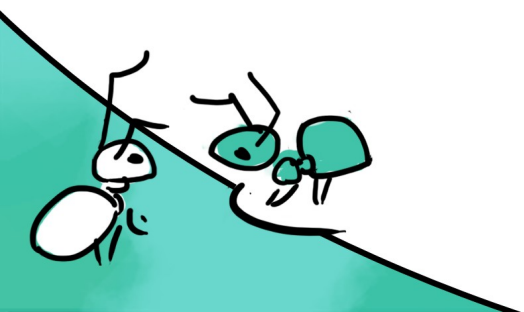
LambertusAntonius Claessens, 1800



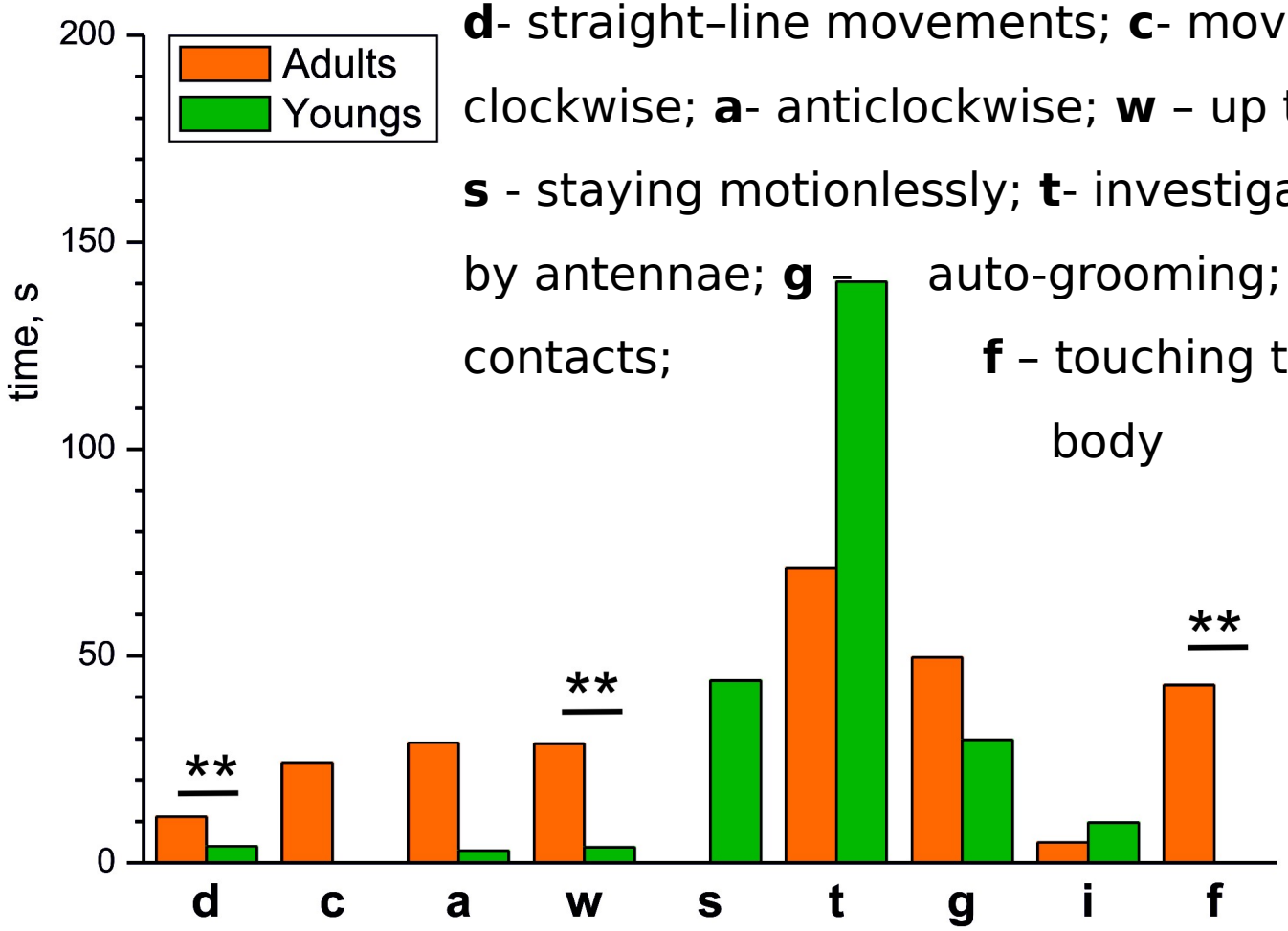
The basic *Myrmica rubra* colony (~1000 ants with queens) was housed in an artificial nest.

Ants were placed into Petri dishes. Video records (8 hours in total) were analyzed with the use of The Observer 10 XT (Noldus Information Technology)

Ants were tested in pairs:
Young (5 -10 days old)-Adult (**YA**) - 5 pairs ;
Adult — adult (**AA**) - 7 pairs;
Young- young (**YY**) - 5 pairs;
Queen — Adult (**QA**) - 7 pairs



Duration of behavioural elements in youngs and adults



d- straight–line movements; **c**- movement clockwise; **a**- anticlockwise; **w** – up the wall; **s** - staying motionlessly; **t**- investigating substrate by antennae; **g** – auto-grooming; **i** -antennal contacts; **f** – touching the partner's body

From 5min-ethograms; medians

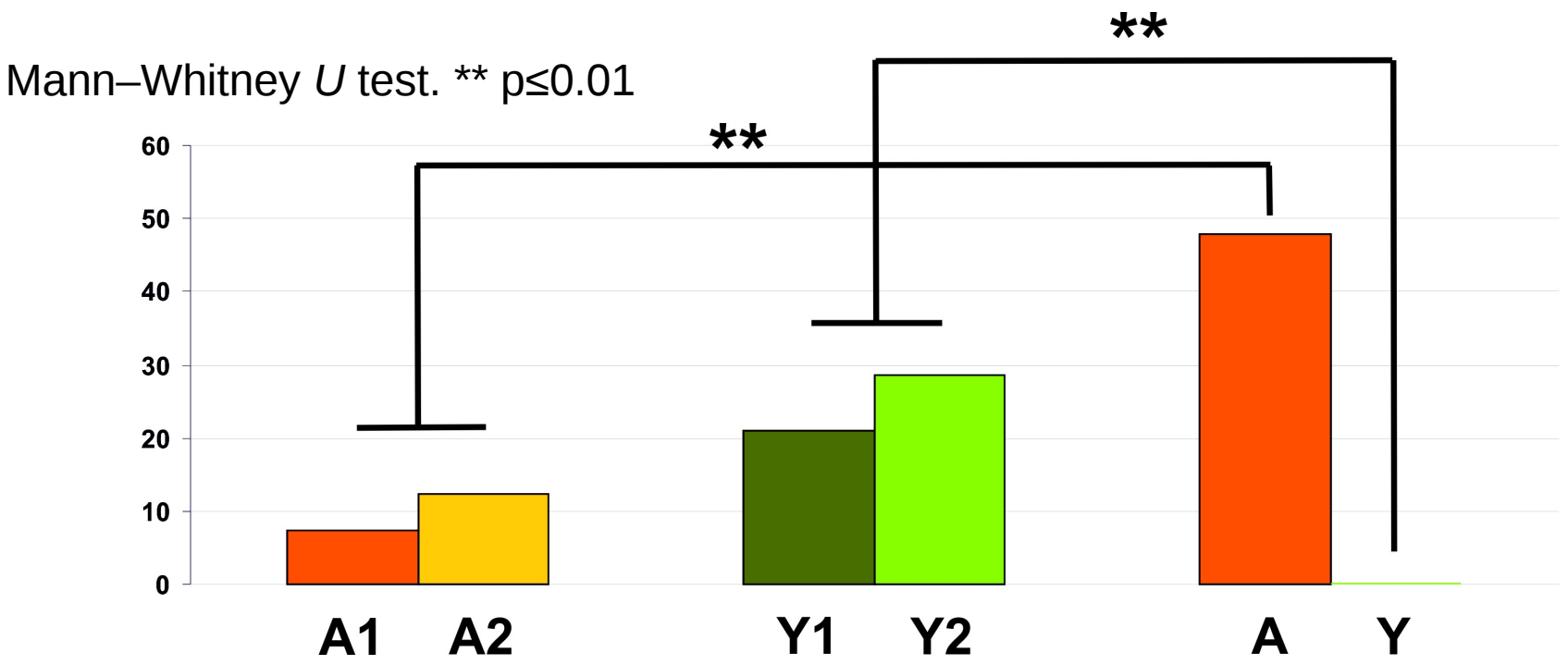
Mann–Whitney *U* test. ** p≤0.01

“f” - touching the partners' body (AY)

I – antennal contact (YY) Video 1

There are essential differences in behaviours of young and adult *Myrmica rubra*, as well as in their mode of communication.

Duration of touching the partner's body by antennae (s)

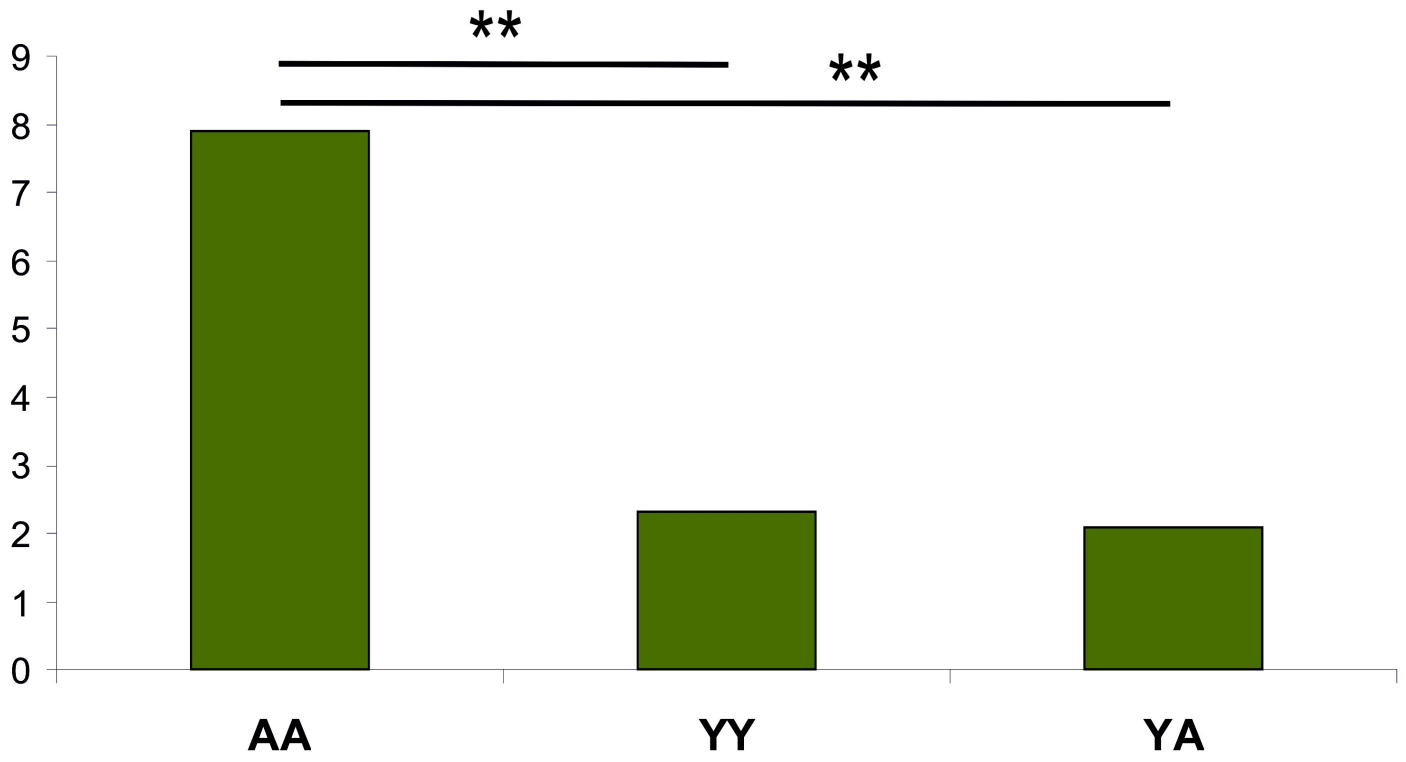


Adults touch youngs much longer than other adults. Thrilled with this, young ants stay motionless and do not touch adult ones. They, however, touch other youngs.

Video 2

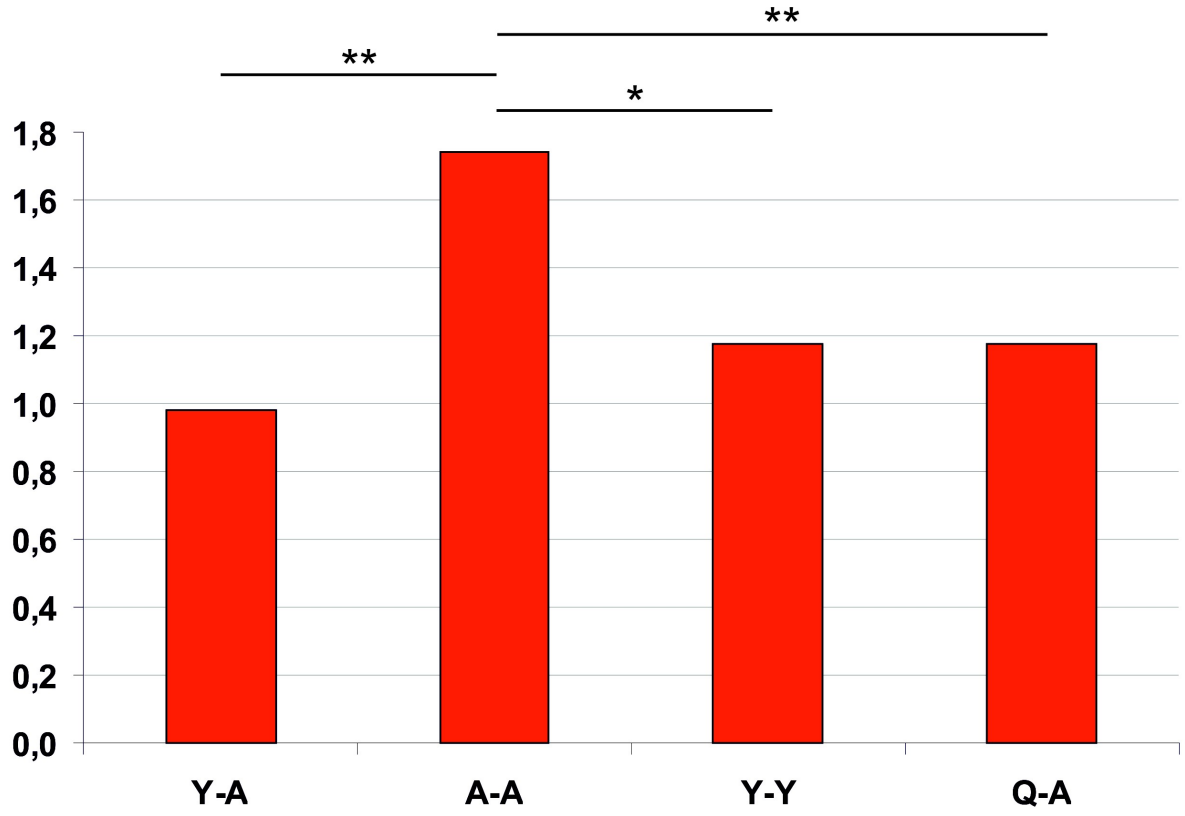
Number of trips from one Petri dish to another

(5min ethograms; n =10 for all pairs)



adults when lacking youngs' company dash from one place to another much more frequently; adults do not leave youngs alone for a long time; youngs are less mobile than adults

Number of contacts per 1 min, medians



Mann–Whitney *U* test. ** p≤0.01 * p≤0.05

Contacts among adults are much more frequent than within other pairs.Possibly because adults are more active and mobile and thus enjoy more encounters

Distinctive features of youngs' communication

- youngs are more passive during contacts with adults

- seldom initiate contacts with adults

- highly interested in contacts with adults, though

- “talkative” in contacts both with adults and other youngs

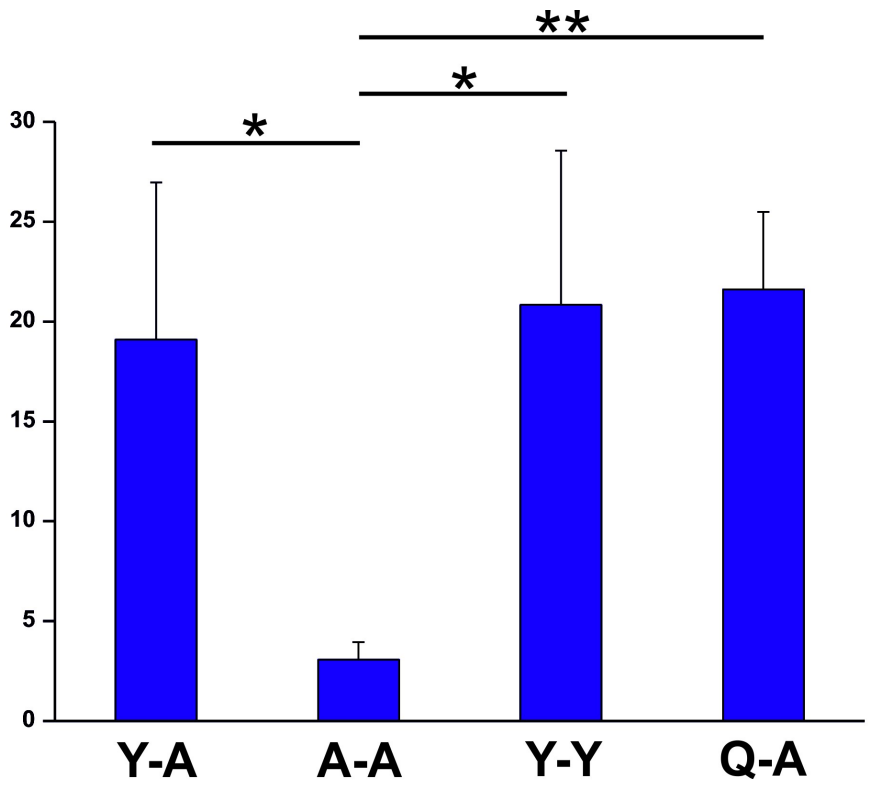
- antennal movements are slow

- frequently ask adults for food (often not successfully)

- often switch from communication to other activities

Video 3 , 4, 5

Duration of contacts, s (average)



Adults communicated with each other ~6 times less than members of all other pairs.

Do young ants need prolonged “bubbling” to gain the experience of communication?

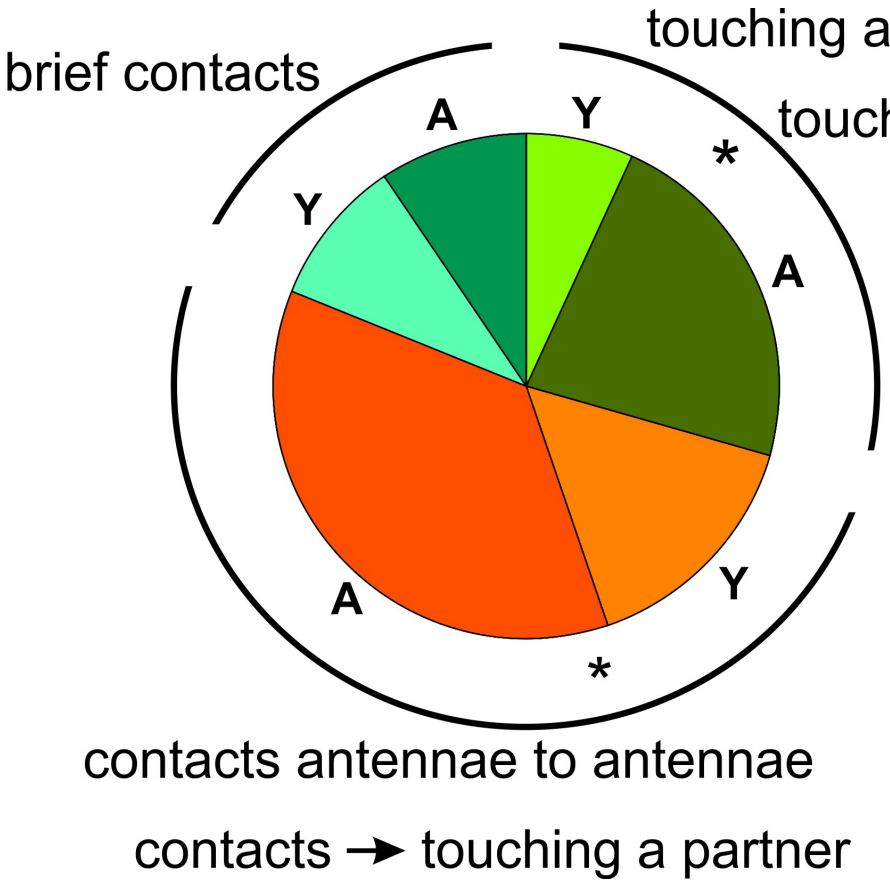
(we don't know yet)

Student's *t*-test. ** p≤0.01 * p≤0.05

The mode of communication between adults and queens is somehow similar with adults' communication with youngs....

More investigations are needed

Contacts within Young-Adults pairs are initiated mainly by Adults



¾ of encounters started by touching and 2/3 of those started by antennal contacts are initiated by adults

Fisher's exact test, * $p \leq 0.05$

There are essential differences in behaviours of young and adult *Myrmica rubra*, as well as in their mode of communication. Adults pay close attention to youngs, touching their bodies and not leaving them alone. They communicate with youngs and queens much longer than with other adults. Communication by antennae is much less purposeful in young ants than in adults. They act clumsily,often switch to other activities and seldom initiate contacts. It is possible that young ants need prolonged “bubbling” to gain the experience of communication.

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