Vector potential of the brown – banded cockroach *Supella longipalpa* (F.) (Dictyoptera – Epilampridae) for bacteria *Psedomonas aeruginosa* in the Laboratory

Sadoon Ibrahim Ismail
Faculty of Basic Education – Mustansiriyah University

Summary:

This research shows that the brown – banded Cockroach can transmit pathogenic bacteria *Psedomonas aeruginosa* in laboratory. The brown – banded cockroach *Supella longipalpa* (F.) was an effective mechanical transmitter of bacteria via feces. Groups of restrained brown – banded cockroaches from a laboratory colony free of *Psedomonas* sp. were fed graded doses of *Psedomonas aeruginosa* and their feces were assayed daily. The amount and duration of *Psedomonas* in feces is dose related with output from 1.1×10 to 6.4×10^4 cell / ml over a range of 3 - 20 days. The percentage of specimens excreting *Psedomonas aeruginosa* is also dose related and ranges from 40% with a 10^2 to 80% with a 10^6. There were no significant sex differences in excretion of *Psedomonas* at each dose.

Introduction:

Cockroach been registered with the brown – banded in Iraq in 1959 spread in recent years in different parts of Iraq (1). which appeared in homes and apartments, and government departments and hospitals. It was installed medical significance as a vector for pathogens (2, 3, 4). During cockroach living in places inhabitad

by rights be a candidate being an important carrier mechanically to pathogens (5). Bacteria were isolated from cockroaches transmit diseases may not be as well (6,7). Experiments which conducted were demonstrate the possibility of this cockroaches to transfer bacteria *Salmonella typhi* and *Staphylococcus aureus* in the laboratory (6).

The Possibility of moving this cockroach bacteria *Psedomonas aeruginosa* in the laboratory did not try despite the importance of these bacteria in the human body diseases.

Note that the control of these bacteria by antibiotics. Some what difficult *Psedomonas aeruginosa* bacteria isolated from infected wounds (8).

Materials and Methods:

Used for the isolation of bacteria *Psedomonas aeruginosa* attended her dilutions required to determine the number of bacteria used hand – feeding according to Miles & Misra method, the way in which mentioned in (8,15). Was isolated 30 from a brown – banded cockroaches which reared that were growth in the laboratory. Bring 30 cups (becker) 50 ml sterile painted interior with pure petroleum jelly (Vaseline) at a depth of 3 cm. prepare lids of sterile gauze measuring 10 × 10 cm. Ties with rubber and 1/2 gr food consists of a sterile 2.5% milk, 0.1 % sucrose 0.01 % yeast (10). And put in every pot 1 ml sterile distil water inside the tube a small test of the capacity of 5 ml in the top cotton swabs sterile up to the base of tube use 5 cockroachs per dose (number of bacteria) so that is one cockroach in every glass and underwent manual feeding process mediated by a pipette with size 0.025 ml commented end precise cone summit (6,16). Sticks were used and the length of 15 cm and paraffin wax (11) to install the cockroaches of the dorsal wax, cockroaches reduce movment and therefore exposed to cooler (12). Before embarking experimentally planted fecal balls on agricultural circles to make sure no contamination with bacteria under probation. It has experience in a sterile atmosphere using a device Hood. After the

completion of the process of manual feeding has been creating 6 glass cups with a capacity of 200 number, not containing water and food.

Left all 5 cockroachs give him a dose each bowl for 45 minutes (5). Duration and distributed the cockroachs on glass mugs capacity 50 ml. Has follow – up experiment to the development of fecal balls taken after a day and put in (BHB), Lap suspension incubator temperature of 37 Cº for 24 hours.

Then tooks a drop of suspense mediated annular carrier and planted on the center and put the dishes in the incubator temperature of 37 Cº for 24 hours and after the appearance of colonies have been identified. It attended dilutions to determine the number of bacteria that are raised with fecal balls. Conducted the experiment for 20 days. Experience of model for comparison includes a plastic bowl and put him 5 samples of cockroachs as well as food water sterile.

Results:

Is evident from the results of Table (1) the use 6 doses different numbers of bacteria *Psedomonas* range of between 10^2 to 10^6 cell / ml. Fee them 30 cockroachs. It was the highest number of bacteria *Psedomonas* raised with fecal balls each table represents cockroach preparing mentioned in the field of higher asking for these bacteria and the percentage of the models put forward these bacteria include all cockroachs. Had at least once during the experiment and can be seen from Table (1) that the injection of the percentage of models that bacteria *Psedomonas* raised per dose ranging from 2 to 4 to any of 40 % to 80 %.

It is clear also that the number of high bacteria used in the high dose of the bacteria at hand and also be a greater proportion of cockroachs raised bacteria produces as well as the longest stay put bacteria prouduces as well as the longest stay put bacterias ability days. The bacteria that raised ranging from 10×1.1 to $10^4 \times 6.4$ for the duration of 3 - 20 per day, which represented the duration of the experiment is noted from the above in figure (1)

which shows the distribution of fecal balls according to the bacterial doses obtained bacteria involved. This means that the highest launch of these bacteria was the second day. For a dose obtained $10^2 \times 3.2$ and the third day for $10^2 \times 5.8$ doses and fifth day for $10^3 \times 7.9$ doses and on the sixth day for $10^4 \times 2.2$ doses and on the eighth day for $10^5 \times 4.5$ doses and finally twelfth day dose $10^6 \times 2.5$. It is clear from table (1) also no significant differences between percentage of males and females to ask bacteria peer dose. The quantity and period of the bacteria involved in the exit associated with the size of the dose given to the cockroachs.

Discussion:

Through the search was concluded that abrown – banded cockroach is a vecter to the bacteria *Psedomonas* it also proved (6) and the seme cockroach carrier of bacteria *S. aureus*, *S. typhi* mechanical.

There were not any reference to the doubling of the bacteria *Psedomonas* within the gut of this cockroachs contrary to what he referred (13,14). When he used the bacterium *Salmonella* and the percentage of reproduction within the gut amarecan cockroach 3.4 %. Referred (10) that the rate of multiplication of the bacteria *Salmonella* in German cockroach was 0.4 % the ratio posed bacteria *Psedomonas* ranged from 40% at number 10^2 falling to 80 % at number 10^6. It turns out that males and females can put these bacteria through fecal balls this is consistent with (10) that there is no significant male and female differences German cockroach to ask the bacterium *Salmonella.* The quantity the period of bacteria *Psedomonas* raised are linked with dose *S. typhi*, *S. aureus*. The research that brown – banded. Cockroach began the transfer of bacteria *Psedomonas* two days after the experiment began and referred (6) that this cockroach seemed transfer of bacteria *S. typhi* been fed on the number 200 million on the first day of experiment and fed 90 million in the second

day of the experiment while referred (5) that amarican cockroach been fed on bacteria *S. typhosa* number 1000 million may be transported in the fourth day of the experiment. Noted (10) that the German cockroach been fed on bacteria *S. enteritidis* serotype typhimurium a number between 2.5×10^2 and 2×10^2 may be moved after feeding three days later. Noted (6) that a brawn – banded cockroach that have been fed on the bacteria *S. aureus* number 120 million has been transferred in the first experience and cockroachs fed the same bacteria may number 60 million quoted by th third day. As noted (5) that amarican cockroach been fed on bacteria *S. aureus* number 1200 million had been transferred on the third day of the experiment.

Table (1): Manual feed bacteria *Psedomonas* Browin – banded cockroach with a comparison between the number of male and female carriea of the bacteria (%).

Inoculum Cell/ml	No. of Cockroaches	Total ♀	Total ♂	Maximum *Psedomonas* Excretion	% Specimens Excreting *Psedomonas*	% ♀ Excreting	% ♂ Excreting	Maximum Duration of *Psedomonas* (Days)
3.2×10^2	5	2	3	1.1×10	40	50	33	3
5.8×10^2	5	3	2	7.2×10	40	33	50	5
7.9×10^3	5	3	2	2.3×10^2	60	67	50	7
2.2×10^4	5	1	4	6.3×10^3	80	100	75	9
4.5×10^5	5	3	2	1.5×10^3	80	67	100	14
2.5×10^6	5	4	1	6.4×10^4	80	75	100	20

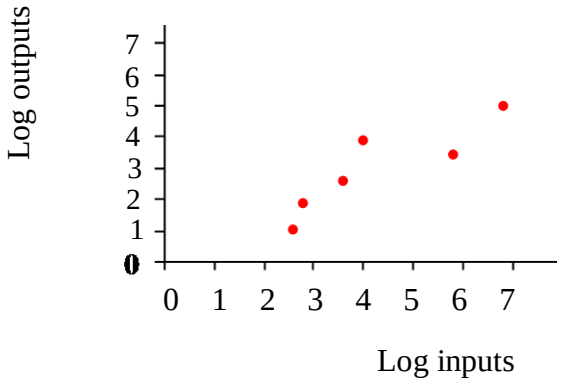

Figure (1): To put the highest bacteria *Psedomonas* each cockroach in the experiment were fed the bacteria.

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