

The Role of Earthworm Powder in increasing growth of some fungi

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ABSTRACT

The current research provide against numerous condensations of desiccated Earthworm powder beginning (200–250–300–350–400–450–500mg/ml) applied to promotion the development of *Aspergillus niger* in addition *Penicillium expansum* in addition the microorganism quantity, the outcome display the development of *A. niger* in addition the microorganism number extra than *P. expansum* in all condensations lengthways the interval of experience in addition investigation expression variances important ($p < 0.05$) between the diverse condensations of Earthworm dust.

Keyword: Powder of Earthworm, Earthworm, Fungi. Spore, *Aspergillus niger*, *P. expansum*,

INTRODUCTION

Earthworm plays functional function in the mud ecosystem, augmentation the mud fertility so the referred a farmer friend in addition considered protein source¹. Earthworm powder utilized to food fish because contain high proportion of protein, Powder of Earthworm function to health of human because have large quantities of zinc, iron, manganese in addition copper².

Earthworm utilized by means of a part of pharmaceutical for different cures since 1340 AD in addition utilized conventional drug as calming, pain relieving in addition antipyretic operator. Earthworms are long living beings in a situation rich through smaller scale creatures, pests in addition other potential pathogens, also manage of versus microbial movement. Earthworm powder utilized in space of a hostile to coagulation impact besides unwinding impact aimed at the vascular framework as a thrombotic treatment^{3,4}. Its tonic characteristic manufactures it valuable help for the liver in addition other organ systems⁵ *Aspergillus niger* use in the sustenance business for the generation of numerous compounds, for example, cellulases, amylase, pectinases, lactase, in addition acid proteases^{6,7}.

Likewise, the yearly creation of citric acid by leavening is currently about 350,000 tons⁸. *Penicillium expansum*, the most well-known foodborne developments on apple natural product, is a stint addition out amongst the most considered species in the variety since it is a reliable manufacturer of poisonous metabolites particularly patulin. *Penicillium expansum* is accounted for to create no less than 50 distinctive auxiliary metabolites, for example, citrinin, roquefortine C, ochratoxin A, penitrem A, PR-poison, chaetoglobosins A in addition^{8,9}.

MATERIALS AND METHODS

Collection the samples in addition preparing powder of Earthworm were composed from house garden in Al-Silaykh region (north of Baghdad) burrowing the mud in addition take the worm to the test center eroded them in faucet liquid to eradicate uncleanness as of the trunk external.

The Earthworm s were liquid logged in purified liquid for 6-8 hours to permit the mud in its region to be expelled, then Earthworm s were carry away by purified liquid in addition composed in Petri dish that kept in an –incubator for 24h.

at 55 °C after that discarded in addition be gathered to manufacture it addicted to powder stowed in fridge of standard temperature⁽¹⁰⁾ then used eight condensations of powder to see any one good to raise the development in addition calculated the microorganism numbers of *A. niger* in addition *P. expansum*.

Preparation of the microorganism suspension: The method used slant containing PDA medium were vaccinated through isolate of *A.niger* in addition *P. oxysporum* at that time individually slant was incubate of 30 for 7 days in addition kept at 4 C⁰ in fridge microorganism suspension was prepared 5 ml of sterilized purified liquid (containing 0.1% tween80) to aid wetting in addition separation of microorganisms, the suspension was filtered through sterile cotton wool. The filtrate was rejecting by 300 rpm for 5 minutes. The supernatant was discarded in addition the microorganism washed twice by re suspending in sterile purified liquid in addition further reject then 5 ml of sterile purified liquid was additional to the impetuous in addition mixed one drop of suspension was supplementary to the haemocytometer by pastor pipette. Number of microorganisms calculated under high power (40X) using the following equation Condensation of

$$\text{microorganisms} = Z * 4 * 10^4$$

Determination fungal activity: the agar well diffusion methods modified, used in the drilling to observed the impact powder Earthworm on the development fungi *Aspergillus niger* & *Penicillium expansum* Vaccinate as the center of (PDA) by sterile swab from fungi stuck working digging by pastor pipette, then transferred condensations Perpetrated (200-250-300-350-400-450-500 mg/ml) of extracts to drilling in addition size (50 microliter) in each of drilling in addition found one drilling containing purified liquid (Control).

Then incubating petri Temperature 25°C during 48, 72 hrs, in addition determined activity of extracts measured diameter development zone around each drilling by centimeter¹¹.

Statistical Analysis: ANOVA test was used to compare the result with among groups according to⁽¹²⁾.

RESULTS AND DISCUSSION

Tables 1, 2, 3, 4 show significant differences ($p < 0.05$) After two days of experience in monitoring the evolution (cm.) of *A. niger* was 0.5 in addition the microorganism's number

(spo. n.) was zero while the development of *P. expansum* in the same condensation was 1 but the microorganisms' number zero, in condensation 200 mg/ml the development was 3 in addition the (spo. n.) 3.5×10^4 that to *A. niger*. while to *P. expansum* development was 1.7 besides (spo. n.) 1×10^4 .

In addition, in 250 mg /ml condensation to *A. niger* the development number was 3.2, the (spo. n.) 4×10^4 while to *P. expansum*. The amount was 1.9 in addition 3×10^4 correspondingly, in 300 mg /ml development to *A. niger* 3.3 besides the (spo. n.) 5×10^4 while to *P. expansum* 2.1 also the (spo. n.) 3×10^4 , the development of *A. niger* Was 3.6×10^4 in addition the (spo. n.) 6.5×10^4 in addition to *P. expansum* development was 2.2 in addition the (spo. n.) 4×10^4 that in condensation 350 mg/ml. While in condensation 400 mg /ml the development of *A. niger* was 3.9 while in *P. expansum* 2.5 while the (spo. n.) 8×10^4 in addition 6×10^4 correspondingly, in condensation 450 mg /ml the development was 4.1 in addition 2.8 to *A. niger* *P. expansum* While the (spo. n.) 9×10^4 to *Asp.* in addition, 7.5×10^4 to *Pen.*

Finally, the in condensation 500 mg/ ml the development of *A. niger* was 4.3 while in *P. expansum* 3.4 while the (spo. n.) 12×10^4 in addition (spo. n.) 9×10^4 to both genes correspondingly. In fourth day of experience in addition in surveillance the development (cm.) of *A. niger* was 1.5 in addition the (spo. n.) 2×10^4 in addition in the same condensation to *P. expansum* the development was 1.4 in addition (spo. n.) 1.5×10^4 in the condensation 200 mg / ml to *A. niger* the development was 3.4 while (spo. n.) 6×10^4 . The development to *P. expansum* 2.1 in addition (spo. n.) 2×10^4 , in 250 mg/ml condensation the development of *A. niger* 3.6 in addition (spo. n.) 6.5×10^4 to *P. expansum* the development was 2.3 in addition (spo. n.) 3×10^4 , the development of *A. niger* 3.8 in addition to *P. expansum* 3.6 while the (spo. n.) was 8×10^4 to *A. niger* in addition 5×10^4 to *Pen.* correspondingly all that in

condensation 300 mg/ml, while in condensations 350-400-450-500 mg/ml the development of *A.niger* was (3.9) (4.1) (4.3) (4.8) while to *P.expansum* in the same condensations the development was (2.8) (3.1) (3.6) (3.9) correspondingly in addition the (spo. n.) to *A. niger* in the same condensations were (10×10^4) (11×10^4) (12.5×10^4) (15×10^4) in addition to *P. expansum* (6.5×10^4) (7×10^4) (9×10^4) (12×10^4) correspondingly (Table, 1, 2, 3, and 4).

The outcomes display that the development of *A. niger* in addition the microorganisms records extra than *P.expansum* all condensations lengthways the interval of experience for that powder comprises on figures of nourishment essentials, that vital in development of Fungi similar carbohydrates, proteins, nitrogen, phosphors, potassium, iron, magnesium, manganese, zinc, copper in addition calcium that's function an vital function in power metabolism similarly potassium is function for DNA, protein installation in addition cell magnitude instruction^{12,13}.

Experience challenge wholly educations in that space for educations displays the powder of Earthworm that has antifungal characteristic *Eisenia foetida* powder have antifungal characteristic that hindering the development of *Cin additionida albicans* in addition examined through liquid is extra active than when examined by acetone^{14,15} founded the similar condensations of Earthworm powder was show antifungal versus *Cin additionida albicans* in addition antibacterial agent versus *Aeromonas hydrophila*. Earthworm have largely been utilized internally as strong aphrodisiacs¹⁶, Anti-inflammatory activist¹⁷ in addition antipyretic¹⁸.

Figure 1 indicates the impact of Earthworm extract (400, 450, and 500 mg) for 2 and 4 days on development of *A. niger*, while figure 2 shows the impact of Earthworm extract (300, 350, and 500) for 2 and 4 days on development of *Penicillium expansum* (cm)

Table 1: Impact of Earthworm extract on Spoons Number [$\times 10^4$] of *A. niger* after second in addition fourth day

| Condensation | Mean \pm SD | | LSD value |
|--------------|------------------|------------------|-----------|
| | 2 day | 4 day | |
| Control | 0.00 \pm 0.00 | 2.15 \pm 0.15 | 0.461 * |
| 200 | 3.55 \pm 0.05 | 6.10 \pm 0.10 | 0.326 * |
| 250 | 4.10 \pm 0.10 | 6.60 \pm 0.10 | 0.409 * |
| 300 | 5.15 \pm 0.15 | 8.05 \pm 0.05 | 0.228 * |
| 350 | 6.55 \pm 0.05 | 9.95 \pm 0.05 | 0.271 * |
| 400 | 7.95 \pm 0.05 | 11.15 \pm 0.15 | 0.297 * |
| 450 | 9.15 \pm 0.15 | 12.25 \pm 0.25 | 0.378 * |
| 500 | 11.90 \pm 0.10 | 15.15 \pm 0.14 | 0.451 * |
| LSD value | 0.311 * | 0.453 * | ---- |

*(P<0.05)

Table 2: Impact of Earthworm extract on development of *A. niger* (cm) after second in addition fourth day

| Condensation | Mean \pm SD | | LSD value |
|--------------|-----------------|-----------------|-----------|
| | 2 day | 4 day | |
| Control | 0.60 \pm 0.10 | 1.45 \pm 0.05 | 0.257 * |
| 200 | 3.05 \pm 0.05 | 3.30 \pm 0.10 | 0.125 * |
| 250 | 3.25 \pm 0.05 | 2.55 \pm 0.05 | 0.278 * |
| 300 | 3.45 \pm 0.05 | 3.85 \pm 0.05 | 0.209 * |
| 350 | 3.65 \pm 0.05 | 4.05 \pm 0.05 | 0.185 * |
| 400 | 3.95 \pm 0.05 | 4.25 \pm 0.05 | 0.227 * |
| 450 | 4.20 \pm 0.10 | 4.55 \pm 0.05 | 0.194 * |
| 500 | 4.45 \pm 0.06 | 4.85 \pm 0.05 | 0.205 * |
| LSD value | 0.215 * | 0.191 * | --- |

*(P<0.05)

Table 3: Impact of Earthworm extract on Microorganisms Number [$\times 10^4$] of *Penicillium expansum* after second in addition fourth day

| Condensation | Mean \pm SD | | LSD value |
|--------------|-----------------|------------------|-----------|
| | 2 day | 4 day | |
| Control | 0.00 \pm 0.00 | 1.45 \pm 0.05 | 0.315 * |
| 200 | 1.15 \pm 0.15 | 2.05 \pm 0.05 | 0.259 * |
| 250 | 2.55 \pm 0.05 | 3.20 \pm 0.10 | 0.261 * |
| 300 | 3.10 \pm 0.10 | 5.15 \pm 0.15 | 0.275 * |
| 350 | 4.15 \pm 0.15 | 6.55 \pm 0.05 | 0.195 * |
| 400 | 6.05 \pm 0.05 | 7.55 \pm 0.15 | 0.224 * |
| 450 | 7.65 \pm 0.15 | 8.95 \pm 0.07 | 0.285 * |
| 500 | 9.15 \pm 0.15 | 12.15 \pm 0.16 | 0.304 * |
| LSD value | 0.373 * | 0.341 * | ---- |

** (P<0.05)

Table 4: Impact of Earthworm extract on development of *Penicillium expansum* (cm) after second in addition fourth day

| Condensation | Mean \pm SD | | LSD value |
|--------------|------------------|-----------------|-----------|
| | 2 day | 4 day | |
| Control | 0.950 \pm 0.05 | 1.45 \pm 0.05 | 0.194 * |
| 200 | 1.75 \pm 0.05 | 2.15 \pm 0.05 | 0.205 * |
| 250 | 1.95 \pm 0.05 | 2.45 \pm 0.05 | 0.137 * |
| 300 | 2.15 \pm 0.05 | 2.70 \pm 0.10 | 0.186 * |
| 350 | 2.40 \pm 0.10 | 3.25 \pm 0.05 | 0.207 * |
| 400 | 2.65 \pm 0.05 | 3.65 \pm 0.05 | 0.225 * |
| 450 | 2.95 \pm 0.05 | 3.95 \pm 0.04 | 0.281 * |
| 500 | 3.50 \pm 0.10 | 4.00 \pm 0.00 | 0.178 * |
| LSD value | 0.215 * | 0.182 * | --- |

* (P<0.05)

Figure 1: A- Impact of Earthworm extract (400, 450) mg on development of *A. niger* after second day; B- Impact of Earthworm extract (500) mg on development of *A. niger* after fourth day; C- Impact of Earthworm extract (500) mg on development of *A. niger* after fourth day

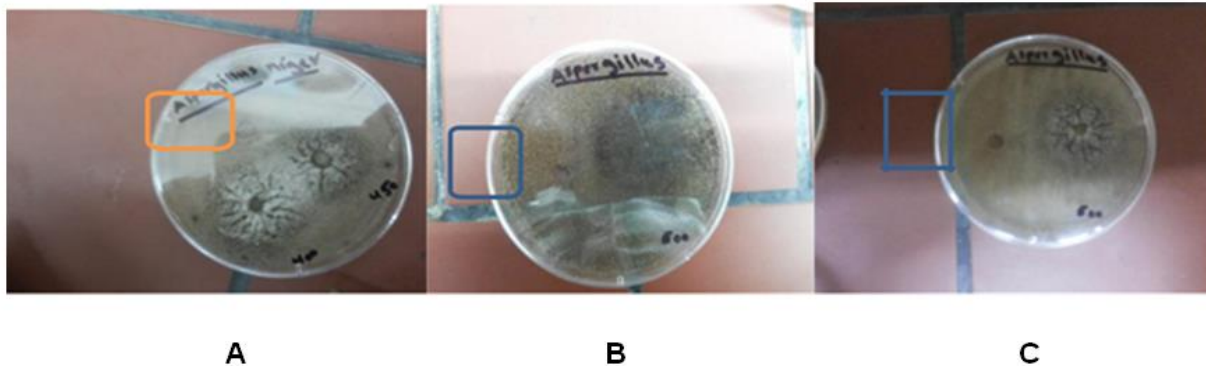
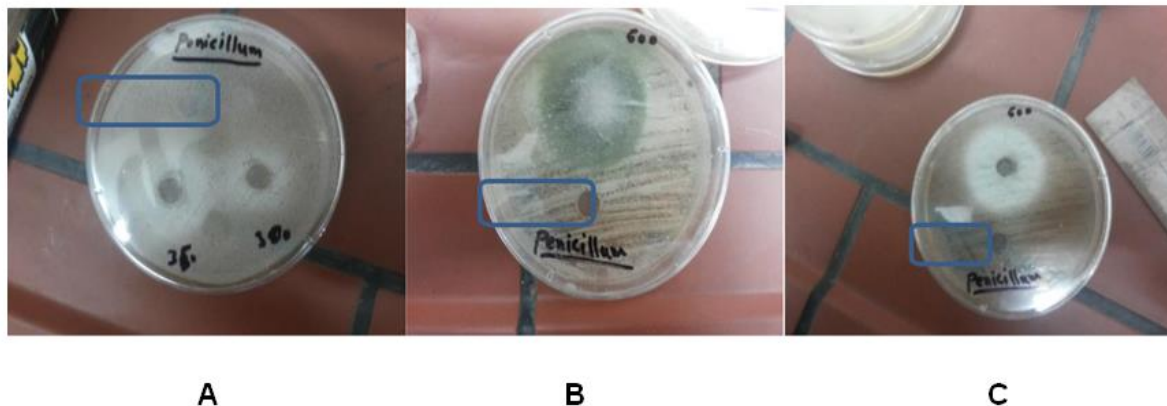


Figure 2: A- Impact of Earthworm extract (300, and 350) mg on development of *Penicillium expansum* (cm) after second day; B- Impact of Earthworm extract (500mg) on development of *Penicillium expansum* (cm) after Fourth day; C: Impact of Earthworm extract (500) mg on development of *Penicillium expansum* (cm) after second day



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