DOE/R4/10153--T2
12-0508
(10153)

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DOE/R4/10153--T2

DE84 000750

ENERGY RECOVERY THROUGH TERMITES

BY

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U. S. Department of Energy
Grant No. DE-FG44-80R410153

December 15, 1981

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(newspaper articles removed)

II. SUMMARY

This project, Energy Recovery Through Termites, was based on the proposed development of an energy recovery system to produce low cost animal protein for use in animal feeds. The result of my study shows that to date we are unable to establish viable colonies of termites. This is based on several key factors as follows:

A. Inability to capture "reproductives" to establish new colonies in a confined area needed to offer recovery or harvest of protein.

B. Confinement of colonies (even without queen or "reproductives") has proven to be far too complex to establish in low cost and modest facilities.

C. The proposal is not cost effective. The resources of skill and materials could not be repaid from the protein recovered.

III. BODY OF REPORT

I had many discussions with Dr. Neal Weber, Entomologist, on methods of establishment of termite colonies. These discussions were coupled with research at the State Library of Florida and materials supplied by Dr. Weber. The objective was to be the collection and establishment of termite colonies in confinement. The confinement methods were as follows:

- A. Petri dishes
- B. 8" x 10" plastic/glass trays⁽¹⁾
- C. Plastic boxes -- 4" x 5-1/2" x 7-1/2"
- D. 10 gallon terrarium

Collection trips were carried out in several locations: woodland, urban lots, old buildings. Stationary collection sites were established to trap nymphs (reproductives) to establish new colonies.

Many attempts were made to establish colonies in varying environments. These were initially set up in containers as listed above. Key environmental factors were supplied in varying relationships and included water, wood, soil and temperature.

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(1) Proved most effective in this study.

Water application was attempted in many forms:

- A. Dishes
- B. Droppers
- C. Wicks
- D. Capillary action⁽¹⁾
- E. Vapor (gaseous)

Many species of wood in varying stages of decomposition were tried, from newly harvested to rotten wood. Several trials were carried out with wood samples containing termites.

Species included:

- A. Pine
  - 1. Loblolly⁽¹⁾
  - 2. Longleaf
  - 3. Shortleaf
- B. Oak
  - 1. Live
  - 2. Water
  - 3. Red
  - 4. White
- C. Gum

Because of the termites subterranean nature a suitable medium had to be found. Sand was found to collapse termite

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(1) Proved most effective in this study.

tunnels. A clay base medium was best -- unpacked so as to facilitate tunneling. A low humus content in the soil proved helpful in the control of fungus by diminishing free water.

Temperature variance was not as critical a factor as water, wood and soil. Experimentation proved the termite capable of enduring temperatures below 32° F. for very short time spans. A more viable temperature range is 65° to 75° F.

IV. CONCLUSIONS AND RECOMMENDATIONS

It was found in this project that the recovery of energy through termites was not cost effective.

We have determined that additional research in this field would not provide further information that would change our basic conclusion.

V. DRAWINGS AND DESIGNS

Proposed Terrarium Design

Study of Design for Capturing Queen Termites

Screening Device for Separating Termites from Soil

Study of Design for Containers for Nest
of Queen Termites

Sand Base +
Cellulose
Material

Plastic Container

Nest for Queen Termite
(One Queen per Container)

1 inch

1 inch = 1 inch

VI. BIBLIOGRAPHY

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VII. APPENDIX

Top View of a Colony

Bottom View of a Colony

Termites Attack Pine Splinter

Humidity Controlled Container

Termites Seeking Food

A Soldier Stands Guard

Workers Devour the Wood

Adults measure 3 to 4 mm in length