10-23-2020

D02. NCNPR Activities at Coy Waller Complex

Mahmoud A. ElSohly
University of Mississippi

Suman Chandra
University of Mississippi

Mohamed M. Radwan
University of Mississippi, mradwan@olemiss.edu

Hemant Lata
University of Mississippi

Amira Wanas
University of Mississippi

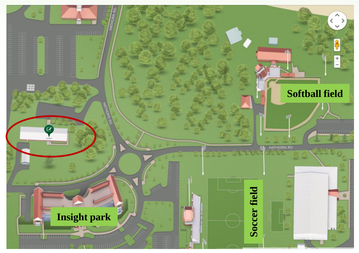
See next page for additional authors

Authors

Mahmoud A. ElSohly, Suman Chandra, Mohamed M. Radwan, Hemant Lata, Amira Wanas, and Chandrani G. Majumdar

NCNPR Activities at Coy Waller Complex

COY WALLER COMPLEX



Coy Waller Laboratory Complex is located on the southwestern corner of the Ole Miss campus. It consists of offices and research laboratories, and the marijuana growing facilities. It is part of the NCNPR, School of Pharmacy and RIPS. Coy Waller Laboratory includes:

1-Indoor growing facility.
2-Outdoor growing facility.
3-Laboratories (7 laboratories).
4-Vaults (2 vaults to keep the dried marijuana plant, extracts and cannabinoids with law temperature storage capability (-20 ^{0}C).
5-Offices (9)

It is the home of the marijuana project which has been at Ole Miss since 1968.

Marijana Project Aims

- Grow, harvest & process cannabis
- Provide cannabis products such as extracts and Individual cannabinoids for NIDA`S Drug Supply Program.
- Manufacture & distribute cannabis cigarettes for research.
- Production of cannabinoids
- Cannabis phytochemistry
- Confiscated cannabis analysis

Outdoor growing

We have the ability to cultivate and produce many varieties of *C. sativa* from seeds or cuttings (1.5 acres to 12 acres).

Indoor growing

Processing of plant material

Gamma Irradiation

To minimize the Microbial count (TAMC & TYMC)

TAMC = Total Aerobic Microbial Count
TYMC = Total yeast and Mold Count

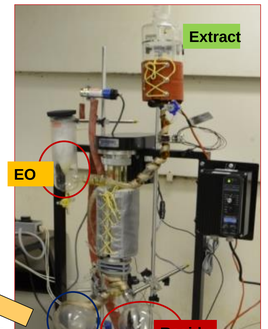
22 x 22 x22 boxes

Plant Material

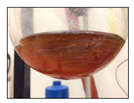
γ-irradiation

10-30 kGy

Cannabis Extraction & Distillation



Distillate



Plant material
1 kg
• 10.0% Δ^9-THC

Extract
102.6 g
• 57.8 % Δ^9-THC

Distillate
68.8 g
76.0 % Δ^9-THC

Thin Film Distillation

Coy Waller's Lab. Team

Dr. Suman Chandra
Project Co-Director
Production Manager

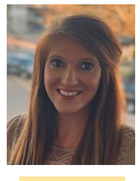
Prof. Mahmoud A. ElSohly
Project Director

Dr. Mohamed M. Radwan
Project Co-Director
QC –Manager

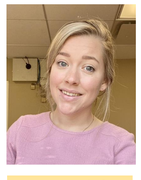
Dr. Hemant Lata
Sr. Research Scientist
(Plant Biotechnologist)

Mrs. Chandrani G. Majumdar
Lab. Supervisor
Sr. R&D Chemist

Dr. Amira A. Wanas
Research Scientist
(Nat. Prod. Chemist)



Mrs. Magen Sealy
Project Coordinator



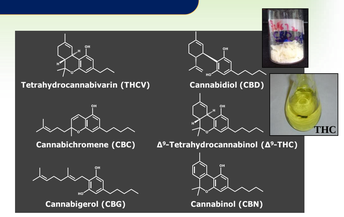
Ms. Lauren Cook
Administrative Coordinator 1

Mrs. Myranda Bennett
Associate R&D Chemist

Mr. Harold Sneed
Field Operations Coordinator

Cannabinoids isolation

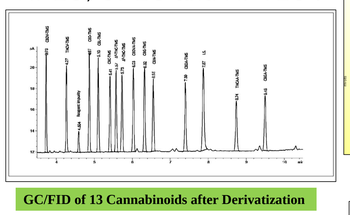
Cannabinoids with purity more than **95%** were prepared from cannabis distillate by using many chromatographic techniques.



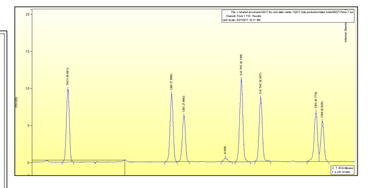
CBD produced with purity > **99%**
The amount produced in 2020:
In 2020 we produced 190 g THC and 500 g of CBD and 51 kg extract

Testing analytical laboratory for Cannabis samples

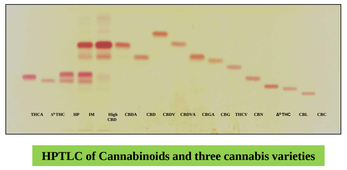
Marijuana and products such as, extracts, hashish, hash oil and edible products which are confiscated by DEA and law enforcement agencies are analyzed in the Coy Waller Lab. using GC/FID. Each year more than 2000 samples of domestic or non-domestic origin are analyzed for different major cannabinoids. All samples from different growing stages of cannabis production as well as during the extraction and isolation of cannabinoids were also analyzed by GC/FID, GC/MS, HPLC, UPLC and HPTLC .



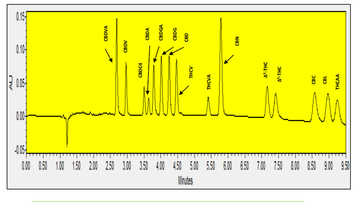
GC/FID of 13 Cannabinoids after Derivatization



GC/FID without Derivatization



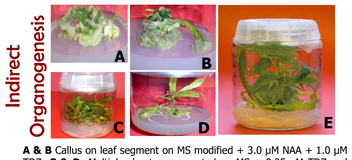
HPTLC of Cannabinoids and three cannabis varieties



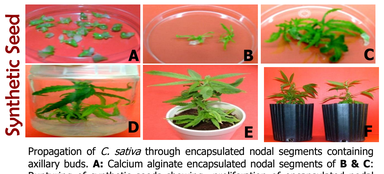
UPLC of chromatogram of 15 Cannabinoids

Tissue Culture

In our laboratory, an *in vitro* clonal propagation protocol has been used for the production and maintenance of high yielding elite clones. The process allows us to develop a secure and stable *in vitro* clonal repository of *C. sativa and* maintain essential genetic materials for future production needs.



A & B Callus on leaf segment on MS modified + 3.0 µM NAA + 1.0 µM TDZ; **C & D**: Multiple shoots regenerated on MS + 0.25 µM TDZ and Rooting on MS + 2.5 µM IBA; **E**: Full fledged regenerated plantlet



Propagation of *C. sativa* through encapsulated nodal segments containing axillary buds. **A:** Calcium alginate encapsulated nodal segments of **B & C:** Rupturing of synthetic seeds showing proliferation of encapsulated nodal segments, **D:** Conversion- showing sprouting and rooting **E**: Regenerated plant established in fertilome, **F:** Fully grown hardened micropropagated plant on 1:1 potting mix- fertilome with coco natural growth medium

ACKNOWLEDGMENTS

The project is supported by National Institute on Drug Abuse (NIDA), contract # N01DA-15-7793.