

FarmaCannabis: o papel da universidade no desenvolvimento de fitoterápicos

Virgínia Martins Carvalho



UFRJ



LATOX-UFRJ – PESQUISA & EXTENSÃO



Padronização e controle de qualidade de matéria-prima para desenvolvimento de produtos medicinais de Cannabis

serrapilheira

apoio à pesquisa científica no Brasil.



Início: 2018
Em andamento

Farmacannabis - UFRJ



Extratos medicinais de Cannabis: produção de insumo farmacêutico ativo vegetal e controle de qualidade



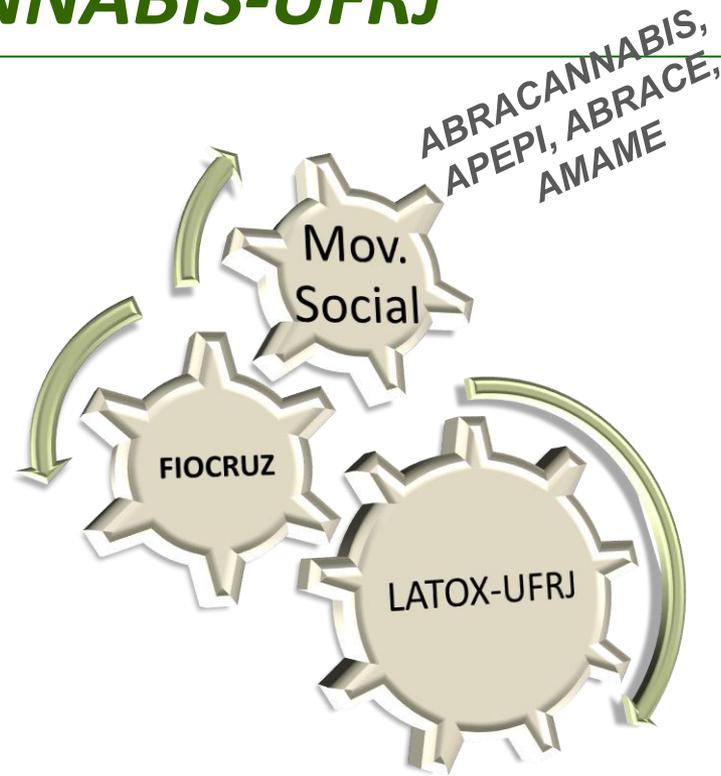
Início: 2019
Em andamento





FARMACANNABIS-UFRJ

Farmacannabis - UFRJ



 *Avaliação de segurança dos tratamentos através da análise dos extratos*

 *Auxílio farmacêutico – minimizar riscos de preparações inadequadas*

Projeto aprovado pelo Comitê de Ética em Pesquisa do Hospital Universitário Clementino Fraga Filho

CAAE: 82021817.0.0000.5257

CENÁRIO BRASILEIRO EM 2015/2016

👤 CFM e ANVISA regulamentam o uso compassivo de “canabidiol” → alto custo de importação de extratos ricos em CBD registrados como suplementos alimentares no país de origem

👤 Movimento social ↔ rede de cooperação entre ativistas e pacientes → produção artesanal de produtos derivados de **Cannabis** de composição/qualidade desconhecida



USO FARMACÊUTICO



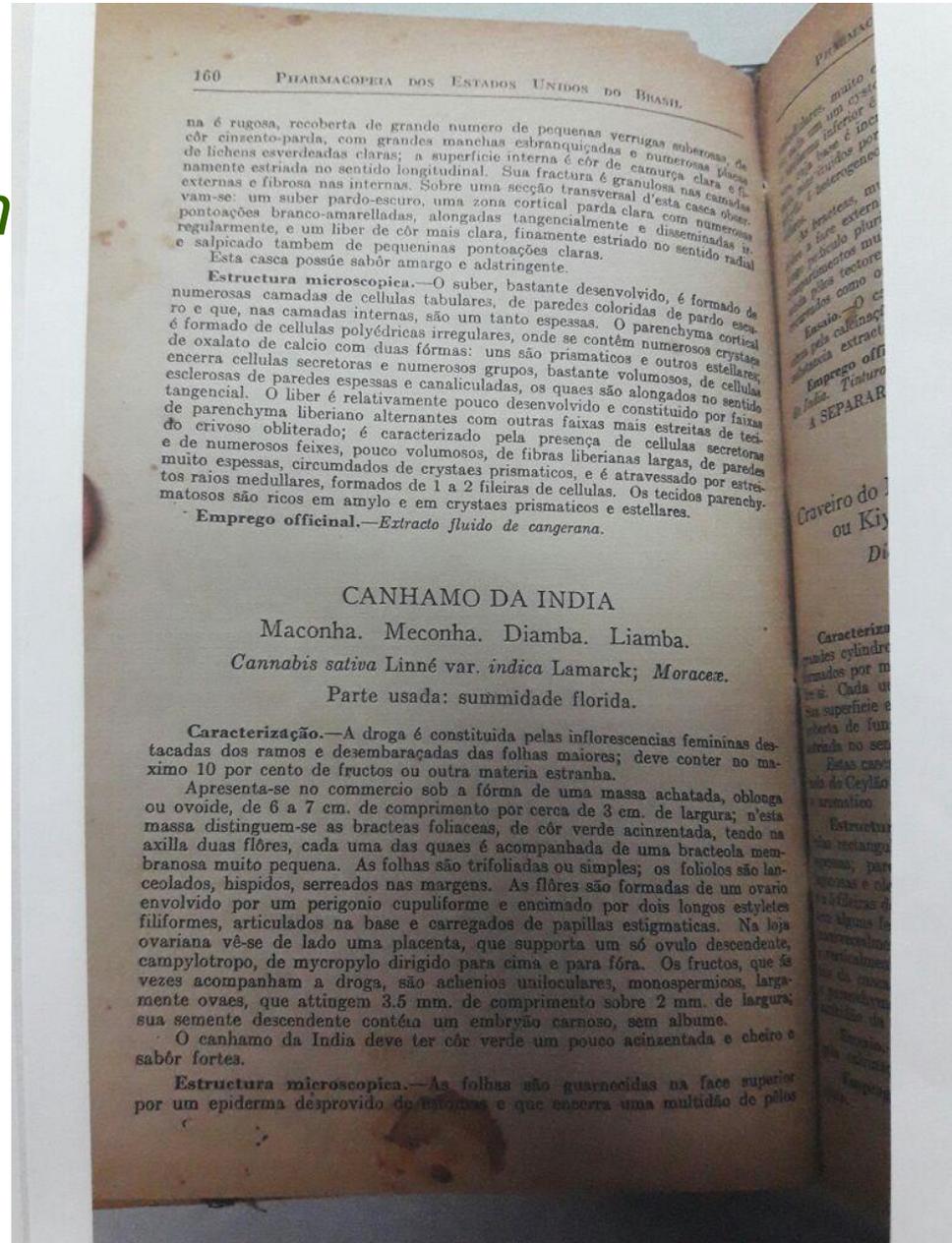
CBD e THC podem compor medicamentos???



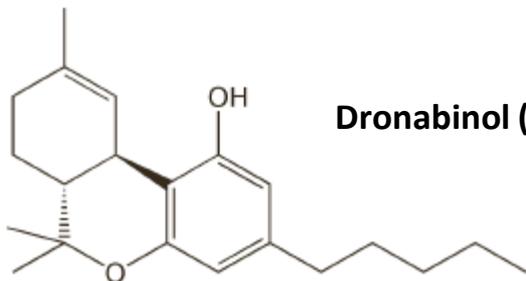
Cannabis pode compor medicamentos????



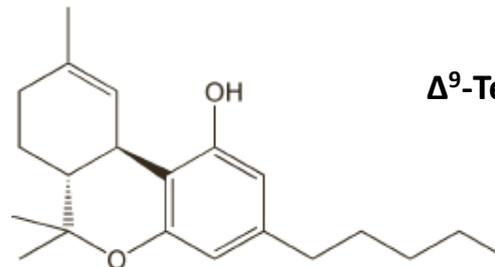
Farmacopéia Brasileira, 1929



TETRAHIDROCANABINOL-THC



Dronabinol (Marinol®)



Δ⁹-Tetrahydrocannabinol (Δ⁹-THC) natural

ANVISA

RDC 98/2000: Dronabinol (THC sintético) psicotrópico sujeito a notificação de receita especial (lista A₃)

Uso Proscrito

LISTA - A3 LISTA DAS SUBSTÂNCIAS PSICOTRÓPICAS (Sujeita a Notificação de Receita "A")

1. ANFETAMINA
2. CATINA
3. CLOBENZOREX
4. CLORFENTERMINA
5. DEXANFETAMINA
- 6. DRONABINOL**
7. FENCICLIDINA
8. FENETILINA
9. FENMETRAZINA
10. LEVANFETAMINA
11. LEVOMETANFETAMINA



Brasil, 2017

LISTA F2 - SUBSTÂNCIAS PSICOTRÓPICAS

1. 4-METILAMINOEX (±)-CIS-2-AMINO-4-METIL-5-FENIL-2-OXAZOLINA
2. BENZOFETAMINA
3. CATINONA ((-)-S)-2-AMINOPROPIOFENONA)
4. CLORETO DE ETILA
5. DET (3-[2-(DIETILAMINO)ETIL]INDOL)
6. DMA - ((±)-2,5-DIMETOXI-*o*-METILFENETILAMINA)
7. DMHP - (3-(1,2-DIMETILHEPTIL)-7,8,9,10-TETRAHIDRO-6,6,9-TRIMETIL-6H-DIBENZO[B,D]PIRANO-1-OL)
8. DMT - (3-[2-(DIMETILAMINO)ETIL] INDOL)
9. DOB - ((±)-4-BROMO-2,5-DIMETOXI-*o*-METILFENETILAMINA)-BROLANFETAMINA
10. DOET - ((±)-4-ETIL-2,5-DIMETOXI-*o*-FENETILAMINA)
11. ETICICLIDINA (N-ETIL-1-FENILCICLOHEXILAMINA)-PCE
12. ETRIPTAMINA - (3-(2-AMINOBTIL)INDOL)
13. LISERGIDA - (9,10-DIDEHIDRO-N,N-DIETIL-6-METILERGOLINA-8 β-CARBOXAMIDA) -LSD
14. MDA - (*o*-METIL-3,4-(METILENIOXI)FENETILAMINA)-TENAMFETAMINA
15. MDMA - ((±)-N, *o*-DIMETIL-3,4-(METILENIOXI)FENETILAMINA)
16. MECLOQUALONA
17. MESCALINA - (3,4,5-TRIMETOXIFENETILAMINA)
18. METAQUALONA
19. METICATINONA - (2-(METILAMINO)-1-FENILPROPAN-L-ONA)
20. MMDA - (2-METOXI-*o*-METIL-4,5-(METILENIOXI)FENETILAINA)
21. PARAHEXILA - (3-HEXIL-7,8,9,10-TETRAHIDRO-6,6,9-TRIMETIL-6H-DIBENZO[B,D]PIRANO-1-OL)
22. PMA - (P-METOXI-*o*-METILFENETILAMINA)
23. PSILOCIBINA - (FOSFATO DIHIDROGENADO DE 3-[2-(DIMETILAMINO)ETIL]INDOL-4-IL)
24. PSILOCINA, PSILOT - (3-[2-(DIMETILAMINO)ETIL]INDOL-4-OL)
25. ROLICICLIDINA - (L-(L-FENILCICLOMEXIL)PIRROLIDINA)-PHP,PCPY
26. STP,DOM (2,5-DIMETOXI-*o*-4-DIMETILFENETILAMINA)
27. TENOCICLIDINA (1-[1-(2-TIENIL)CICLOHEXIL]PIPERIDINA)-TCP
- 28. THC - (TETRAIDROCANABINOL)**



SATIVEX=MEVATYL

<https://www.gwpharm.com/healthcare-professionals/sativex>

Sativex[®] (delta-9-tetrahydrocannabinol and cannabidiol in the EU; nabiximols in the US) is an oromucosal spray of a formulated extract of the cannabis sativa plant that contains the principal cannabinoids delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) in a 1:1 ratio as well as specific minor cannabinoids and other non-cannabinoid components. We developed Sativex[®] to be administered as an oromucosal spray, whereby the

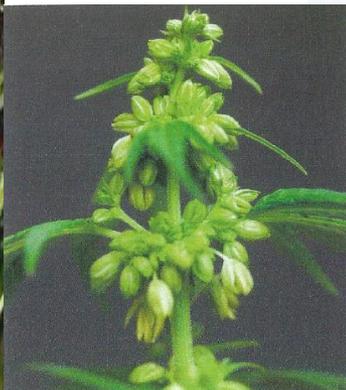
PubChem Nabiximols (Compound)

Nabiximols is an herbal preparation containing a defined quantity of specific cannabinoids formulated for oromucosal spray administration with potential analgesic activity. Nabiximols contains a standardized extract of **tetrahydrocannabinol (THC)**, the non-psychoactive cannabinoid **cannabidiol (CBD)**, other minor cannabinoids, flavonoids, and terpenes from two cannabis plant varieties.

CANNABIS X CANABINÓIDES



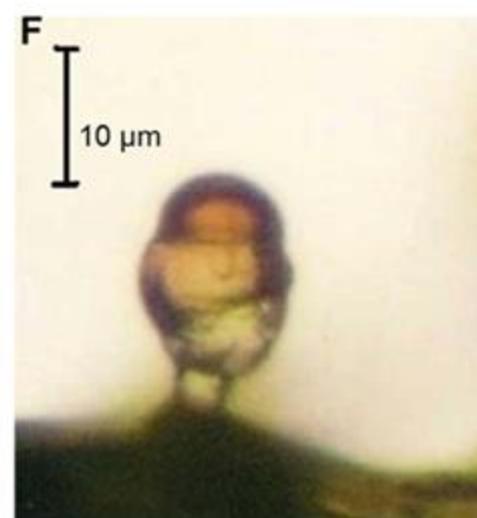
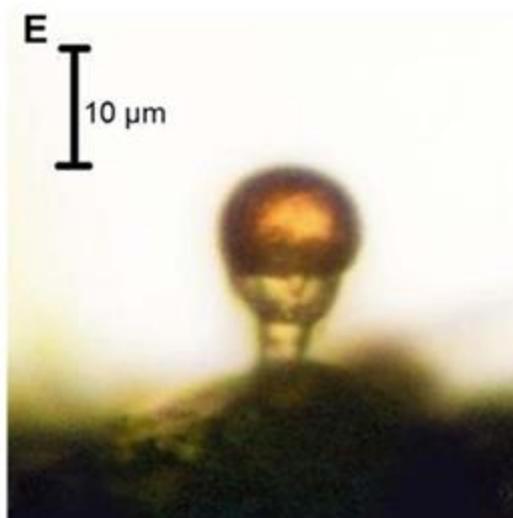
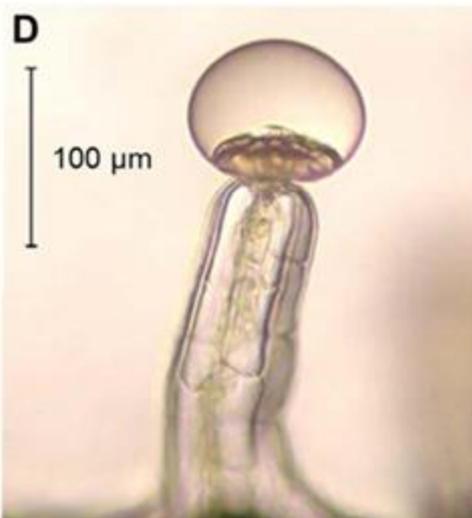
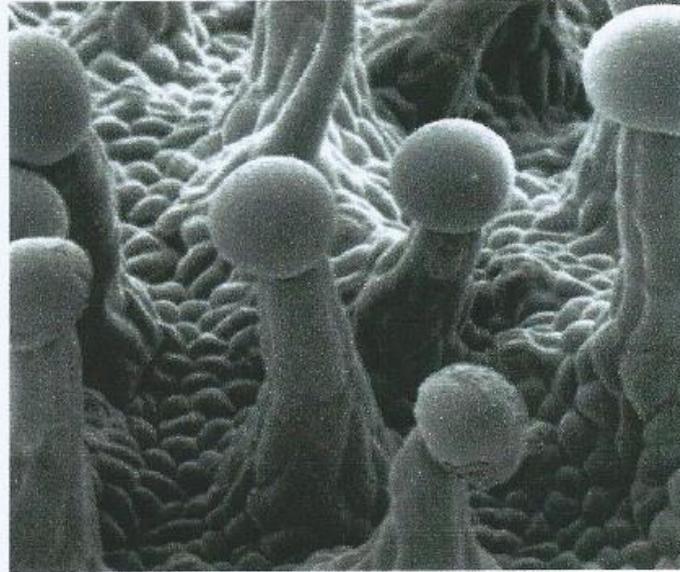
Estaminada



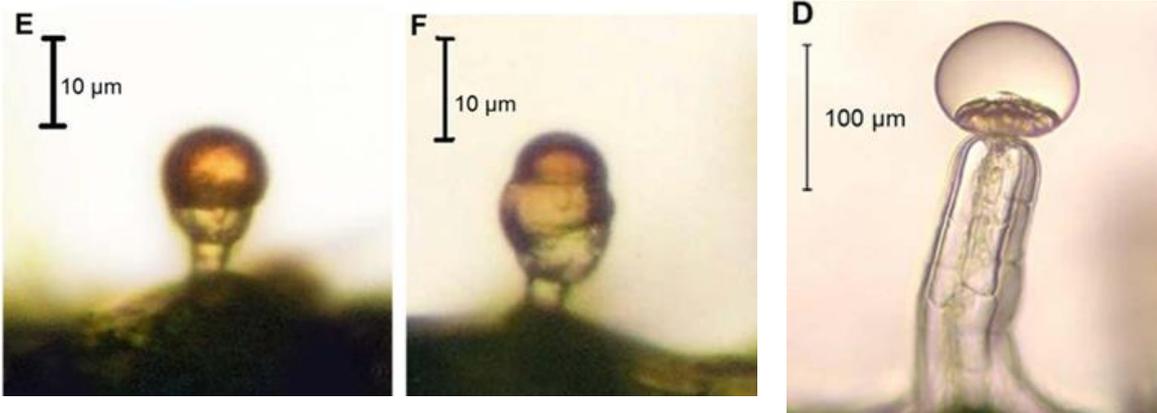
Pistilada



CANNABIS X CANABINÓIDES



CANNABIS X CANNABIDIOL



REVIEW ARTICLE

Front. Plant Sci., 04 February 2016 | <https://doi.org/10.3389/fpls.2016.00019>

Cannabis sativa: The Plant of the Thousand and One Molecules

Christelle M. Andre*, Jean-Francois Hausman and Gea Guerrierio

400

JOURNAL OF
SEPARATION SCIENCE

LEGHISSA ET AL.

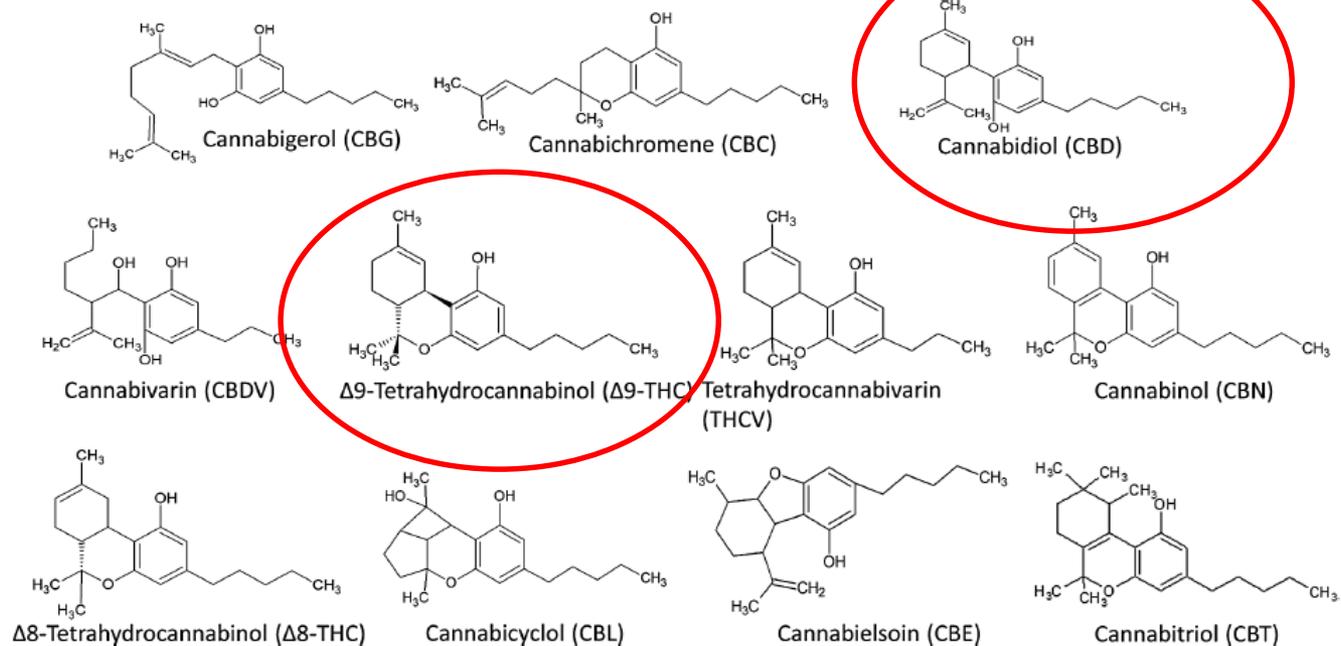
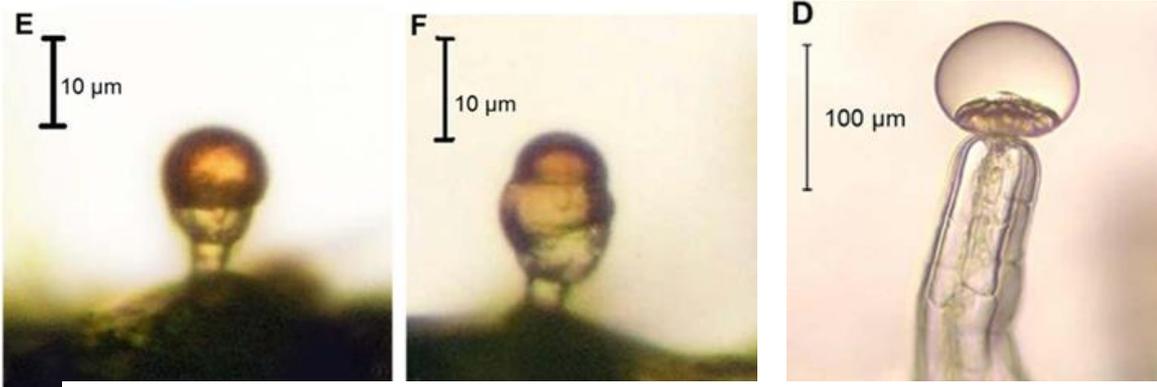


FIGURE 1 Structures of the ten most prevalent cannabinoids in cannabis

CANNABIS X TERPENOS



REVIEW ARTICLE

Front. Plant Sci., 04 February 2016 | <https://doi.org/10.3389/fpls.2016.00019>

Cannabis sativa: The Plant of the Thousand and One Molecules

Christelle M. Andre*, Jean-Francois Hausman and Gea Guerriero

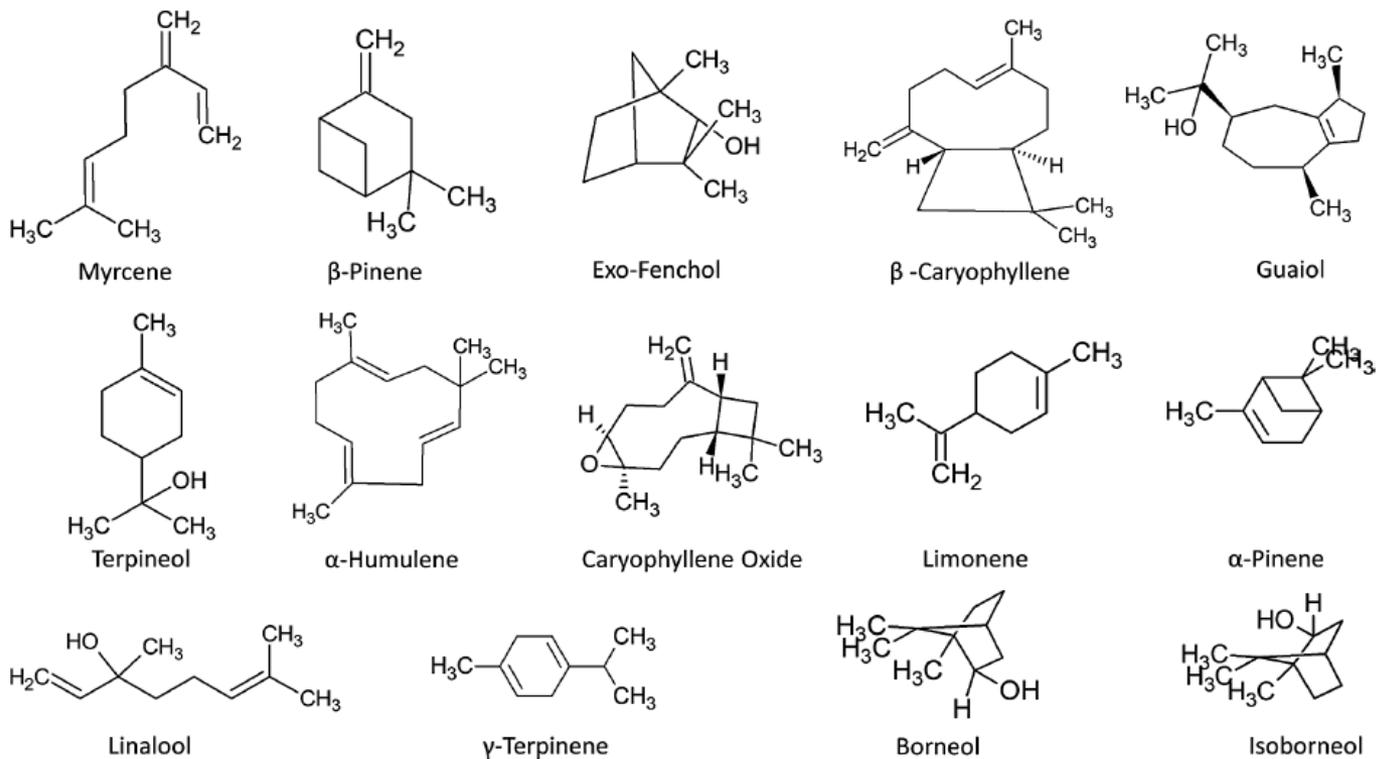


FIGURE 2 Structures of a selection of common terpenes and terpenoids found in *Cannabis sativa*

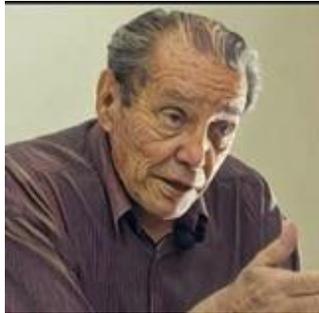
CANNABIS – PERFIL CANNABINÓIDES

Table 4 Content ranges of major and minor cannabinoids in cannabis and their degradation products

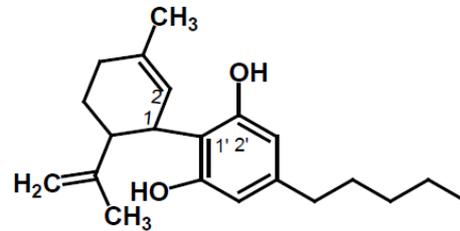
| Compound | % dry weight |
|-----------------|--------------|
| Δ^9 -THC | 0.1–25 |
| CBD | 0.1–7.98 |
| CBN | 0.0–1.6 |
| THCV | 0.0–1.36 |
| CBG | 0.03–1.15 |
| CBC | 0.0–0.65 |
| Δ^8 -THC | 0.0–0.1 |

Source: Modified from McPartland and Russo (2001) with additional data from Fishedick et al. (2010); Fournier et al. (1987); Pitts et al. (1992); Small (1979); and Veszki et al. (1980).

USO DO CANABIDIOL NO TRATAMENTO DE EPILEPSIA



Cannabidiol
CBD



- Main pharmacological characteristics:
- Anxiolytic
 - Antipsychotic
 - Analgesic
 - Anti-inflammatory
 - Antispasmodic



Prof. Raphael Mechoulam

Pharmacology 21: 175–185 (1980)

1980

Chronic Administration of Cannabidiol to Healthy Volunteers and Epileptic Patients¹

Jomar M. Cunha, E.A. Carlini, Aparecido E. Pereira, Oswaldo L. Ramos, Camilo Pimentel, Rubens Gagliardi, W.L. Sarvito, N. Lander and R. Mechoulam

Departamento de Psicobiologia, Departamento de Medicina, Departamento de Neurologia, Escola Paulista de Medicina; Departamento de Neurologia, Faculdade de Medicina da Santa Casa, São Paulo, and Department of Natural Products, Pharmacy School, Hebrew University, Jerusalem

USO DE EXTRATO DE CANNABIS

Momentum grows for medical use of cannabis

An American girl whose life might have been saved by cannabis has inspired a surge of interest in cannabis-derived medications, which scientists say is long overdue. Chris McCall reports.

Chris McCall

www.thelancet.com Vol 386 October 24, 2015



Charlotte Figi and her father at a cannabis greenhouse in Colorado Springs, CO, USA

frontiers
in Neurology

2018

SYSTEMATIC REVIEW
published: 12 September 2018
doi: 10.3389/fneur.2018.00759



Potential Clinical Benefits of CBD-Rich Cannabis Extracts Over Purified CBD in Treatment-Resistant Epilepsy: Observational Data Meta-analysis

Fabricio A. Pamplona^{1*}, Lorenzo Rolim da Silva² and Ana Carolina Coan³

¹Entourage PhytoLab, São Paulo, Brazil; ²Redeocor Brasil, São Paulo, Brazil; ³UNICAMP Campinas, Brazil



Contents lists available at ScienceDirect

Seizure

journal homepage: www.elsevier.com/locate/yseiz



CBD-enriched medical cannabis for intractable pediatric epilepsy: The current Israeli experience



Michal Tzadok^{a,1,*}, Shimrit Uliel-Siboni^{b,1}, Ilan Linder^c, Uri Kramer^b, Orna Epstein^d, Shay Menascu^b, Andrea Nissenkorn^a, Omer Bar Yosef^a, Eli Hyman^d, Dorit Granot^e, Michael Dor^f, Tali Lerman-Sagie^c, Bruria Ben-Zeev^a

^a Pediatric Neurology Units of Chaim Sheba Medical Center, Tel Hashomer

^b Pediatric Neurology Units of Tel Aviv Sourasky Medical Center, Tel Aviv

^c Pediatric Neurology Units of Wolfson Medical Center, Holon

^d Pediatric Neurology Units of Assaf Harofeh Medical Center, Zrifin

^e Pediatric Neurology Units of Panaxia Medical Devices and Pharmaceuticals, Tel Aviv, Israel

^f Pediatric Neurology Units of Medical Cannabis Unit, Ministry of Health, Tel Aviv, Israel

2015

Epilepsy & Behavior 47 (2015) 138–141



Contents lists available at ScienceDirect

2016

Epilepsy & Behavior

journal homepage: www.elsevier.com/locate/yebeh

Brief Communication

Perceived efficacy of cannabidiol-enriched cannabis extracts for treatment of pediatric epilepsy: A potential role for infantile spasms and Lennox–Gastaut syndrome

Shaun A. Hussain^{*}, Raymond Zhou, Catherine Jacobson, Julius Weng, Emily Cheng, Johnson Lay, Phoebe Hung, Jason T. Lerner, Raman Sankar

Division of Pediatric Neurology, Mattel Children's Hospital at UCLA, David Geffen School of Medicine, Los Angeles, CA, USA

Epilepsy & Behavior 70 (2017) 288–291

2017

The legal status of cannabis (marijuana) and cannabidiol (CBD) under U.S. law

Alice Mead, J.D. LL.M.^{*}

GW Pharmaceuticals, Inc., 5800 Armada Dr., Suite 210, Carlsbad, CA 92008, United States

POTENCIAL TERAPÊUTICO

Quadro 12 – Evidências sobre a eficácia terapêutica de Cannabis e canabinoides com referências dos principais estudos.

| Evidências conclusivas | |
|---|---------------------------|
| Indicação clínica | Forma/apresentação |
| Uso crônica em adultos ^{15,17,206} | Cannabis |
| Espasticidade reportada pelo paciente na esclerose múltipla ^{15,207,208} | Canabinoides orais |
| Náuseas e vômitos induzidos por quimioterapia ^{15,209,210} | Canabinoides orais |

| Evidências moderadas | |
|--|---------------------------|
| Indicação clínica | Forma/apresentação |
| Distúrbio do sono de curto prazo: apneia obstrutiva do sono, fibromialgia, dor crônica, esclerose múltipla ^{15,211,212} | Canabinoides (nabiximol) |

| Evidências limitadas | |
|--|------------------------------|
| Indicação clínica | Forma/apresentação |
| Ansiedade para falar em público, no transtorno de ansiedade social ^{15,213} | Canabidiol |
| Lesão por trauma cerebral ou hemorragia intracraniana ^{15,214,215} | Cannabis |
| Aumento do apetite e perda de peso associada com HIV/AIDS ^{15,216,217} | Cannabis, canabinoides orais |
| Distúrbio ^{15,218,219} | THC em cápsulas |
| Espasticidade reportada pelo médico na esclerose múltipla ^{15,220,221} | Canabinoides orais |
| Distúrbio ^{15,222} | Canabinoides orais |

CFM, 2019

Transtornos psiquiátricos (adicção, ansiedade, depressão, psicose, etc.)

Doenças neurodegenerativas (esclerose múltipla, epilepsia, ELA, Parkinson, Alzheimer, etc.)

Dor crônica

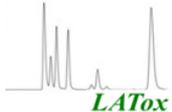
Glaucoma, paliativo na área oncológica e HIV



FARMACANNABIS – PESQUISA & EXTENSÃO



UFRJ



www.farmacia.ufrj.br/latox/

Universidade Federal do Rio de Janeiro
Faculdade de Farmácia
Laboratório de Análises Toxicológicas

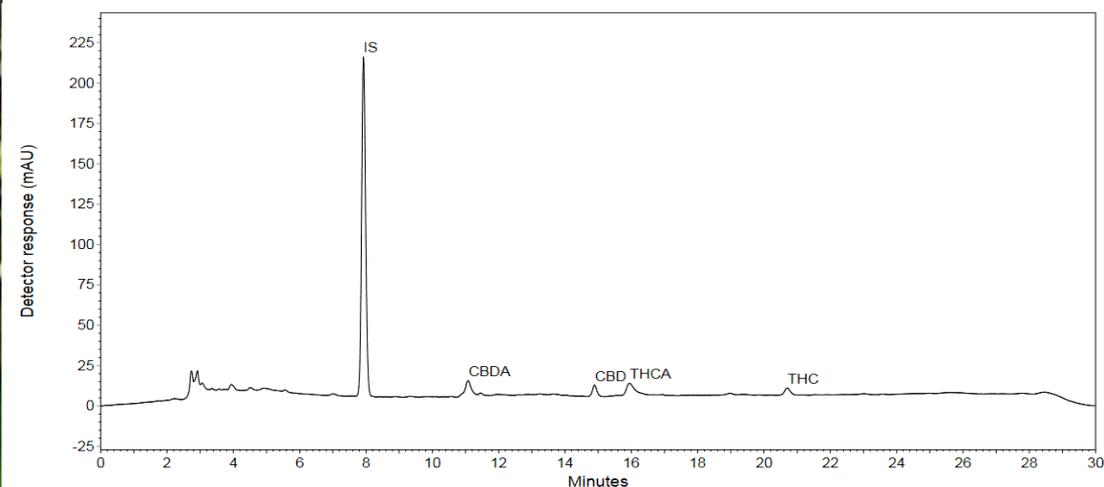
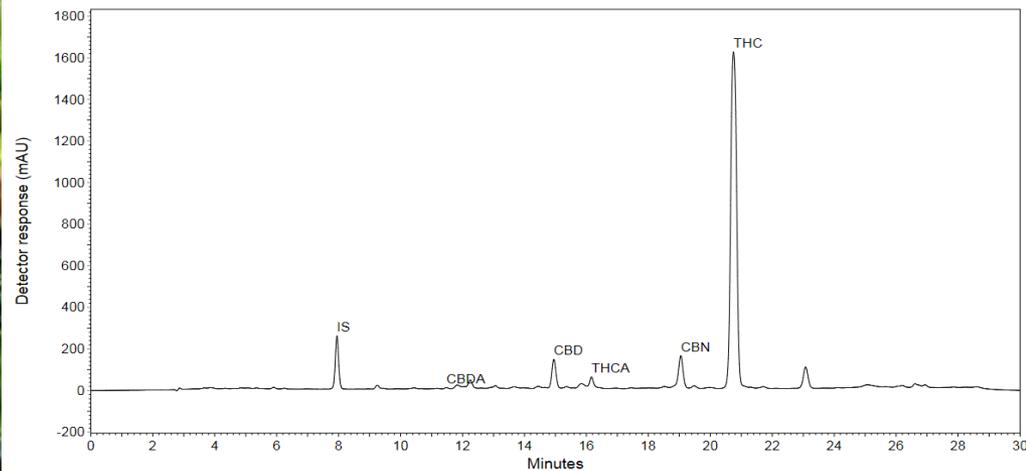
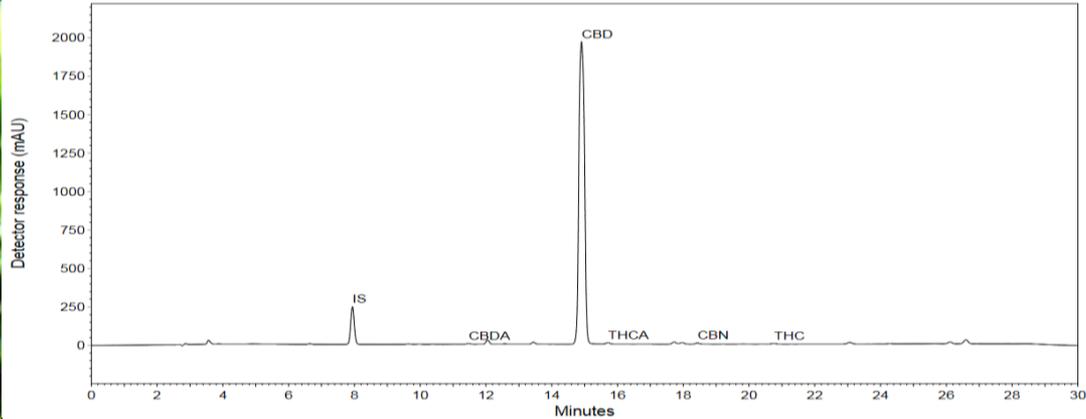


IDENTIFICAÇÃO E QUANTIFICAÇÃO DE CANNABINÓIDES EM PRODUTOS MEDICINAIS DE CANNABIS



FARMACANNABIS – PESQUISA & EXTENSÃO

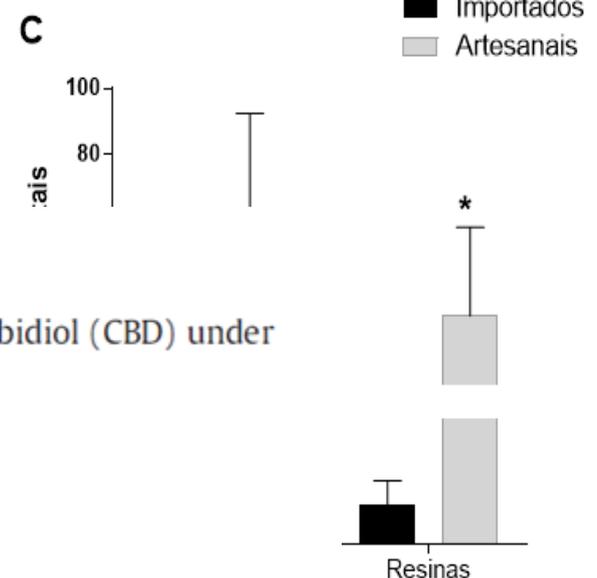
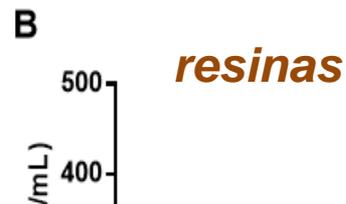
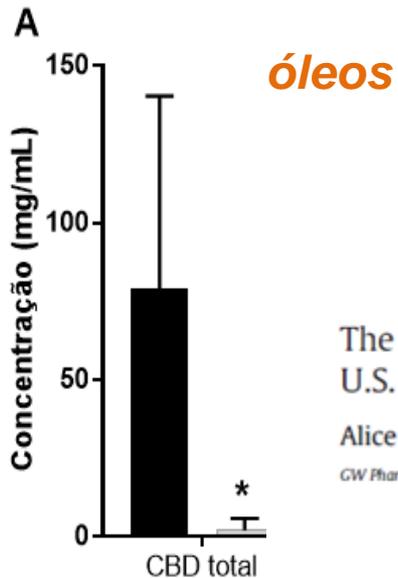




FARMACANNABIS – PESQUISA & EXTENSÃO

| | CBD | THC | CBDA | THCA | CBN |
|----|------|------|------|------|------|
| LD | 0,20 | 0,22 | 0,11 | 0,15 | 0,09 |
| LQ | 0,59 | 0,66 | 0,35 | 0,44 | 0,26 |

n=118



Epilepsy & Behavior 70 (2017) 288–291

2017

The legal status of cannabis (marijuana) and cannabidiol (CBD) under U.S. law

Alice Mead, J.D. LL.M. *

GW Pharmaceuticals, Inc., 5800 Armada Dr., Suite 210, Carlsbad, CA 92008, United States

DROGA X MEDICAMENTO????

Table 3 Cannabis plant groups and typical Δ^9 -THC/CBD concentration and ratio

| | | THC | CBD | THC:CBD Ratio |
|-----|-----------------|------------|------------|---------------|
| I | Drug | 0.5–15% | 0.01–0.16% | 50:1 |
| II | Intermediate | 0.5–5% | 0.9–7.3% | 0.25/~ 2 |
| III | Fiber | 0.05–0.70% | 1.0–13.6% | < 1:5 |
| IV | CBG | < 0.05% | < 0.5% | - |
| V | Non-cannabinoid | 0 | 0 | - |

Source: Modified from Galal et al. (2009). Note: THCA-predominant strains can yield in excess of 25% Δ^9 -THC; specially selected CBDA clones can yield up to 20% CBD.

FARMACANNABIS – PESQUISA & EXTENSÃO

Table 1: Cannabinoids concentrations in medicinal *Cannabis* extracts consumed in Brazil.

| | THC | | CBD | | CBN | | THCA | | CBDA | |
|-----------------|--------------|---------------|--------------|---------------|------------|------------|-----------|------------|-----------|-----------|
| | Mean ± SD | Range | Mean ± SD | Range | Mean ± SD | Range | Mean ± SD | Range | Mean ± SD | Range |
| IMPORTED | | | | | | | | | | |
| Oils | 1.2 ± 1.3 | 0.0 - 4,3 | 72.6 ± 60.6 | 13,17 - 284.9 | 0.2 ± 0.2 | 0.0 - 0.8 | 0.3 ± 0.5 | 0.0 - 1.8 | 0.2 ± 0.5 | 0.0 - 1.8 |
| Resins | 2.6 ± 2.5 | 0.0 - 8.2 | 162.6 ± 42.9 | 105.0 - 240.6 | 0.6 ± 0.5 | 0.0 - 1.4 | 1.1 ± 1.9 | 0.0 - 5.2 | 1.8 ± 2.3 | 0.0 - 6.1 |
| NATIONAL | | | | | | | | | | |
| Oils | 7.1 ± 13.6 | 0.0 - 63.7 | 0.9 ± 1.7 | 0.0 - 10.5 | 0.4 ± 1.2 | 0.0 ± 8.4 | 0.8 ± 1.4 | 0.0 - 8.2 | 0.4 ± 1.0 | 0.0 - 4.4 |
| Resins | 293.4 ± 57.2 | 194.4 ± 348.5 | 14.9 ± 2.3 | 10.8 - 17.0 | 11.9 ± 9.5 | 4.2 ± 29.6 | 4.9 ± 4.0 | 0.7 - 11.5 | 0.6 ± 0.9 | 0.0 - 2.4 |

Note: Concentrations in mg/mL and mg/g for oils and resins, respectively.

Table 2: Label accuracy by cannabidiol contents.

| | CBD concentrations ^a | | CBD labeled concentrations ^a | |
|-----------------------------|---------------------------------|---------------|---|---------------|
| | Mean ± SD | Range | Mean ± SD | Range |
| <u>Accurate^b</u> | | | | |
| Oil (n=14) | 76.0 ± 52.0 | 21.1 - 210.5 | 76.0 ± 52.0 | 25.0 - 200.0 |
| Resin (n=2) | 211.9 | 183.2 - 240.6 | 211.9 | 180.0 - 240.0 |
| <u>Under^c</u> | | | | |
| Oil (n=10) | 50.3 ± 35.0 | 13.2 - 121.9 | 50.3 ± 35.0 | 21.2 - 100.0 |
| Resin (n=6) | 146.1 ± 30.9 | 105.0 - 189.3 | 146.1 ± 30.9 | 160.0 - 240.0 |
| <u>Over^d</u> | | | | |
| Oil (n=4) | 117.8 ± 112.4 | 42.7 - 284.9 | 117.8 ± 112.4 | 10.0 - 200.0 |



^aCBD mg/mL for oil and mg/g for resin

^bCBD content tested within 15% of labeled value

^cCBD content exceeded labeled value by more than 15%

^dCBD content tested more than 15% labeled value

CANNABIS – PESQUISA & EXTENSÃO



Ministério da Saúde
FIOCRUZ
Fundação Oswaldo Cruz



Instituto Nacional de Controle de Qualidade em Saúde

UFRJ



Microbiological quality assessment of Cannabis: from plant to medicinal extract

Juliana dos Santos Carmo *; Dr^a Virgínia Martins Carvalho; Priscila Rodrigues de Jesus; Dr^a Joana Angélica Barbosa Ferreira
40 produtos nacionais → 16 contaminados com fungos e/ou bactérias (40%)
(Farmacopéia Brasileira 5^a edição)



Figure 1: *Aspergillus parasiticus*



Figure 2: *Aspergillus flavus*



Figure 3: *Staphylococcus aureus*

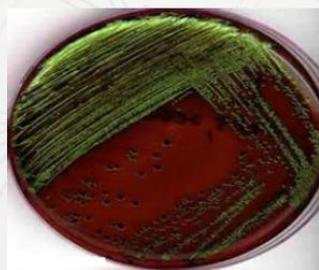


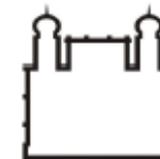
Figure 4: *Escherichia coli*

- ✓ *Candida albicans*
- ✓ *Escherichia coli*
- ✓ *Enterobacter cloacae*
- ✓ *Bacillus mycoides*
- ✓ *Staphylococcus epidermidis*
- ✓ *Bacillus subtilis*

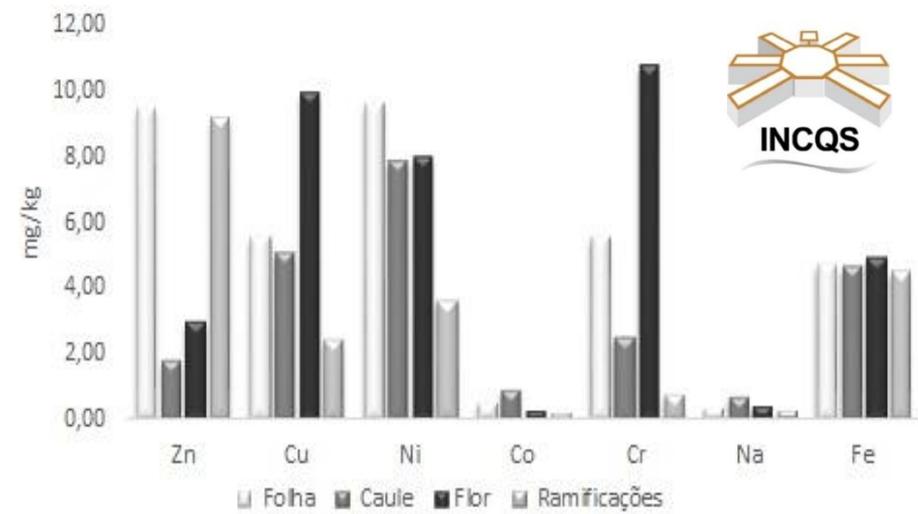
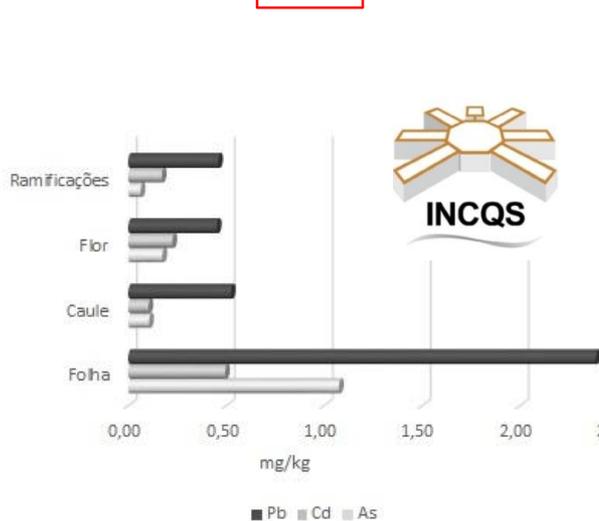
CANNABIS – PESQUISA & EXTENSÃO



UFRJ



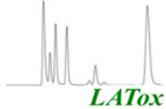
| | As | Cd | Pb | Ag | Zn | Cu | Ni | Co | Cr | Mn | Na | Fe | Al | K | Ca |
|---|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| A | 0,0160 | <0,0025 | 0,0405 | 0,0197 | 0,0783 | 0,2659 | 0,0405 | 0,0135 | 4,1538 | 2,1120 | 0,0254 | 0,0221 | 0,0054 | 0,4196 | 0,2663 |
| B | 0,0421 | <0,0025 | 0,0537 | 0,0272 | 0,1553 | 0,4179 | 0,0743 | 0,0173 | 3,5665 | 1,5262 | 0,0325 | 0,0361 | 0,0327 | 0,5021 | 0,5057 |



CANNABIS – PESQUISA & EXTENSÃO



UFRJ



www.farmacia.ufrj.br/latox/

Universidade Federal do Rio de Janeiro
Faculdade de Farmácia
Laboratório de Análises Toxicológicas

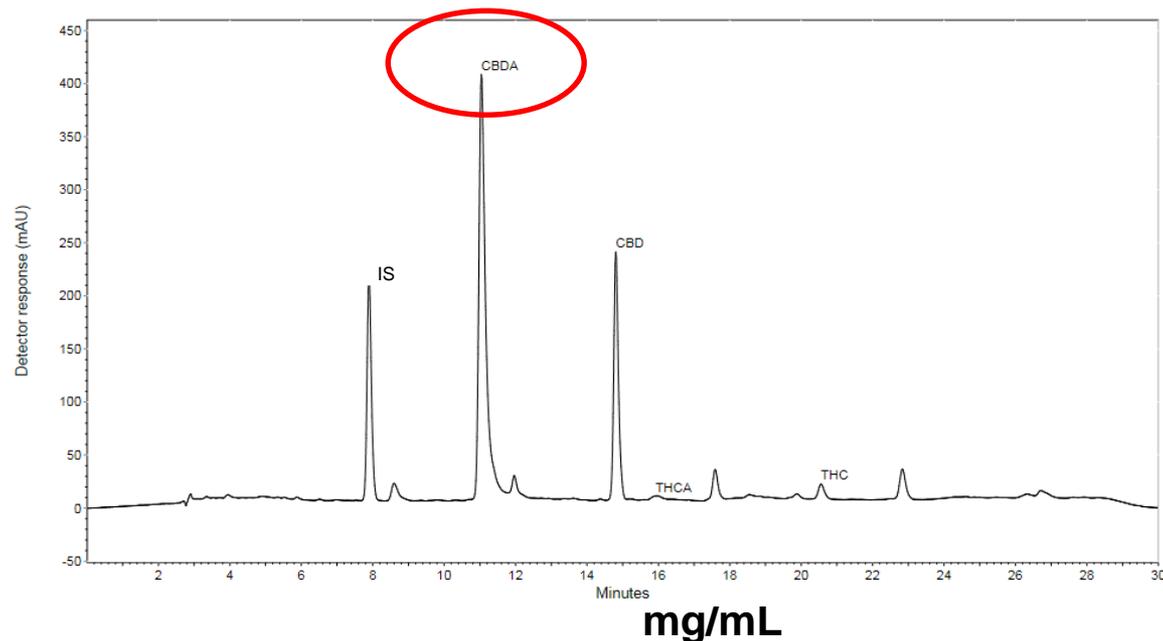


MONITORAMENTO DA PRODUÇÃO ARTESANAL DE EXTRATOS DE CANNABIS: OBSERVAÇÃO, SUPORTE FARMACÊUTICO E APOIO AO AUTO-CUIDADO

Aguiar AFL, Andrade Junior PR, Santos CR, Souza FLC, Vieira ACM, Guimarães ALA, Mattos G, Matteus E, Gandra M. Carvalho VM*



CANNABIS – PESQUISA & EXTENSÃO



| | CBDA | CBD | THCA | THC |
|------------|----------------------|-------------|-------------|-------------|
| | BEFORE (n=11) | | | |
| Media ± SD | 1.51 ± 1.78 | 0.79 ± 1.16 | 1.58 ± 1.55 | 1.39 ± 1.12 |
| Range | 0.00 – 4.33 | 0.08 – 3.30 | 0.10 – 4.77 | 0.00 – 2.71 |
| | AFTER (n=8) | | | |
| Media ± SD | 0.41 ± 0.68 | 4.06 ± 3.83 | 0.53 ± 0.95 | 3.84 ± 4.18 |
| Range | 0.00-2.07 | 0.00-10.45 | 0.00-2.59 | 0.23-10.94 |

INTERVENÇÃO NA TÉCNICA DE PREPARAÇÃO

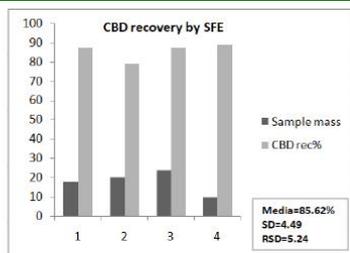
MÉTODOS DE PRODUÇÃO DO INSUMO FARMACÊUTICO ATIVO VEGETAL



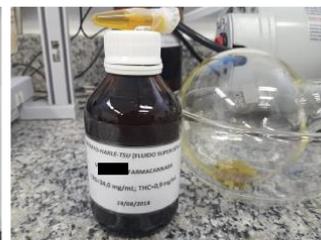
FARMACANNABIS PESQUISA & EXTENSÃO



Harle-Tsu raw material extract by SFE with the same pressure and temperature. The CO₂ mass and vegetable mass was variable.



Extracts A, B, C and D were collected and the solvent was removed in rotary evaporator.



Resin was dissolved in a vehicle to obtain a Cannabis medicinal extract, CBD=24.0 mg/mL; THC=0.9 mg/mL

| Production - Quantitative data | |
|------------------------------------|----------|
| Material | Mass (g) |
| Vegetal raw material* | 71.4 |
| Active raw material (resin by SFE) | 6.8 |
| CBD (by SFE) | 3.7 |

Note: Mass obtained from Harle-Tsu plant used in study.
*Dry and decarboxylated

1000 g dry and decarboxylated raw material

1000 mL rich CBD Hemp Oil
CBD ≅ 50 mg/mL

50g CBD

analitica

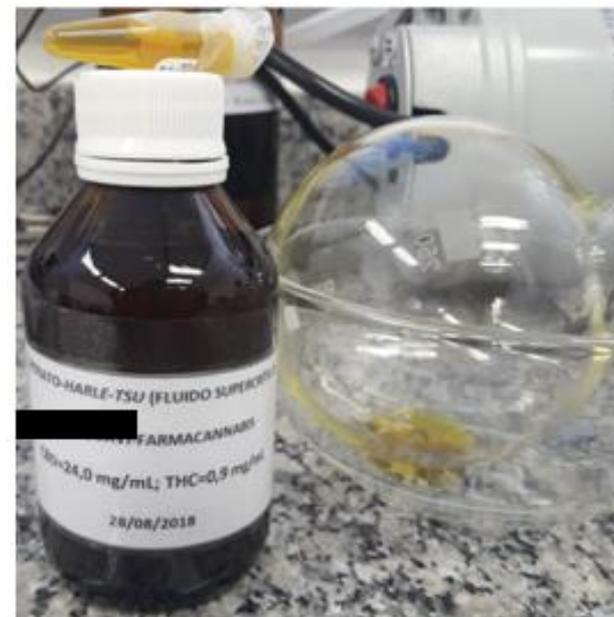
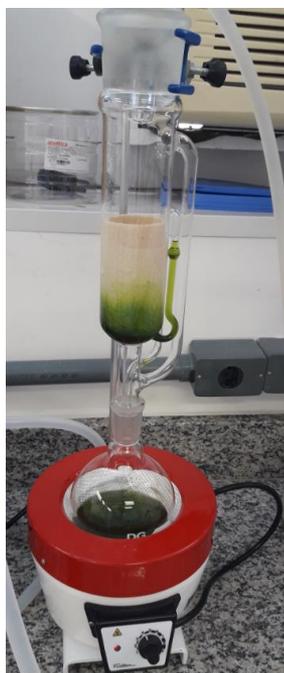
Acknowledgements

- ✓ Serrapilheira Institute by financial support, Process Number Serra-1709-18891.
- ✓ INCQS for partnership in quality control studies.
- ✓ Nova Analítica by technical support



Matéria prima: cultivada pelo responsável/paciente

Teores planejados de THC e CBD

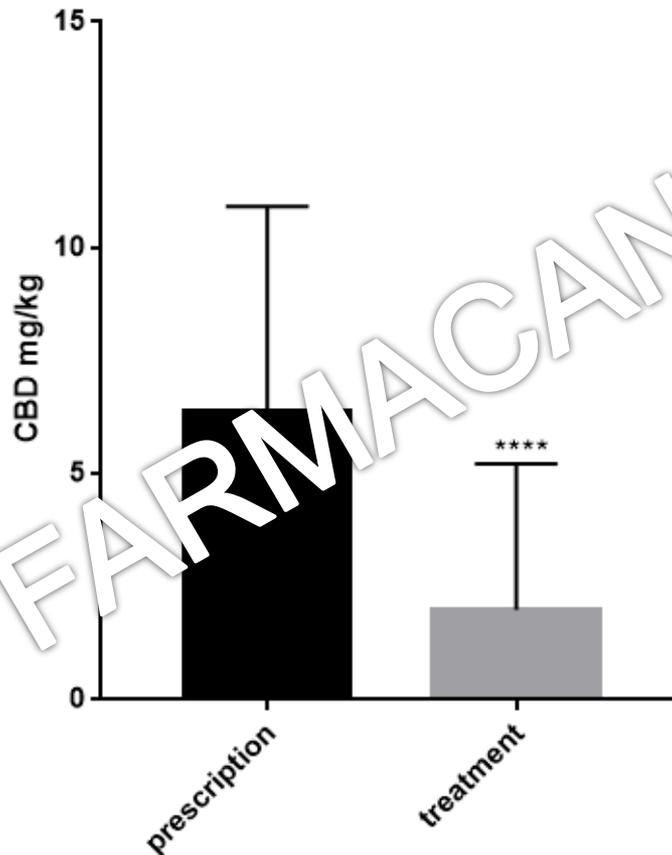


DESAFIOS – USO TERAPÊUTICO

DOSE PRESCRITA (BUROCRACIA DE IMPORTAÇÃO X TRATAMENTO)

POSOLOGIA PRESCRITA X REAL

CBD prescription mean= 6 ± 5 mg/kg (range: 1 - 18 mg/kg)
CBD treatment mean= 2 ± 3 mg/kg (range: 0.0 - 11 mg/kg)
Mann-Whitney Test p-value < 0.0001



DESAFIOS – USO TERAPÊUTICO

Extrato produzido por ONG na Paraíba - Dados do rótulo: data de fabricação 05/02/2018 e validade 05/04/2018 – “EXTRATO DE CANNABIS INDICA”, ESPÉCIE GOLD “**ÓLEO LARANJA**”

| RESULTADO | CBD | THC | CBDA | THCA | CBN |
|---------------|-----|-----|------|------|-----|
| Teor em mg/mL | ND | ND | 0,21 | ND | ND |

Cannabis Sativa 5% — 60 cap
(óleo laranja
rico em CBD)
a base
de 5 gotas 8/8 horas
em uma graduação
de 2017

São Luiz do Maranhão
Menino, 2 anos,
Síndrome de West CID
G40, sem convulsões,
apenas espasmos, e
atraso psicomotor

Uso oral
Depakote - 4ml 8/dia
Salm - 1 + 1 + 1,5g
Óleo laranja - 16 gotas 3x/dia. Observar 1a
2 meses.
Se necessário, passar para 24 gotas e 32 gotas

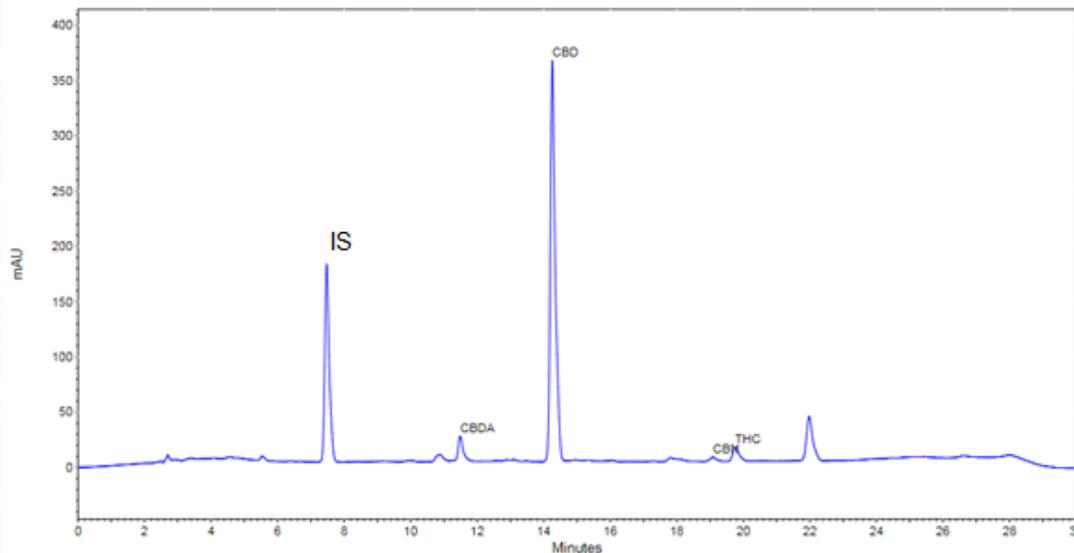
DESAFIOS – USO TERAPÊUTICO

Extrato artesanal preparado pelos pais, cultivo próprio, variedade *Harle-Tsu*

| RESULTADO | CBD | THC | CBDA | THCA | CBN |
|---------------|-------------|-------------|------|------|------|
| Teor em mg/mL | 4,40 | 0,24 | 1,46 | 0,12 | 0,10 |

São Paulo
Menina, Epilepsia
mioclônica grave -
Síndrome de Dravet

0,8 mL diário = 3,52 mg de CBD (0,06 mg/Kg)



*Mãe/Pai que
cultivam com salvo
conduto judicial
receberam apoio e
orientação
farmacêutica para
melhorar o
rendimento de CBD*



*Desenvolvimento real da
ciência ocorre quando o
paradigma entra em crise
profunda dando lugar a um
novo paradigma*





UFRJ



OBRIGADA!!!

virginiamc@pharma.ufrj.br



serrapilheira

apoio à pesquisa científica no Brasil.

