## Cannabis Induced Panic Disorder – A Case Series

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**Background:** Lifetime cannabis use has been associated with anxiety and panic attacks. The causality seems uncertain, as it is not clear if cannabis use is responsible for increasing the level of anxiety to clinical levels, or if anxiety triggers cannabis use. Treatment strategies for patients with dual diagnosis, of panic disorder and cannabis use disorder are still based mostly on clinician's experience.

**Objective:** To present 4 cases of patients diagnosed with both panic disorder and cannabis use disorder (diagnosed according to the DSM-5 criteria) from clinical and therapeutic perspectives.

**Methods:** Four patients were examined by a psychiatrist and a clinical psychologist, and these patients were monitored during 6 months of pharmacological treatment.

**Results:** The first patient, male, 26 years old, presented also a diagnosis of borderline personality disorder, and he was initiated on fluoxetine 40 mg/day, pregabalin 150 mg/day and naltrexone 50 mg/day. The second patient, female, 30 years old, was diagnosed with multiple addictions (alcohol, cannabis, nicotine, and cocaine) beside her panic disorder, and she was initiated on sertraline 100 mg/day and naltrexone 50 mg/day (after abused substances detoxification). The third patient, male, 35 years old, was already on treatment for his panic disorder with paroxetine 40 mg/day, and gabapentin 600 mg/day and naltrexone 50 mg/day were initiated for cannabis use disorder. The fourth patient, male, 36 years old, received treatment with sertraline 150 mg/day, buspirone 20 mg/day, and naltrexone 50 mg/day. Three patients had a favourable evolution after 6 months, two of them achieving remission for both targeted conditions, and one only for cannabis use disorder. The fourth patient droped-out after 6 weeks and entered a psychological counselling programme.

**Conclusions:** Investigation of multiple co-morbidities in patients with cannabis use disorder and panic disorder is very important. Anxiolytics (non-benzodiazepines) and antidepressants may have positive impact over both conditions on medium term.

## Pharmacological Treatment of Cannabis Use Disorder and Schizophrenia Spectrum Disorders Dually Diagnosed Patients – Current State of Research

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**Background:** Treatment of patients diagnosed with schizophrenia who also present a substance use disorder is a challenge for clinicians, due to high rates of drug use relapse, psychotic ex-

acerbations, lower functionality, lower quality of life, and poorer insight and therapeutic adherence.

**Objective:** To find evidence in the literature for supporting therapeutic recommendations in patients diagnosed with cannabis use disorder and schizophrenia.

**Methods:** A literature search was performed in the main electronic databases (PubMed, EMBASE, CINAHL, Thomson Reuters/Web of Science) using as keywords "schizophrenia", "schizoaffective disorder", "schizophreniform disoder", "psychotic disorder not otherwise specified", "cannabis use disorder", combined with "pharmacological treatment". All papers published between 1998 and 2018 have been included in the primary analysis. Inclusion criteria: observational, interventional, randomized, single/double-blind or open trial, retrospective trials; age between 18 and 65; patients diagnosed with schizophrenia, schizoaffective disorder, schizophreniform disorder, or psychotic disorder not otherwise specified who also presented cannabis use disorder; use of structured methods for evaluation of the symptoms severity. Exclusion criteria: unspecified trial design, case reports, case series, systematic reviews and meta-analyses, age under 18 and above 65, multiple somatic and psychiatric co-morbidities, lack of specified instruments for symptoms severity evaluation, psychotherapy as the only active intervention.

**Results:** A number of 78 trials were detected after the primary search, and only 3 remained after the filter of inclusion/exclusion criteria was applied. Clozapine was found superior to risperidone for cognitive symptoms (n = 36), and to risperidone for positive symptoms (pilot study, n = 30). Olanzapine was equally effective with risperidone (n = 49) on psychotic symptoms and substance use in first-episode patients.

**Conclusions:** There is a paucity of good quality data regarding the efficacy of pharmacological approaches in schizophrenia spectrum disorders and cannabis use disorder dually diagnosed patients. Clozapine was superior to other atypical agents, while olanzapine and risperidone were equally efficient for this indication.

# Business

## Study of Oxidative Stability of Cold-Pressed Hemp (Cannabis Sativa L.) Seed Oil

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The oxidative stability of fats and oils is directly influenced by their chemical composition. In particular, it strictly depends on endogenous factors, such as the fatty acids composition and the qualitative, quantitative profile in natural antioxidants as well as the presence of pro-oxidant compounds (e.g. chlorophyll). Furthermore, many external factors (e.g. temperature, oxygen and light) influence it. Hemp seed oil is characterized by a predomi-

nantly unsaturated lipid fraction; in fact, it is a rich source of polyunsaturated fatty acids, mainly linoleic acid (LA) and α-linolenic acid (ALA), which are particularly prone to oxidation. For this reason, it is essential to define its shelf-life. This investigation aims to assess the state of oxidation by monitoring the parameters related to peroxide value (POV), free acidity (expressed as % of oleic acid), Oxidative Stability Index (OSI), spectrophotometric investigation in the ultraviolet region ($K_{232}$ and $K_{268}$) and Electron Spin Resonance forced oxidation assay. Moreover, the fatty acid profile of the hemp seed oil was characterized by GC-FID. Unpeeled seeds of *Cannabis Sativa* L. Futura 75 variety were cold pressed. The hemp seed oil obtained was purified by centrifugation and filtration and packaged in 100 mL dark glass bottles. In order to simulate possible real retail shelf conditions, the samples were subjected to 12 hours of light (with LED lighting at 270 lux) and 12 hours of dark, at room temperature (25°C) and they were collected and analysed every 10 days over a period of 3 months. The results of this study will be presented and discussed.

## Agriculture

### Hermaphroditism in Cannabis Sativa L. vs. Cross-Pollination – Impact on Sex Ratios and Genetic Variation

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The formation of hermaphroditic flowers in cannabis plants during cultivation, which are female flowers accompanied by production of anthers, ranging from a few to many, was studied. Spontaneous development of anthers was observed in flower buds of 3 cannabis strains – 'Moby Dick', 'Space Queen, and 'Lemon Nigerian' (Figure 1). Anthers were collected and morphological features and pollen germination rates were examined and found to be similar to those of anthers produced in genetically male flowers. Seed development occurred within the hermaphroditic flowers at up to 30% frequency, depending on the
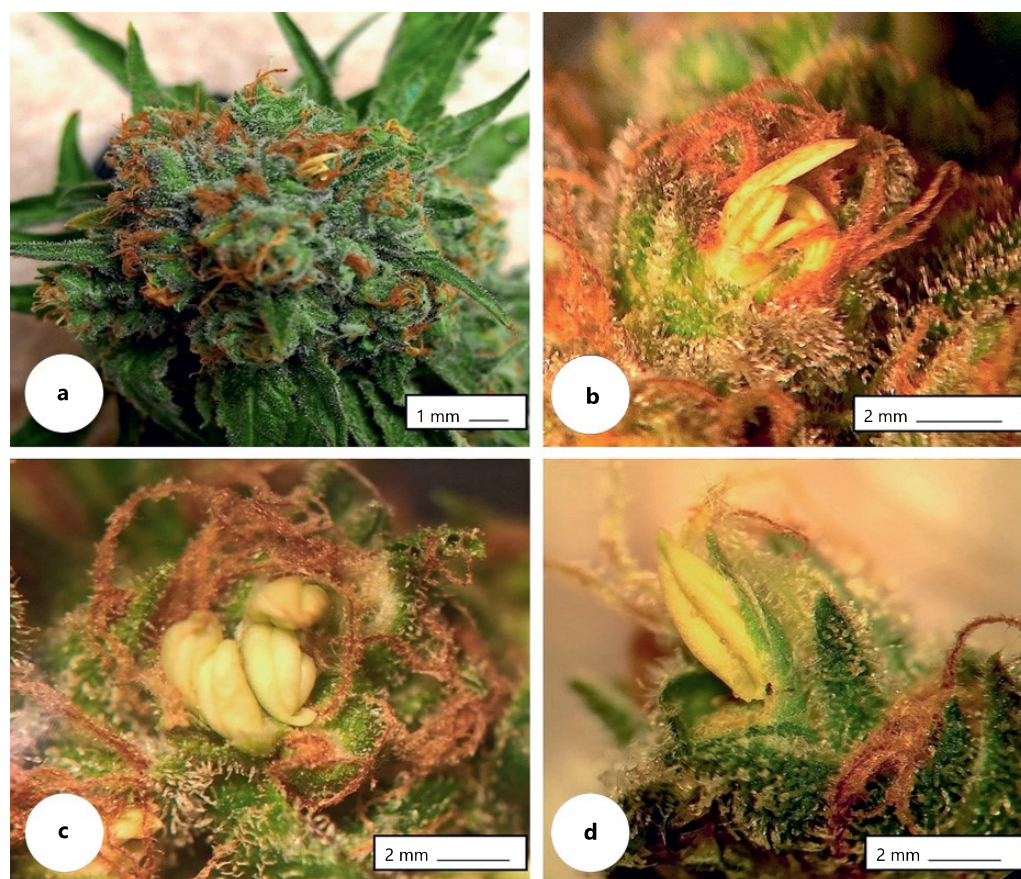


**Fig. 1. a–d** Hermaphroditic flower formation in cannabis (for Abstract no CANNX19-0026).