THC Levels in Cannabis Flowers at Cannafest Prague 2026 – A Cross-Sectional Analysis of 165 Cannabis Flower Samples Submitted by Expo Visitors

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Introduction

Since 1 January 2026, the Czech Republic has allowed individuals over 21 to grow up to three cannabis plants for personal use and possess up to 100 g at home and 25 g elsewhere [8]. Recreational sales remain prohibited. Given the limited availability of potency data for home-grown cannabis, we measured THC and CBD concentrations in cannabis flowers submitted by visitors at Cannafest Prague 2026, held from 6 to 8 November at PVA Expo Praha Letňany [1].

Background & Aim of the Study

Home growers in the Czech Republic raise cannabis plants from seeds or cuttings. THC and CBD concentrations can vary with plant genetics and growing conditions, so cultivar names alone provide limited information about the cannabinoid content of a harvest. This cross-sectional study used on-site near-infrared (NIR) spectroscopy [2] to characterize THC and CBD concentrations in cannabis flower samples voluntarily submitted by visitors to Cannafest Prague 2026.

Methodology – Study Workflow

The NIR method was based on a chemometric prediction model previously validated against chromatographic reference methods [3]. The following workflow was applied to all submitted samples:
- Recording of sample information (strain name, if available)
- Issuing of an access code for online result retrieval
- Photographic documentation of the sample
- Homogenization using a metal grinder
- Transfer of the homogenized sample into an aluminum weighing dish
- Cannabinoid levels were determined as the mean of three NIR measurements
- Manual review and upload of the analytical results to the laboratory server

Throughout the entire analytical process, all samples remained in the possession of the participants and were not retained by the investigators at any time.

Materials

MicroNIR handheld NIR spectrometer (NIRLAB AG, Switzerland)
Chemometric prediction model: Cannabis v34 (NIRLAB AG, Switzerland)
USB webcam for photographic documentation
Metal grinder, Ø 40 mm (NV Grinders, Austria)
Round aluminum weighing dishes, Ø 57 mm (VWR International)

Fig. 1: NIRLab NIR spectrometer



Fig. 2: Metal grinder



Fig. 3: Sample in weighing dish



Results

A total of 165 cannabis flower samples were submitted for analysis and classified according to their CBD and THC levels:
- 13 CBD-dominant samples (CBD ≥ 1%, THC < 1%): CBD level range: 4.3 – 16.9%
- 4 CBD–THC hybrid samples (CBD ≥ 1%, THC ≥ 1%): see Fig. 4
- 148 THC-dominant samples (CBD < 1%, THC ≥ 1%): The 148 THC-dominant samples showed a median THC level of 18.7% (range: 4.7–25.9%) and are within the potency range of modern high-THC cannabis flowers currently observed across Europe [4] (see Fig. 5). Strain names were recorded according to the information provided by the participants.

Fig. 4: Cannabinoid levels of CBD–THC hybrid samples

Strains	CBD (%)	THC (%)
Deez Nuts	11,1	2,8
CBD Dreams	11	1,1
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Black Sherry Gushers	16,1	1,6

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Key Findings

- Sample collection at Cannafest Prague 2026
- On-site analysis using NIR spectroscopy
- 165 cannabis flower samples analyzed
(148 THC-dominant, 13 CBD-dominant, 4 CBD-THC hybrid samples)
- Median THC level: 18.7% (THC-dominant samples)
- THC range: 4.7 – 25.9% (THC-dominant samples)

Fig. 5: Distribution of THC levels in THC-dominant samples

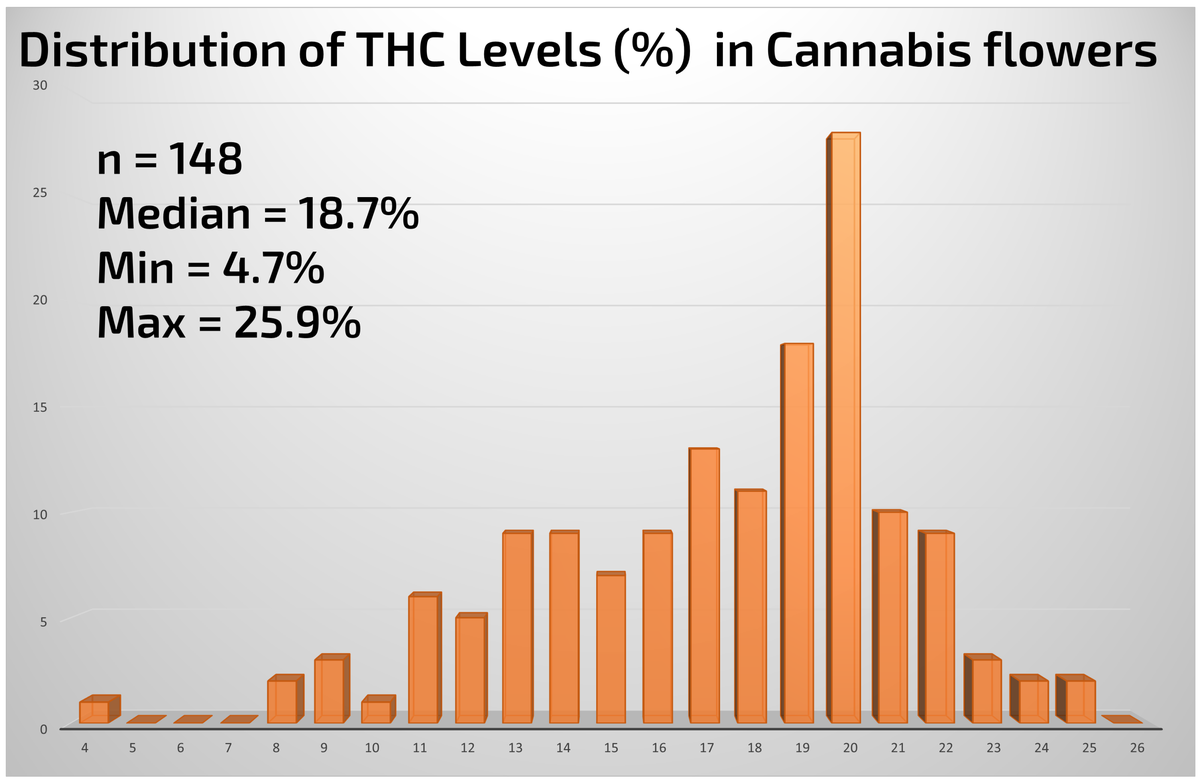


Fig. 6: Example NIR spectrum of a THC-dominant cannabis flower

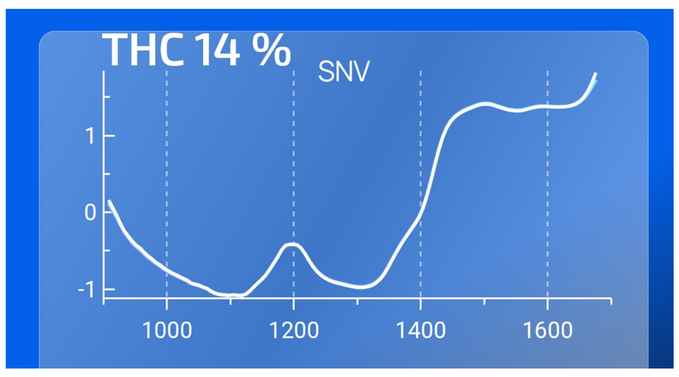
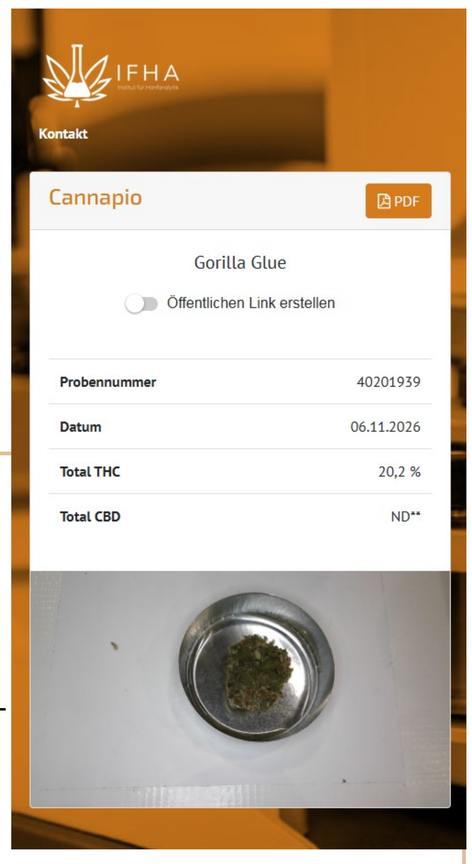


Fig. 7: Example online result



Discussion

European studies reported mean THC concentrations of 7–13% in herbal cannabis and an increase in potency over time [5,6]. At Cannafest Prague 2026, THC-dominant flowers had a median of 18.7% THC (range 4.7-25.9%), above historical European means. Samples taken at Mary Jane Berlin 2026 (Germany) yielded a slightly lower median (17.4%) and a similar maximum (25.7%) [7]. Comparisons with historical means are descriptive. Voluntary submissions at a specialist trade fair limit the generalizability of the findings to the overall cannabinoid composition of cannabis flowers in the Czech Republic.

Acknowledgements

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