Analysis of Hempen Ale™ for Cannabinoids

To the Editor:

The availability and consumption of hemp seed food products has raised important questions concerning the interpretation of drug assay results. A previous study examined the possibility of positive marijuana urine tests from hemp seed snack bars (1). Hempen Ale, an alcoholic beverage formulated, brewed, and bottled by the Frederick Brewing Co. (Frederick, MD) that has hemp seeds as one of its ingredients, was recently made available commercially. We investigated the possibility that Hempen Ale contains substances that may produce marijuana positive urine drug tests.

Three bottles of Hempen Ale were purchased from local commercial retail vendors. Each bottle was sampled in triplicate and assayed on the Syva 30R™ using the Behring EMIT II immunoassay system with a 50-ng/mL 11-nor-Δ⁹-THC-9-carboxylic acid cutoff. The manufacturer states that a Δ⁹-THC concentration greater than 35 ng/mL produces a positive response via the EMIT II system. Five-milliliter samples were also taken in triplicate from each bottle, extracted using a solid-phase column, and derivitized with BSTFA. Two-microliter aliquots were injected into a Hewlett-Packard 5890/5970 gas chromatograph-mass spectrometer (GC-MS) and then assayed in selective ion monitoring (SIM) mode for the presence of Δ⁹-THC and 11-nor-Δ⁹-THC-9-carboxylic acid. The ions chosen for the Δ⁹-THC and 11-nor-Δ⁹-THC-9-carboxylic acid SIM assays were 386, 315, and 303 and 371, 473, and 488, respectively. Ethanol analyses were performed on a Hewlett-Packard GC with flame ionization detection and calculated as a percentage (v/v).

The negative control provided by the Behring EMIT II kit produced an absorbance reading of -36. The positive cannabinoids control produced an absorbance reading of 78. Because each sample resulted in an absorbance reading less than the negative control, these data were interpreted as negative for cross-reacting cannabinoids. Each 5-mL aliquot assayed by GC-MS in SIM mode also resulted in negative findings. The limits of detection of Δ⁹-THC and 11-nor-Δ⁹-THC-9-carboxylic acid using this procedure are 1 and 2 ng/mL, respectively. The ethanol concentration was assayed as a 50-fold dilution. The mean percentage of ethanol was found to be 5.83% ± 0.168% (v/v). The manufacturer states an alcohol concentration of 5.0% by volume. Urine specimens obtained from one volunteer at time 0, 15 min, and 1 h after consumption of two 12-oz. Hempen Ales were found to be negative for cannabinoids using EMIT II screening procedures. EMIT II, ethanol, and GC-MS data are summarized in Table I.

Different batches of Hempen Ale may contain varied amounts of hemp seeds. The manufacturer states that the amount of hemp seeds added during the brewing process varies less than 1% between batches. The hemp seeds go through two wash cycles before the brewing process to ensure that vegetative material that may potentially contain THC is removed. Thus, these studies demonstrate the absence of detectable concentrations of THC and cross-reacting substances in Hempen Ale and indicate that its ingestion in moderate amounts is not sufficient to produce a cannabinoid-positive drug screen.

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References