

IDENTIFICATION OF BOTANICAL SMART DRUGS: AN INTEGRATED APPROACH

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Classical taxonomic determination of plants is essentially based on morphological characters. However, such an approach is not feasible when fragments of the plants to be classified are only available. In this study, we have combined morphological, molecular and chemical data in order to achieve a pharmacognosic identification of last-generation “smart drugs”. We have analyzed a few products present on the market as room scents under the names: “B-52”, “Jungle Mystic Incense” and “Blendz”. Microscope analysis has allowed to identify leaf fragments and pollen belonging to Malvaceae and Solanaceae in a sample of B-52, Malvaceae, Scrophulariaceae and Lamiaceae in a sample of Jungle, and Malvaceae and Sapindaceae in a sample of Blendz.

Molecular analyses have been carried out on a sample of Jungle by using the chloroplast gene *rbcl*, a universal marker of DNA barcoding. DNA has been extracted from samples, amplified with universal primers for *rbcl*, and the obtained fragments have been cloned and sequenced. The analysis of 25 cloned inserts on GenBank has revealed the presence of Lamiaceae and Scrophulariaceae in the sample.

Ethanol extracts of the three samples have been analysed by gas chromatography coupled to EI ionization, single-quadrupole mass spectrometry, revealing the presence of synthetic cannabinoids. Cannabinoid JWH-122 (1-pentyl-3-(4-methyl-1-naphthoyl)indole) has been detected in “B-52”; compound JWH-250 (2-(2-methoxyphenyl)-1-(1-pentyl-1*H*-indol-3-yl)ethanone) in “Jungle” (fig. 1b), and compounds JWH-073 (1-naphthalenyl(1-butyl-1*H*-indol-3-yl)methanone and JWH-018 (Naphthalen-1-yl-(1-pentylindol-3-yl)methanon) in “Blendz”. All these chemicals are currently under law restrictions in Italy (Tab. I, T.U. 309/90).

Further investigations will be carried out, aimed at obtaining a more in-depth pharmacognosic characterization of the botanical fragments. In addition, a multi-locus molecular approach based on different markers with a higher genetic variability (e.g. *trnH-psbA*), will allow to achieve taxonomical identifications at the level of genus/species.

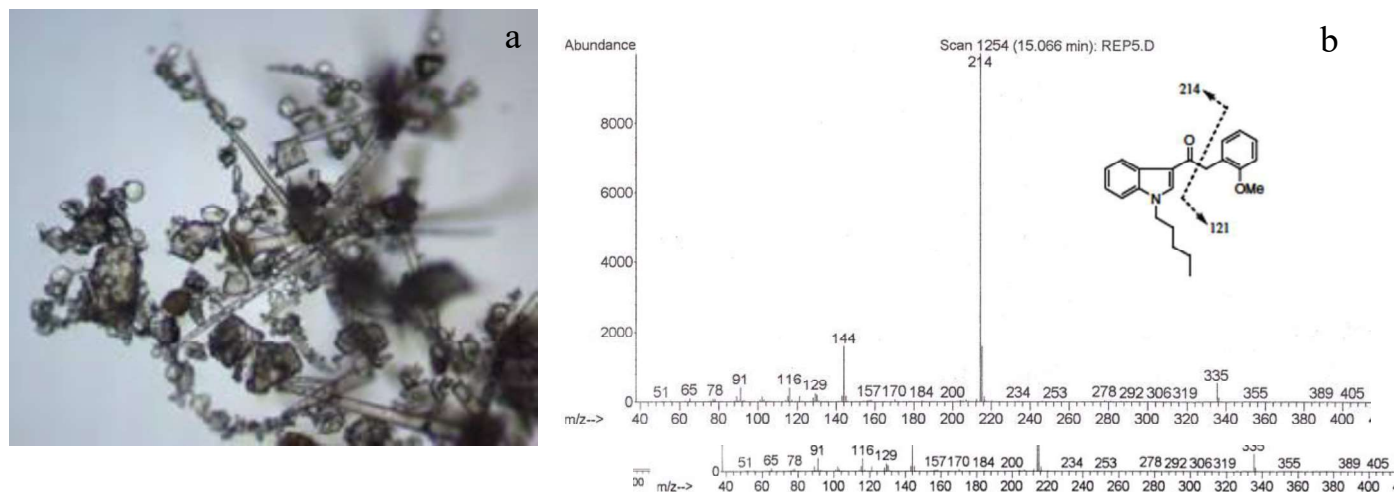


Fig. 1 Sample of Jungle mystic incense. (a) Branched non-glandular hairs, starch and crystals; (b) MS spectrum obtained from EI ionization of the 15.06 retention time peak, attributed to synthetic cannabinoid JWH- 250.

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