MENTHOL CONTENT IN CANADIAN CIGARETTES

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BACKGROUND

- Menthol is a flavour known to impart cooling and analgesic properties to cigarette smoke.
- In 2009, the Government of Canada prohibited the addition of flavours to cigarettes because they served as an inducement to youth smoking. At the time menthol was exempted from this prohibition.
- Recently, the Government of Canada has taken action to remove the exclusion for menthol and related compounds and several provinces, such as Alberta, Nova Scotia, and New Brunswick, have prohibited "minty" characterizing flavours
- In Canada, menthol cigarettes represent 4.7 % of total cigarette sales

OBJECTIVE

The objective of this study was to examine the menthol content and emissions from menthol cigarettes and compare this to new "Green" branded cigarettes that were introduced in the Alberta market after provincial prohibition on characterizing flavourings in tobacco.

METHODOLOGY

- A study of "Green" branded (7) and menthol branded (19) cigarettes, comprising of approximately 64 % of the menthol market, was conducted
- Physical characteristics were also assessed.
- Menthol constituent concentration along with nicotine and other constituents were analyzed in whole tobacco; tar, nicotine, menthol and other emitted substance were analyzed in cigarette smoke emissions.
- Whole tobacco constituents (nicotine, nornicotine, anabasine, myosmine, and anatabine) and menthol were measured by an ISO 17025 accredited laboratory.
- In whole tobacco, nicotine related alkaloids were determined using Gas Chromatograph– coupled to Nitrogen Phosphorous Detector as per official Health Canada test method HC T-301.
- Modified Gas Chromatography Flame Ionization laboratory method (Health Canada T-304) was used for menthol analysis in whole tobacco.
- Method for whole tobacco humectants was modified to analyze for menthol
- All whole tobacco target analytes are expressed on a 'dry matter' basis with exception of menthol which is reported on 'as received' basis.
- All analytes measured in whole tobacco were measured in filler excluding paper, packing and filter, hence all constituent measurements are reported per gram of filler.

RESULTS

•In menthol cigarettes, menthol constituent concentrations ranged from 0.79 to 5.7 mg/g tobacco filler, and menthol emissions averaged 0.38 ± 0.16 and 0.98 ± 0.30 mg/cigarette under ISO and Health Canada emissions protocols, respectively.

•"Green" branded cigarettes did not contain or emit quantifiable levels of menthol (5 of 7 below LOD (<0.008 mg/g); 2 of 7 below LOQ (<0.025 mg/g)).

Table 1: Cigarette properties of "Green" and Menthol Brands

Cigarette Characteristics	"Green" brands	Menthol brands
Tobacco Weight (g)	0.67 ± 0.12	0.61± 0.14
Diameter (mm)	7.2 ± 0.9	7.0 ± 0.8
Circumference (mm)	23 ± 3	22 ± 3
Cigarette Length (mm)	89 ± 8	89 ± 11
Filter Length (mm)	24 ± 3	24 ± 5
Tobacco Portion Length (mm)	65 ± 5	65 ± 7
Pressure Drop - Vents Open (mmH_2O)	114 ± 8	96 ± 35
Pressure Drop - Vents Closed (mmH_2O)	133 ± 16	121 ± 43
Tip Ventilation (%)	23 ± 16	35 ± 17

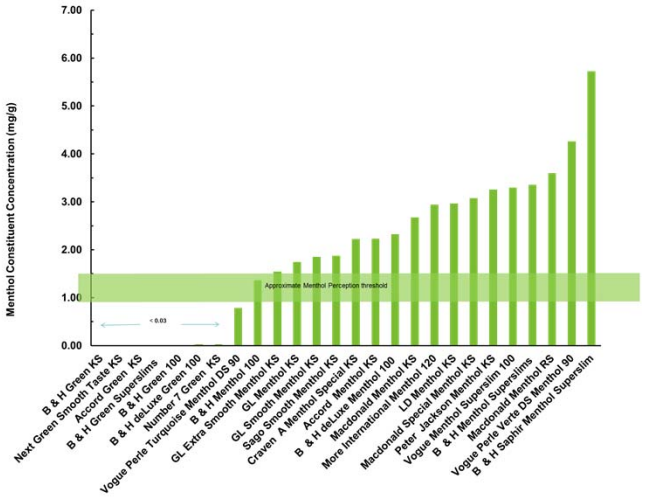

Figure 1: Menthol constituent concentration of "Green" and Menthol brand cigarettes

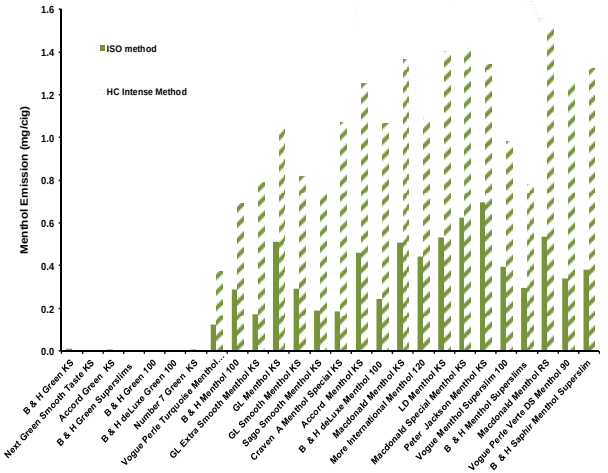

Figure 2: Menthol emissions of Green and Menthol brand cigarettes utilizing both ISO and Health Canada methods

•Emissions of tar, nicotine, and triacetin did not differ between "Green" and menthol brands

•Glycerol emissions, using both Health Canada and ISO methods, were significantly higher in "Green" cigarettes when compared to menthol brands

•For paired menthol and "Green" products (e.g. B & H Menthol Superslims vs. B & H Green Superslims), in 2 of the 4 pairs, tip ventilation was greater in the menthol product.

CONCLUSIONS

•"Green" branded cigarettes did not contain or emit quantifiable levels of menthol.

•Menthol cigarettes do not vary significantly, in terms of nicotine and tar content, when compared to "Green" branded cigarettes.

•In comparison with US products, Canadian menthol brands contain a lower concentration of menthol, Canadian concentration average : 2.7 mg/g of cigarette filler, U.S. concentration average 8.9 mg/g (assuming average filler weight 0.7 g/cigarette) (Ai et al 2015)).

•This study provides a baseline measure of menthol content in cigarettes on the Canadian market and may inform future Health Canada regulatory surveillance and compliance activities.

REFERENCES

1.Ai J, Taylor KM, Lisko JG, Tran H, Wilson CH, Holman MR. Menthol Content in US Marketed Cigarettes. Nicotine Tobacco Research. 2016: 18(7): 1575-1580

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