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Letter to the Editor

Absinthe and tobacco—a new look at an old problem? (comment on: Absinthe—is its history relevant for current public health?)

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The recent Huisman *et al*. paper[1] addresses an interesting phenomenon that has been neglected so far in the modern scientific literature: the similar patterns between absinthe and tobacco use (e.g. Figure 1) and their relevance as exemplary behaviours with major threats to public health. Parallels between the use (and abuse) of the two products were first drawn by the 19th century French temperance movement, and we are surprised that Huisman *et al*. didn't reference the two widely disseminated books on the subject, Jolly's 'Le tabac e l'absinthe. Leur influence sur la santé publique sur l'ordre moral et social' (1st edition 1875, 2nd edition 1887)[2] and Galopin's 'Le tabac, l'absinthe, et la folie' (undated, circa 1885).[3]

We disagree with Huisman *et al*. about the argument in the section 'Absinthe today' of the paper, which raises the following important point:

> The absinthe currently sold is not the same as the absinthe that was drunk in the pre-ban era, because of current restrictions in the amount of thujone (no more than 35 mg/kg) that beverages can contain according to EU law. Therefore, the present-day absinthe is arguably a more innocent substance than the absinthes of old, which had much higher concentrations of thujone (sometimes 25 times as much), and consequently served as a stimulant (because of the thujone) and a relaxant (because of the alcohol) at the same time.

This point is of special public health relevance as it postulates some so-called secondary effects of absinthe that might explain deleterious effects regularly summarized under the syndrome 'absinthism'.

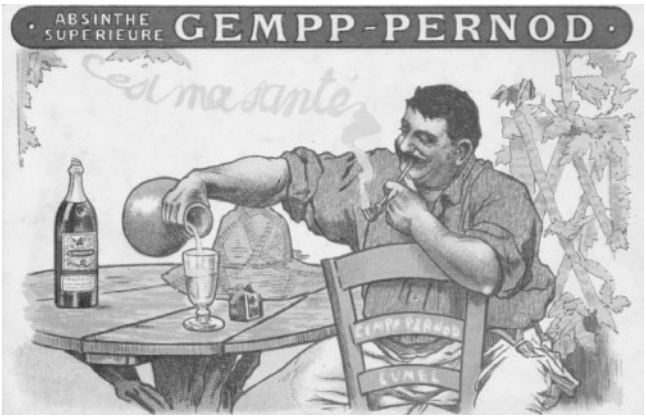

Figure 1 Absinthe and smoking: 'It's for my good health'

This point clearly must be rebutted as it is unsupported by scientific proof. Huisman *et al*. base their argument on higher concentrations of thujone (sometimes 25 times as much) found in pre-ban absinthe. As reference, they cite an article of Höld *et al*.[4] If we consult this article, we find that the information about the thujone contents goes back to an article of Strang *et al*.,[5] which is one of the most widely cited papers about absinthe. The authors of the article postulate that 'the thujone content of old absinthe was about 0.26 g/l' and Duplais' French distilling guide written in 1855[6] is given as reference. This citation is misleading. Duplais' recipes merely give the wormwood content used for absinthe making, and there is no mention of thujone (or any other terpene) in both volumes of Duplais' work. As there was no mention of 0.26 g/l in Duplais' book, it can only be presumed how Strang *et al.* derived this concentration. Most probably they meant that an educated guess as to the thujone content of absinthe can be made from Duplais' recipes. In a previous article,[7] we have unambiguously demonstrated that the calculation of 260 mg/l was an overestimation. We have clearly shown that dependent on the recipe, the mean thujone content of absinthe may have been ranged around 17–23 mg/l with large standard deviations of 16–21 mg/l, the median content may have been around 10–14 mg/l.[7] In the years following the publication of Strang *et al*.,[5] this imprecise citation

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of 260 mg/l led to further propagation of an inaccurate assumption. This *estimated* thujone content is now frequently presented as a known fact, e.g. 'Absinthe contains a number of terpenes and terpene derivatives, including thujone (ca. 2.4 mM)'.[8] The working group of Casida at Berkeley[4,9,10] derived that thujone is best known as the active ingredient and toxic principle of absinthe, which is a presumption unsupported by literature data.

Furthermore, experimental evidence pointing to the overestimation of the thujone content of pre-ban absinthe was provided by a number of studies. Some absinthes produced according to historic recipes only contained relatively low concentrations of thujone (mean: 1.3 ± 1.6 mg/l, range: 0–4.3 mg/l).[11] Concentrations below 10 mg/l were also found in a number of tests of vintage absinthes.[11–14] In contrast, experimental evidence is still lacking to confirm Strang's claims of high thujone content.

Over and above the question of the thujone level itself, we very much doubt that absinthe would cause any secondary effects even *were* it to contain 260 mg/l of thujone. For example, the consumption of as much as 1 l of an alcoholic beverage containing 260 mg/l of thujone, would result in an intake of about 4.3 mg thujone/kg bw for a 60 kg adult. Even this unrealistically high intake of alcohol produces thujone concentrations below the 'no observed effects level' (NOEL) of 5 mg/kg bw (for a detailed toxicological review about thujone see Padosch *et al*.[15]). The consumption of 1 glass (30 ml) of such an absinthe, containing approximately 7.8 mg of thujone, would result in an intake of approximately 0.1 mg thujone/kg bw, which is 50 times lower than the NOEL.

We conclude that the scientific literature contains no proof that historic absinthes may have contained thujone in concentrations able to produce any secondary effects. The current state of research considers absinthism to be a type of alcoholism.[15] The research focus about absinthe should therefore be moved from thujone to ethanol. In our view, the influence of tobacco in the etiology of absinthism demands further research. Today, the association of simultaneous alcohol drinking and smoking leading not to additive but multiplicative effects is strikingly proven for the carcinogenicity of both substance groups.[16] It is therefore not unlikely that smoking to at least some degree contributed to the health threat of ethanol in the high-proof spirit absinthe in late 19th century France.

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