Integrating biodynamic methods into elm mistletoe cultivation – effects on pharmaceutical products

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Research Question

Elm mistletoe has been used as cancer remedy since 1952, after mistletoe-bearing elms had been found in France (Leroi 1952). A specific therapeutic potential for elm mistletoe extracts (Iscador Ulmi) has been observed for the treatment of bronchial carcinoma (Wilkens & Mandera 2012). In order to meet rising pharmaceutical demands on a long-term basis, the cultivation of elm mistletoe was initiated in 1976, based on vegetative propagation of mistletoe receptive elms, based on vegetative propagation of mistletoe receptive elms by root cuttings (Grazi 1987).

During the same period, Dutch elm disease (DED) began to affect elm trees all over Europe (Nierhaus-Wunderwald & Engesser 2003). At the end of the 20th century, known natural elm mistletoe had been almost completely eradicated. First effects of DED on cultivated mistletoe-bearing elms were observed in 2007, and meanwhile 90% of cultivated elm mistletoe stocks have been damaged. In order to guarantee elm mistletoe supply for remedy production, new strategies were developed: Additionally to intensified care and pro-active protection of surviving mistletoe-bearing elms, the generative propagation of mistletoe-bearing elms was developed.

One instrument to improve the resilience against DED was to apply biodynamic (BD) preparations 500 and 501 on surviving and newly raised mistletoe-bearing elms. Because elm mistletoe meanwhile is exclusively harvested from cultivated sites under controlled conditions, it was possible to examine influences of BD treatment on pharmaceutical mistletoe products with picture forming methods.

Research Methods

On sites near Dornach (Switzerland), where elm mistletoe has been cultivated since 1980, horn manure spray preparation (BD 500) was applied in March 2011. Selected mistletoe-bearing elms (= type A = frequent BD treatment) received additional BD 500 application in April and May 2011. Horn silica spray preparations (BD 501) were applied on these elms (type A) two weeks before the harvest of summer mistletoe in June and in October (Fig.1), i.e. six weeks before winter mistletoe harvest. In comparison, selected mistletoe-bearing elms of type B (= rare BD treatment) did not receive any BD 501 application and only one BD 500 application in March.

Fig. 1: Application of horn silica preparation (BD501) on mistleteo bearing elm trees in autumn 2009.

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Duplicate samples were taken for type A and type B treatment from a) summer mistletoe extract (SuEx), b) winter mistletoe extract (WiEx) and c) Iscador Ulmi (active substance = SuEx and WiEx blended on a specific device; see Baumgartner et al. 2014). Samples were blinded and examined with capillary dynamolysis, round image chromatography and copper chloride crystallization; differences were described qualitatively.

Results

The 12 encoded samples could be correctly grouped (SuEx, WiEx and Iscador) by means of capillary dynamolysis and round image chromatography. Within the three groups, the samples could be correctly allocated to frequent BD application (type A) and rare BD application (type B).

Copper chloride crystallization generated poorly differentiated images for SuEx and WiEx samples that did not allow differentiation of frequent (A) and rare (B) BD application. In contrast, highly differentiated images for Iscador samples allowed to identify differences between frequent (A) and rare (B) BD application. These were comparable to differences found between hand mixture of summer and winter mistletoe sap versus blending of summer and winter mistletoe saps on the Iscador-specific device.

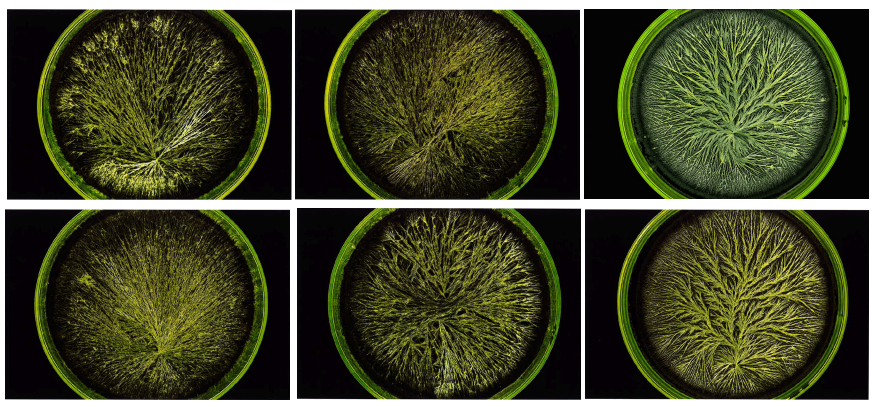

Fig. 2: Copper chloride crystallization revealed differences between extracts of summer mistletoe (left), extracts of winter mistletoe (middle) and Iscador (summer & winter extract blended on specific device, right) and also between frequent (Type A, upper row) and rare (Type B, lower row) BD treatment.

Conclusions

Frequent BD application on mistletoe stocks seems to enrich the inner quality of the active substance (Iscador) in similar ways as blending summer and winter mistletoe saps on the Iscador-specific device. Synergistic effects can be hypothesized.

References

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