



Figure 3: Percentage of activated NK cells (a) and T cells (b) in human peripheral blood in response to treatment with *Azorella compacta* infusion (ACI) for 24 h is shown on dot plots. Cells that stain both for CD69 and a cell marker appear in the upper right quadrant of a dot plot. Numbers in each quadrant are the percent of cells found in each quadrant. Mean fluorescent intensity (MFI) of CD69 expression on activated NK cells (c), T cells (d), and granulocytes (e) from human peripheral blood in response to treatment with ACI for 24 h is shown as histograms. The filled histograms (black color) represent the group control (untreated) and the open histograms the stimulated (pretreated) group. The mitogen, phytohemagglutinin (PHA), was used as a positive control. The histograms are representative of three separate experiments using cells from three different donors.

alternative to prevent viral and bacterial infections, and to face age-associated immune deficiency. The identities of the eight most abundant compounds in ACI [Figure 2] were determined on the basis of their UV and MS spectra after comparison with data reported in literature. The MS data and literature references^[14-20] are presented in Table 1. A description on the HPLC/PDA/ESI-MS characterization of the ACI polyphenolic profile, and also figures of MS/MS spectra corresponding to the molecular ions of compounds 1-8 are given in Appendix. The compounds 1 and 3, the major constituents of ACI, have been shown to exhibit free radical scavenging, and anti-inflammatory and antidiabetic properties.^[21,22] Therefore, it is

conceivable that the claimed benefits of this herbal tea might be attributed, at least in part, to these compounds.

CONCLUSIONS

In this study, the health-promoting properties of ACI were determined by evaluating its free radical scavenging and immune-stimulating effects. The total contents of polyphenols were quantified and individual phenolic acids and flavonoids were tentatively identified in ACI. Chlorogenic acid and iso-orientin, two powerful antioxidants, were identified as the major polyphenols in ACI. The infusion showed a potent scavenging effect against DPPH free radical and superoxide anion radical, which can be attributed to the presence of chlorogenic acid and iso-orientin. The *ex-vivo* activation of human immune cells by ACI, as determined by cell surface CD69 expression, was reported for the first time. ACI was shown to substantially stimulate NK cells, whereas T cells and granulocytes were activated on a lower scale. All together, these data support the traditional use of ACI to treat and prevent diseases in which free radicals are implicated, and suggest that this functional herbal tea could be used as a potential nonspecific immune stimulator.

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Conflicts of interest

There are no conflicts of interest.

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