

Studies of the seasonal variation of isoquinoline alkaloid content in *Corydalis bracteata* (*Fumariaceae*)

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The genus *Corydalis* contains about 350-500 species, widely distributed in the northern hemisphere. Some *Corydalis* plants have been used in traditional Asiatic medicines as an analgesic in the treatment of skin and infectious diseases, gastric and liver disorders. The major bioactive constituents of these herbs are considered to be isoquinoline alkaloids. The European studies of these compounds have revealed their anti-tumor and anticholinesterase activity in animals and suggest their probable use as cancer chemopreventive agents and drugs to combat Alzheimer's disease. *Corydalis bracteata* is an early spring perennial tuberous herb distributed in the Siberian part of Russia. After short spring vegetation (April - June) the plants lose aerial parts and are only represented by an underground tuber.

Using HPLC, the accumulation of six protopine and tetrahydroprotoberberine alkaloids was studied in *C. bracteata* tissues during spring aerial growth. The seasonal variation in alkaloid content showed a marked age and tissue specific manner. Early in season and during flowering, the highest values of alkaloids were observed in tubers and leaves, whereas during fruiting the fruits were characterized by a significant increase in alkaloid content, in parallel to a decrease in all other aerial and underground organs. These variations were accompanied by cell-specific distribution of alkaloids in different tissues, as visualized by fluorescent microscopy.

The relationship between alkaloid content in tissues depending on growth stages of plants and their particular cell-specific accumulation is discussed with regard to the biosynthesis and involvement in a defence role of these metabolites.

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