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**Title:** A combination of thyme and primula dry extracts possesses antitussive activity and inhibits leukotriene formation

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**Body:** Acute bronchitis is an inflammatory disease of the lower airways and is frequently accompanied by cough. Fixed combinations of extracts of thyme (THY) and primula (PRI) (Bronchipret®) have long and successfully been used in the treatment of acute bronchitis. We investigated the mixture (THY/PRI) for its antitussive activity as well as the mixture and the single extracts for their ability to inhibit 5-lipoxygenase (5-LO) activity and the associated formation of pro-inflammatory leukotrienes (LTs). To assess antitussive activity, guinea pigs were pre-treated with three doses of THY/PRI (50, 160, 500 mg/kg, corresponding to the 1-, 3- and 10-fold human equivalent dose) and stimulated with inhaled citric acid. As readout, cough frequency was measured. Three studies were performed and a meta-analysis accomplished. Interference with 5-LO activity was studied in a cell-free assay using isolated human recombinant 5-LO as well as in cell-based assays where formation of LTB<sub>4</sub> and cysteinyl(cys)LTs was investigated in stimulated human neutrophils or monocytes, respectively. THY/PRI dose-dependently and significantly reduced the cough number (30 ± 4% to 56 ± 5%) when compared to vehicle control (0.9% NaCl; 10 ± 4%). The reference control codeine caused 85 ± 2% reduction. THY/PRI as well as THY and PRI efficiently suppressed formation of LTB<sub>4</sub> (IC<sub>50</sub> = 40, 25, 35 µg/mL) and cysLT (IC<sub>50</sub> = 10, 12, 30 µg/mL). They also inhibited the activity of isolated 5-LO (IC<sub>50</sub> = 8, 12, 20 µg/mL). In summary, the herbal medicinal product composed of a fixed combination of THY and PRI extracts (as contained in Bronchipret®) possesses antitussive activity and is a potent inhibitor of LT production.