

Mechanisms of relaxant action of S-petasin and S-isopetasin, Sesquiterpenes of *Petasite formosanus*, in isolated guinea pig trachea

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摘要

Abstract

We investigated the mechanisms of action of S-petasin and S-isopetasin, from *Petasites formosanus* Kitamura which is used as a folk medicine for treating hypertension, tumors, and asthma in Taiwan. The tension changes of tracheal segments were isometrically recorded on a polygraph. S-Petasin and S-isopetasin non-competitively inhibited cumulative histamine-, and carbachol-induced contractions with an exception that S-isopetasin produced a parallel, rightward shift of the concentration-response curve of carbachol in a competitive manner. S-Petasin also non-competitively inhibited cumulative Ca(2+)-induced contractions in depolarized (K⁺, 60 mM; histamine, 100 microM; or carbachol, 10 microM) guinea-pig tracheas. S-Isopetasin did in depolarized (K⁺, 60 mM) trachea too. The nifedipine (10 microM)-remaining tension of carbachol (0.2 microM)-induced precontraction was further relaxed by S-petasin or S-isopetasin, suggesting that no matter whether either blocked VDCCs or not, S-petasin or S-isopetasin may have other mechanisms of relaxant action. The relaxant effect of S-petasin or S-isopetasin was unaffected by the presence of propranolol (1 microM), 2',5'-dideoxyadenosine (10 microM), methylene blue (25 microM), glibenclamide (10 microM), N omega-nitro-L-arginine (20 microM), or alpha-chymotrypsin (1 U/ml). However, S-petasin (100-300 microM), but not S-isopetasin, significantly inhibited cAMP-, but not cGMP-dependent PDE activity of the trachealis. The above results reveal that the mechanisms of relaxant action of S-petasin and S-isopetasin may be primarily due to its non-specific antispasmodic and antimuscarinic effects, respectively.