The active ingredient from processed aconitine root as $Na_v1.7$ voltage-gated sodium channels blocker

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Processed roots of *Aconitum carmichaeli* (Ranunculaceae) (PA) has been known as one of the intense active herbal medicine in Japanese Kampo medicine. Because its raw root contains toxic alkaloids, PA has usually been used after the detoxication by autoclaving, and is prescribed to ameliorate various pains. However, the active ingredients of PA to produce antinociception has not been well identified. In this study, we examined the effect of seven alkaloids containing in PA on $Na_v1.7$ voltage-gated sodium channels (VGSCs) transfected HEK293 cells. 10 μM mesaconitine, aconitine and hypaconitine, which are toxic alkaloids containing in the raw roots of *A. carmichaeli*, showed the inhibitory effects on $Na_v1.7$ VGSCs peak currents significantly, and those effects continued after washing out of those compounds with perfusion. In contrast, benzoylmesaconine, benzoylaconine, aconine and hypaconine, which are produced after the autoclaving of PA, did not show the inhibitory effect on $Na_v1.7$ VGSCs peak currents.

These results indicated that mesaconitine, aconitine and hypaconitine, which are mainly containing in the raw root and are survived from the degradation by autoclaving, would be the antinociceptive active ingredients of PA *via* the inhibition of $Na_v1.7$ VGSCs currents.