Fractionation Fraction D (hereafter abbreviated as D), which was obtained by gel chromatography of the hot-water extract of young barley leaves on a column of Sephadex G-25 fine, was used as the starting material. D was fractionated on a column of Amberlite CG-120 (H⁺) successively with H₂O, 10% AcOH, and 1% HCl. The hypotensive fraction (water eluate, E) was chromatographed on a column of Amberlite CG-400 (OAc⁻) with the same solvent systems. Both the H₂O and 10% AcOH fractions showed the hypotensive effects. The aqueous solution of E separated precipitates on standing, which were ineffective. The mother liquor was fractionated by preparative paper chromatography (PPC) with 4:1:5 BuOH-AcOH-H₂O into 4 fractions, d, e, f, and g. The effective fraction, e (RF 0.25-0.45), was further divided into 5 subfractions e₁-e₅ by repeated PPC, among which (RF 0.40) was the most effective. The average decrease of blood pressure in SHR was 70 mmHg 1 hr after intravenous injection of 0.2 mg/100 g of body weight.

The isolated fraction e₂ was soluble in H₂O, difficulty soluble in MeOH, in insoluble in EtOH, Me₂CO, and Et₂O. It gave single spots on paper and thin layer chromatographies. Purple spots were visible when irradiated by a mercury lamp, but the color turned yellow on exposure to ammonia gas. The spots impregnated with ammonia also colored yellow under the daylight. Further, characteristic violet color developed by ferric chloride spray. These evidences suggest that fraction e₂ contained a phenolic compound as the main component.

Mechanism of action The isolated aortae and atria of Wistar-Kyoto rats were used in this experiment. D inhibited the tonus and the contractions by noradrenaline and K in a dose-dependent manner. That is, the minimal inhibitory concentrations of D to tonus and the contractions by K and noradrenaline were equally 2x10⁻⁴ g/ml, and 10⁻³ g/ml showed the approximately 50% inhibition against the tonus and those contractions. But no difference as to the inhibitory effect of D on the contractions by noradrenaline and K was found. It is reported that maintenance of tonus and contraction by K is due to Ca influx and Ca release and the contraction by noradrenaline is due to only Ca release. It is suggested that D may inhibit Ca influx and Ca release in blood vessel. D did not inhibit the spontaneous movement of atria even in the extremely high concentration of D (2x10⁻³ g/ml). Thus, it is thought that the inhibitory effect on heart muscle does not participate in the hypotensive effect of D. Also, D may have a selectivity to blood vessel.

Fraction A₁ from the extract of chlorella (hereafter A₁) did not show the inhibitory effect on the tonus and the contractions by noradrenaline and K in blood vessel and also on the spontaneous movement of atria even in the extremely high concentration of A₁ (2x10⁻³ g/ml). These results suggest that the hypotensive effect of A₁ may be due to the mechanism different from that of D.

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