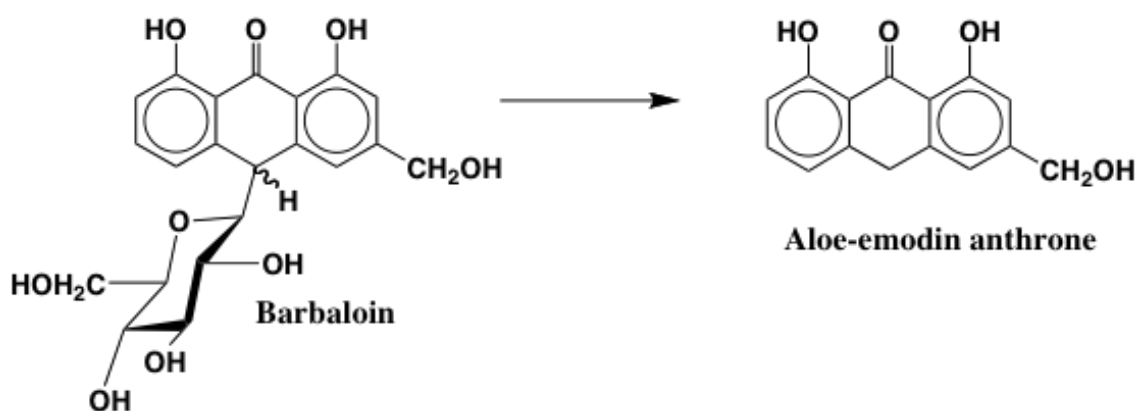


Barbaloin



代謝実験

動物代謝

腸内細菌代謝 ヒト腸内細菌フローラ、ヒト腸内細菌分離株 *Eubacterium* sp.

BAR

単一化合物 barbaloin

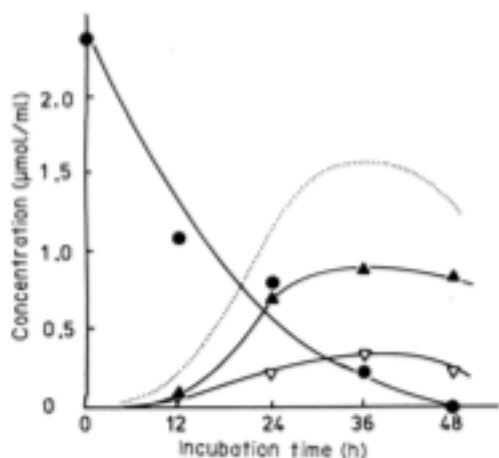
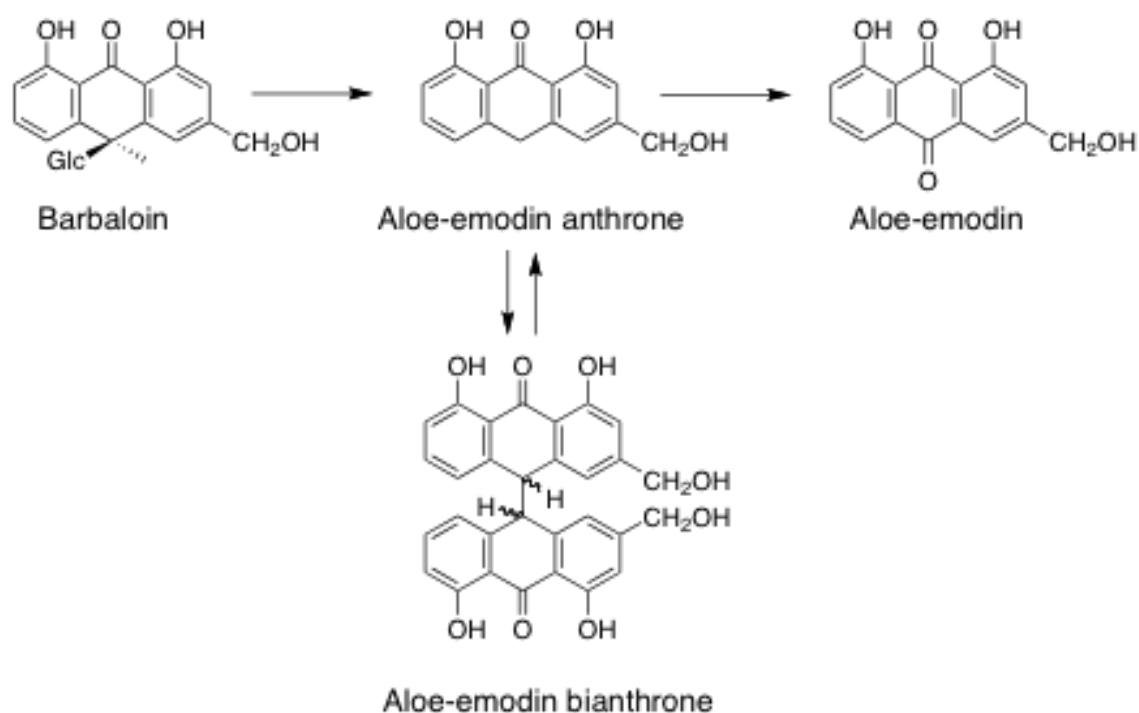


Fig. 1. Time course of metabolite formation by a bacterial mixture from human feces

Barbaloin was anaerobically incubated at 37 °C with a bacterial mixture from human feces and the products were quantitatively analyzed by TLC-densitometry. (●), barbaloin; (▲), aloe-emodin anthrone; (▼), aloe-emodin bianthrone; The dotted line is the sum of aloe-emodin anthrone and aloe-emodin bianthrone x 2. [Hattori *et al.*, *Chem. Pharm. Bull.*, **36**, 4462-4466 (1988)]



As illustrated in Fig. 1, barbaloin is converted to aloe-emodin anthrone by human intestinal bacterial flora, which is readily oxidized to yield aloe-emodin and aloe-emodin anthrone. [Hattori *et al.*, *Chem. Pharm. Bull.*, **36**, 4462-4466 (1988)]

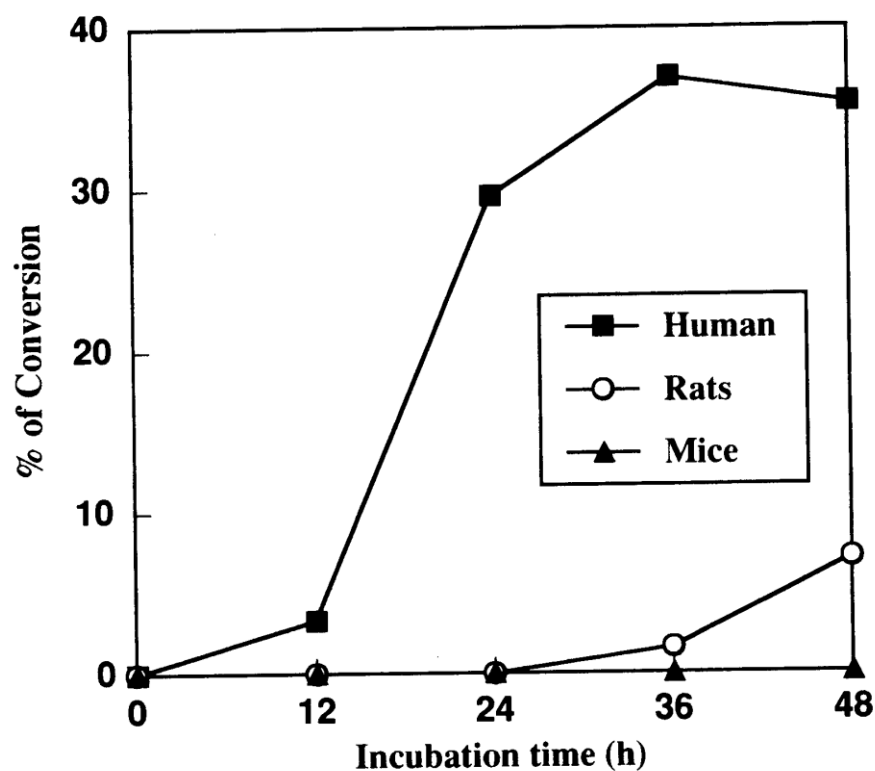


Fig. 2. Comparison of metabolic activity of barbaloin among fecal flora from humans, rats and mice

Feces of two Wistar rats (male, 6 weeks old) and three Donryu rats (male, 4—7 weeks old); two ddY mice (male, 4 weeks old), two BALB/C mice (female, 7—11 weeks old) and one C₃H mouse (female, 7 weeks old) were examined for their ability to metabolize barbaloin to aloe-emodin anthrone. [Hattori *et al.*, *Chem. Pharm. Bull.*, **36**, 4462-4466 (1988)]

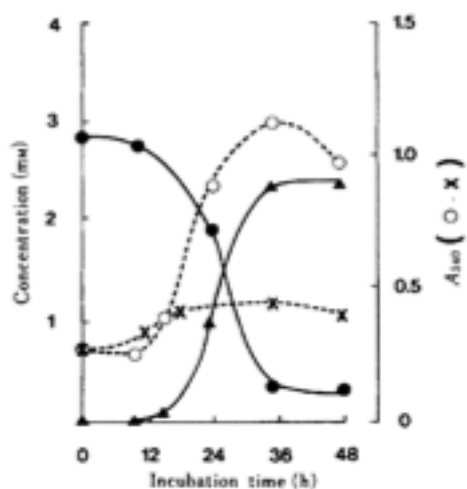


Fig. 3. Stimulation of growth of strain BAR by barbaloin and transformation of barbaloin to aloe-emodin anthrone

Bacterial growth in PYF broth (x) and PYF broth containing 1 mg/ml barbaloin (○) was monitored by measuring turbidity at 540 nm. (●), barbaloin; (▲), aloe-emodin anthrone. Aloe-emodin anthrone was quantitatively determined as an azomethine derivativ formed with *N, N'*-dimethyl-*p*-nitrosoaniline. [Che *et al.*, *Chem. Pharm. Bull.*, **39**, 757-760 (1991); Che *et al.*, *Planta Med.*, **57**, 15-19 (1991)]

Table 1. Effects of barbaloin on faecal water content

Rat	Fecal water content (%)		
	0 h	8 h	24 h
Conventional	63.5±3.0	51.3±2.3	56.9±6.8
Gnotobiot mono-associated with <i>Eubacterium</i> sp. BAR	73.±3.2	85.5±3.2*	77.3±1.8
Gnotobiot mono-associated with <i>Peptostreptococcus intermedius</i>	73.9±3.8	71.9±1.3	73.7±1.3

Values are expressed as means±S.E.M. of four gnotobiot rats and three conventional rats. * $p < 0.05$ when compared with the value at 0 h. [Akao *et al.*, *Biol. Pharm. Bull.*, **19**, 136-138 (1996)]

Animals, treatments and sampling

Male Wistar rats (6 weeks old) and male Wistar germ-free rats (WA/Jic, 7 weeks old) were purchased from Clea Japan, Inc. (Tokyo, Japan). Conventional rats were maintained for two weeks before use and then kept individually in metabolic cages for the experiments: water and standard laboratory food (CE-2, Clea Japan, Inc.) were freely available. Sennoside B (40 mg/kg) or barbaloin (100 mg/kg) was orally administered to three rats, and water (1.0 ml) to three rats as the control. Germ-free rats were individually maintained in metabolic cages under germ-free conditions: autoclaved water and sterilized CE-2 were freely available. Four germ-free rats were infected to create the gnotobiotic rats with *Eubacterium* sp. strain BAR (2 ml medium) on the first and the third day, and four other germ-free rats with *P. intermedius* (2 ml medium) on the first and the third day. One week later, sterile barbaloin (16 mg/rat; 80–100 mg/kg) was orally administered to two groups of gnotobiotic rats. Fresh faeces were compulsively obtained just before and at 8 and 24 h after the administration, and then their water content (%) was determined. [Akao *et al.*, *Biol. Pharm. Bull.*, **19**, 136-138 (1996)]

参考文献

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