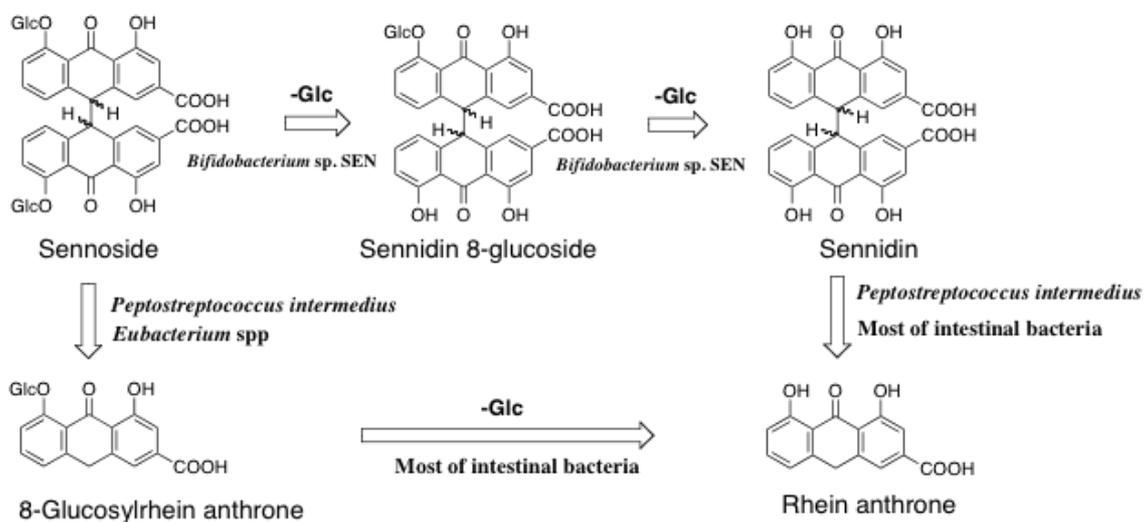


## Sennoside B



Metabolic processes of sennoside by human intestinal bacteria

### 代謝実験

腸内細菌代謝 ラット腸内細菌フローラ、ヒト腸内細菌

動物代謝 ラット

単一化合物 sennoside B

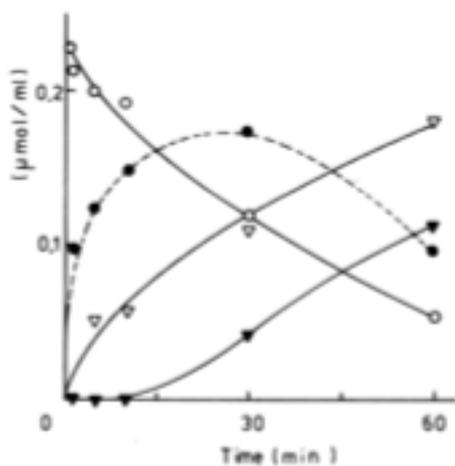


Fig. 1. Metabolism of sennoside B by a suspension of rat feces.

○, sennoside B; ●, sennidin B 8-glucosides; ▽, sennidin B; ▼, sennidin A  
 [Hattori *et al.*, *Chem. Pharm. Bull.*, **30**, 1338-1346 (1982)]

### Preparation of a suspension of rat feces and its supernatant fluid

Fresh feces (20 g) of Wistar rats (female, 180—220 g body weight) were suspended in 100 mM phosphate buffer (200 ml, pH 7.3) containing 0.05% cysteine, which had previously been bubbled through with carbon dioxide to eliminate air. The supernatant fluid was prepared by centrifuging the suspension at 10000 rpm for 10 min.

[Hattori *et al.*, *Chem. Pharm. Bull.*, **30**, 1338-1346 (1982)]

### Incubation of sennoside B with a suspension of rat feces and quantitative analysis of its metabolites

To 5 ml of a suspension of rat feces was added 500  $\mu$ l of a sennoside B solution (1 mg/ml, dissolved in 100 mM phosphate buffer, pH 7.3). After replacing air in the test tube with carbon dioxide, the mixture was incubated at 37°C for the indicated periods of time. The tube was then immediately cooled and centrifuged at 10000 rpm for 10 min. Next, 2% ethylenediaminetetraacetic acid (EDTA) (0.5 ml), 0.5 N HCl (0.5 ml) and *n*-BuOH (2 ml) were added to 2 ml of the upper layer. After vigorous shaking, the mixture was centrifuged at 3000 rpm for 10 min to separate it into two layers. Five  $\mu$ l of the upper layer was applied on a silica gel thin-layer plate (Merck Silica gel 60 F254, layer thickness 0.25 mm). The plate was then developed with a solvent system A, *n*-PrOH–AcOEt–H<sub>2</sub>O (4: 4: 3, v/v) containing a few drops of AcOH. The spots on chromatogram were detected under ultraviolet (UV) light and analyzed quantitatively by using a Shimadzu CS-910 chromatoscanner (Shimadzu Seisakusho Ltd., Kyoto).

[Hattori *et al.*, *Chem. Pharm. Bull.*, **30**, 1338-1346 (1982)]

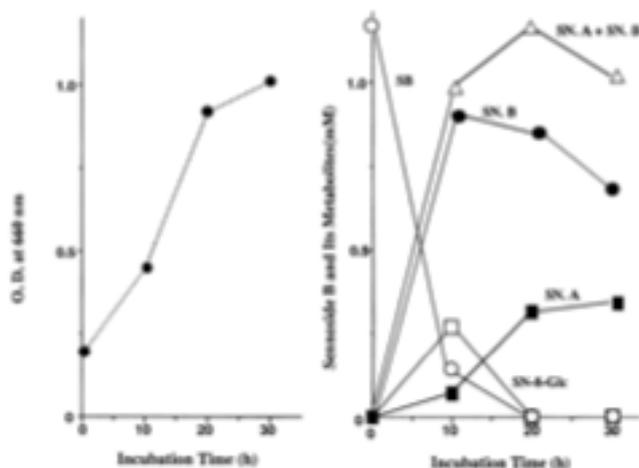


Fig. 2. Time course of sennoside B metabolism in PYF broth by *Bifidobacterium* sp. strain SEN.

Left: ●, bacterial growth. Right: ○, sennoside B (SB), ●, sennidin B (SN. B); □, sennidin B 8-glucoside (SN-8-Glc); ■, sennidin A (SN. A); △, sennidins A and B (SN. A+SN. B). [Akao *et al.*, *Applied and Environmental Microbiology*, **60**, 1041-1043 (1994)]

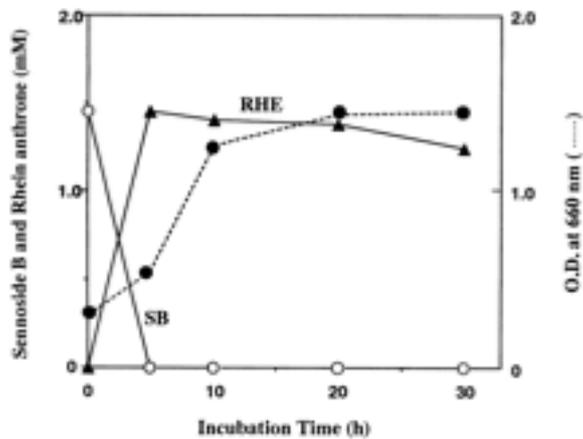


Fig. 3. Metabolism of sennoside B in PYF broth by a mixed culture of *Bifidobacterium* sp. strain SEN and *Peptostreptococcus intermedius*.

Rhein anthrone (RHE: ▲) was detected as an azometin derivative by adding *N,N'*-dimethyl-*p*-nitrosoaniline. O.D., optical density. [Akao *et al.*, *Applied and Environmental Microbiology*, **60**, 1041-1043 (1994)]

## 参考文献

- 1) Kobashi K., Nishimura T., Kusaka M., Hattori H. and Namba T.: Metabolism of sennosides by human intestinal bacteria. *Planta Med.*, **40**, 225-236 (1980).
- 2) Hattori M., Kim G., Motoike S., Kobashi K. and Namba T.: Metabolism of sennosides by intestinal flora. *Chem. Pharm. Bull.*, **30**, 1338-1346 (1982).
- 3) Akao T., Akao T., Mibu K., Hattori M., Namba T. and Kobashi K.: Enzymatic reduction of sennidin and sennoside in *Peptostreptococcus intermedius*. *J. Pharmaco-bio Dyn.*, **8**, 800-807 (1985).
- 4) Akao T., Mibu K., Erabi T., Hattori M., Namba T. and Kobashi K.: Non-enzymatic reduction of sennidins and sennosides by reduced flavin. *Chem. Pharm. Bull.*, **35**, 1998-2003 (1987).
- 5) Hattori M., Namba T., Akao T. and Kobashi K.: Metabolism of sennosides by human intestinal bacteria. *Pharmacology*, **36** (s-1), 172 -179 (1988).
- 6) Akao T., Che Q. M., Kobashi K., Yang L., Hattori M. and Namba T.: Isolation of a human intestinal anaerobe, *Bifidobacterium* sp. strain SEN, capable of hydrolyzing sennosides to sennidins. *Applied and Environmental Microbiology*, **60**, 1041-1043 (1994).
- 7) Yang L., Akao T., Kobashi K. and Hattori M.: A sennoside-hydrolyzing b-glucosidase from *Bifidobacterium* sp. strain SEN is inducible. *Biol. Pharm. Bull.*, **19**, 701-704 (1996).
- 8) Yang L., Akao T., Kobashi K. and Hattori M.: Purification and characterization of a novel sennoside-hydrolyzing b-glucosidase from *Bifidobacterium* sp. strain SEN, a human intestinal anaerobe. *Biol. Pharm. Bull.*, **19**, 705-709 (1996).