

Anti-MRSA Compounds from *Herichium erinaceus* (Bull.:Fr.) Pers.

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Methicillin-resistant *Staphylococcus aureus* (MRSA) is currently one of the most prevalent pathogens in nosocomial infections. Because hospital-acquired MRSA strains exhibit resistance to many antibiotics and are transmitted from patient to patient via transiently colonized hands of hospital personnel, MRSA infections pose a serious problem for hospitalized patients.

We found that extracts of the fruiting bodies and the mycelia of *Herichium erinaceus* (Bull.:Fr.) Pers. exhibited anti-MRSA activity. Therefore, we tried to isolate the anti-MRSA compounds from the fungus.

Isolation of the active compounds was guided by anti-MRSA activity. The fungus was cultivated by shaking at 30°C for 4 weeks. The culture was centrifuged, and the resulting residue was extracted with 85% ethanol, and the extract, after evaporating the solvent, was partitioned between chloroform and water and then ethyl acetate and water. Repeated silica gel chromatography and HPLC of the chloroform-soluble and ethyl-acetate-soluble parts gave five active compounds. The fruiting bodies of the fungus were also extracted with 85% ethanol, and the extract was concentrated and fractionated by solvent partitions between chloroform and water, and then ethyl acetate and water. Repeated silica gel chromatography and HPLC of the chloroform-soluble part gave an anti-MRSA compound.

As a result, erinacines A (1) and B (2) were isolated as anti-MRSA compounds from the mycelia

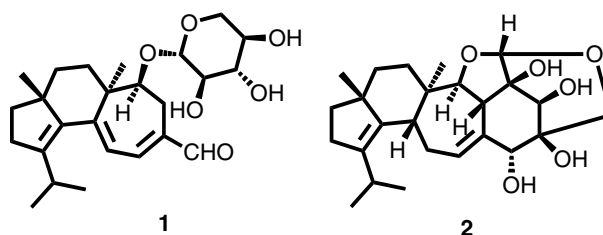


FIGURE 11. Structures of erinacine A (1) and erinacine B (2).

(Figure 1). These compounds have already been isolated as nerve growth factor (NGF) stimulators (Kawagishi et al., 1994, 1996). Determination of the structures and estimation of detailed biological activity of the other active compounds are now in progress.

In addition, a clinical test of this mushroom was done in a hospital in Japan, and MRSA in some patients disappeared when they were given this mushroom to eat.

REFERENCES

- Kawagishi H et al. 1994. Erinacines A, B and C, strong stimulators of nerve growth factor (NGF)-synthesis, from the mycelia of *Herichium erinaceum*. *Tetrahedron Lett*, 35(2), 1569–1572.
- Kawagishi H et al. 1996. Erinacines E, F, and G, stimulators of nerve growth factor (NGF)-synthesis, from the mycelia of *Herichium erinaceum*. *Tetrahedron Lett*, 37(41), 7399–7402.