

Figure 1. The beautiful but dangerous *Podostroma cornu-damae*, courtesy Taylor Lockwood. Recent poisonings in Japan were apparently caused by confusion with the similarly colored club mushroom *Clavulinopsis miyabeana*.



THE MOST DANGEROUS MUSHROOM

(that you've never heard of)

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Professor Hideo Tomioka, a friend of mine recently sent word from Nagoya, Japan, of a dangerous mushroom that has been making headlines there. According to the August 26, 2011 edition of Yomiuri Shinbun, Japan's largest daily, a mushroom known as kaen-dake (in Romanji) has been expanding its range in Shiga Prefecture. Alarms have been raised as this region is adjacent to the huge Chūkyō metropolitan area which is the 3rd largest in Japan (8.74 million people) and includes the city of Nagoya. The newspaper article included a photo of the bright red coral like fungus *Podostroma cornu-damae* (Fig. 1) and cautioned readers to be very careful of this mushroom. The fungus was unfamiliar to both of us, but there is an uncommon (and not known to be dangerous) species of *Podostroma* in North America (*Podostroma alutaceum*, Fig. 2 and 3).

Several poisonings have been reported in Japan, resulting from consumption of *Podostroma cornu-damae*. In 1999, one of a group of five people from Niigata prefecture died two days after consuming about 1 gram (0.035 oz) of a fruit body that had been soaked in sake. In 2000, an individual from Gunma prefecture died after eating the fried mushroom. Symptoms associated with consumption in these cases included stomach pains, changes in perception, decrease in the number of leukocytes and thrombocytes, peeling skin on the face, hair loss, and shrinking of the cerebellum, resulting in speech impediment and problems with voluntary movement (Saikawa et al., 2001). In another instance, an autopsy revealed multiple organ failure, including acute kidney failure, liver necrosis and disseminated intravascular coagulation (Koichi et al., 2003). In one case of poisoning, the patient suffered from hemophagocytosis, in addition to severe leukocytopenia and thrombocytopenia seven days after ingesting the fungus. Plasmapheresis and administration of granulocyte colony-stimulating factor

were used to treat the blood disorders. The authors suggested that these treatments, in addition to the large volume of administered intravenous fluid—9 liters (2.4 US gal) over a 12-hour period—were responsible for his successful recovery (Suzuki et al., 2002).

The poisoning symptoms are similar to



Figure 2. The North American species, *Podostroma alutaceum*, found in Iowa. Courtesy of Jim Frink and the Prairie States Mushroom Club.

those observed previously with animals that have consumed trichothecene mycotoxins. Japanese researchers detected the presence of the macrocyclic trichothecenes: satratoxin H, satratoxin H 12', 13'-diacetate, satratoxin H 12'-acetate, and satratoxin H 13'-acetate. When grown in liquid culture the fungus additionally produces roridin E, verrucarins J, and satratoxin H. With the exception of verrucarins J, a 0.5 gram (0.018 oz) dose of all of these compounds, when injected into the abdomen of mice, will result in their death the following day (Saikawa et al., 2001).

We are certainly lucky that this exceptionally poisonous fungus does not occur here. Professor Tomioka wrote that simply touching it is said to lead to the swelling of your flesh!

Podostroma cornu-damae is an ascomycete fungus, a member of the order Hypocreales (Pezizomycotina), and previously has gone by other names. According to Index Fungorum the fungus was originally described as *Hypocrea cornu-damae* by Patouillard (1895) and was found "in lignis putidus in Thibet, orient." *Podostroma cornu-damae* is next attributed to Boedijn (1934) (and see Doi, 1973). It was published in Saccardo's famous *Sylloge Fungorum* (1905), which was a comprehensive list of all of the names that had been used for mushrooms and other fungi (and was the only such list of its kind).

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Figure 3. The North American species, *Podostroma alutaceum*, found in Iowa and courtesy of Jim Frink and the Prairie States Mushroom Club.



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