

HEALTH/SCIENCE

Snakes alive! Japan's show their stuff

By KEVIN SHORT

The autumn harvest season is perhaps the best time for a leisurely stroll in the Japanese countryside. Small tractors move slowly through the rice paddies, followed closely by an army of birds — crows, egrets, shrikes, herons and small hawks — ready to pounce on the frogs, insects and other small prey turned out by the harvester.

Autumn is also a good season to see the many snakes that call the Japanese countryside home. As the temperature cools into late afternoon, you can watch them cross the narrow farm roads between the fresh-cut paddies and the woodlots. The small-to medium-size snake with the striking red, black and yellow pattern is the *yamakagashi*, or Japanese keelback; the large, heavy snake with indistinct black stripes can only be the *aodaisho* rat snake; the smaller black-striped snake with red eyes is

farmhouses, shrines and temples and especially grain storage sheds, where it hunts out rats and other small mammals. An excellent climber, the *aodaisho* may also take an occasional bird or egg.

The *shima-hebi* garter snake is another common Colubridae, usually found near water. This snake is a superb swimmer, and often enters the rice paddies to hunt frogs.

An all-black variation of the *shima-hebi*, called the *kara-su-hebi* (crow snake), is found in Hokkaido.

The *yamakagashi* keelback is also fond of frogs, and frequently hunts around paddies and irrigation ditches. Many people believe the docile *yamakagashi* is harmless, but it is potentially dangerous, belonging to a group of poisonous snakes known as backfanged Colubrids.

The *yamakagashi* possesses a strong poison, but lacks an efficient delivery system. The keelback has no long, hol-

mushi viper.

The *mamushi* is a member of the family Viperidae, a group of snakes that have taken the art of injecting poison to its logical conclusion. Vipers have two large hinged fangs, which are folded back against the roof of the mouth when the snake is at rest, but swing down and out when the mouth is open, erecting into position for a lightninglike stab.

Viper fangs are tubular, with a hole at the tip, and function like a precision hypodermic syringe. Poison moves directly from the secreting glands through the hollow fangs and deep into the victim's body.

The *mamushi* belongs to the Crotalinae, or pit-vipers, a subfamily of the Viperidae that has evolved a special heat-sensitive organ. Between the *mamushi*'s eyes

and nostrils is a large "pit" leading into this organ, thought to be capable of detecting a difference in temperature as small as 0.2°C.

This pit is extremely useful in locating small mammals at night. The body heat from even a mouse or vole is a dead giveaway. But Masami Hasegawa, a specialist in small vertebrates at the Natural History Museum and Institute, Chiba, has characterized the *mamushi* as a "good all-around player," rather than a specialist in nocturnal mammal hunting.

The *mamushi* takes full advantage of a great variety of available prey, feeding on frogs in and around the rice paddies, and small mammals in the surrounding forests. Although nonaggressive, the *mamushi* will attack humans in self-defense. Farmers are often bit on the arm when

reaching into the paddies. An antivenin is available, though; few people die from a *mamushi* bite nowadays.

Snakes, with their shiny scales, beady, lidless eyes and forked tongue, are feared and despised. In most areas of Japan, the *mamushi* is killed on sight, and other harmless species are killed by mistake in the general frenzy that accompanies a snake sighting.

The *mamushi* is also harvested and placed in *shochu* liquor to make a medicinal drink, said to be good for curing colds and even restoring sexual vitality. Dried and powdered *mamushi* is sold at Chinese herbal medicine shops, and is popular when mixed with powder from the *suppon* (soft-shelled turtle).

Snakes are an important element in the countryside ecosystem, and fascinating creatures in their own right. Hasegawa describes the fine-tuned adaptive characteristics of

