

are American crayfish, brought to Japan in 1930 as feed for the bullfrog aquaculture programs. Now these aggressive invaders have spread throughout the low-land rice districts. The habitat of the native Japanese crayfish is restricted to mountain streams in the northern part of the country.

Dragonfly eggs, laid down in the fall, hatch out into swimming nymphs, called naiads or *yago*. These voracious hunters have specialized jaws which can be snapped out at lightning speed. They ambush other insects, and even small fish, and must grow and molt several times before crawling out and metamorphosing into masters of the air.

A bucket of water scooped from a rice paddy is swarming with aquatic insects: water scorpions, toe-biters, diving beetles, whirlgigs, boatmen and backswimmers. Blood-sucking leech lurk among the seedlings, and the surface of the paddy is alive with water striders (sometimes called "Jesus-bugs" for their ability to walk on water). Water striders slide effortlessly over the surface film, feeding on mosquitoes and other tiny flying insects that fall into the paddy.

Barn Swallow and house martin, back home from southern wintering grounds, get double usage out of the rice paddies. Their first few weeks after arrival are spent scooping up paddy mud for nest-building. Next these aerial acrobats begin chasing flying insects that swarm over the paddies, and swooping down to pluck unlucky water striders right off the surface.

Resident birds, working hard to feed their growing



JAPANESE CHINKAPIN TREES bloom alongside a newly planted rice field. Coexisting together for two millennia, the paddies' wildlife have adapted their biological clocks to the rice farmers' harvest calendar. PHOTOS BY KEVIN SHORT



SCHEGEL'S GREEN TREE FROG (*Rhacophorus schelegelii*) kills time on the dike alongside a rice field. On the right, the annual rice planting isn't quite the backbreaking work it used to be, thanks to specialized tractor attachments.

chicks, spend entire days flying back and forth from nest to paddy. Starling, crow and turtle dove forage in the shallow areas around the edge of the paddy. A convenient overhang may contain a common kingfisher, waiting patiently for a chance to plummet down onto a loach or bitterling.

Little egret wade through the paddy, sharp eyes peeled for frogs and crayfish. In late afternoon the egret retire to their communal nesting colonies, but then black-crowned night heron take over for the late shift.

Migratory birds are also well aware of the bounty of food that becomes available when the paddies are flooded.

The Dusky Thrush, winter visitors from Siberia, are reluctant to return home until they have had a shot at foraging in the newly flooded paddies. Golden Plover arrive from their southern wintering grounds, spend a few weeks feeding intensively and storing up fat reserves, then leave for arctic breeding grounds. Solitary snipe and large flocks of cattle egret also somehow manage to time their arrival to coincide precisely with the transplanting season.

Rice paddies, especially those in narrow valleys surrounded by *zokibayashi* mixed woodlots, are far more than simple agricultural plots. They are rich wetland

habitats. Intensive rice cultivation reached Japan in the Yayoi Period, about 200 B.C. Japanese wildlife — insects, fish, mollusks, crustaceans, amphibians, reptiles, birds and even mammals such as weasels — have thus had two millennia to adapt their behavior and seasonal activities to the annual cycle of rice cultivation.

Keeping this in mind gives one a whole new perspective on the Japanese countryside landscape. With net, binoculars and magnifying lens, a simple rice paddy becomes a rewarding field for nature observation. May, with the newly flooded paddies and flocks of migratory waterfowl, is a great time to begin exploring.