NEW MONTANAN DECTICID, A GLACIAL RELICT

by

Gary Belovsky and Jennifer Slade
School of Natural Resources
University of Michigan
Ann Arbor, MI 48109-1115

We have been studying the population dynamics of grasshoppers at the National Bison Range near Molese, Montana since 1981. These studies have included the use of enclosed field populations to assess the importance of food limitation, interspecific competition, and predation in limiting grasshopper populations. In June of 1989, we established experimental grasshopper populations at a new site in the 9000 ha wildlife refuge. Unexpectedly, we found an abundance of a large decticid (Tettigoniidae) (3-5/m^2) at this site. Because there were insufficient numbers of several grasshopper species for us to initiate experimental populations, we stocked the excess enclosures with the decticid.

Our encounter with the decticid was serendipitous because we had been studying another site 100 m away on the other side of a rock outcrop for the previous 5 years without encountering them. To our surprise, the decticid is a new species of the genus *Steiroxys* (David Lightfoot is examining specimens). Adult females are large, attaining a body size of 1000-1400 mg fresh mass. More surprising, since finding this species, we have captured more than 1000 individuals without finding a male. The females are diurnally active, flightless, and slow-moving. We have searched without success for males at other times of the day and in the surrounding vegetation types. Furthermore, all of the recently emerged nymphs that we have captured are females. Female nymphs reared in the laboratory do deposit eggs as adults. Currently, we are trying to hatch the eggs to assess their viability and to determine whether any males are produced. But it appears that this species is parthenogenetic.

Since initially finding this species, we have located populations at three other sites on or near the Bison Range. John Henry has found a population approximately 35 km to the north, and Jeff Moorehead has found the species 50 km to the east in the Mission Mountains. The populations occur at elevations above 1300 m in lush meadows on north or northwest hillsides. These meadows are in small depressions (area less than 0.5 ha) where deep organic soils accumulate. Here the decticid feeds principally on forbs, such as lupine, yarrow, and dandelion (90% of crop contents).

Interestingly, all of these populations, except in the Mission Mountains, are found on hills that were islands in Pleistocene glacial-lake Missoula. Furthermore, the shoreline of this Pleistocene lake was just below 1300 m, the lowest elevation at which the decticid is found. The distribution of this new species appears to have been shaped by this 550 m deep lake that covered most of western Montana more than 12,000 years ago.

One might think that the habitat of this species is restricted to areas with microclimate conditions like those found in the Pleistocene. Using experimental populations of the species established in other habitats, we know this is not the case, since the decticid grows and survives better in habitats where it does not naturally occur. Competition with other Orthoptera cannot account for the decticid's habitat distribution, because it is a superior competitor reducing densities of grasshoppers in our experimental populations by 33-91%.

However, using tethered individuals, we found that this slow-moving and soft-bodied decticid is preyed upon by birds 3-4 times more heavily in the habitats where it does not occur. These areas have 40-70% bare-ground, while the inhabited areas are at most 20% bare. We believe that individuals of this decticid require vegetation cover to escape birds. Do predators limit the distribution of this locally successful herbivore?

We do not believe that predators alone limit the decticid's distribution. Does the availability of oviposition sites limit distributions? Could diseases, parasites or parasitoids limit distributions? What are the implications of parthenogenesis for this species? This new and unique species raises many interesting questions.

FOREST FLOOR KATYDIDS OF THAILAND

by

Sigfrid Ingrisch
Entomologisches Institut ETH-Zentrum,
CH-8092 Zurich, SWITZERLAND

Despite a great diversity of katydids which become active during the night, searching for Tettigonioidea in a tropical forest in the daytime is rather discouraging. Acridoidea gather at the forest edge or in larger clearings, but Tettigonioidea are hardly ever seen. An exception are species of the genus *Lipotactes* Brunner 1898 (Tympanophorinae) in southeast Asia, which already attracted my attention on my first visit to Thailand in April 1985. They live on the forest floor, usually on sparsely covered ground, where they are often found sitting on scattered herbs and grasses rising slightly above the litter.

I found two species: *L. montanus* Ingrisch 1990 in the mountains of northern and central Thailand and *L. silvestris* Ingrisch 1990 in lowland forests near the Cambodian border (Fig. 1). These rather small, brownish katy-

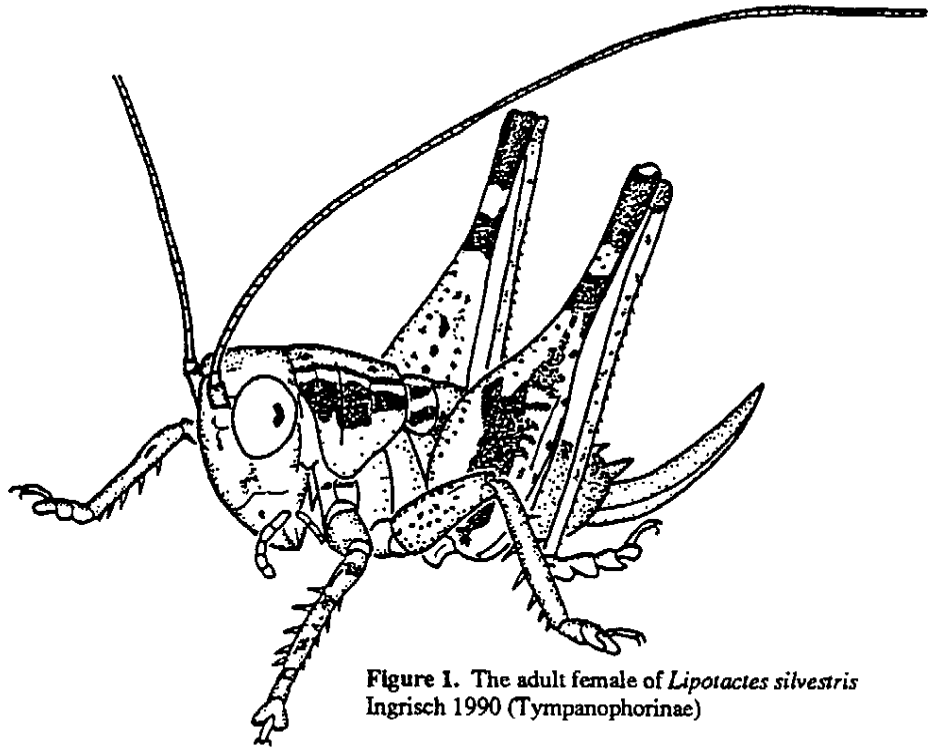

Figure 1. The adult female of *Lipotactes silvestris* Ingrisch 1990 (Tympanophorinae)