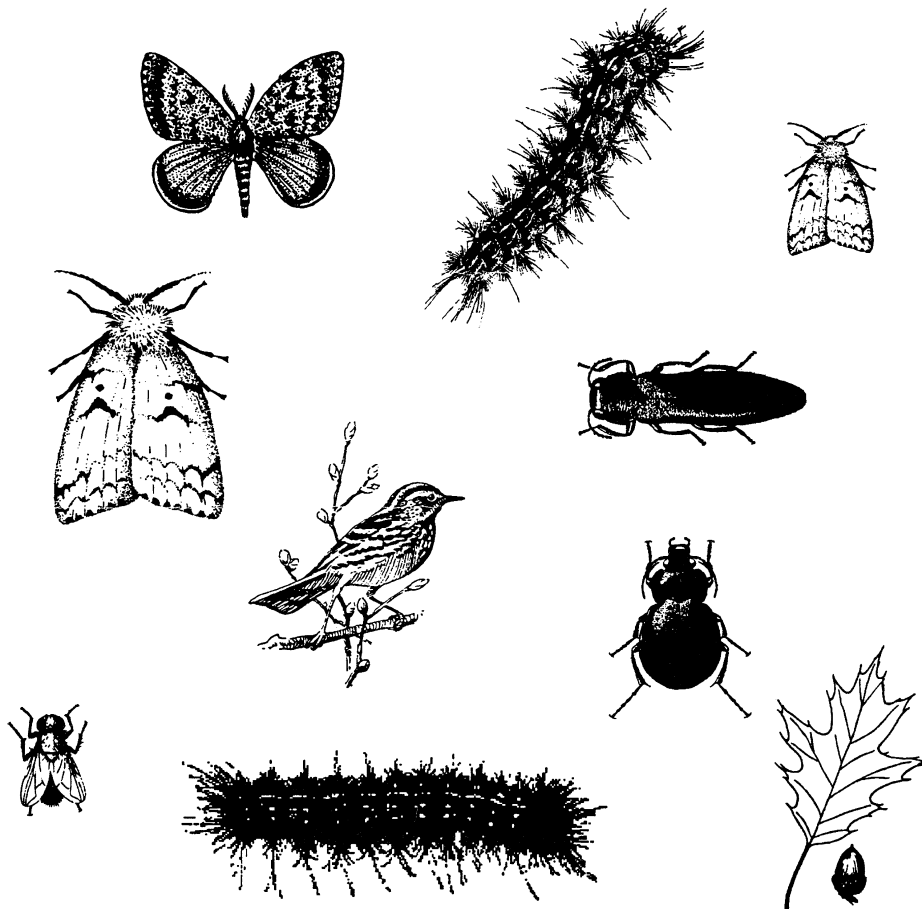




PROCEEDINGS

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NORTH AMERICAN GYPSY MOTH FEMALES: AN ADVANTAGE OF BEING FLIGHTLESS

Yuri N. Baranchikov¹, Tamara A. Vshivkova¹, Maxim E. Grebennikov¹,
and Michael E. Montgomery²

¹Institute of Forest, Russian Academy of Sciences, Krasnoyarsk 660036, Russia

²USDA Forest Service, Northeastern Forest Experiment Station, Northeastern Center
for Forest Health Research, 51 Mill Pond Rd., Hamden, CT 06514

ABSTRACT

Gypsy moth larvae from North America (West Virginia, United States), Western Europe (Loiret, France), and Asia (Bellyk, South Siberia, Russia) were reared individually at petri dishes in a laboratory at Krasnoyarsk, Russia. They were fed ad libitum by the foliage of 4 host-trees species: *Betula pendula*, *Cotoneaster lucidus*, *Larix sibirica* and *Tilia cordata*. Each day foliage was collected from the same five trees of each species, carefully mixed and fed to the insects. Duration of instar and the weight of larvae and pupae were recorded for each larvae. Adult females were dissected with nearest 12 hours of eclosion and the number of fully formed eggs, with vivid chorion sculpture was calculated. The data are based on 324 females from 3 populations on 4 host-plants.

The differences in pupal weights of the 3 geographic populations was not consistent between the tree species. Asian female pupae were significantly heavier than European and North American on *Cotoneaster* and larch; on *Betula* the weight of the Asian and North American pupae was the same, but higher than that of European pupae; on *Tilia* there was no difference between European and Asian pupae, and all North American larvae died. Fecundity of Asian females was 40% lower on *Betula*, 25% lower on *Cotoneaster*, and 47% lower on *Tilia* than Euro-American strains. There were no differences in fecundity on larch. Weight specific fecundity (eggs per gram of pupal weight) of Asian strain was significantly lower than Euro-American strain on all hosts (ranging from 55 to 77%). This means that the Euro-American strain is approximately 30% more productive than the Asian one.

The weight of an individual egg mass was not measured in this experiment, but in other tests we have found that differences in the weight of an egg between populations is either small (< 10%) or not different. Thus, we do not believe that the Asian population is producing fewer but larger eggs. The lower relative fecundity of Asian females may be a cost for their ability to fly. The data suggest that the Asian gypsy moth females use a larger part of the resources accumulated by larvae to produce the mass of flight muscles and energy reserve to fuel flight. By being flightless, the Euro-American females can direct more of the resources in the pupae to the production of eggs.