

Discussion # 10

23 November

There will be no discussion on Thursday, Thanksgiving Day. Participation in the Wednesday discussions is optional but recommended; those who usually come on Thursday are encouraged to attend one of the Wednesday sessions if possible. (These are at 12:30 and 3:30, in Moore 104.) Write-ups for this discussion are not needed.

[from the 2009 final exam]

Recent Zoology Ph.D. graduate Marty Meyer conducted several experiments to describe the effects of macro-invertebrates on the decomposition of leaf litter on the forest floor. One experiment compared the rates of decomposition of litter exposed to different species of mollusks or to no macro-invertebrates. It was conducted at one site.

Marty used fresh, air-dried leaf litter collected on site, thus reflecting the natural mix of plant species. The litter, after being thoroughly mixed, was placed in bags made of 2.0 mm mesh plastic screen with an internal framework comprised of a 10 x 10 x 8 cm plastic cage; 4.0 g of litter was placed in each bag. Holes were cut in the bags to allow invertebrates access to the litter.

Litter bags were placed in “microcosms.” These microcosms were 1 x 1 x 0.5 m cages, with frames of PVC pipe and covered on all sides by 2.0 mm mesh plastic screen. The microcosm bottoms were covered with a 0.5 cm layer of soil under a layer of locally collected air-dried leaf litter. Two small *Peperomia* plants were planted in each microcosm.

After one month for the plants to establish themselves, 10 litter bags were placed in each microcosm; 6 different mollusk treatments were applied at the same time.

The 6 treatments consisted of one of five species of mollusks, or no mollusks. The mollusks were at approximately natural densities. The species included snails and slugs, and native and introduced species, and they varied in total biomass per microcosm:

species	type	origin	approximate biomass per microcosm
<i>Arion intermedius</i>	slug	introduced	0.0038 (g dry weight)
<i>Succinea</i> spp.	snail	native	0.0063 (g dry weight)
<i>Deroceras laeve</i>	slug	introduced	0.0200 (g dry weight)
<i>Oxychilus alliarius</i>	snail	introduced	0.0420 (g dry weight)
<i>Limax maximus</i>	slug	introduced	0.2500 (g dry weight)

The treatments were randomly assigned to microcosms, with 7 microcosms per treatment for a total of 42 microcosms. Six months after the mollusks and litter bags were added to the microcosms the litter bags were collected and the litter remaining in them was air dried and weighed.

The response variable is the fraction of the weight of litter lost in each microcosm: [(total initial

weight in all 10 bags – total final weight) / total initial weight]. The data are listed below and will be distributed electronically.

The questions:

Is the rate of litter decomposition affected by the presence of mollusks?

Does the effect of mollusks on litter decomposition differ among the species? If so, how?

control:	35.71	32.92	33.40	27.47	37.35	27.48	37.04
<i>A. intermedius</i>	40.41	40.61	36.44	28.94	43.09	31.58	34.42
<i>Succinea</i> sp.	38.80	34.50	38.93	30.78	40.94	33.69	42.45
<i>D. laeve</i>	36.91	40.84	36.84	28.20	40.00	45.58	40.14
<i>O. alliarius</i>	37.44	42.55	38.03	41.67	39.76	35.07	38.16
<i>L. maximus</i>	39.62	37.17	42.40	44.23	40.96	40.40	40.52