

**Table 10.3** Observed Number of Ant Species Evaluated at Different Sample Sizes for the Extended Winkler Sampling Experiment<sup>a</sup>

Observed Species Richness after Following Number of Samples:									Estimated Species Richness <sup>b</sup>		
10	20	30	40	100	200	300	400	All (500)	ICE	Jackknife	M-M
36.5 (35.2)	50.0 (48.2)	56.3 (54.3)	62.1 (60.0)	79.5 (76.7)	92.7 (89.5)	100.1 (96.6)	104.5 (100.8)	107 (103.3)	112.0	117.0	103.6

<sup>a</sup>Number of species represents the mean of 100 randomizations of sample pooling order.

<sup>b</sup>ICE, incidence-based coverage estimator; jackknife, first-order jackknife estimator; M-M = Michaelis-Menten asymptote (the percentage of the M-M asymptote is given in parentheses in the first nine columns).

the number of individuals increased quite dramatically with increasing sample size, the increase in mean number of species per sample was far less pronounced. Increasing the sample size from 0.25 m<sup>2</sup> to 1 m<sup>2</sup>, and certainly from 1 m<sup>2</sup> to 2 m<sup>2</sup>, is associated with a very limited return for a costly additional investment in effort.

Based on the results of the sample size experiment, when sufficient sampling devices are available it is probably generally more efficient to take a greater number of smaller samples than to take a lesser number of larger samples. Since a single Winkler sack can generally hold the sieved litter from a 1-m<sup>2</sup> sample, this is probably the most appropriate sample size for most situations.

**Complementarity of Sampling Methods**

Table 10.4 lists the combinations of two and three sampling methods that produced the largest numbers of ant species in the sampling methods experiment. In each case, only combinations that produced the four highest species counts are shown. Winkler extraction is an element in all combinations, along with inspection of dead wood, small soil samples, pitfall traps (7-day), and Berlese funnels. The various two-

method combinations captured species totals ranging from 59 to 65% of the M-M asymptote calculated for all methods combined (Table 10.2). Species totals for three-method combinations ranged from 73 to 77% of the M-M

**Table 10.4** Combinations of Two and Three Sampling Methods That Obtained the Maximum Number of Ant Species in the Sampling Methods Experiment

Combination of Sampling Methods	N <sup>a</sup>
Winkler sack samples + small soil samples + inspection of dead wood	105
Winkler sack samples + inspection of dead wood + pitfall traps (7-day)	104
Winkler sack samples + pitfall traps (7-day) + small soil samples	103
Winkler sack samples + small soil samples + Berlese funnel samples	99
Winkler sack samples + inspection of dead wood	88
Winkler sack samples + small soil samples	87
Winkler sack samples + pitfall traps (7-day)	84
Winkler sack samples + Berlese funnel samples	80
Total number of litter species sampled by all methods	134
Total number of species from all strata	167

<sup>a</sup>N, number of species.