

Diet-dependent life history of a wolf spider *Pardosa pseudoannulata*

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The wolf spider *Pardosa pseudoannulata* is a generalist predator that inhabits aquatic-terrestrial interfaces, where it preys on a wide variety of insects and an important natural control agent in rice, since it can feed on multiple pest species. Differences in both availability and quality of prey lead to differences in the fitness of the spiders. Mixed-prey diet could improve the fitness of a generalist predator by adding complimentary nutrients to the diet, however, there are few studies investigating the effect of mixed diet on spider fitness. We investigated the survival and growth of spiderlings fed on different prey combinations. Laboratory feeding assays included the following treatments: a single species of Collembola, green leafhopper (*Nephotettix virescens*), whiteback planthopper (*Sogatella furcifera*), and all possible pairwise combinations of these. A starvation treatment was included as a control. The total duration of the experiment was 188 days, carapace width (growth indicator) was measured weekly; survival and frequency of moulting were measured on a daily basis. Compared to single prey diets, provision of mixed diets generally enhanced the fitness parameters of spiderlings, but a mixed diet consisting of two homopterans resulted in early high mortality of spiderlings. The highest survival, frequency of moulting and growth rate were seen in spiderlings fed on mixed diets "Collembola-leafhopper" and "Collembola-planthopper". Spiderlings fed on "Collembola only" diet developed and grew poorly. Spiderlings reared on a monotypic diets "planthopper only" or "leafhopper only" developed only to the third instar and experienced slow growth. The effects of mixed-prey "leafhopper+planthopper" diet were similar to "planthopper only", but resulted in higher frequency of moulting than "leafhopper only" diet. The results of this study demonstrate that mixed diets can enhance spider fitness, but this enhancement depends on the combination of prey species, which may differ in nutritional quality for a generalist predator.

