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A Cost-Benefit Analysis of Life History in a Colonial Spider,
Philoponella prominens

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Most of the world's more than 34,000 described spider species are solitary, aggressive, territorial, and cannibalistic predators. However, approximately 50 species exhibit some form of permanent group-living, and most of them have been found and studied thus far in tropical and subtropical regions where prey is abundant. We have studied *Philoponella prominens* populations in central Korea where there are four distinct seasons and found that they hibernate during the winter and have seasonally facultative living patterns. We investigated potential benefits of sociality in terms of cost of web building, reproduction rate, prey abundance, prey capture rate, tenure time, and so on. We found no differences in prey abundance, and capture rate between solitary and colonial individuals, but there were significant differences in tenure time and web-building cost. In the case of colonial spiders, reduction in the cost of web building by sharing them with other individuals have a positive effect on reproduction rate. This result is not consistent with the risk sensitivity model that has used frequently to explain the evolution of sociality in spiders

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Alkali and Metal Element Content in Soil and Vegetation near
the Daesung Coal Mine in Keumsan, Chungnam.

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The research has been made for the effects of pollution of alkali and metal element content by the abandoned coal mine on top soils and vegetations near the Daesung coal mine in Keumsan Chungnam. The samples of soils and vegetations, *Miscanthus sinensis Andersson*(MS) and *Pinus rigida*(PR), were collected in the coal-bearing polluted regions by coal mine activity and the non-polluted regions. The comparisons with two soil types indicated that Ca, Sr content in the polluted soils were higher than those of the non-polluted soils, whereas Al and Ba content had the opposite trends. On the other side, K, Na, and Ti content had no differences between two regions. In the average elemental content of vegetations, Cs and Na content were slightly high in MS growing on the polluted regions, however, Ba, Ca, K, and Sr content were, conversely, very high in the non-polluted regions. In the case of PR, Na content were especially very high in the polluted regions. Also, there was investigated among of the elemental content in MS and PR divided by the above-ground parts and roots, respectively. Na and Sr content were especially very high and Cs and Rb content were slightly high in roots of MS which were distributed in the non-polluted regions. However, in the polluted regions, Ba and Na content were greatly high in roots, while K and Sr content reversely showed. Ba and K content contained in roots of PR were high in the non-polluted regions. In roots of PR growing the polluted regions, on the contrary, Ba and Na content were much higher than those of non-polluted regions.