

LIFE CYCLES AND INTERACTIONS IN SPIDER MITES (ACARI: TETRANYCHIDAE) ON DWARF BAMBOO, *SASA SENANENSIS* (F. & S.) (POACEAE), IN JAPAN

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ABSTRACT - To clarify the interactions among mite species coexisting on the same plant, we determined the population dynamics of five spider mites (Acari: Tetranychidae) and their predators (Phytoseiidae, Stigmaeidae) appearing on dwarf bamboo, *Sasa senanensis* (Franchet and Savatier) (Poaceae), which has a high degree of structural heterogeneity in leaf pubescence. Tetranychid mites, *Aponychus corpuzae* Rimando, *Panonychus bambusicola* Ehara and Gotoh and *Stigmaeopsis longus* (Saito) preferred glabrous leaves, whereas *Schizotetranychus recki* Ehara and *Yezonychus sapporensis* Ehara, and the predators *Agistemus summersi* Ehara (Stigmaeidae) and *Phytoseius tenuiformis* Ehara (Phytoseiidae) preferred hirsute leaves. Species living on glabrous leaves tended to avoid species living on hirsute leaves. However, three species that prefer glabrous leaves sometimes coexisted with and sometimes avoided species that preferred hirsute leaves. Each species probably has some range of leaf hairiness that they tolerate and prefer. The presence of leaf hairs along the midvein of the lower surfaces of the leaves are especially important because they increase the acceptable range for coexistence of species preferring glabrous or hirsute leaves. *Stigmaeopsis longus* coexisted with *Typhlodromus bambusae* Ehara, which is a species-specific predator of *St. longus*. *Yezonychus sapporensis* coexisted with *Ag. summersi*, which is a predator of *Y. sapporensis* and *Sc. recki*. The population density of each spider mite species produced one to three peaks in spring, autumn and/or early winter depending on the species and the census periods. *Phytoseius tenuiformis* accounted for most of the phytoseiid mites on *Sasa* leaves and occurred on the most hirsute leaves. Almost all phytoseiid mites collected in the nests of the spider mite *St. longus* were *T. bambusae*. The critical photoperiods of five spider mite species ranged from 13.5 to 14.5 h at 18°C, which occurred between late August and mid-September in Sapporo. The dates by which 50% or more individuals entered diapause were between late August and late September, roughly corresponding with timing predicted by the critical photoperiods. The maximum number of generations that could be produced in a year was estimated as four or five based on the total degree-days accumulated above the lower temperature threshold (10.2-12.1°C) of five spider mite species and the thermal constant (164.5-217.7 DD) of these mite species.

Key words - Acari, Tetranychidae, Phytoseiidae, Stigmaeidae, life cycle, dwarf bamboo, interspecific interaction, voltinism, Japan.

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