**Supporting Information**

**Sublethal effects of flonicamid on the population growth of** **the grain aphid *Rhopalosiphum padi* (L.) (Hemiptera: Aphididae)**

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**Table S1 The** **life table parameters calculated in *Rhopalosiphum padi***

|  |  |  |
| --- | --- | --- |
| Life table parameters | Formula | References |
| Net reproductive rate () |  | Efron and Tibshirani 1993 |
| Finite rate of increase () |  | Efron and Tibshirani 1993 |
| Intrinsic rate of increase () |  | Efron and Tibshirani 1993 |
| Mean generation time () |  | Efron and Tibshirani 1993 |
| Specific age-age period fertility (*fxj*) | Ex/nx | Chi and Liu 1985; Chi 1988; Chi and Su 2006 |
| Age-stage-specific survival rate (*sxj*) | n*xj/*n01 | Chi and Liu 1985; Chi 1988; Chi and Su 2006 |
| Age-specific survival rate (*lx*) |  | Chi and Liu 1985; Chi 1988; Chi and Su 2006 |
| Age-specific fecundity (*mx*) |  | Chi and Liu 1985; Chi 1988; Chi and Su 2006 |
| Life expectancy (*exj*) |  | Chi and Liu 1985; Chi 1988; Chi and Su 2006 |
| Reproductive value (*vxj*) |  | Chi and Liu 1985; Chi 1988; Chi and Su 2006 |

Note: In the above formula, *x* is the time interval (1 day), specific age-age period fertility (*fxj*)is number of produced aphids at age x and period j*,* age-stage-specific

survival rate (*sxj*) is the probability that a newborn will survive to age x and period j, age-specific survival rate (*lx*) is the survival rate of any individual during period *x*, and age-specific fecundity (*mx*) is the average number of aphids produced per female aphid during period x. Life expectancy (*exj*) represents the average life expectancy of individuals at age x and period j; Reproductive value (*vxj*) represents the reproductive value of aphids at age x and period j, that is the contribution to the future population.

**References**

Chi, H. S. I. N., Liu, H. S. I.,1985. Two new methods for the study of insect population ecology.*Bulletin of the Institute of Zoology, Academia Sinica*, 24(2), 225-240.

Chi, H.,1988. Life-table analysis incorporating both sexes and variable development rates among individuals. *Environmental Entomology*, 17(1), 26-34.

Chi, H., Su, H. Y., 2006. Age-stage, two-sex life tables of *Aphidius gifuensis* (Ashmead) (Hymenoptera: Braconidae) and its host *Myzus persicae* (Sulzer)(Homoptera: Aphididae) with mathematical proof of the relationship between female fecundity and the net reproductive rate. *Environmental Entomology*, *35*(1), 10-21.

Efron B, Tibshirani R J. 1993. An introduction to the bootstrap. In: Monographs on Statistics and Applied Probability. Chapman and Hall, London. p. 436.