*Running head: pest consumption by generalist predators*

**Pest consumption by generalist arthropod predators increases with crop stage in both organic and conventional farms**

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**Supporting Information**

Appendix S1: Table S1. Trophic guild assignments of major arthropod families / genera in this study.

|  |  |  |
| --- | --- | --- |
| **Trophic guild** | **Order** | **Family / Genus** |
| Rice herbivore | Hemiptera | Alydidae / *Leptocorisa* |
|  | Hemiptera | Cicadellidae / *Nephotettix* |
|  | Hemiptera | Delphacidae / *Nilaparvata* |
|  | Lepidoptera | Hesperiidae |
|  | Hemiptera | Lygaeidae / *Pachybrachius* |
|  | Hemiptera | Pentatomidae / *Scotinophara* |
|  | Lepidoptera | Pyralidae |
|  | Orthoptera | Pyrgomorphidae / *Atractomorpha* |
| Tourist herbivore | Orthoptera | Acrididae |
|  | Coleoptera | Chrysomelidae |
| Detritivore | Diptera | Chironomidae |
|  | Diptera | Chloropidae |
|  | Diptera | Ephydridae |
|  | Diptera | Muscidae |
|  | Diptera | Sciomyzidae |
|  | Diptera | Stratiomyidae |
|  | Orthoptera | Tetrigidae |
| Predator | Araneae | Araneidae |
|  | Araneae | Clubionidae |
|  | Coleoptera | Coccinellidae |
|  | Araneae | Oxyopidae |
|  | Araneae | Tetragnathidae |
|  | Araneae | Thomisidae |

Appendix S1: Table S2. Trophic discrimination factor (TDF) (mean ± SD) of carbon (Δ13C) and nitrogen (Δ15N) for each prey source in the mixing model. TDFs were estimated from the diet-dependent discrimination equation proposed by Caut et al. (2009).

|  |  |  |
| --- | --- | --- |
| **Source** | **Δ13C** | **Δ15N** |
| Rice herbivore | 1.08 **±** 0.50‰ | 2.41 **±** 0.59‰ |
| Tourist herbivore | 0.68 **±** 0.48‰ | 2.05 **±** 0.71‰ |
| Detritivore | 0.82 **±** 0.26‰ | 1.42 **±** 0.85‰ |

Appendix S1: Table S3. (a) Predators and (b) the most abundant rice herbivores in our organic and conventional farms. The numbers represent the number of individuals in our sweep net samples pooled across replicate farms and crop stages. The percentages refer to the proportion of each taxon within its feeding guild (predator or rice herbivore). Note that our sampling was designed for stable isotope analysis but not for a rigorous arthropod survey, which may require more sampling efforts.

**(a) Predators:**

|  |  |  |
| --- | --- | --- |
| Taxon | Organic | Conventional |
| Araneae | 91 (74.0%) | 105 (76.6%) |
| Coccinellidae | 32 (26.0%) | 32 (23.4%) |

**(b) Rice herbivores:**

|  |  |  |
| --- | --- | --- |
| Taxon | Organic | Conventional |
| Delphacidae / *Nilaparvata* | 536 (62.8%) | 501 (62.9%) |
| Cicadellidae / *Nephotettix* | 261 (30.1%) | 248 (31.1%) |
| Pentatomidae / *Scotinophara* | 34 (4.0%) | 32 (4.0%) |

Note: The total numbers of rice herbivores collected in organic and conventional farms were 853 and 797, respectively.

Appendix S1: Table S4. Summary of predators’ diet composition in organic and conventional farms over crop stages. *n* represents the sample size for each farm type-crop stage combination. Note that the discrepancies in *n* were due to insufficient predator samples for model estimation in some farms. N indicates the number of predator samples across replicate farms at each crop stage.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Farm type | Crop stage | Prey source | | | | | | *n* |  |
| Rice herbivore | | Tourist herbivore | | Detritivore | | N |
| Mean | SD | Mean | SD | Mean | SD |  |
| Organic | Tillering | 0.342 | 0.109 | 0.271 | 0.115 | 0.387 | 0.174 | 7 | 27 |
| Flowering | 0.616 | 0.106 | 0.165 | 0.075 | 0.219 | 0.119 | 6 | 12 |
| Ripening | 0.899 | 0.039 | 0.054 | 0.009 | 0.046 | 0.035 | 5 | 13 |
| Conventional | Tillering | 0.553 | 0.182 | 0.183 | 0.064 | 0.264 | 0.120 | 7 | 28 |
| Flowering | 0.814 | 0.107 | 0.090 | 0.041 | 0.096 | 0.067 | 6 | 12 |
|  | Ripening | 0.934 | 0.027 | 0.046 | 0.011 | 0.020 | 0.016 | 7 | 11 |

Appendix S1: Figure S1. Stable isotope signatures (δ13C and δ15N) of primary producer (rice, *Oryza sativa* L.) and prey sources (rice herbivore, tourist herbivore and detritivore) in rice farms (mean ± SE). Arthropod samples were pooled across all study farms. The isotope values of prey sources were corrected for trophic discrimination factors (TDFs) estimated from the diet-dependent discrimination equation proposed by Caut et al. (2009). Note that the primary producer samples were collected from six (three organic and three conventional) of the 14 study farms during a preliminary survey in 2017.

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**Literature Cited**

Caut, S., Angulo, E. & Courchamp, F. (2009) Variation in discrimination factors (Δ15N and Δ13C): the effect of diet isotopic values and applications for diet reconstruction. *Journal of Applied Ecology* 46, 443-453.