



International Association for the
PLANT PROTECTION SCIENCES

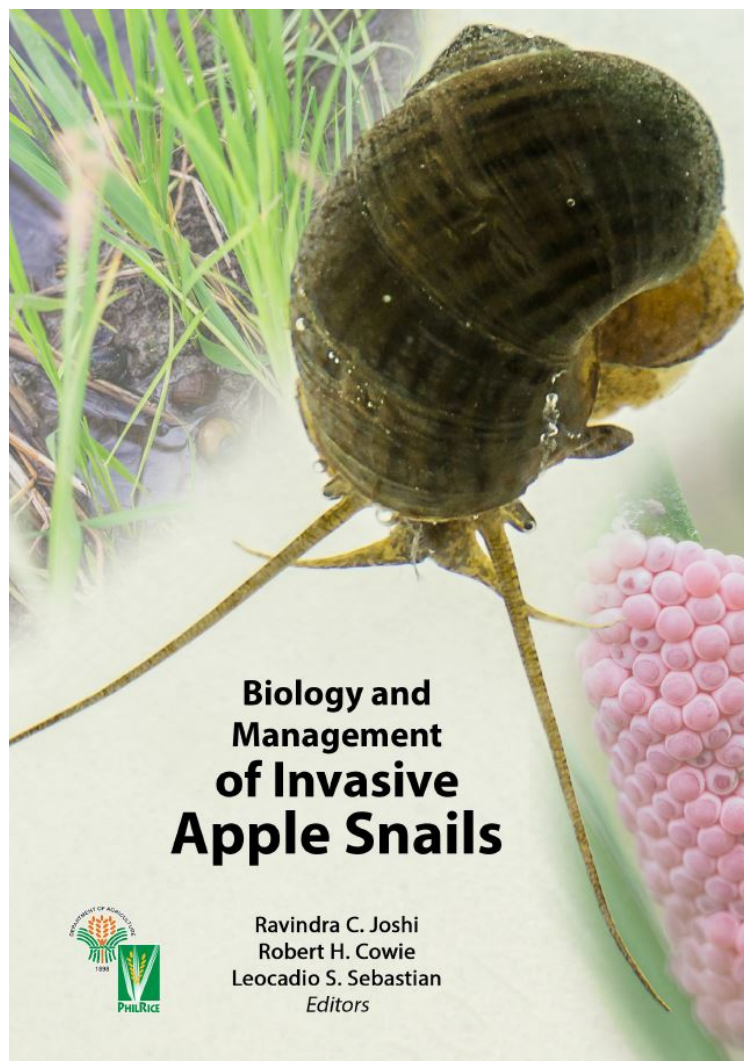
IAPPS

NEWSLETTER

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NEW BOOK ON INVASIVE APPLE SNAILS



We are happy to present a new book on invasive apple snails, **Biology and Management of Invasive Apple Snails**, by Joshi, R.C., Cowie, R.H. & Sebastian, L.S. (eds.) 2017, published by the Philippine Rice Research Institute (PhilRice).

Apple snails, family Ampullariidae, are so called because many species, notably in the genera *Pomacea* and *Pila*, bear large, round shells.

Pomacea species are native to South and Central America, parts of the Caribbean, and the southeastern USA, while *Pila* species are native to Africa and Asia. In the year 2000, one species of apple snail, *Pomacea canaliculata*, was listed among the world's 100 most invasive species, largely because it had become a major pest of wetland rice in much of Southeast Asia. However this listing was published at a time when there was still confusion regarding the true identity of the invasive species in Asia; in fact two species are involved, not only *Pomacea canaliculata* but also *Pomacea maculata*. *Pomacea canaliculata* is native to Argentina

and Uruguay, while *P. maculata* is more widely distributed from the La Plata region of Argentina to the Amazon basin of Brasil, including Uruguay and Paraguay, and possibly Bolivia, Ecuador and Peru.

These two species have commonly been referred to as golden apple snails, or GAS, often without clarifying specifically which species, perhaps both, was involved, or indeed simply assuming it to be *Pomacea canaliculata*. For clarity, this book avoids this ambiguous common name designation,

and hopes that others will move forward with the correct species designation for the apple snails with which they work. One or both of these species of *Pomacea* have become widely established not only in many parts of Southeast Asia but also in Japan, Taiwan, Guam, Hawaii, Papua New Guinea, the Dominican Republic, Spain and parts of the mainland USA. *Pomacea diffusa* has been introduced to Sri Lanka, and *Pomacea scalaris*, as well as *Pomacea canaliculata*, has been introduced to Taiwan. An additional unidentified species has been introduced to the southeastern USA. Most of these introductions are the result of escape or release from aquaculture operations, or happen through the pet trade. In the Philippines alone, estimates of economic losses associated with apple snails ranged from US\$425 million to US\$1.2 billion in 1990.

Pomacea species are also important transmitters of *Angiostrongylus cantonensis*, the rat lungworm, which has had major human health consequences, most notably in southern China, where the snails are eaten raw as a delicacy.

There is therefore a clear need to control the proliferation and spread of these pests in ecologically and economically sustainable ways. This requires research on control and management measures, but also a clear understanding of the identities and basic biology of the species involved.

The present book reinterprets old problems and presents much of this new knowledge, with the lessons learned and knowledge available in one country or region informing management approaches more widely. We hope that this new book will not only bring together this new knowledge in a single accessible place but also highlight the need to prevent the further spread of these invasive species, especially in the context of a changing climate.

The book can be downloaded as a free pdf from this link:

<https://www.hawaii.edu/cowiela/b/pubs.htm>

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BAKANAЕ (FOOLISH SEEDLING), AN EMERGING DISEASE OF RICE

Bakanae disease caused by *Fusarium fujikuroi* (*Gibberella fujikuroi*) is one of the newly emerging problem of rice (*Oryza sativa* L.) in Jammu and Kashmir in India. Farmers from Jammu division (Kathua, Samba and Jammu districts) reported infected crop exhibiting abnormal elongation, at the time of maturity. Infected rice plants showed tall lanky tillers bearing pale-green flag leaves which are conspicuous above the general level of the crop. Infected plants survive until maturity but bear only empty panicles. In severe cases the crop topples over, and the panicles become brownish. All these symptoms have been causing 75% crop damage during August, September and October 2017 in all the three above districts. Most of the aromatic rice varieties (Pusa 1121 and Sharbati basmati) are susceptible to Bakanae causing huge financial losses to farmers communities.

In Kathua district village Marheen, symptoms of Bakanae first appeared about a month after planting. as brownish spots on the leaves, which were taller, more slender, and slightly chlorotic

when compared to healthy seedlings. Here, up to 40% of the seedlings were destroyed. During September 2017 in Jammu district village R. S. Pura, and in Samba district village Chakphakira during October 2017, we noticed the rapid elongation of infected plants, caused by excessive gibberellin produced by the pathogen. Plants affected by *Bakanae* are often visible arching above healthy rice plants, with brownish color of the panicles.



Bakanae symptoms: a) toppled over rice crop

b) abnormal elongation and empty panicles

The rice plants, however, recovered with the application of fungicides and fungal biocontrol agents at different period resulting in the reduction in pathogen populations:

- Carbendazim (seed treatment) @2.5g/kg during the nursery period
- After removing the soil debris, seedling treatment with the Carbendazim @2g/l of water
- Application of Mancozeb @2g/l after seedling transplantation
- Application of *Trichoderma viride*: 2.5 kg is mixed well in 60kg of farmyard manure FYM and applied over one hectare at land preparation ahead of transplanting. Application of *Trichoderma* spp. as biocontrol agent is gaining attention due to high capability of hyper-parasitizing and plant growth-promoting properties against soil borne pathogens.

In India, *Bakanae* disease incidence and prevalence has also been reported in other states like Bihar, Uttar Pradesh, Utrakhand Punjab, Haryana and Rajasthan.

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IAPPS Mission: to provide a global forum for the purpose of identifying, evaluating, integrating, and promoting plant protection concepts, technologies, and policies that are economically, environmentally, and socially acceptable.

It seeks to provide a global umbrella for the plant protection sciences to facilitate and promote the application of the Integrated Pest Management (IPM) approach to the world's crop and forest ecosystems.

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