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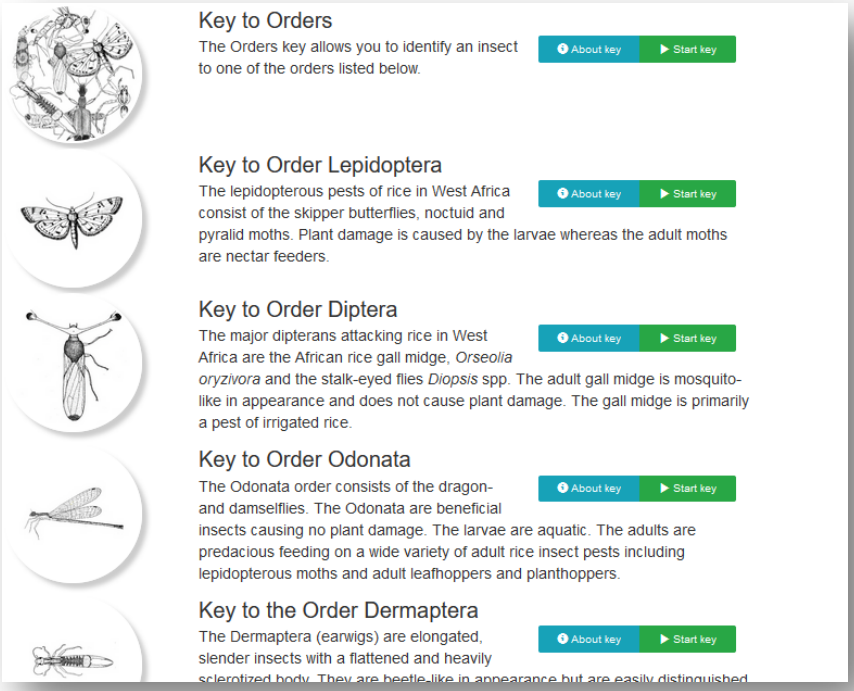
NEW INTERACTIVE PATHWAY KEYSFOR IDENTIFYING INSECT PESTS OF RICE AND THEIR NATURAL ENEMIES

The correct identification of insect pests and their natural enemies is critical for developing sound and sustainable pest management strategies. As agriculture intensified and insect pests became more problematic, identification of major insect pests and their natural enemies became increasingly relevant when designing appropriate pest management strategies, especially for rice. Appointed as the first entomologist at the International Rice Research Institute (IRRI) based in the Philippines, Dr. Mano D. Pathak, established a comprehensive rice insect pest and natural enemy collection in the early 1960s. The aim was to support national rice research programs identify specimens in their own rice arthropod collections. Subsequently, to support this objective, a dichotomous key to over 862 species was published in the chapter ***Taxonomy of Rice Insect Pests and their Arthropod Parasites and Predators***, authored by insect and spider taxonomist, Alberto T. Barrion, with James A. Litsinger, in the book, **Biology and Management of Rice Insects,** edited by E. A. Heinrichs and published by IRRI in 1994.



In the 1990s, a similar collection program was begun to establish a rice insect and natural enemy collection at WARDA (West African Rice Development Association), now AfricaRice. Specimens of major insect pests and natural enemies found in West African rice were identified by Dr Barrion, who then created an illustrated, dichotomous identification key which was published in the book, **Rice Feeding Insects and Selected Natural Enemies in West Africa, a**uthored by E. A. Heinrichs and Alberto Barrion **(2002).**

Since the printed versions of both books have been out-of-print for several years, a recent upgrade of the Lucid software program https://www.lucidcentral.org provided the possibility of creating interactive, digital versions of both keys. Initially developed for creating matrix identification

keys, the Lucid builder now enables paper-based dichotomous keys to be converted and "published" as online, interactive pathway keys. Courtesy of IAPPS, the IRRI and West African keys are now freely available online. You can access them by going to www.plantprotection.org, "Resources"-"Education and Training"-"Online identification keys…." For further information, please email support@plantprotection.org

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INTERNATIONAL TRAINING WORKSHOP ON "MASS REARING AND RELEASE OF PARASITOIDS" IN BANGLADESH

Insect pests are among the most limiting factors to crop production, inflicting losses of billions of dollars worldwide. As an agriculture-based country supporting smallholder farmers, Bangladesh relies heavily on the use of chemical pesticides to combat pests and increase crop yields. Heavy reliance on chemical pesticides, however, can increase incidence of asthma, reproductive disfunction, and other health challenges. Overuse of pesticides can have serious adverse impacts on non-target species and beneficial organisms such as parasitoids, predators, and pollinators. This can lead to insecticide resistance in pests and resurgence of minor pests. As global trade and weak quarantine regulations pervade, the increased introduction of invasive species in recent years can exacerbate these challenges.

Management of these challenges requires safe, economical, and acceptable methods, such as biological control, an integral component of integrated pest management (IPM). Globally, augmentation through inundative release of mass-reared parasitoids and predators is becoming a popular IPM tool. But, in Bangladesh, its development and adoption are still limited. The Bangladesh Agricultural Research Institute (BARI) is developing protocols for mass rearing and field releasing parasitoids with the assistance of Virginia Tech's Feed the Future Bangladesh Integrated Pest Management Activity (IPMA) and the International Wheat and Maize Improvement Center (CIMMYT), which jointly organized a training workshop on mass rearing and release of parasitoids at BARI, Gazipur, July 23-27, 2022.

Four researchers from Nepal and six from Bangladesh participated in this program, which involved lectures, lab activities, and field activities, as well as a visit to a private biocontrol lab, Ispahani Agro Limited. In the laboratory session, participants learned about rearing of laboratory host insects, preparation of artificial diets, mass rearing of parasitoids, and

more. Specifically, the program addressed mass production of hosts *Spodoptera litura*, wax moth, and *Corcyra cephalonica* for mass rearing of the parasitoids *Trichogramma* spp., *Habrobracon hebetor*, and *Telenomous remus*.

With this knowledge, the trained researchers can develop "satellite labs" where mass rearing and release of parasitoids can take place across Nepal and Bangladesh. During rearing of parasitoids at laboratories, the participants may face technical difficulties. Therefore, IPMA is in the process of establishing a Memorandum of Understanding with BARI to facilitate building a network between participants and the entomology division of the institute so that participants can gain instant support. IPMA and CIMMYT – and in Nepal, another award led by Virginia Tech entitled Feed the Future Nepal Integrated Pest Management (FTFNIPM) – will continue to conduct such trainings throughout both countries to improve lab capacity in biocontrol, mitigate the spread of destructive pests, and decrease reliance on chemical pesticides.

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CONTRIBUTE TO CABI'S NEW PLANT HEALTH CASES REAL-LIFE EXAMPLES OF PLANT HEALTH IN PRACTICE.

CABI, together with Editors in Chief Lone Buchwaldt, David B. Collinge, and Boyd A. Mori is embarking on a new type of online publication called **Plant Health Cases**.

Plant Health Cases will be a curated, peer-reviewed collection of real-life examples of plant health in practice. This will be an invaluable resource for students, lecturers, researchers, and research-led practitioners. We will be developing cases in all areas relevant to plant health, including:

- plant diseases
- plants pests
- weeds
- environmental factors
- agronomic practices
- diagnosis, prevention, monitoring and control
- international trade and travel

What is a Case Study?
A Plant Health Case is a relatively short publication with a well-defined example of research in plant health, e.g., a study which results in reduced impact from a disease or pest problem. Cases should be between 3000 and 5000 words long, and can include photos, figures and tables. They should be written in an engaging style that is both science-based and accessible using a limited number of references. Importantly, each case should suggest points for discussion to broaden the reader's horizon, inspire critical thinking and lead to interactions in the classroom or field.

Interested in Contributing to Plant Health Cases?
We are currently looking for contributions of case studies, and we welcome your ideas! You may have existing case study material ready prepared for use in teaching, or a good example of research in plant health which could be easily adapted to our template. For further information and guidance on how to submit your idea for a case study please see here: https://www.cabi.org/products-and-services/plant-health-cases/
Your submission will be peer-reviewed, and a DOI assigned at the time of publication similar to your other scientific publications. The corresponding author will receive £100 upon acceptance of the final case study.

Publication Plan
We're aiming to launch Plant Health Cases in mid-2023. Our case studies will offer practical, real-life examples in one easily searchable platform. All users will be able to search, browse and read summaries of case studies. Full text access will be available via individual or institutional subscription, or by purchasing a single case study. For further information, please contact:

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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.

Membership Information: IAPPS has four classes of membership (individual, affiliate, associate, and corporate) which are described in the IAPPS Web Site www.plantprotection.org.

The *IAPPS Newsletter* welcomes news, letters, and other items of interest from individuals and organizations. Address correspondence and information to:

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