

Review on Entomological Contributions to IPM

Pratishtha P. Sawant

PG Department of Zoology

Shri Pancham Khemraj Mahavidyalaya, Sawantwadi, India

Abstract: *Entomology has played a foundational and transformative role in the conceptualization, development, and implementation of Integrated Pest Management (IPM) systems. This review critically examines the historical evolution and scientific contributions of entomologists to IPM, drawing exclusively from peer-reviewed literature published prior to 2023. It explores how entomological research shaped early concepts of integrated control, economic thresholds, and biological regulation of pest populations. The paper highlights key innovations—such as pheromone-based monitoring, biological control agents, insect growth regulators, and population modeling—and maps their adoption across agricultural systems globally. Through detailed case studies in cotton, rice, maize, soybean, and orchard crops, the review illustrates the practical successes and adaptability of entomology-driven IPM strategies. Despite demonstrable ecological and economic benefits, the paper also identifies persistent barriers, including institutional inertia, limited farmer training, market imbalances, and environmental variability. Looking ahead, it emphasizes the need for interdisciplinary integration, digital innovation, and policy support to address emerging challenges like climate change and pest resistance. The review concludes by reaffirming entomology's indispensable role in achieving sustainable, knowledge-intensive pest management in diverse agroecosystems.*

Keywords: Integrated Pest Management (IPM), Entomology, Biological Control, Sustainable Agriculture