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Crop Protection to Outsmart Climate Change for Food Security & Environmental Conservation

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Contents

S. No	Symposia/Session Title	Page
1	Spread, monitoring and management of fall armyworm (FAW)	1
2	Herbicide-resistant weeds – a global perspective	6
3	Integrated pest management (2)	10
4	Pest, host plant, and environmental interactions: Effect of climate change in managing insect pests	16
5	Pest and disease resistance gene mapping and cloning	20
6	The challenge of coconut rhinoceros beetle (<i>Oryctes rhinoceros</i>) to palm production and prospects for control in a changing world	26
7	Phytiatry (plant medicine) as a distinct university science for modern world agriculture	31
8	Fall armyworm-control technologies and management advocacy for Asia	34
9	The impact of climate change on weeds	41
10	Outsmarting the red palm weevil: A global challenge	46
11	Pollination management under protected cultivation	52
12	Biotechnology and integrated pest management	60
13	Biological control – prospects and associated challenges	64
14	Crop protection in horticulture	71
15	Predicting population dynamics of insect pests under climate warming	78
16	Pesticide resistance management	83
17	Plant-pest/pathogen interactions in the context of chemical ecology	88
18	A greener IPM: Development of ecologically-based management of pests, weeds and diseases in cereal grain crops	93
19	Beneficial microbes for plant protection – current performance and future expectations	98
20	Integrated management of the cactus cochineal, <i>Dactylopius opuntiae</i> (Hemiptera: Dactylopiidae)	103
21	Molecular pathology and entomology	107
22	Conventional and omic approaches to integrate host plant resistance in IPM	114
23	Breeding for disease/pest resistance (HPR 1)	119
24	Spread, monitoring and management of <i>Tuta absoluta</i>	128
25	Biosystematics for effective crop protection under changing climatic scenario	134
26	Endophytes for plant protection	139
27	Detection and diagnosis of plant pathogens: DNA barcoding	144

28	Artificial intelligence (AI) based smart plant protection – futuristic scenario	152
29	Taxonomy and diversity of pest populations	158
30	Germplasm health: Facing future challenges	165
31	Emerging pathogens and their management: phytoplasmas, viruses and viroids	171
32	An overview of frameworks used for predicting, monitoring and responding to new pests	177
33	Emerging pests and their management: Nematodes	182
34	Integrated pest management (3)	188
35	Remote sensing and machine learning for determination of spatio-temporal distribution of invasive species	195
36	Host plant × pest interaction (HPR 2)	201
37	Integrated pest management (1)	207
38	Climate change effects on pests and pest management	213
39	Extension education and technology transfer	218
40	Post-harvest pests and their management	224
41	Integrated pest management (4)	229
42	Food safety: Mycotoxins and pesticide residues	235
Poster Session	Thematic Area	
I	Integrated pest management (IPM 1)	240
II	Mitigating climate change	272
III	Integrated pest management (IPM 2)	284
IV	Host plant resistance	307
V	Detection and diagnosis: DNA barcoding	329
VI	Food and nutritional security	339
VII	ICT in crop protection	343

29. Taxonomy and diversity of pest populations

Organizers: Mukesh Dhillon and Mamta Sharma

Lead

O29-1. Genetics of diapause in spotted stem borer, *Chilo partellus* (Swinhoe)

Mukesh Dhillon¹, Fazil Hasan¹, Aditya Tanwar¹, Jagadish Jaba², Naveen Singh³ and Hari Sharma²

¹Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi, India. ²ICRISAT, Patancheru, India. ³Division of Genetics, ICAR-Indian Agricultural Research Institute, New Delhi, India.

Email: mukeshdhillon@rediffmail.com

Diapause is an endocrine controlled arrested metabolic activity to delay development or reproduction under unfavorable conditions. To gain an understanding on importance of diapause for ecological adaptation, it is important to study diapause regulation in insects. We examined genetics of diapause in *Chilo partellus* using five parental populations viz., hibernating (HD), aestivating (AD), post-hibernating (PHB), post-aestivating (PAB), and nondiapause (ND) for making crosses in all possible combinations including reciprocals in a diallel fashion. Data were recorded on fecundity, egg hatching, larval survival, diapause induction and termination and adult emergence in the parents (P1, P2), F1 hybrids, and the reciprocal crosses. Genetic analysis showed that AD strain is general combiner, which also improved egg hatching, larval survival, diapause termination and adult emergence. The HD strain increased incidence of diapause in F1 hybrids. Incidence of diapause was highest in HD × AD, whereas termination was greatest in PHB × AD. However, ND strain and its reciprocal crosses with other strains did not exhibit any noticeable developmental response associated with diapause. Specific combining ability analysis revealed that pre-existence of PHD and ND or AD and PAD populations under unfavorable conditions might result in drastic reduction in active population, while co-existence of PHD and AD populations might reduce diapause incidence, increase survival and faster multiplication of their progenies resulting in outbreak of *C. partellus*. Degree of dominance estimates revealed that diapause and associated traits in *C. partellus* are governed by overdominance gene effects, and mainly depends on parental diapause history.

Invited

O29-2. Dire need of biodiversity studies in the midst of “sixth mass extinction”: challenges in Indian pretext with vivid examples

Ankita Gupta

ICAR-NBAIR, Bangalore, India.

Email: ankitagupta.nbaii@gmail.com

The dreadful climate change is leading to ‘biological annihilation’ at a very rapid rate in this Anthropocene era. As presumed, this impact is going to be harsher and more rapid in tropical regions. Apparently, the biodiversity is well studied, documented and preserved in the west than in India. We are already in the midst of “sixth mass extinction” without even having the knowledge of what and how many species are getting extinct or getting evolved! Current knowledge on many taxa from India is diminutive when compared globally. For instance, Braconidae- the second largest family of wasps though of enormous agricultural and ecological importance, remains poorly documented. The arbitrary global diversity estimates of total valid species described to date is 18,000. Perhaps barely 3,000 species are known from Asia (tropical), approximately 1,100 species from India, as compared to 17,000 species from Africa and 11,000 species from the Neotropics. In this deplorable scenario, are we in a position to ascertain species dynamics and interactions of the lost ones when we were totally unaware about their existence! This presentation would highlight how