

**VALIDATION OF IPM TECHNOLOGY AGAINST PESTS OF TOMATO
IN SUBTROPICAL ZONE OF ARUNACHAL PRADESH**

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ABSTRACT

Field experiments were carried out in tomato at three locations at farmer's fields of Jampani village, East Siang District of Arunachal Pradesh during 2011 and 2012 with variety 'Pusa Ruby' to find out the impact of IPM as compared to farmer's practices. IPM module comprised of the ecofriendly management practices such as use of *Trichoderma viride*, trap crop with marigold, six releases of *Trichogramma chilonis*, one spray of *HaNPV* and *SINPV* each, two sprays of neem oil and installation of pheromone traps of *Spodoptera litura*. In farmer's practices, blitox 50 WP was applied in nursery as soil drenching for control of damping off and bacterial wilt followed by three round sprays of profenophos 50 EC and 2 round sprays of imidacloprid 17.8 SL in main fields. The experiment for validation of IPM technology was evaluated in farmer's participatory mode during late rainy season of 2011 and 2012 with the objective to provide alternatives to synthetic hazardous pesticides. Implementations of IPM programme in tomato crop led to reduction of pesticide consumption and their replacement with ecofriendly approaches.

**SEASONAL INCIDENCE AND NATURAL ENEMIES OF
HELICOVERPA ARMIGERA (HÜBNER) ON WHEAT**

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ABSTRACT

The polyphagous and noxious insect pest i.e. *Helicoverpa armigera* occurs and cause damage to its non-preferred wheat crop also. The preliminary studies under field conditions with surveys of localities at Pantnagar, Uttarakhand revealed very less frequency of *H. armigera* on wheat, which began in the first week of March and declined in last week of April in the *rabi* seasons 2014-15 and 2015-16. The seasonal incidence on different varieties of wheat and chickpea clearly showed that the wheat varieties were not preferred its larvae (0.35 to 0.75

larvae/10 plants) in comparison to its preferred host chickpea (7.69 larvae/10 plants). A total of 7 natural enemies and two microbial agents had been observed on *H. armigera* in wheat.

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ANTIXENOSIS IN MAIZE TO THE SPOTTED STEM BORER *CHILO PARTELLUS* SWINHOE

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ABSTRACT

Maize genotypes were evaluated for ovipositional antixenosis to identify genotypes with high level of resistance to spotted stem borer, *Chilo partellus* Swinhoe. In both multi and no-choice tests, oviposition was observed on all genotypes, which significantly varied among the genotypes. Genotypes WNZPBTL 2, CM-500, PFSR 51016/1, WNZPBTL 6, AEB (Y) C5 F 38-1, HK I-PC-5 and CM-202 revealed significantly lesser egg masses/ plant. In multi choice test WNZPBTL 2 was observed with 11.1 eggs/ egg mass, that was near to the resistant check CM-500(14.2) whereas, in HKI-1378 and HKI-1352, it went up to 45.0 and 48.3 eggs/ egg mass, respectively and thus closer to the susceptible check, Basiloal Selection (56.9). Likewise, WNZPBTL 2 with 16.3 eggs/ plant was near to the resistant check, CM-500 (14.2); with HKI-1352 and HKI-1378, it was 219.3 and 207.1 eggs/ plant respectively, and on par with the susceptible check, Basiloal Selection (184.0).

Under no-choice test, PFSR 51016/1, WNZPBTL 3 and WNZPBTL 6 revealed the least number of egg masses/ plant and these were near to CM-500 (1.81); on the other hand WNZPBTL 6, WNZPBTL 3, YCY 2-2-4-1, PFSR 51016/1, WNZPBTL 10 (9 F), WNZPBTL 2, CM-202 and V 351 revealed significantly less eggs/ plant and these were statistically on par, and near to the resistant check. Genotypes HKI-1378, HKI-1352, HK I-PC-5 and HKI-163 were observed with maximum number of eggs/ plant, and were on par with each other, and near to the susceptible check. Correlation analyses between multi and no choice experiments revealed significant positive correlation of egg masses laid on genotypes (0.363*), and number of eggs laid (0.555**).

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POPULATION DYNAMICS OF MAJOR SUCKING PESTS OF OKRA

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ABSTRACT

To determine the population dynamics in relation to weather factors on the whitefly *Bemisia tabaci*; leafhopper, *Amrasca biguttula biguttula*; aphid, *Aphis gossypii*, a field experiment was conducted in okra at the Vegetable Research Centre (VRC), Pantnagar in *kharif*, 2014. The study revealed that the population of *A. biguttula biguttula* gradually increased and attained maximum (11.12 leafhopper/ 3 leaves) at 70 DAS in the 37th standard week (second week of September). The population of *B. tabaci* attained its peak (third week of September) (12.03 whitefly/ 3 leaves) at 70 DAS in the 37th standard week, while the population of *A. gossypii* attained maximum (22.5 aphids/ 3 leaf) peak at 56 DAS in the 35th standard week. The population of *A. biguttula biguttula*, *B. tabaci* and *A. gossypii* increased with maximum temperature and bright sunshine hours.

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MANAGEMENT OF GRAPEVINE STEM BORER, *CELOSTERNA SCRABRATOR* WITH SOIL APPLICATION OF CHLORANTRANILIPROLE 0.4GR

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ABSTRACT

Field evaluation of the efficacy of Ferterra 0.4 GR, a new formulation of chlorantraniliprole was done against grapevine stem borer during 2014-15 and 2015-16. The results revealed that the stem borer activity indicated by the live holes with amount of frass collected from the live hole ceased successfully with its soil application at the root zone @ 15 g/vine. This application achieved maximum reduction (100% at 35 to 45 days after treatment) in the live holes in 2014-15; and in 2015-16, this reduction lasted up to 55 days, with 100% in the live holes. The standard check- dichlorvos stem injection (80ml/l), though was effective up to 20 days of the treatment, its effect decreased towards 55 to 60 days after treatment, and it was almost on par with the untreated check. The maximum grapevine berry yield was also obtained with chlorantraniliprole soil application; 15 g/ vine was observed to be on par with higher doses (20 and 30 g/vine).

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LIFE TABLE OF *EARIAS VITELLA* (F.) ON OKRA CULTIVARS

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ABSTRACT

Field investigations were conducted to ascertain the key mortality factors of *Earias vitella* on okra cultivars i.e., Parbhani Kranti, wild cultivar and Arka Anamika for three generations. These revealed that unknown reasons, the larval parasitoids (*Rogas* sp.; *Bracon lefroyi*) and the pupal parasitoid (*Bassus fabiae*) are the mortality factors. The unknown reasons and *B. fabiae* might be the key mortality factors during larval and pupal stages, respectively. Among the studied biotic factors, the highest parasitization resulted from *B. fabiae* across the cultivars with a maximum of 43.24% on the Arka Anamika cultivar. The decreasing values of Trend Index in all the generations reared on different cultivars revealed that the mortality factors were effective in reducing the pest population.

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EVALUATION OF NOVEL INSECTICIDES AGAINST THRIPS *SCIRTOTHRIPS DORSALIS* HOOD ON CAPSICUM UNDER SHADE NETHOUSE

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ABSTRACT

Field experiments were conducted under shade nethouse at the Hi-Tech Horticulture farm, Rajasthan Agricultural Research Institute (Sri Karan Narendra Agriculture University, Jobner) Durgapura, Jaipur, with new insecticides against thrips *Scirtothrips dorsalis* Hood on capsicum during summer 2014 and 2015. The results revealed that acephate 75SP at 0.075 % was the most effective with 79.52% reduction of thrips, followed by fipronil 5SG at 0.005%, imidacloprid 0.0058% and emamectin benzoate 0.002%. Novaluron 0.01% and NSKE 5% resulted in the least mortality of thrips 42.6 and 43.9%, respectively. Thus acephate 75SP @ 1gm/l or fipronil 5SC @ 1ml/ l could be suggested against thrips on capsicum under shade nethouse conditions.

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ON BIOLOGICAL PARAMETERS OF TEA LOOPER *BISTON (BUZURA) SUPPRESSARIA* (LEPIDOPTERA: GEOMETRIDAE) AS INFLUENCED BY HOST PLANTS

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ABSTRACT

Biology of tea looper, *Biston (Buzura) suppressaria* Guen. was studied on three hosts viz. tea, mango and rhododendron. Significant variations in the stadia period of 4th and 5th instar caterpillars reared on tea and mango was observed. The mean pupal duration of *B. suppressaria* was maximum on mango than in tea. Fecundity on tea was significantly higher than on mango. Incubation period was found to be almost equal in both tea and mango. Mean longevity of female was significantly high on mango followed by tea. In case of males also longevity was significantly more on mango. The weight gained by both male and female moths was more on tea. In rhododendron, the caterpillars failed to complete their biology. Based on minimum larval mortality, shorter larval development period and higher fecundity and body weight, tea appeared to be the most preferred and supporting host among the hosts evaluated.

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DOSE DETERMINATION OF EMAMECTIN BENZOATE UV RR 5% WG AGAINST SPODOPTERA LITURA ON SOYBEAN

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ABSTRACT

A study was conducted with soybean to determine the efficacy of emamectin benzoate UV RR5% WG under field conditions during *kharif*, 2009 and 2010. The formulation (emamectin benzoate UV RR5% WG) was compared with popular organophosphorus insecticides viz., triazophos and ethion. The results showed that *Spodoptera litura* was highly susceptible to emamectin benzoate UV RR5% WG@ 18.8, 9.4 and 8.1 g a.i./ ha during both years.

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RELATIVE ABUNDANCE, FORAGING ATTRIBUTES AND TRANSIT TIME OF INSECT POLLINATORS IN PIGEONPEA

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ABSTRACT

The observations on the relative abundance of pigeonpea pollinators revealed that it was

dominated by *Megachile* spp. with *Megachile lanata* being the most abundant. The relative abundance was observed to be significantly high at the time span of 1001- 1200 hr. The foraging speed and rate varied among species and stages of the blooms. The highest foraging rate was observed in *Xylocopa tenuiscapa* followed by *Megachile* spp. The highest foraging rate was observed during the peak of blooms (49th standard week) and the lowest at commencement and cessation of the blooms. The lowest transit time was seen with *M. lanata* whereas the highest was with *Megachile monticola* including the highest transit time spent at the commencement and cessation of blooms. On the basis of foraging attributes, pollinators contribute their highest performance at the peak of blooms.

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BIOCHEMICAL BASIS OF RESISTANCE IN RICE VARIETIES AGAINST YELLOW STEM BORER *SCIRPOPHAGA INCERTULAS*

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ABSTRACT

Screening of 25 rice varieties was done to study their biochemical basis of resistance against yellow stem borer, *Scirpophaga incertulas* (Walker). A field screening experiment was conducted at the NARP Farm, Navsari Agricultural University, Navsari, Gujarat, during *kharif* 2011 and 2012. The varieties GAR 13 and IR 22 were observed with resistant reaction. Thirteen varieties viz., Narmada, NAUR 1, GR-6, GR-7, GR 12, GR-102, GR-103, Pawna, IR 28, IR-50, IR-66, PRH 10 and PR 116 were moderately resistant. The varieties GR 4, GR 10, GR-101, GR-104, Dandi, GR-5 and Gurjari were moderately susceptible, while GR 11 and GR 9 were susceptible. Significantly higher infestation was observed in the highly susceptible variety, Jaya. Moreover, deadheart and white earhead damage were found exhibiting significant positive correlation with nitrogen, phosphorous, protein and chlorophyll content. Negative correlation was observed with potassium, phenol and silica content. Thus, rice varieties with lower nitrogen, chlorophyll and protein content with high phenolic compounds and silica content could be utilized for developing yellow stem borer resistant varieties.

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EVALUATION OF INSECTICIDES AGAINST INSECT PESTS OF SOYBEAN

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ABSTRACT

A field experiment conducted evaluated the efficacy of chlorantraniliprole 18.5SC @ 100 ml/ha, indoxacarb 15.8 SC @ 300 ml/ha, quinalphos 25 EC @ 1500 ml/ha, triazophos 40 EC @ 800 ml/ha, thiacloprid 21.7 SC @ 650 ml/ha and one botanical, neem oil @ 3 lit/ha against major pests of soybean. Among these, thiacloprid 21.7 SC was found to be the most effective against flea beetle, *Monolepta signata*; quinalphos 25 EC against the tobacco caterpillar *Spodoptera litura* (F.) and blister beetle *Mylabris phalerata* Thunb; chlorantraniliprole 18.5SC against stem fly *Ophiomyia phaseoli* Tryon; and chlorantraniliprole 18.5SC and thiacloprid 21.7 SC against leaf folder *Nacoleia vulgalis* Guenee. The highest yield was obtained with thiacloprid 21.7SC treatment.

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TOXICITY AND SUBLETHAL EFFECTS OF INSECTICIDES TO *CHRYSOPERLA ZASTROWI SILLEMI* (ESBEN-PETERSON)

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ABSTRACT

A laboratory experiment was conducted in the Department of Agricultural Entomology, College of Agriculture, Vijayapur, to evaluate the toxicity and sublethal effects of different insecticides to second instar grub of *Chrysoperla zastrowi sillemi* (Esbén-Petersen) (Neuroptera: Chrysopidea). The results of the experiment indicate that among the twelve treatments tested, irrespective of the interval, the grub mortality increased with dosage of insecticides. Among all insecticides tested, minimum mean mortality was observed at 72 hours after treatment (HAT) in NSKE (13.33%) and neem gold 0.03 EC (21.67%) were less toxic, whereas buprofezin 50 SC (40.00%), emamectin benzoate SG (48.33%) and thiamethoxam 25 WG (48.33%) were moderately toxic insecticides. These insecticides had little effect on longevity of adults, fecundity, hatching, pupal emergence and feeding capacity of *C. zastrowi sillemi*.

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EFFICACY OF INSECTICIDES AND BIORATIONALS ON SOYBEAN SEMILOOPER *GESONIA GEMMA*

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ABSTRACT

Incidence of semilooper in soybean ranged from 8.79 to 10.60 larvae/ mrl (m row length) and

6.30 to 11.52 larvae/ mrl, a day before the first and second sprays, respectively. At 3 and 7 days after first and second sprays the least population of semilooper was achieved with rynaxypyr 20SC (2010-11 & 2011-12). At 14 days, the population became the least with rynaxypyr 20SC after first spray and with chlorpyrifos 20EC after second spray. Rynaxypyr 20SC was found to be the most effective followed by emamectin benzoate and chlorpyrifos.

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**BIOLOGICAL CONTROL OF YELLOW MITE
*POLYPHAGOTARSONEMUS LATUS ON CAPSICUM CHINENSE***

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ABSTRACT

A study on the biological control of yellow mite *Polyphagotarsonemus latus* in hot chilli, *Capsicum chinense* was carried out in the Acarology laboratory, and under field conditions at the Department of Entomology, Assam Agricultural University, Jorhat during 2014 and 2015. The predatory mite *Amblyseius cucumeris* as biocontrol agent was evaluated. Under laboratory conditions, there was maximum reduction of yellow mite with 1:12 predator-prey ratio, while there was least reduction with 1:33 ratio. Under field conditions, *A. cucumeris* release @5, 6, 7, 8, 9 and 10 predators/ leaf resulted in significant control, with highest reduction being achieved with release of 10 predators/ leaf i.e., 56.95, 83.06, 100 and 100% after 3, 6, 9 and 12 days of release, respectively. The predatory mite *A. cucumeris* was found to be thus effective in controlling the yellow mite even at low pest density under field condition.

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**MOLECULAR PHYLOGENY OF THE LARGE CARPENTER BEE
*XYLOCOPA AESTUANS FROM NORTH WEST INDIA***

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ABSTRACT

Xylocopa aestuans (L.), a key large carpenter bee associated with pollination in both managed and natural ecosystem, belong to one of the largest subgenera, *Koptortosoma* Gribodo under the genus *Xylocopa* Latreille. This paper presents molecular variation and phylogeny of this species deploying partial cytochrome oxidase I (COI) and cytochrome *b* (*cytb*) sequences of mitochondrial genome. This study is the first report of *X. aestuans* mitochondrial genes with

respect to amplicon regions. It was observed that both the sequences showed high A-T bias with 80.67 % and 81.54 % in CO1 and *cytb*, respectively. The BLASTN similarity search of the obtained sequences showed a maximum similarity of 97% with *Xylocopa pubescens* Spinola accession. A separate phylogenetic analysis of both the sequences showed appropriate subgenus clustering of tested *Xylocopa* sequences. The study also showed the evolutionary association of *X. aestuans* with *X. pubescens*. Interestingly, *Koptortosoma* sp. showed two separate clusters supporting the polyphyletic nature of the subgenus. The evolutionary distances of *Koptortosoma* sequences showed that differences were larger than expected and showed probability of substitution from one base to another instantaneously. The study illustrates a complex genetic variation coupled with highly structured evolutionary divergences within species of *Xylocopa*, especially *X. aestuans*.

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QUALITY ASSESSMENT OF HONEY COLLECTED FROM UTTARAKHAND AND UTTAR PRADESH

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ABSTRACT

The study characterizes the physico-chemical parameters of honey samples collected from different locations in Uttarakhand and Uttar Pradesh. It was observed that these samples had the following properties: Moisture was 12.96- 19.02%; pH 3.28 - 4.80, TSS 68.2 -71° brix, total solids 80.97- 87.03 %, reducing sugar 45.64 - 62.37%, total sugar 50.26 - 71.02% and non-reducing sugar 2.42- 11.04%. The sample with least moisture content was from Haldwani (13%) followed by Tanda (14%) and Rampur (15%). The minimum pH was observed in the sample from Pilibhit (3.28). The highest TSS was observed in the honey from Dineshpur (71°brix) followed by Khatima, Tanda and Almora (70° brix). The total solid % was found to be the maximum with honey from Haldwani (87%) followed by the ones from Tanda (85%) and Rampur (84%). The reducing sugar was found to be maximum with Haldwani (62%) sample, followed by the ones from Halduchaor (59%) and Almora (56 %); while the total sugar was found to be the maximum with Haldwani (71%) sample, followed by those from Almora (65%) and Halduchaor (64%).

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EVALUATION OF CERTAIN INSECTICIDES AND ACARICIDES AGAINST THRIPS AND MITES ON CAPSICUM AND DISSIPATION OF SPIROMESIFEN 22.9SL

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ABSTRACT

Polyhouse experiments evaluated some new insecticides and acaricides against thrips, *Scirtothrips dorsalis* Hood and mite *Polyphagotarsonemus latus* Banks. The results revealed that of the seven insecticides, thrips population got significantly reduced with spinosad (0.06 thrips/ leaf) followed by diafenthiuron (0.50 thrips/ leaf) and thiamethoxam (1.30 thrips/ leaf). Likewise against mite spiromesifen (0.06 mites/ leaf) was significantly superior followed by diafenthiuron (2.21 mites/ leaf), triazophos (3.68 mites/ leaf). The leaf curl index (LCI) was also used in evaluating the efficacy in addition to population counts, which gave similar results. Also dissipation of spiromesifen was studied with residues quantified through regular sampling till the residues are below determination level (BDL) of 0.05 mg kg⁻¹ following the validated QuEChERS method. The qualitative and quantitative analysis of spiromesifen performed on LC- MS/MS (PDA) revealed initial deposits of 1.61 mg kg⁻¹ detected at 2 hr after last spray, which dissipated to BDL at 10th day after spray. The half life and safe waiting period for harvest was 2.09 and 10.00 days, respectively.

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INCIDENCE OF SOUTH AMERICAN TOMATO LEAF MINER *TUTA ABSOLUTA* (MEYRICK) (LEPIDOPTERA: GELECHIIDAE) AND ITS NATURAL ENEMIES IN SOUTHERN KARNATAKA

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ABSTRACT

Surveys carried out in four districts of southern Karnataka viz., Bengaluru Rural, Chikkaballapura, Kolar and Mysuru to know the incidence level of South American Tomato Leaf Miner *Tuta absoluta* (Meyrick). These undertaken at monthly intervals from July 2015 to April 2016 revealed that the infestation ranged from a low (5.97% leaf) during November 2015 and (1.59% fruit) during July 2015 to a maximum (24.72% leaf and 13.99% fruit damage) during February 2016. The study also evaluated the effect of mulching in reducing the infestation, besides recording two natural enemies from the surveyed areas in southern Karnataka.

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CHLORANTRANILIPROLE: A NOVEL PESTICIDE AGAINST LEPIDOPTERAN PREDATORS OF LAC INSECT *KERRIA LACCA* (KERR)

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ABSTRACT

Crop protection plays a significant role in safeguarding productivity against insect pests. Likewise treatment of broodlac (seed material) is the starting point for achieving sustained lac production. Broodlac happen to be the major source of pest infestation on new lac crops. Laboratory and field experiments were conducted to investigate the biosafety of chlorantraniliprole against lac insect, *Kerria lacca* (Kerr) and find out its efficacy against key lepidopteran predators by dipping broodlac in insecticide solutions for 5, 10 and 15 min duration. Seven concentrations of chlorantraniliprole 18.5% SC formulation, ranging from 0.001% (0.05 ml L⁻¹) to 0.0111% (0.6 ml L⁻¹) were evaluated. Chlorantraniliprole did not show any detrimental effect on survival and settlement of 2nd instars larvae and adult female, as significant difference was not observed between treatments and control, indicating its biosafety. Treatment of broodlac with chlorantraniliprole showed pronounced effect on reduction of key lepidopteran predators viz., *Eublemma amabilis* (Noctuidae) and *Pseudohypatopa pulverea* (Blastobasidae). The treatment of *rangeeni* broodlac with 0.0037% concentration (0.2 ml L⁻¹ water) for 5 min or 0.0020% (0.1 ml L⁻¹ water) for 10-15 min duration was effective in reducing the population of *E. amabilis* and *P. pulverea*. Whereas, treatment of *kusmi* broodlac with 0.0056% (0.3 ml L⁻¹ water) for 5 min dipping or with 0.0037% for 10-15 min dipping provided effective suppression of these predators. Thus treatment of broodlac prior to inoculation with chlorantraniliprole is our excellent addition to the IPM for managing the predators' population harbored in broodlac. This study confirms the potential for use of chlorantraniliprole in lac culture for control of lepidopteran predators.

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DIFFERENTIAL RESPONSE TO SEX PHEROMONE OF THE SHOOT AND FRUIT BORER *CONOGETHES PUNCTIFERALIS* REARED ON CASTOR AND CARDAMOM

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ABSTRACT

Conogethes punctiferalis (Crambidae: Lepidoptera) is an important pest of castor, *Ricinus communis*. The *Conogethes* species population infesting cardamom, *Elettaria cardamomum* in India was earlier thought to be *C. punctiferalis*. This is because moths of both populations appear similar in morphology, particularly wing patterns and colour. The moths too showed a differential response to the sex pheromone components viz. (E)-10-hexadecenal (E10-16:Ald), (Z)-10-hexadecenal (Z10-16:Ald) and hexadecenal (16:Ald) when exposed in castor and cardamom fields. This elicited a doubt that the pheromone composition of castor and cardamom populations might be different. Therefore investigations using Electroantennogram (EAG) and wind tunnel bioassays of populations on castor and cardamom were conducted. *Conogethes* reared on castor (CBR) had greater EAG response than the one reared on cardamom (CBE) to E10-16:Ald+ Z10-16:Ald mixed in 1:1 (0.96 ± 0.025 mV). However, CBE elicited highest response to E10-16:Ald+ Z10-16:Ald at 100:8 (1.10 ± 0.25 mV). In comparative EAG studies both populations gave higher responses to respective female abdominal gland extracts. Wind tunnel bioassay of synthetic pheromone blend E10-6: Ald+ Z10-16:Ald+ 16:Ald (100:8:16) showed source contact when tested against males of CBR, contradictory to CBE. The experimental results revealed that the major pheromone component of both the populations was E10-16: Ald but differed in minor components and their proportions. Supportive data on other aspects of the two populations suggested that these are different and could be different species.

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TAXONOMY OF AGRICULTURALLY IMPORTANT PLUSIINAE (LEPIDOPTERA: NOCTUIDAE)

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ABSTRACT

Eight species belonging to six genera viz., *Thysanoplusia* Ichinose, *Chrysodeixis* Hubner, *Trichoplusia* McDunnough, *Argyrogramma* Hubner, *Autographa* Hubner and *Anadevidia* Kostrowicki of the subfamily Plusiinae were collected from different parts of India. Among these were eight species considered as important pests in agricultural ecosystems. This paper provides the details of host plants, diagnostics and keys for their identification along with descriptions of male and female genitalia.

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OILS AS UV PROTECTANTS OF *BEAUVERIA BASSIANA* CONIDIA AND BIOEFFICACY AGAINST *LIPAPHIS ERYSIMI* (KALT)

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ABSTRACT

The management of insect pests by entomopathogenic fungus depends upon maintaining sustenance of fungal isolates to abiotic stress. The present study was conducted to evaluate four plant based oils viz. soybean, rice bran, sunflower and mustard oil as UV protectants with conidia of *Beauveria bassiana* (Balsamo) and their pathogenicity against third instar nymphs of mustard aphid *Lipaphis erysimi* (Kalt). *Beauveria bassiana* supplemented with soybean oil recorded maximum colony forming units (9.47×10^3 conidia/ml) followed by sunflower (8.09×10^3 conidia/ml), rice bran (4.14×10^3 conidia/ml) and mustard oil (3.23×10^3 conidia/ml) after 60 sec of UV exposure. When supplemented with soybean and sunflower oil and evaluated against third instar nymphs of *L. erysimi* it resulted in 67.18 and 66.14% mortality, though at par with each other but significantly better than untreated control (61.92%). However, when oil supplemented conidial suspension of *B. bassiana* was exposed to UV (305 nm) for 20 sec, the mortality decreased to 61.20, 59.48 and 54.61% in soybean, sunflower and untreated control (conidial suspension without oil), respectively. Among all *Beauveria* isolates, the native isolate *B. bassiana* (F10) and an isolate of commercial formulation Mycojaal[®] resulted in maximum mortality of nymphs of mustard aphid and were most pathogenic.

The following are short communications, these have no abstracts

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EFFICACY OF QUINALPHOS 25EC AGAINST LEAFHOPPER *OROSIUS ALBICINCTUS* IN SESAMUM

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ESTIMATION OF AVOIDABLE YIELD LOSSES IN CHICKPEA GENOTYPES BY *HELICOVERPA ARMIGERA* (HUBNER)

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**INFLUENCE OF BIOPHYSICAL FACTORS ON BER STONE WEEVIL
AUBEUS HIMALAYANUS VOSS INFESTATION**

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**LABORATORY AND FIELD EVALUATION OF INSECTICIDES AGAINST
MUNGBEAN LEAF EATING CATERPILLAR *AGRIUS CONVOLVULI***

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SEED TREATMENT AND NEEM CAKE AGAINST TERMITES IN WHEAT

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**SPIRALLING WHITEFLY *ALEURODICUS DISPERSUS* RUSSELL
A NEW PEST OF KING CHILLI IN MANIPUR**

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**PEST COMPLEX AND POPULATION DYNAMICS OF
MAJOR INSECT PESTS IN SOYBEAN**

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**SEASONAL INCIDENCE OF SUCKING PESTS ON
MOTHBEAN *VIGNA ACONTIFOLIA* (JACQ.) MARECHAL**

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**EFFECT OF INSECTICIDES INCLUDING A NOVEL MOLECULE
TRIFLUMEZOPYRIM AND BIOPESTICIDES ON RICE PLANTHOPPERS**

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