

**EFFICACY OF READY MIX FORMULATION OF SPIROTETRAMAT 120 +
IMIDACLOPRID 120: 240 SC AGAINST SUCKING PEST COMPLEX OF BRINJAL**

BISWAJIT PATRA*, MOULITA CHATTERJEE
SK. F. ALAM*** AND A. SAMANTA*****

*Regional Research Station (Hill Zone)

Uttar Banga Krishi Viswavidyalaya, Kalimpong 734301

**Department of Agricultural Entomology

Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar 736165

***Department of Agricultural Entomology

Bidhan Chandra Krishi Viswavidyalaya, Nadia 741252

*Email: biswa.kris@gmail.com (corresponding author)

ABSTRACT

Field experiments were conducted during pre-kharif season of 2011 and 2012 at University Experimental Farm, Unit C, Kalyani, West Bengal to study the efficacy of a ready mix formulation of spirotetramat 120 + imidacloprid 120: 240 SC at three combination doses (i.e., 45+45 g a.i./ ha, 60+60 g a.i./ ha and 75+75 g a.i./ ha) against the jassid, whitefly and red spider mite. Six standard checks viz., spirotetramat 150 OD @ 75 g a.i./ ha, imidacloprid 200SL @ 75 g a.i./ ha, dicofol 18.5% EC @ 185 g a.i./ ha, oxydemeton methyl 25 EC @ 250 g a.i./ ha, dimethoate 30 EC @ 300 g a.i./ ha and thiamethoxam 25 WG @ 25 g a.i./ ha along with a untreated check were also evaluated. The study revealed that the combination of spirotetramat 120 + imidacloprid 120: 240 SC @ 75+75 g a.i./ ha was the best treatment in terms of minimum pest population as well as maximum yield.

**CONTROLLED POLLINATION AND POPULATION DYNAMICS OF
POLLINATORS OF APPLE IN KASHMIR**

TAHMINA MUSHTAQ*, SHEIKH BILAL AND BABY SAMUNA

Division of Entomology, SKUAST-K (Shalimar), Srinagar 191121, J&K

*Email: tttahmina2@gmail.com

ABSTRACT

To investigate impact of Controlled Release Pollination on abundance and % population of major pollinators of apple, three pollination treatments were compared during 2011-12. i.e., natural pollination (Treatment T₀), controlled release with three hive units (Treatment T₁) and controlled release with five hive units (Treatment T₂). Comparative abundance showed that hymenopterans were the most abundant visitors to apple flowers in all the treatments with the maximum population being under treatment T₂ (77.78). The population of *Apis mellifera* L. in

the three treatments differed significantly and an increase of 273.59 and 185.53% was demonstrated in a significant manner in orchards with controlled release of five and three hives, respectively, when compared to naturally pollinated orchards.

Indian Journal of Entomology, 80 Online published, IJE 16045/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00128.1

POPULATION DYNAMICS OF MANGO FRUIT FLY

PATEL, K.B.*, SUSHIL KUMAR AND PATEL, K.M.

Department of Agricultural Entomology,
N.M. College of Agriculture, Navsari Agricultural University, Navsari 396450
*Email: ketan_ento@nau.in

ABSTRACT

A field experiment was carried out at Navsari Agricultural University, Navsari during 2009-11. Population of fruit fly was observed during 13 (26 March- 1 April) - 30 (23- 29 July) Standard Week (SW) in 2009-10, 2010-11 (and pooled results), respectively. Highest fruit fly infestation (36.67 %) was observed on 22th SW coinciding with ripening cum harvesting period of mango which increased with temperature, relative humidity, wind velocity and evaporation.

Indian Journal of Entomology, 80 Online published, IJE 16049/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00129.3

MORPHOMETRICS OF STINGLESS BEE IN SOUTHERN KERALA

K. K. DIVYA*, V. S. AMRITHA AND S. DEVANESAN

Department of Agricultural Entomology, College of Agriculture,
Kerala Agricultural University, Thiruvananthapuram 695522
*Email: divyakrishnan350@gmail.com (corresponding author)

ABSTRACT

Morphometrics variations of stingless bees in southern Kerala when analysed revealed significant variations within locations and between upland and midland physiographic regions. Among the 17 morphometric parameters variations observed in proboscis, forewing, femur, metatarsus and third sternite were more significant and play a prominent role to improve their pollinating and honey collecting ability. Stingless bees have a capacity to adjust their body parameters based on the available flora and physiographic regions.

Indian Journal of Entomology, 80 Online published, IJE 16050/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00130.X

VALIDATION OF IPM MODULES AGAINST MAJOR PESTS OF OKRA

**M. RAJASHEKHAR, K. RAVINDER REDDY
CH. RAJA GOUD** AND K. MANASA**

Department of Vegetable Science, College of Horticulture
Sri Konda Laxman Telangana State Horticultural University, Rajendranagar, Hyderabad 500030

**Department of Entomology

*Email: shekarmudavath1@gmail.com

ABSTRACT

Field experiment was laid out at the College of Horticulture, Rajendranagar to validate eight IPM Modules against major pests of okra *Abelmoschus esculentus* (L.) Moench during *kharif* 2014. IPM Modules studies include M₁- Low Cost Technology, M₂ - Bio Intensive Module- I, M₃ - Bio Intensive Module- II, M₄- Dr. YSRHU Recommended Module, M₅. NCIPM, Delhi Recommended module, M₆- Biointensive module+ Insecticide Module, M₇- Insecticide Module, and M₈- untreated control, in three replications. Data on population of thrips, leafhoppers, mites, whiteflies and coccinellids were recorded at weekly intervals. Insecticide module, NCIPM recommended module and Biointensive module+ Insecticide module were found to be the best. The maximum number of coccinellids/ leaf was recorded in NCIPM recommended module.

Indian Journal of Entomology, 80 Online published, IJE 16052/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00131.1

POLLINATOR DIVERSITY AND FORAGING BEHAVIOUR OF HONEY BEE *APIS CERANA INDICA* ON NIGER

ROJEET THANGJAM*, H.R. RAMYA, M.K. DEKA, R.K. BORAH AND H.R. SINGH

Department of Entomology,

Assam Agricultural University, Jorhat 785013, Assam

*Email: rojeetthangjam@gmail.com

ABSTRACT

Investigation on the diversity of insect pollinators on niger crop revealed that a total of 19 species of insect pollinators visit the flowers. These belong to ten families under five orders viz., Hymenoptera, Diptera, Coleoptera, Hemiptera and Lepidoptera. *Apis dorsata*, *A. cerana indica*, *A. florea*, *Andrena* sp., *Phytomia zonata*, *Eristalinus taeniops*, *E. punctulatus*, *Eristalinus arvorum*, *Erisyrphus balteatus*, *Micraspis discolor*, *Harmonia dimidiata*, *Popillia* sp., *Aulacophora foveicollis*, *Dysdercus cingulatus*, *Tajuria cippus*, *Chilades* sp., *Pieris canidia indica*, *Nyctemera* sp. and *Amata* sp. were observed. Among these, *A. cerana indica* was the dominant forager (41.95%) followed by *A. florea* (20.13%) and *A. dorsata* (19.80%). The activity of the pollinators was maximum during 0900 to 1100 hr. The maximum number (8.67 ± 0.33) of *A. cerana indica* /m² /min was observed during 1000-1100 hr and minimum (1.33 ± 0.33) at 1600-1700 hr. The highest frequency of flower visit/ min. was (14.00 ± 0.58) at 1000-1100 hr and the lowest (0.23 ± 0.33 visits/ min) at 1600-1700 hr. Likewise, maximum time spent/ flower was 4.99 ± 0.40 sec during 1000-1100 hr and minimum was 1.00 ± 0.06 sec during 1600-1700 hr.

Indian Journal of Entomology, 80 Online published, IJE 16053/ April 2018

APPLICATION OF RADAR IN ENTOMOLOGY- A REVIEW

H. R. RAMYA*, INEE GOGOI AND ROJEET THANGJAM

Department of Entomology, Assam Agricultural University, Jorhat 785013

*Email: ramyahr1991@gmail.com

ABSTRACT

Application of radar in the field of entomology has provided many new insights into the phenomenon of migration. There are various kinds of radars which could be deployed for entomological studies. In particular, radars have produced a wealth of quantitative information on the spatial and temporal distribution of insect migrants. In many insects engaged in high altitude, wind borne migration often several kilometers above the earth surface happens. Hence, radar could help in understanding the ecology and population dynamics. Direct observation of high flying migrants is very difficult especially at night, but entomological radar provides a new way in exploring it. Radars could be used for tracking such migrations, and in addition might be of use in insect identification too. There are few case studies explained herein the review which elaborate the use of radars in entomology.

Indian Journal of Entomology, 80 Online published, IJE 16054/ April 2018

A NEW GRANULOVIRUS AGAINST *PIERIS BRASSICAE*

PINKI BHANDARI*, SARITA CHAUDHARY, NAYANA, E.D., AND S.K. RAZA

Division of Bioscience, Institute of Pesticide Formulation Technology, Gurgaon 122016

*Email; drpbhandariipft@gmail.com

ABSTRACT

A laboratory experiment was conducted in the virology lab of IPFT, Gurgaon during 2015 at $25\pm 2^{\circ}\text{C}$ and $70\pm 5\%$ RH to check the efficacy of some biopesticides (PbGV, neem formulation, SHNPV, SINPV) along with over prescribed doses of pesticides (dicofenozole 25%EC, cypermethrin 10%EC, chlorpyrifos 20%EC) against cabbage butterfly *Pieris brassicae* L. The efficacy was computed in terms of highest mortality in minimum period of time, with LD_{50} and LT_{50} . These revealed variations in mortality rate with insecticides, but with biopesticides, maximum mortality and higher infectivity potential were obtained with a newly identified baculovirus strain viz. PbGV.

Indian Journal of Entomology, 80 Online published, IJE 16056/ April 2018

NUTRIENT AND ANTIOXIDANT PROFILE OF BEE HONEY FROM KERALA

KRISHNASREE, V.,* AND MARY UKKURU, P.
Department of Home Science, College of Agriculture
Kerala Agricultural University, Vellayani, Trivandrum
* Current address- School of Food Science
M.O.P. Vaishnav College for Women, Chennai 600034
*Email: krishnasree.arun@gmail.com

ABSTRACT

The nutrient profile and antioxidant activity of the major bee honeys viz., *Apis cerana indica* F. (Ac), *Apis mellifera* L. (Am), *Apis dorsata* F. (Ad), *Apis florea* F. (Af) and *Trigona iridipennis* S. (Ti) from their raw and processed obtained in the southern zone of Kerala were analyzed. It was observed the energy content ranged from 328 to 353 kcal and carbohydrate content from 80.25 to 88 g/ 100g. The protein content was negligible and the major amino acid proline was detected only in raw and processed Ad honey (4.5 mg each) and *T. iridipennis* (8, 3 mg) honeys. With respect to the mineral content potassium was detected at higher levels among all the honeys, which ranged from 30.5 to 52 mg/ 100g among the raw honeys and from 28 to 47.5 mg/ 100g among the processed honeys. The iron content was recorded from 0.54 to 1.4 mg/ 100g among the raw honeys and from 0.24 to 1.3 mg/ 100g among the processed honeys. The trace elements analyzed were zinc (0.04 to 5 mg/ 100g), copper (0.002 to 0.13 mg/ 100g) and manganese (0.001 to 0.35 mg/ 100g). All the honeys showed good to moderate levels of antioxidant activity (100 to 500 µg/ml) with the highest being in *T. iridipennis* honey. Significant reduction (1%) of antioxidant activity was exhibited among the processed honeys.

Indian Journal of Entomology, 80 Online published, IJE 16062/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00135.9

ESTIMATION OF LOSSES CAUSED BY MAIZE STEM BORER *CHILO PARTELLUS* (SWINHOE) IN KHARIF MAIZE

ASHWINDER K. DHALIWAL*, D.S. BRAR* AND JAWALA JINDAL**

*Department of Entomology; **Maize Entomology Laboratory, Department of Plant Breeding,
Genetics and Biotechnology, Punjab Agricultural University, Ludhiana
Email: batthscorpion@pau.edu

ABSTRACT

The losses caused by maize stem borer, *Chilo partellus* (Swinhoe) in *kharif* maize sown at different times were estimated by protecting the crop with deltamethrin 2.8 EC against *C. partellus* during *kharif* 2013 and 2014 in Punjab. The incidence of *C. partellus* was lower in the crop sown on 25th June than in the crop sown during last week of May and on 10th June. Accordingly, the losses caused by *C. partellus* were lower in the crop sown on 25th June (8.66-13.26%) than in the crop sown during last week of May (11.34-16.31%) and on 10th June (11.42-14.55 %). The comparison of protected and unprotected conditions revealed that the avoidable losses caused by *C. partellus* were found to be 12.99%.

Indian Journal of Entomology, 80 Online published, IJE 16065/ April 2018

**POPULATION DENSITY OF PREDATORS
IN EARLY SEASON CRUCIFEROUS CROPS**

C. SATYANARAYANA* AND K.T. ARUNAKUMARA**

College of Horticulture (University of Horticultural Sciences), Bidar 585403, Karnataka

Current address: *,**Department of Plant Protection

*Email: skchitral@rediffmail.com

ABSTRACT

An experiment was conducted to assess the relative abundance of predators and effect of pest management practices on their population dynamics in early season cruciferous crops at College of Horticulture, Bidar during 2013 and 2014. In the visual observations, members of Araneae were more abundant than insects, and were found consistently at all sampling sites from transplanting to harvest. Cabbage (77.96%), cauliflower (82.99%) and radish (75.32%) registered highest share of these spiders. Chinese cabbage recorded maximum number of predators (63.93 ± 6.93), of which coleopterans were major (48.36%). Sampling with sticky traps resulted in maximum number of coleopterans and hemipterans. Commonly trapped ground dwelling ones were Lycosidae, Labiduridae, Carabidae and Formicidae. In the pitfall traps the dermapterans (Labiduridae) were found to be more- in cabbage (67.87%) followed by, cauliflower (67.57%), Chinese cabbage (70.68%) and radish (48.20%). Effect of pest management practices on predators living on the leaves was considerable as seen with visual observations and sticky trap catches, but with ground dwelling ones such effect was not perceivable.

Indian Journal of Entomology, 80 Online published, IJE 16071/ April 2018

**FIELD EFFICACY OF NEWER INSECTICIDES AGAINST
TOBACCO CATERPILLAR *SPODOPTERA LITURA* (F.) IN SOYBEAN**

S. RAMESH BABU*, RAMGOPAL DUDWAL AND M.K.MAHLA

Agricultural Research Station, Borwat Farm, Maharana Pratap University of Agriculture and Technology (MPUAT), Banswara 327001, Rajasthan

*Email: babuento@yahoo.co.in

ABSTRACT

An experiment was conducted for two *kharif* seasons during 2013 and 2014 to find out the field efficacy of newer insecticides against tobacco caterpillar, *Spodoptera litura* (F.) in soybean. In both the years on 3, 7 and 12 DAS (days after spraying), chlorantraniliprole showed significant maximum larval mortality achieving a cumulative value of 79.29-84.77%. Indoxacarb showed a cumulative efficacy of 70.53-72.22%. Emamectin benzoate and novaluron+ indoxacarb demonstrated more than 50% efficacy and recorded a cumulative efficacy of 56.72-56.58% and 55.92-58.62% in emamectin benzoate and novaluron+ indoxacarb, respectively; whereas, novaluron showed the

cumulative efficacy of 46.23-49.96%. Profenophos and triazophos demonstrated the weakest efficacy against larvae of *S. litura*, not exceeding 40% at individual assessments. The pooled mean data on seed yield, showed an incremental yield of 11.44 q/ha in chlorantraniliprole over untreated control then followed by indoxacarb which recorded an incremental yield of 9.12 q/ha. The highest cost benefit ratio was noticed in chlorantraniliprole (5.54) and indoxacarb 15.8 EC (5.63).

Indian Journal of Entomology, 80 Online published, IJE 16073/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00138.4

STUDIES ON CHARACTERS FOR IDENTIFICATION OF *APIS* AND NON *APIS* BEES ON CORIANDER

MANJU DEVI*, HARISH KUMAR SHARMA AND R.K. THAKUR

Department of Entomology

Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan 173230

*Email: manjupanwer@gmail.com

ABSTRACT

Coriander is used as a strip crop to attract pollinators in order to facilitate pollination of major crops. This strip crop planting is important in determining the occurrence and abundance of pollinators in a locality. Amongst various insect pollinators, bees accomplish more than 80% of insect pollination. The wild bees including bumble bees, leaf cutting bees, alkali bees and carpenter bees are especially adapted for gathering pollen and nectar from flowers. In the present study, insect pollinators were collected by fluorescent pan traps, scan sampling and sweep net during March, 2013-2014. An effort was made to study and develop keys for identification of *Apis* and non *Apis* bees. All the samples were identified on the basis of tongue length as long tongue and short tongue bees. The bees collected on coriander bloom represent the family Megachilidae, Halictidae and Apidae were found on coriander bloom. Most of the bees belong to genus *Halictus* having 3 different species (Family Halictidae), one species of family Megachilidae and two species of family Apidae.

Indian Journal of Entomology, 80 Online published, IJE 16074/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00139.6

ROOT MEALYBUGS AND ASSOCIATED FAUNA IN BLACK PEPPER

**NAJITHA UMMER*, SUSANNAMMA KURIEN,
MAICYKUTTY P. MATHEW AND ANJANA CHANDRAN****

Department of Agricultural Entomology, College of Horticulture, Vellanikkara

Kerala Agricultural University, Kerala 680656

**Vegetable and Fruit Promotion Council of Kerala

*Email: najithaummer@gmail.com

ABSTRACT

Surveys were conducted in eleven locations in two districts (Wayanad and Idukki) of Kerala during 2013-14 and 2015-16. Three mealybug species viz., *Formicococcus polysperes* Williams, *Dysmicoccus brevipes* (Cockerell) and *Pseudococcus* sp. were found infesting the roots and basal stem region of black pepper vines (*Piper nigrum* L.). *F. polysperes* was dominant in both districts. Infestation caused aerial symptoms like yellowing, wilting and defoliation of leaves. *F. polysperes* was also found to be infesting ginger in infested black pepper gardens. Four species of ants viz., *Crematogaster rogenhoferi* Mayr, *Lophomyrmex quadrispinosus* (Jerdon) (Myrmicinae), *Anoplolepis gracilipes* (Smith) and *Paratrechina* sp. (Formicinae) were associated with root mealybug colonies. Among the natural enemies, larvae of *Horniolus* sp. were observed to predate on root mealybug colonies. Many weed hosts and intercrops in pepper garden were documented as collateral hosts of root mealybugs.

Indian Journal of Entomology, 80 Online published, IJE 16077/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00140.2

BIOCHEMICAL CHANGES IN RICE YELLOW STEM BORER INFESTED RICE ACCESSIONS

V. AMSAGOWRI^{*}, N. MUTHUKRISHNAN^{}, C. MUTHIAH^{***}, M. L. MINI^{****}
AND S. MOHANKUMAR^{*****}**

Department of Agricultural Entomology, Agricultural College and Research Institute
Tamil Nadu Agricultural University, Madurai 625104

^{**}Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore
641003; ^{***}Regional Research Station, Aruppukottai 626 107, Tamil Nadu Agricultural
University; ^{****}Department of Biotechnology; ^{*****}Centre for Plant Molecular Biology and
Biotechnology, Tamil Nadu Agricultural University, Coimbatore 641003

*Email: vasuviji0590@gmail.com (corresponding author)

ABSTRACT

Biochemical constitution of twenty two rice accessions showing susceptible, moderately susceptible, moderately resistant and resistant reaction to yellow stem borer, *Scirpophaga incertulas* (Walker) were studied in 40 days old transplanted healthy and stem borer infested plants under screen house condition. Total phenol increased by range of 13.11 to 43.66 %, OD phenol increased by range of 20.00 to 61.29 %, total sugar increased by range of 30.62 to 64.35 %, reducing sugar increased by range of 33.68 to 64.48 % and non-reducing sugar increased by range of 22.57 to 61.17 % due to stem borer infestation in different rice accessions. The results depicted that the amount of total sugars, reducing sugar and non-reducing sugars in all susceptible genotypes was found higher compared to resistant and moderately resistant accessions. Higher level of total phenols and orthodihydroxy phenol were found in resistant and moderately resistant accessions as against susceptible accessions and indicating that these defensive compounds are contributing towards the rice yellow stem borer resistance.

Indian Journal of Entomology, 80 Online published, IJE 16079/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00141.4

**PHOSPHINE RESISTANCE IN RUSTY GRAIN BEETLE
CRYPTOLESTES FERRUGINEUS (STEPHENS) FROM SOUTH INDIA**

**MURALITHARAN, V. *, SONAI RAJAN, T., CHANDRASEKARAN, S.
AND S. MOHANKUMAR****

Department of Agricultural Entomology
CPPS, Tamil Nadu Agricultural University, Coimbatore 641003

**Department of Plant Biotechnology
CPMB&B, Tamil Nadu Agricultural University, Coimbatore 641003

*Email: muraliento@gmail.com

ABSTRACT

Fumigation with phosphine gas is the most common method of disinfestation of stored grains from insect pests. However, the indiscriminate and prolonged use of phosphine gas resulted in the development of heritable resistance in most of the stored grain insect pests including rusty grain beetle, *Cryptolestes ferrugineus*. The recent high level of phosphine resistance is threatening the grain storage. There is no detailed information available on the level of phosphine resistance in Indian populations of *C. ferrugineus* particularly in south India. Forty samples of *C. ferrugineus* were collected from different food grain reserves across four major southern states of India viz., Tamil Nadu, Telangana, Andhra Pradesh and Kerala. The frequency of resistance was evaluated with resistance bioassay with two discriminating concentrations, 0.05 and 1.0 mg L⁻¹ over 20 and 168 hr, respectively.

The results revealed that the resistance was common in all the field collected populations of *C. ferrugineus* with two level of resistance viz., weak and strong resistance and the frequency is ranging from 20.22 to 94.12% in Tamil Nadu, whereas it was 78.65 to 88.64% in confined samples from Telangana. In Andhra Pradesh it was up to 73.33 to 95.00% and 32.88 to 97.70% in Kerala at low concentration of phosphine gas (0.05 mg L⁻¹). In high concentration (1.0 mg L⁻¹), the frequency of resistance was observed ranging from 5.00 to 34.44, nil, 13.56 to 60.34 and 8.89 to 50.56% in Tamil Nadu, Telangana, Andhra Pradesh and Kerala, respectively. Among the populations evaluated, the populations from Guntur, Thrissur, Egmore, Sattenapalle, Nandyal, Kadapa, Cochin, Duggirala, Madurai and Kannur exhibited high level of strong resistance to phosphine suggesting that these populations might have been exposed to repetitive selections with high concentration of phosphine gas over long period of time.

Indian Journal of Entomology, 80 Online published, IJE 16080/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00142.6

BUD BORER COMPLEX AND YIELD LOSS IN SAPOTA

K. D. BISANE

Fruit Research Station, ICAR-AICRP on Fruits (Banana, Sapota, Papaya),
Navsari Agricultural University, Gandevi 396360, Gujarat
Email: kdbisane@yahoo.co.in

ABSTARCT

The seasonal succession of sapota bud boring pests complex viz., bud borer (*Anarsia achrasella*) and chiku moth (*Nephoteryx eugraphella*) was studied from 2013-15. The bud borer cause damage to new buds round the year with the peak activity during April (10.19-10.82%) and May (10.83-11.70%) at commencement of main flowering phase of sapota. Similarly, chiku moth infestation was also observed throughout the year and attained highest during May (5.10-6.27%) and December (6.23-6.76%). Regarding correlation, bud borer damage found increased with increase in maximum temperature and ultimately evaporation at lower morning relative humidity in summer coincide with peak flowering, while chiku moth activity was mainly with relative humidity. The avoidable loss due to both the pests in terms of yield under unprotected condition was recorded up to 25.16 and 27.76%.

Indian Journal of Entomology, 80 Online published, IJE 16081/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00143.8

**INSECT BIODIVERSITY IN CAULIFLOWER AND
BIOLOGY OF CABBAGE WHITE BUTTERFLY *PIERIS BRASSICAE* (L.)**

M.SHARMILA*, P. DEVJANI, KH.IBOHAL **, N.IRABANTA SINGH

Centre of Advanced study in Life sciences, Manipur University, Canchipur, Imphal 795003

*Department of Entomology, Central Agricultural University, Iroisemba

*Email:maibamsharmila@gmail.com

ABSTRACT

Insect species complex of cauliflower and biology of *Pieris brassicae* (L.) were studied during 2013-2014 in the Department of Life Sciences, Manipur University. The study revealed twenty five species of insects comprising of 16 pests and 8 predators (4 coccinellids, 3 syrphids and one crambid). The biology of *Pieris brassicae* (L.) on cauliflower revealed that the egg period was 3.00 ± 0.00 and 4.0 ± 0.00 days during October- December and January-April, respectively. The entire life cycle (egg to adult) occupied 50.22 ± 1.56 and 60.76 ± 1.71 days during the two seasons studied.

Indian Journal of Entomology, 80 Online published, IJE 16085/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00144.X

**TAXONOMY OF GENUS *AGATHIA* GUENEE (LEPIDOPTERA: GEOMETRIDAE)
WITH DESCRIPTION OF A NEW SPECIES FROM WESTERN GHATS, INDIA**

***TARUN GOYAL, JAGBIR SINGH KIRTI** AND ABHINAV SAXENA**

Department of Agriculture, Baba Farid College, Bathinda 151001

**Department of Zoology and Environmental Sciences, Punjabi University, Patiala 147002

*Email: goyaltarun06@gmail.com

ABSTRACT

Four species of the geometrid genus *Agathia* Guenee viz., *hemithearia* Guenee, *hilarata* Guenee, *lycaenaria* Kollar and *viridana* Stoll referable to the genus *Agathia* Guenee have been collected

and identified from different localities of Western Ghats, India. The external genitalia of these illustrated. A new species i.e., *microlaetata* sp. nov. has also been described.

Indian Journal of Entomology, 80 Online published, IJE 16086/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00145.1

**INFLUENCE OF BACILLUS THURINGIENSIS TOXINS
ON THE DEVELOPMENT AND MIDGUT PROTEASES
IN DIFFERENT LARVAL INSTARS OF *HELICOVERPA ARMIGERA***

VISWESHWAR, R^{*}, AKBAR, S.M.D.^{**}, SHARMA, H.C.^{**} AND SREERAMULU, K.^{*}**

^{*}Department of Biochemistry, Gulbarga University, Kalaburagi 585106, Karnataka

^{**}Department of Entomology, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru 502324, Telangana

^{*}Email: ksramu@rediffmail.com. (corresponding author)

ABSTRACT

Helicoverpa armigera (Hubner) (Lepidoptera: Noctuidae) is one of the most important pest worldwide. *Bacillus thuringiensis* (Bt) toxins have used as a biopesticide or deployed in transgenic plants for controlling this pest. We examined the biological activity of Cry1Ac, Cry1Ab and Bt formulation in different larval instars of *H. armigera* with respect to larval development and proteolytic activity to pinpoint the most susceptible instar, and the insect response to ingestion of Bt toxins. In the presence of Bt toxins, the larval mortality and weight loss increased in a dose-dependent manner, and the maximum effect was observed in neonates. Active Cry1Ac toxin resulted in greater mortality and weight loss in all the larval instars. Total protease, trypsin and chymotrypsin activities declined in the presence of Bt toxins as compared to the untreated control in all the larval instars. Ten protease isozymes were observed in the untreated control larvae in second, third and fourth instars. Maximum protease isozymes inhibition was observed in Bt toxin fed neonates. Inhibition of protease activity increased with the concentration of Bt toxins. In presence of Bt toxins, aminopeptidase activity increased from II to IV instar and alkaline phosphatase activity decreased from II to III and then increased in IV instar. The pathogenicity of Bt was greater in early larval instars of *H. armigera* than the later instars, suggesting that application of Bt formulation or deployment of Bt toxins in transgenic plants should be directed against the early larval instars.

Indian Journal of Entomology, 80 Online published, IJE 16087/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00146.3

**DIVERSITY AND POPULATION DYNAMICS OF PARASITOIDS
OF CITRUS LEAF MINER ON ACID LIME IN KARNATAKA**

**HANAMANTAGOUDA V. PAUL^{*}, VENKATESHALU, J.B.GOPALI AND
MALLIKARJUN AWATI^{**}**

Department of Entomology, College of Horticulture, Bagalkot 587104

^{**}Department of Crop Physiology

*Email: hanamul16@gmail.com (corresponding author)

ABSTRACT

The parasitoid species composition, their population dynamics and parasitism on *Phyllocnistis citrella* were studied in acid lime ecosystem in Bagalkot and Vijayapur districts (Karnataka), during 2014-15. The parasitoid complex comprised totally seven hymenopteran parasitoids belonging to three families viz., Eulophidae, Braconidae and Platygasteridae. Two larval- pupal parasitoids viz., *Cirrospilus ingenuus* Gahan and *Sympiesis striatipes* Ashmead and five larval parasitoids viz., *Omphale* sp., *Bracon* sp., *Citrostichus* sp., *Apanteles* sp. and a Scelioninae species were observed. The parasitization ranged from 29.83 to 70.94%. Among these *C. ingenuus*, *S. striatipes* and *Citrostichus* sp were the most dominant and thus could be exploited in biological control. Out of seven parasitoids, *Omphale* sp., *Apanteles* sp., and an unidentified species of Scelioninae had been reported herein as parasitoids of citrus leaf miner for the first time from India. Correlation between the live mines of citrus leaf miner and its parasitoids indicated that *C. ingenuus* is a potent parasitoid for conservation and exploitation in biological control.

Indian Journal of Entomology, 80 Online published, IJE 16088/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00147.5

EVALUATION OF NEW INSECTICIDES AGAINST MAIZE STEM BORER *CHILO PARTELLUS* (SWINHOE)

ASHWINDER K. DHALIWAL*, D.S. BRAR AND JAWALA JINDAL**

Department of Entomology; **Maize Entomology Laboratory

Department of Plant Breeding, Genetics and Biotechnology

Punjab Agricultural University, Ludhiana 141004

*Email: batthscorpion@pau.edu (corresponding author)

ABSTRACT

New molecules were evaluated against maize stem borer, *Chilo partellus* in *kharif* maize under artificial infestation conditions during 2013 and 2014. The foliar application of deltamethrin 2.8 EC @ 200 ml/ ha used as standard check was found to be the most effective. However, soil application of chlorantraniliprole 0.4 GR @ 8, 10 and 12 kg/ ha and foliar application of Dipel @ 750 ml/ ha being at par with each other were found to be moderately effective. The seed treatment of imidacloprid 600 FS was found to be the least effective.

Indian Journal of Entomology, 80 Online published, IJE 16090/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00148.7

COST EFFECTIVE TRAPPING OF FRUIT FLIES IN MANGO

P. D. GHOGHARI*, G. B. KALARIA AND JUGAL KISHOR BANA

Agriculture Experimental Station, Paria, Navsari Agricultural University, Navsari 396145

*Email: pdghoghari@nau.in

ABSTRACT

Field experiments were conducted to evaluate cost effective management strategies against fruit flies in mango during 2009-10 to 2012-13 in south Gujarat. Installing the plastic bottle trap containing wooden block (5x5x1 cm) impregnated with mixture of ethyl alcohol, methyl eugenol and DDVP in ratio of 6:4:1 @ 10 traps/ ha collects maximum number of male fruit flies (22823/ ha); this resulted in lowest fruit fly damage (4.45%) and maximum cost benefit ratio (1:76.17). The glass (wide mouth) bottle trap is the next best containing 0.1% methyl eugenol and 0.1% DDVP followed by the Nauroji traps.

Indian Journal of Entomology, 80 Online published, IJE 16091/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00149.9

ANNOTATED CHECKLIST OF INDIAN RHYNCHOPHORINAE (COLEOPTERA: DRYOPHTHORIDAE)

SINGH, A.K. * AND B. RAMESHA

Department of Agricultural Entomology, Kerala Agricultural University
College of Agriculture, Padannakkad 671314

*Email: arunsingh260@gmail.com

ABSTRACT

A checklist of all the 60 species of Indian Rhynchophorinae distributed under 27 genera is given, out of which 27 species are endemic to India. Detailed synonyms along with taxonomic history, distribution and references are also included.

Indian Journal of Entomology, 80 Online published, IJE 16093/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00150.5

BIOLOGY OF SPOTLESS LADYBIRD BEETLE *CYCLONEDA SANGUINEA* (LIMBIFER) ON TWO SPOTTED SPIDER MITE *TETRANYCHUS URTICAE* (KOCH)

ANUSHA, B.* AND SRINIVAS, M.

A.P. Rice Research Institute and Regional Agricultural Research Station
Maruteru 534122, West Godavari District, Andhra Pradesh

*Email: anu06subha@gmail.com

ABSTRACT

Spider mites are one of the major pests of vegetable, ornamental and fruit crops, causing considerable loss in yield. The two spotted spider mite (TSSM), *Tetranychus urticae* Koch is a common phytophagous mite that feeds on many fruits, vegetables, ornamental plants, and field crops. The experiment revealed that its coccinellid predator *Cycloneda sanguinea* completed its developmental stages i.e., egg, four larval instars, and pupae with a mean of 3.06 ± 0.25 , 5.50 ± 0.66 and 3.20 ± 0.20 days, respectively.

**PATHOGENICITY OF ISOLATES OF
METARHIZIUM ANISOPLIAE TO *DIAPHANIA INDICA* SAUNDERS**

PRAVEENA. A* AND K. SUDHARMA

Department of Agricultural Entomology
College of Agriculture, Vellayani 695522 Thiruvananthapuram

* Email: pravi157@gmail.com (corresponding author)

ABSTRACT

Two indigenous isolates of *Metarhizium anisopliae* (Metschnikoff) Sorokin were isolated from laterite soil in Vellanadu (Southern and Central foot hills), Kerala using *Galleria mellonella* L. as bait. The GenBank accession number assigned for the two isolates SP8 and SP11 were KX171217 and KX171220, respectively. Laboratory studies carried out to assess the pathogenicity of these isolates showed that these were pathogenic to larvae of *Diaphania indica* Saunders and caused 100 and 78.33% mortality, respectively at seven days after treatment. The isolate SP8 was significantly superior, and these isolates could be used as biocontrol agents of *D. indica*.

**EFFICACY OF *CHROMOLAENA ODORATA* LEAF POWDER AND
BEAUVERIA BASSIANA AGAINST STORED GRAIN PESTS**

**SURAJIT KALITA, LAKSHMI KANTA HAZARIKA*
PURNIMA DAS AND KARISHMA DAS**

Department of Entomology, Assam Agricultural University, Jorhat 785013

*Email: lkhazarika@yahoo.com (corresponding author)

ABSTRACT

Toxicity study of *Chromolaena odorata* (L.) King & H. Rob. (Asteraceae) leaf powder @ 25 g/kg along with *Beauveria bassiana* (Bals.) Vuill. (Deuteromycetes) @12.5 g/ kg revealed 100 and 50% adult mortality of *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) and *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae) at 20 days after treatment; *C. odorata* @100 g/ kg gave highest mortality of 29.67% in the 1st instar larvae of *Corcyra cephalonica* (Stainton) (Galleriidae: Lepidoptera) at 20 days after treatment. Thus *C. odorata* leaf powder was found to be having insecticidal and repellency properties.

**BIOCHEMICAL AND ANTIOXIDANT PROPERTIES OF HONEY FROM
TETRAGONULA IRIDIPENNIS (SMITH) OF SOUTHERN KERALA**

K. K. DIVYA^{*}, V. S. AMRITHA, B. APARNA AND S. DEVANESAN

Department of Agricultural Entomology

College of Agriculture, Kerala Agricultural University, Vellayani, Thiruvananthapuram

*Email: divykrishnan350@gmail.com (corresponding author)

ABSTRACT

The biochemical and antioxidant properties of stingless bee honey were analysed at the College of Agriculture, Vellayani during 2013-15, to evaluate the quality parameters hitherto not reported in India. Honey collected from 15 locations each of midland and upland physiographic regions of southern Kerala were subjected to quality analysis. Parameters viz., flavanoids (220.09 mg catechin/ kg), total poly phenols (879.84 mg catechol/ kg), diastase (31.20 Diastase Number- DN), invertase activity (136.15 Invertase Number- IN) and antioxidant content (374.84 uMFe 11/100 g) of the honey samples from upland was statistically superior to midland. The moisture content (20.45%) recorded from midland was significantly higher than the upland.

Indian Journal of Entomology, 80 Online published, IJE 16138/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00166.9

**MANAGEMENT OF COTTON WHITEFLY *BEMISIA TABACI* (GENNADIUS)
(HEMIPTERA: ALEYRODIDAE)**

SWATI MEHRA^{*}, KRISHNA ROLANIA^{} AND MANDEEP RATHEE^{*}**

Department of Entomology, CCS Haryana Agricultural University, Hisar 125 004

*Email: swatimehra7191@gmail.com

ABSTRACT

Schedules incorporated with biorationals and insecticides were evaluated against whitefly, *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae) on Bt cotton hybrid. Four sprays of nimbecidine 300 ppm @ 5ml/l at 10 days interval gave highest benefit cost ratio (0.86). First spray of nimbecidine 300 ppm @ 5ml/l followed by dimethoate 30 EC @ 1.5 ml/l, triazophos 40 EC @ 3 ml/l, novaluron 10 EC @ 1ml/l, nimbecidine 300 ppm @ 5ml/l and triazophos 40 EC @ 3 ml/l at 5 days interval proved the most effective. Maximum yield (20.66 q/ha) was obtained with six sprays of nimbecidine 300 ppm @ 5ml/l at 5 days interval along with yellow sticky traps installed @ 125 Nos/ha. This was observed to be at par with four sprays of nimbecidine at 10 days interval (20.53 q/ha).

The following are short communications, these have no abstracts

Indian Journal of Entomology, 80 Online published, IJE 16031/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00154.2

**REDESCRIPTION AND NEW RECORD OF *BEMISIA PONGAMIAE* TAKAHASHI
(HEMIPTERA: ALEYRODIDAE) FROM INDIA**

**D. VIMALA* AND
R. SUNDARARAJ**

*Southern Regional Centre, Zoological Survey of India, Chennai, Tamil Nadu

**Forest and Wood Protection Division, Institute of Wood Science and Technology, Bangalore

** Email: rsundariwst@gmail.com (corresponding author)

Indian Journal of Entomology, 80 Online published, IJE 16042/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00155.4

**FORAGING BEHAVIOUR AND POLLINATION EFFECT OF
HONEY BEES ON STRAWBERRY**

**S. GOGATE
N. KUMAR* AND
S. RAHMAN**

Department of Entomology,
Assam Agriculture University, Jorhat 785013

* Rajendra Agricultural University, Pusa (Samastipur) 848125
Email: supriyagate21@gmail.com (corresponding author)

Indian Journal of Entomology, 80 Online published, IJE 16046/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00156.6

**EFFICACY OF CERTAIN INSECTICIDES AGAINST
DIAMOND BACK MOTH ON CAULIFLOWER**

SOURAB SHARMA

S.V.S. RAJU AND

D. RAKSHITH ROSHAN*

Department of Entomology and Agriculture Zoology
Banaras Hindu University, Varanasi 221005

*Email: rakshith.devu@gmail.com (corresponding author)

Indian Journal of Entomology, 80 Online published, IJE 16047/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00157.8

**EFFECT OF ZEOLITE DESSICANT ON
PULSE BEETLE *CALLOSOBRUCHUS CHINENSIS* (L.)**

DEVI ELANGBAM BIDYARANI* AND

MAHESWARI T. UMA

Department of Entomology, College of Agriculture
PJTSAU, Rajendranagar, Hyderabad 500030

*Email: bidyaranielangbam@gmail.com

Indian Journal of Entomology, 80 Online published, IJE 16059/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00158.X

**NEW RECORD OF THE LEGUME FEEDING WHITEFLY *TETRALEURODES
ACACIAE* (QUAINTANCE) (HEMIPTERA: ALEYRODIDAE) FROM INDIA**

R. SUNDARARAJ* AND

D. VIMALA**

*Forest and Wood Protection Division, Institute of Wood Science and Technology, Bangalore

**Southern Regional Centre, Zoological Survey of India, Chennai

*Email: rsundariwst@gmail.com

Indian Journal of Entomology, 80 Online published, IJE 16063/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00159.1

**FIRST REPORT OF ALMOND MOTH *CADRA CAUTELLA* AS A CAUSE OF
PREMATURE FRUIT DROP IN TREE BEAN *PARKIA ROXBURGHII* G DON.**

**ARATI NINGOMBAM*
SUSHEEL K. SHARMA
TH. SURJIT SINGH AND
NARENDRA PRAKASH**

ICAR Research Complex for NEH Region
Manipur Centre, Lamphelpat, Imphal 795004
*Email: arati.ning@gmail.com (corresponding author)

Indian Journal of Entomology, 80 Online published, IJE 16064/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00160.8

ESSENTIAL OILS AND THEIR TOXICITY AGAINST *TRIBOLIUM CASTANEUM*

RANJEET KUMAR
Post Graduate Department of Entomology
Bihar Agricultural University, Sabour, Bhagalpur 813210
Email: rkipm06@gmail.com

Indian Journal of Entomology, 80 Online published, IJE 16078/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00161.X

**FIELD EFFICACY OF INSECTICIDES AGAINST
LEAFHOPPER INFESTING OKRA**

**A. Y. DAVADA*
M. V. VEKARIA AND
P. H. RABARI**
Department of Agricultural Entomology, C.P. College of Agriculture
Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar 385506
*Email: adil.davda@gmail.com

Indian Journal of Entomology, 80 Online published, IJE 16082/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00162.1

**MAJOR INSECT PESTS OF GREEN GRAM IN NAGALAND
AND THEIR POPULATION DYNAMICS**

**TOPY NYODU* AND
I.T. ASANGLA JAMIR**
Department of Agricultural Entomology
School of Agricultural Sciences and Rural Development

Medziphema Campus 797106, Nagaland University, Nagaland
*Email: topy.nyodu@yahoo.com

Indian Journal of Entomology, 80 Online published, IJE 16089/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00163.3

**BIOLOGY AND SEASONAL INCIDENCE OF MEXICAN BEETLE
ZYGOGRAMMA BICOLORATA PALLISTER ON PARTHENIUM
IN NEW ALLUVIAL ZONE OF WEST BENGAL**

S. K. SAHOO

Pulses and Oilseeds Research Station, Berhampore 742101, Murshidabad
Email: shyamalsahoo@yahoo.co.in

Indian Journal of Entomology, 80 Online published, IJE 16097/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00164.5

**SEM STUDY OF *BEAUVERIA BASSIANA* INFECTED LARVAE OF
CORCYRA CEPHALONICA (STANTON)**

KARISHMA DAS*

PURNIMA DAS

ABHILISA MUDOI

SHIMANTINI BORKATAKI AND

SOMAR HAZARIKA

Department of Entomology

Assam Agricultural University, Jorhat 785013

*Email: karishmadas17@gmail.com (corresponding author)

Indian Journal of Entomology, 80 Online published, IJE 16099/ April 2018

Article DOI Number : 10.5958/0974-8172.2018.00165.7

DEVELOPMENT OF *CORCYRA CEPHALONICA* ON CEREAL GRAINS

KALE, S.N.*

P. M. TALHA AND

P.C. HALDAVNEKAR

Biocontrol Laboratory, Regional Fruit Research Station

Vengurle, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli

*Email: sameerakl@yahoo.com